

SLÁN²⁰⁰⁷

Survey of Lifestyle, Attitudes and Nutrition in Ireland

Injuries in Ireland:

Findings from national population surveys



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The SLÁN 2007 'Injuries in Ireland' Report is available to download from www.slan07.ie

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EXECUTIVE SUMMARY

INTRODUCTION AND METHODS

This report presents the main findings on self-reported injuries that required medical treatment among Irish adults from the 2007 Survey of Lifestyle, Attitudes and Nutrition (SLÁN 2007) in Ireland. The SLÁN 2007 survey, commissioned by the Department of Health and Children, involved face-to-face interviews in the homes of 10,364 randomly selected adults, aged 18 years and over. There was a 62% response rate to SLÁN 2007. The sample is representative of the general population in Ireland when compared with Census 2006 figures and was further weighted, for the purpose of analysis, to match population characteristics (full details of the survey method are given in the *SLÁN 2007: Main Report* by Morgan *et al*, 2008).

This report on injuries in Ireland also utilises data collected from several other sources, namely: the HBSC 2006 Survey for Ireland (full details in Nic Gabhainn *et al*, 2007); the Irish Injury Data Base (IDB) pilot, data collected by the National Suicide Research Foundation; the Hospital In-Patient Enquiry (HIPE) scheme, data collected by the Economic and Social Research Institute (see www.esri.ie/health_information/hipe/); and mortality data from the Central Statistics Office (see www.cso.ie).

The present study aims:

- to determine self-reported, medically attended injury rates among school children and adults in Ireland;
- to present the circumstances surrounding the occurrence of an injury event;
- to consider the influence of socio-demographic variables on self-reported injury requiring medical attention;
- to explore rates of injuries treated in hospital emergency departments, injuries that required hospitalisation and fatal injuries;
- to consider the policy and practice implications of the study's findings.

Using standard international indicators (Centers for Disease Control, 1994 and 1996; Overpeck *et al*, 2000), SLÁN 2007 respondents were asked a series of questions on the occurrence of injury in the past 12 months, including:

- the number of injuries requiring medical treatment;
- the location, activity and mechanism leading to the injury;
- days of activity loss due to the injury.

This report presents the findings on injuries in Ireland and considers the influence of the key socio-demographic variables of age, gender, social class, education, income, residential location, employment status and marital status.

KEY FINDINGS

- Findings show that 9% of all adults and 43% of all school children reported one or more medically attended injuries in the previous 12 months. Injuries were more prevalent among men and boys, and among those in the age group 12-29 years. Social gradient was only evident among the adult population, with more people from the higher social class category reporting that they were injured and required medical treatment.
- Among adults, self-reported medically attended injuries were more prevalent in urban settings, among non-medical card holders, among those in paid employment and among those with third-level education.
- Of adults reporting an injury requiring medical treatment, 52% reported 3 or more days of lost activity, with no gender or age differences evident. Activity loss due to injury was more common among the middle social classes (SC 3-4), those with lower income, unemployed and medical card holders. Among school children reporting injury, 37% reported a loss of activity due to an injury, with more boys and older children reporting this.
- Among the adult population, the main locations where injuries occurred were in the home, at a sports facility and on the road. The main activities leading to injury were sports or physical activities, work-related injury and injury during work around the house. The main mechanisms leading to injury were falling or tripping, motor vehicle accidents and cuts or abrasions. Among school children, the main locations where injuries occurred were in sport facilities, at home and in school, while the main activities leading to injury were sports or physical activities, walking or running not for sport, and fighting.
- The highest rates of injury were reported in hospital emergency departments, followed by self-reported injury, injury-related hospital discharges and injury mortality. Both self-reported injury and emergency department presentations were highest among young people in the age group 15-34 years. The rates of injury-related hospital discharges and injury-related fatalities were highest among the older population (aged 65 and over).
- The rates of self-reported fall-related injuries were highest among the younger population (18-34 year-olds). However, fall-related injury rates from all sources peaked among the older population of 65+ year-olds. Among the younger population, fall-related injuries were not likely to translate into hospitalisation and fatalities were very rare. Among the older population, fall-related injuries requiring hospitalisation were as common as self-reported fall-related injuries. Falls-related injuries were more common among young men and among older women (aged 55+ years).
- Traffic-related injuries, especially among men, were the leading cause of injury-related mortality. Such injuries were most common among young people (aged 15-34) and much older people, with mortality rates peaking among 15-24 year-olds and 75-84 year-olds.

CONCLUSIONS AND POLICY IMPLICATIONS

- For the first time, SLÁN 2007 provides comprehensive information from a large and representative sample on injuries in the general population in Ireland and on the socio-demographic factors that influence them. The results have a number of implications for national health policy.
- Findings in this report describe the circumstances surrounding injury occurrence, specifying the main activities, locations and mechanisms leading to injury. This information could assist in developing injury prevention efforts targeted at different age groups in the population.
- A two-fold social gradient was identified among the adult population. Injuries requiring medical treatment were more common among the more affluent population, suggesting the possibility for heightened exposure to activities leading to injury (such as sports). Severe injuries, however, were more prevalent among the less well-off, perhaps reflecting a lack of accessibility to care among this group, potentially preventing those who are less well-off from getting the necessary treatment for more minor injuries.
- Exploring the different data sources on injuries only reveals their many limitations and highlights the need for a more consistent, nationally coordinated effort in standardising data collection, which can lead to more focused efforts on injury prevention.
- Despite the shortcomings of existing data, the present report has identified young people and the elderly as 'at risk' groups for injury, and the home and sports facilities as the main locations where injuries occur. Both populations and locations should be addressed in appropriate prevention policies.
- Sports-related injuries require special attention. Increasing levels of physical activity is deemed a national priority in order to combat the obesity epidemic, not just in Ireland but worldwide. However, this should only be done with the provision of safe environments for such activity.
- Evaluating the implementation of existing policies for injury prevention should be a priority in order to gain an understanding of their effectiveness.
- This report calls for more injury-specific research that will inform policy-makers about the priorities for intervention. It also calls for policies that will assist in the prevention of injuries and the promotion of safety.
- Injury prevention is a complex task, requiring one body to be responsible for the coordinated collection of data and the planning and delivery of prevention programmes. Similar efforts have been made in relation to cancer and diseases of the circulatory system. As the third leading cause of death in Ireland today, injury prevention deserves similar attention.

1. INTRODUCTION

This report presents the main findings on self-reported medically attended injuries in Irish adults from the 2007 Survey of Lifestyle, Attitudes and Nutrition (SLÁN 2007) in Ireland, commissioned by the Department of Health and Children. The report is part of a series presenting in-depth findings from the SLÁN 2007 *Main Report* (Morgan *et al*, 2008). For a full list of the SLÁN 2007 reports, see page iv of this report.

The SLÁN 2007 survey involved face-to-face interviews in the homes of 10,364 randomly selected adults, aged 18 years and over, with sub-studies on body size and a detailed physical examination. There was a 62% response rate to the survey. The sample is representative of the general population in Ireland when compared with Census 2006 figures and was further weighted, for the purpose of analysis, to match population characteristics.

SLÁN 2007 is the largest national health survey among the Irish adult population to date and also the largest to study the extent of injuries among the adult population. As part of the main survey, respondents were asked a series of questions on injuries requiring medical attendance (i.e. injuries resulting in medical treatment), on the circumstances surrounding the occurrence of injury events, the mechanism that caused the injury and the severity of the injury.

This report presents the findings from SLÁN 2007 on injuries in Ireland and considers the influence of such key socio-demographic variables as age, gender, social class, education, income, residential location, employment status and marital status.

STUDY RATIONALE

There is limited routinely collected information on injury in Ireland. No data have been collected on injuries that are treated in the community. SLÁN 2007 thus provided a unique opportunity to investigate patterns of injury in the adult population. To achieve a more complete overview of injuries in Ireland, this report also presents data from other sources on:

- injuries in young people (aged 10-17), with data from the 2006 Health Behaviour in School-aged Children (HBSC) Survey in Ireland;
- injury presentations in hospital emergency departments, with data from the Irish Injury Data Base (IDB) pilot;
- injury-related hospital discharges, with data from the Hospital In-Patient Enquiry (HIPE) scheme;
- injury-related mortality, with data from the Central Statistics Office.

BACKGROUND

Injuries are the leading cause of death and disability among young people across the world and one of the leading causes of death across all age groups, with more than 5 million deaths globally every year. In the World Health Organization (WHO) European Region, injuries kill 800,000 people annually, accounting for 8% of all deaths in Europe (Sethi *et al*, 2006; WHO, 2006a). In the 27 EU Member States, injuries represent the 4th leading cause of death, following cardiovascular diseases, cancer and diseases of the respiratory system (Angermann *et al*, 2007). In Ireland, there are an estimated 1,500 fatalities each year from unintentional injuries (or accidents), making injuries the 3rd leading cause of death in the country (Scallan

et al, 2001). Globally, injuries are the leading cause of death in people under the age of 45, accounting for 36% of deaths in children under 15 years (WHO, 2006a), and 23% of deaths among those under 19 years (Valent *et al*, 2004).

Not all injuries result in death. It is estimated that for every injury-related death, injuries are responsible for 30 people attending hospital and 300 others attending emergency departments for outpatient treatment (Sethi *et al*, 2006; WHO, 2006a). Injuries that do not result in death may have short- or long-term effects on the health of the injured person, including ongoing disability for many. In order to assess the total burden to society beyond the immediate cost of treatment, the World Bank and the WHO have developed a measure of the impact of disease. Called the Disability-Adjusted Life-Year (DALY), it is a summary measure that combines the impact of illness, disability and mortality on population health. The DALY combines the amount of time lived with disability and the amount of time lost due to premature mortality, using actual data and estimates of illness and death in a population. One DALY equals one lost year of healthy life (Murray *et al*, 2002). In the WHO European Region, injuries account for 14% of overall DALYs in the general population (Sethi *et al*, 2006) and 19% among 0-19 year-olds (Valent *et al*, 2004). Data on injury-related disability are not collected in Ireland (Scallan *et al*, 2001), but according to estimates, there were 19.6 DALYs per 1,000 persons in 1999 (Polinder *et al*, 2007).

PREVALENCE OF INJURIES IN IRELAND

Injuries are a major public health problem in Ireland, although only limited information is routinely collected. Scallan *et al* (2001), in their report *Injury in Ireland*, reviewed the significant weaknesses and limitations in the data being collected at present (mortality and hospital discharge data). Many existing mortality records do not include standard International Classification of Disease codes describing external causes of injury, which limits understanding of the circumstances surrounding injury fatalities. Hospital discharge data, based on the Hospital In-Patient Enquiry (HIPE) scheme, is also lacking basic information. Only 40% of records include information describing location of injury occurrence.

Yet, based on analysis of data covering 17 years, it is clear that unintentional injuries are the leading cause of death among young people in Ireland, causing 44% of deaths in 5-14 year-olds and 70% of deaths in 15-24 year-olds (Laffoy *et al*, 1995; Scallan *et al*, 2001; Boland *et al*, 2005). Over the same period, unintentional injuries were also responsible for 9% of all hospital admissions (Scallan *et al*, 2004). When comparing intentional and unintentional injuries, unintentional injuries are responsible for 73% of all injury deaths and 64% of all injury-related hospital admissions. The majority of unintentional injury deaths and admissions are found among rural residents (Boland *et al*, 2005). In relation to the burden of injury in Ireland, unintentional and intentional injuries are the 5th and 6th leading causes of DALYs in men, whereas unintentional injury is the 7th leading cause of DALYs among women (WHO, 2006b).

The profile of fatal injuries is different to that of non-fatal injuries. Scallan *et al* (2004) explored the relationship between injury mortality and morbidity based on 1980-1996 data from the Central Statistics Office and 1993-1997 data from the Hospital In-Patient Enquiry (HIPE) scheme. Their findings highlight the differences in the causes of injury deaths and injury discharges: the leading cause of injury deaths was due to motor vehicle traffic accidents and the leading cause for hospitalisation was due to falls. This emphasises the need for more than one source of information on injury.

RISK FACTORS FOR INJURIES

Injuries are not equally distributed in society. Injury is more common in low-and middle-income countries. People in these countries are 4 times more likely to die of injury compared to people in high-income countries (WHO, 2006a). Regardless of a country's wealth, children, men, older people and poorer people have a higher risk for injury-related death. Socio-economically deprived children are 3-4 times more at risk of injury than children from better-off families (WHO, 2006a). Alcohol and drugs are risk factors for all intentional and unintentional injuries. Between 40% and 60% of all injury deaths are attributed to alcohol consumption (Sethi *et al*, 2006). There are also more specific risk factors for different types of injury. For example, the main risks for road traffic injuries are speed, alcohol, dangerous roads, poor visibility and not using protective equipment, such as a driver's seat belt or a cyclist's helmet (Sethi *et al*, 2006).

INJURY PREVENTION

Injuries have traditionally been regarded as random, unavoidable 'accidents' or 'mishaps'. However, in the last few decades, attitudes have changed due to new knowledge. Nowadays, injuries, both intentional and unintentional, are regarded as largely preventable (Peden *et al*, 2002). More recently, it has been estimated that 2 out of every 3 deaths and most non-fatal injuries can be prevented (Sethi *et al*, 2006; WHO, 2006a).

Injury prevention should be acknowledged as a society's responsibility rather than an individual's responsibility. Interventions that save lives are very good value for money: they can help reduce a country's annual cost for both fatal and non-fatal injuries. For example, each €1 spent on smoke alarms can yield a €69 saving; each €1 spent on child safety seats can yield a €32 saving (WHO, 2006a). Furthermore, over the last 20 years, countries have halved injury death rates in the WHO European Region, which shows that injuries can be prevented by public health action (UNICEF, 2001).

The present report, arising from the SLÁN 2007 survey, presents data from various sources. Aiming to draw as complete a picture as possible, the report utilises data from SLÁN 2007 (Morgan *et al*, 2008) and the 2006 Health Behaviour in School-aged Children (HBSC) Survey in Ireland (Nic Gabhainn *et al*, 2007) to present data on self-reported injury in the community (i.e. not from medical settings). Data from other sources include the pilot of the Irish Injury Data Base (IDB) on injury presentations in emergency departments; the Hospital In-Patient Enquiry (HIPE) scheme to present data on injury resulting in hospitalisation; and mortality data from the Central Statistics Office to present fatal injuries.

2. METHODOLOGY

SLÁN 2007: POPULATION AND SAMPLING

The sampling frame used for SLÁN 2007 was the GeoDirectory. This is a list of all addresses in the Republic of Ireland, compiled by An Post, which distinguishes between residential and commercial establishments. It does not include names of individuals; rather, it is a list of addresses. The residential list was used for the SLÁN 2007 survey. Further details on the sampling and weighting of data are provided in the *SLÁN 2007: Main Report* (Morgan *et al*, 2008).

SLÁN 2007 consisted of three distinct components: face-to-face interviews with 10,364 adults; measurement of body mass index (BMI) and waist circumference of a sub-sample (967) aged 18-44; and physical examination of a sub-sample (1,207) aged 45 and over. Information on injuries was collected at the time of the survey's main face-to-face interviews. The overall response rate was 62%.

MEASURES

Injury

SLÁN 2007 respondents were asked 5 questions about injuries (see *Appendix 1*):

- a general question on the number of times in the past 12 months a person had been injured and required medical treatment as a result;
- a question on the number of days of activity lost in the past 12 months due to the most severe injury received;
- a question on where the injury happened;
- a question on the activity being performed when the injury occurred;
- a question on the mechanism or cause of the injury.

When respondents reported more than one injury event, they were asked to describe in their following answers *the most severe injury* received.

The two first questions were taken from population health surveys developed by the Centers for Disease Control and Prevention (1994 and 1996) and Overpeck *et al* (1997). The other three questions were based on the ICD-9 external codes and on the International Classification of External Causes on Injury (ICECI) classification system (Overpeck *et al*, 2000).

For the purpose of analysis, questions were dichotomised as 'injured once or more in the past 12 months' *versus* 'was not injured'; and 'missed 3 or more days of activity' *versus* 'missed less than 3 days of activity'.

Data on self-inflicted injuries were reported in the *SLÁN 2007: Mental Health and Social Well-being Report* (Barry *et al*, 2009).

Socio-demographic variables

SLÁN 2007 respondents were measured on 9 socio-demographic variables, including gender.

Age groups: Respondents were asked their age in years. For the purpose of analysis, all responses were split into 4 age groups – 18-29 years; 30-44 years; 45-64 years; and 65+ years.

Social class: Household social class was constructed for each respondent. There are 4 social class (SC) categories based on present or last occupation: SC 1-2 (professional and managerial); SC 3-4 (non-manual and skilled manual); SC 5-6 (semi-skilled and unskilled); and 'unclassified' (mainly those who never worked or where information on occupation was not provided).

Education: Respondents were asked about their highest level of educational attainment. For the purpose of analysis, responses were split into 3 groups: (1) Primary ('Some primary (not complete)' and 'Primary or equivalent'); (2) Post-primary ('Intermediate/Junior/Group Certificate or equivalent' and 'Leaving Certificate or equivalent'); and (3) Third-level ('Primary degree' and 'Postgraduate/Higher degree').

Residential location: Respondents were asked where their household was situated. For the purpose of analysis, responses were dichotomised into 2 groups: (1) Rural ('In open country' and 'In a village'); and (2) Urban ('In a town (1,500+)', 'In a city (other than Dublin)' and 'In Dublin').

Medical card status: A General Medical Services (GMS) medical card issued by the Health Service Executive enables a bearer to receive a range of free health services. All recipients of the card either undergo a means-test (an income assessment to determine if income is below a set threshold for free care eligibility) or are already receiving a means-tested payment, such as social welfare or a Government pension. A full medical card entitles the bearer to free General Practitioner (GP) services; prescribed drugs and medicines (with some exceptions); in-patient public hospital services; out-patient services; dental, optical and aural services; medical appliances; and maternity and infant care services. A GP-only medical ('visit') card only allows free GP visits. In SLÁN 2007, respondents were asked whether or not they had a medical card. For the purpose of analysis, responses were dichotomised into 2 groups: (1) Has medical card ('Yes – Full Medical Card' and 'Yes – GP-only Medical Card'); and (2) No medical card ('No').

Income (equivalised household): Respondents were asked to provide information about their approximate net household income, as well as the number and age group of individuals (children and adults) living in their household. The equivalised household income is calculated from the above figures using the national equivalence scale (Callan *et al*, 1996; Central Statistics Office, 2007). The equivalised household income adjusts for household size such that the needs of the composition of households are taken into account. The national equivalence scale used here attributes a weight of 1 to the first adult, 0.66 to each subsequent adult and 0.33 to each child (for equivalence purposes, children are those under the age of 14). For analysis purposes, the equivalised income is split into quintiles, from the highest income quintile to the lowest.

Marital status: Respondents were asked to report their current marital status. Following convention, the 6 survey response options were collapsed into 4 for the purpose of analysis: (1) Single (never married); (2) Married or cohabiting; (3) Separated or divorced; and (4) Widowed.

Employment: Respondents were asked to select one of 10 categories that best described their usual situation with regard to work. For the purpose of analysis, answers were dichotomised into: (1) in paid employment (including employee, self-employed outside farming, farmer); and (2) not in paid employment (including student full-time, on State training scheme (e.g. FÁS), not in paid employment but actively looking for a job, long-term sickness or disability, home duties/looking after the home of family, and retired).

HBSC 2006: POPULATION AND SAMPLING

MEASURES

Injury

The Health Behaviour in School-aged Children (HBSC) Survey is a WHO (European) cross-national collaborative study. Principal investigators from all participating countries cooperate in relation to survey content, methods and timing, and international protocol development (Currie *et al*, 2008). Strict adherence to the protocol is required for inclusion in the international database. Data for the HBSC survey are collected every 4 years.

The HBSC survey is based on a self-administered questionnaire that is completed by school children in their classrooms. The Irish HBSC 2006 used a cluster sample of classes nested within schools, stratified by geographical regions in order to obtain a nationally representative sample. In HBSC 2006, 10,334 school children aged 10-17 were sampled from 215 schools in Ireland, with a response rate of 63% of invited schools and 83% of invited pupils (Nic Gabhainn *et al*, 2007).

HBSC 2006 respondents were asked 4 questions about injuries, similar to those in SLÁN 2007 (see Appendix 2):

- a general question on the number of times in the past 12 months a person had been injured and required medical treatment as a result;
- a question on the number of days of activity lost in the past 12 months due to the most severe injury received;
- a question on where the injury happened;
- a question on the activity being performed when the injury occurred.

The first two questions were taken from population health surveys developed by the Centers for Disease Control and Prevention (1994 and 1996) and Overpeck *et al* (1997). The other two questions were based on a study of the circumstances of adolescents' lives (Scheidt *et al*, 1995) and ICD-9 external codes (Centers for Disease Control and Prevention, 1994).

The cut-off points to define injury occurrence and severity for the HBSC data are similar to those applied to the SLÁN 2007 data.

Socio-demographic variables

HBSC 2006 respondents were measured on 3 socio-demographic variables, including gender.

Social class: Young people were asked about their parents' occupations. For each respondent, social class was constructed based on father's occupation; in the absence of such, mother's occupation was used. There are 3 social class (SC) categories: SC 1-2 (professional and managerial); SC 3-4 (non-manual and skilled manual); and SC 5-6 (semi-skilled and unskilled).

Rural/Urban: Young people were asked about the setting in which they lived – in a city or town, a village or the country. For the purpose of analysis, responses were dichotomised into 2 groups: (1) Rural ('village' or 'country'); and (2) Urban ('town' or 'city').

ANALYSIS OF INJURY DATA

Three levels of analysis are employed in this report: univariate, bivariate and multivariate. Univariate statistics (means and percentages) are calculated for each variable. Bivariate analysis (one-way ANOVA and chi-squared test) are used to highlight differences by individual demographic variables in variable means or proportions. Multivariate analyses (linear and logistic regression) are used to identify possible socio-demographic determinants of different injury outcomes and also to build a better understanding of the aetiology of these outcomes.

3. INJURIES IN IRELAND – SLÁN 2007 RESULTS

Table 1 presents the socio-demographic distribution of the SLÁN 2007 sample.

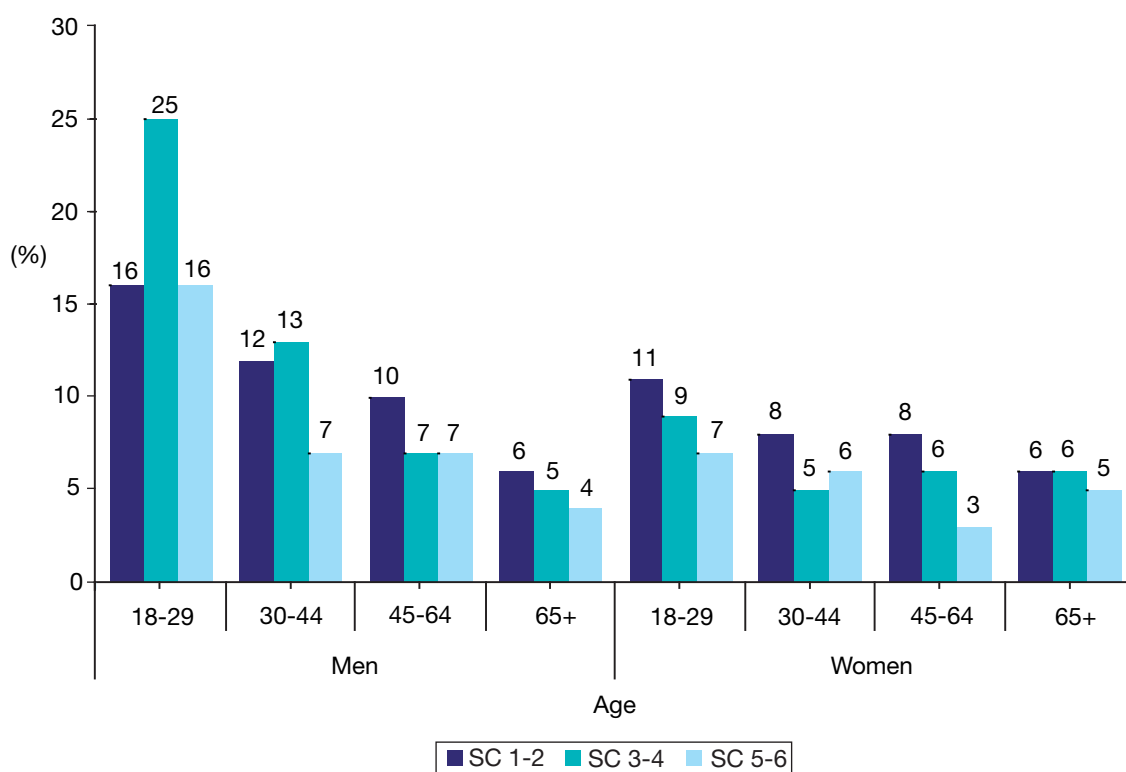
Table 1: Weighted percentages of socio-demographic characteristics of SLÁN 2007 respondents (N = 10,364)

| SOCIO-DEMOGRAPHIC CHARACTERISTIC | % | SOCIO-DEMOGRAPHIC CHARACTERISTIC | % |
|---------------------------------------|----|--|----|
| Gender | | Age group (years) | |
| Men | 50 | 18-29 | 25 |
| Women | 50 | 30-44 | 31 |
| Social class | | 45-64 | 29 |
| SC 1-2 (Upper) | 31 | 65+ | 15 |
| SC 3-4 (Middle) | 38 | Education | |
| SC 5-6 (Lower) | 16 | Primary | 20 |
| Unclassified | 15 | Post-primary | 44 |
| Residential location | | Third-level | 36 |
| In open country (rural) | 31 | Medical card and insurance | |
| In a village (rural) | 10 | Has a medical card | 33 |
| In a town (1,500+) (urban) | 23 | Has private insurance | 41 |
| In a city (other than Dublin) (urban) | 11 | Medical card and insurance | 8 |
| In Dublin City or County (urban) | 25 | No medical card and no insurance | 26 |
| Household income | | Working situation | |
| Under €10,000 | 4 | Employee, including apprenticeship or community employment | 49 |
| €10,000 – €19,000 | 15 | Self-employed | 8 |
| €20,000 – €29,999 | 17 | Farmer | 3 |
| €30,000 – €39,999 | 17 | Student full-time | 6 |
| €40,000 – €49,999 | 17 | On State training scheme | 1 |
| €50,000 or more | 30 | Not in paid employment, actively looking for a job | 4 |
| Marital status | | Long-term sickness or disability | 3 |
| Single | 36 | Home duties, looking after the home | 16 |
| Cohabiting | 6 | Retired | 9 |
| Married | 48 | Other | 1 |
| Separated | 3 | | |
| Divorced | 2 | | |
| Widowed | 7 | | |

MEDICALLY ATTENDED INJURY

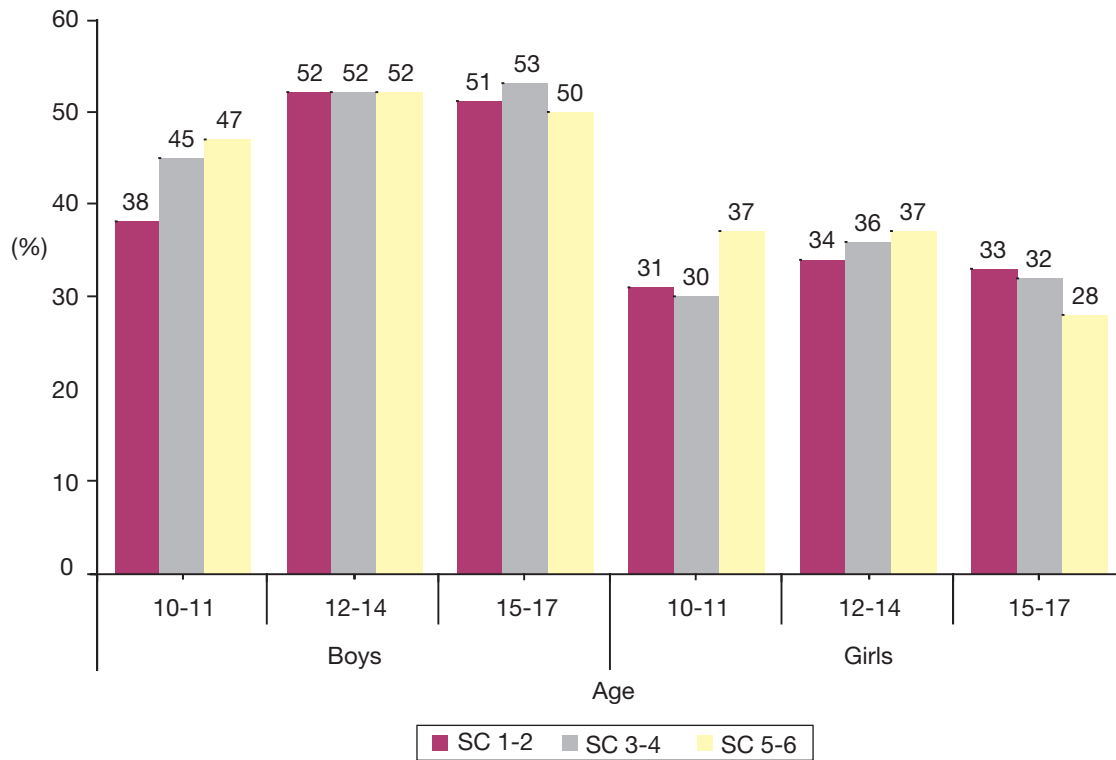
Adult respondents were asked about injuries that lead to medical treatment. Overall, 9% reported one or more such injuries in the previous 12 months (11% men and 7% women; $p < 0.001$) (see Figure 1). Medically attended injuries were more common among younger respondents (age 18-29: 14%; 30-44: 9%; 45-64: 7%; 65+: 5%; $p < 0.001$). Respondents in social class SC 5-6 were less likely to report an injury (SC 1-2: 10%; SC 3-4: 10%; SC 5-6: 7%; $p < 0.05$).

Figure 1: SLÁN 2007: Percentage of adults who reported one or more injuries in the previous 12 months, by gender, age and social class



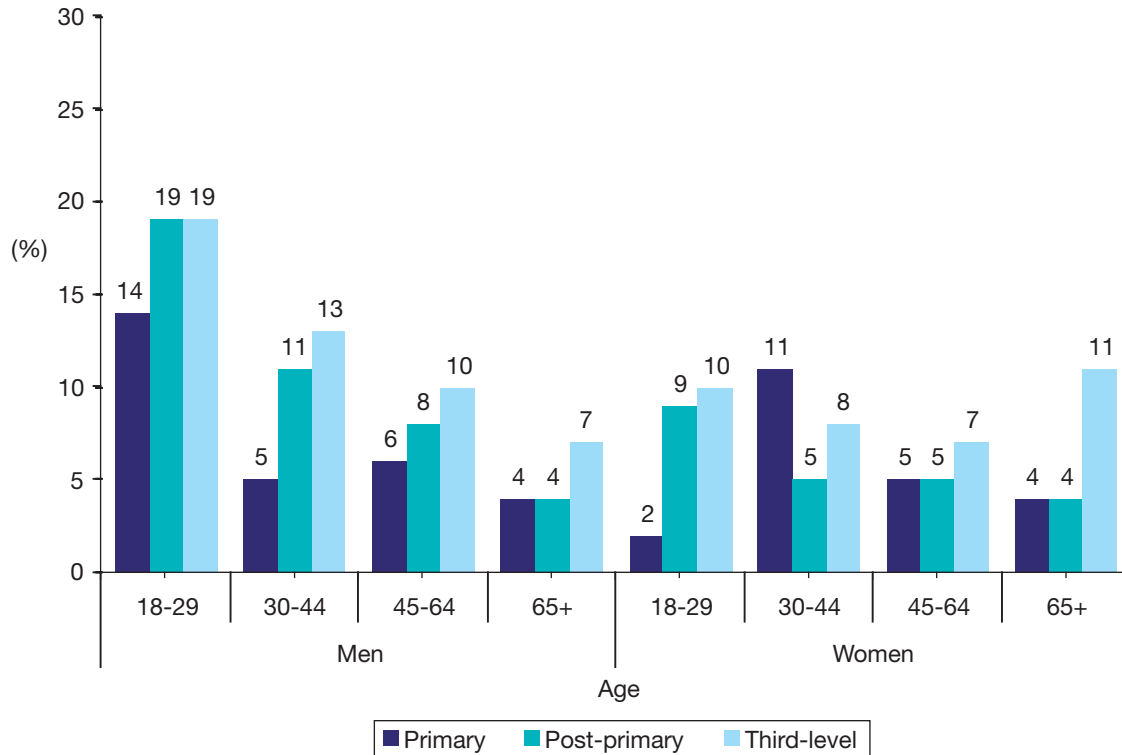
Among adolescents participating in HBSC 2006, 43% reported a medically attended injury in the past 12 months (51% boys and 34% girls; $p < 0.001$) (see Figure 2). Injuries were slightly less prevalent among younger children (age 10-11: 27%; 12-14: 45%; 15-17: 42%; $p < 0.001$). No social class gradient was evident (SC 1-2: 42%; SC 3-4: 43%; SC 5-6: 42%).

Figure 2: HBSC 2006: Percentage of adolescents who reported one or more injuries in the previous 12 months, by gender, age and social class



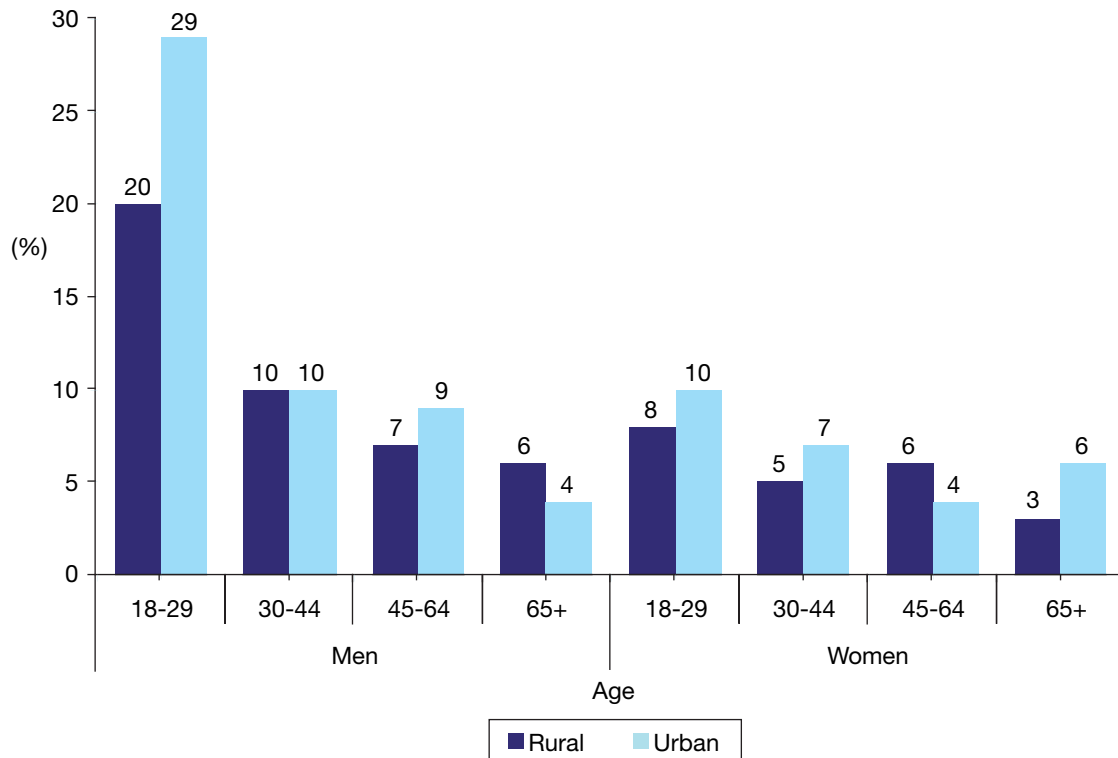
Among adults, there was a clear education gradient in self-reported injuries that required medical treatment (see Figure 3): 5% of those with primary education reported at least one medically attended injury in the previous 12 months, compared to 9% of those with post-primary education and 11% of those with third-level education ($p < 0.001$). The relatively higher percentage of reported injuries among older women with third-level education could be attributed to the overall small number of women in this group.

Figure 3: SLÁN 2007: Percentage of adults who reported one or more medically attended injuries in the previous 12 months, by gender, age and level of education



Residential location was also associated with injuries (see Figure 4): 8% of those living in rural areas reported at least one medically attended injury in the previous 12 months, compared to 10% of those living in urban areas ($p < 0.001$). This pattern was not found among adolescents (42% urban and 43% rural).

Figure 4: SLÁN 2007: Percentage of adults who reported one or more medically attended injuries in the previous 12 months, by gender, age and residential location



Having a medical card was found to be associated with injuries, with 8% of medical card holders reporting an injury in the past 12 months, compared to 10% of non-holders ($p < 0.05$).

Income was associated with self-reported medically attended injury, although there was no clear pattern (lowest income: 9%; 2nd: 7%; 3rd: 9%; 4th: 9%; highest income: 11%; $p < 0.01$). Medically attended injury was also found to be associated with marital status: single people were more likely to report an injury compared to all other groups (single: 13%; married/cohabiting: 7%; divorced/separated: 8%; widowed: 5%; $p < 0.001$). In addition, people in paid employment were more likely than those not in paid employment to report an injury (10% compared to 7%; $p < 0.001$).

Analysis indicates that men are 1.8 times more likely than women to report an injury ($p < 0.001$) and younger people are 2.6 times more likely than others to report an injury ($p < 0.001$). Reported injuries were less prevalent among lower social classes compared to SC 1-2 (OR 0.7, $p < 0.01$ for SC 5-6) and more prevalent among respondents with higher levels of education compared to people with primary education (OR 1.5, $p < 0.05$ for third-level education). This could possibly suggest that people who are more affluent and with a higher education could be more exposed to sports or other activities that may involve a risk of injury and/or are more likely to seek medical attention for their injuries.

ACTIVITY LOST THROUGH INJURY

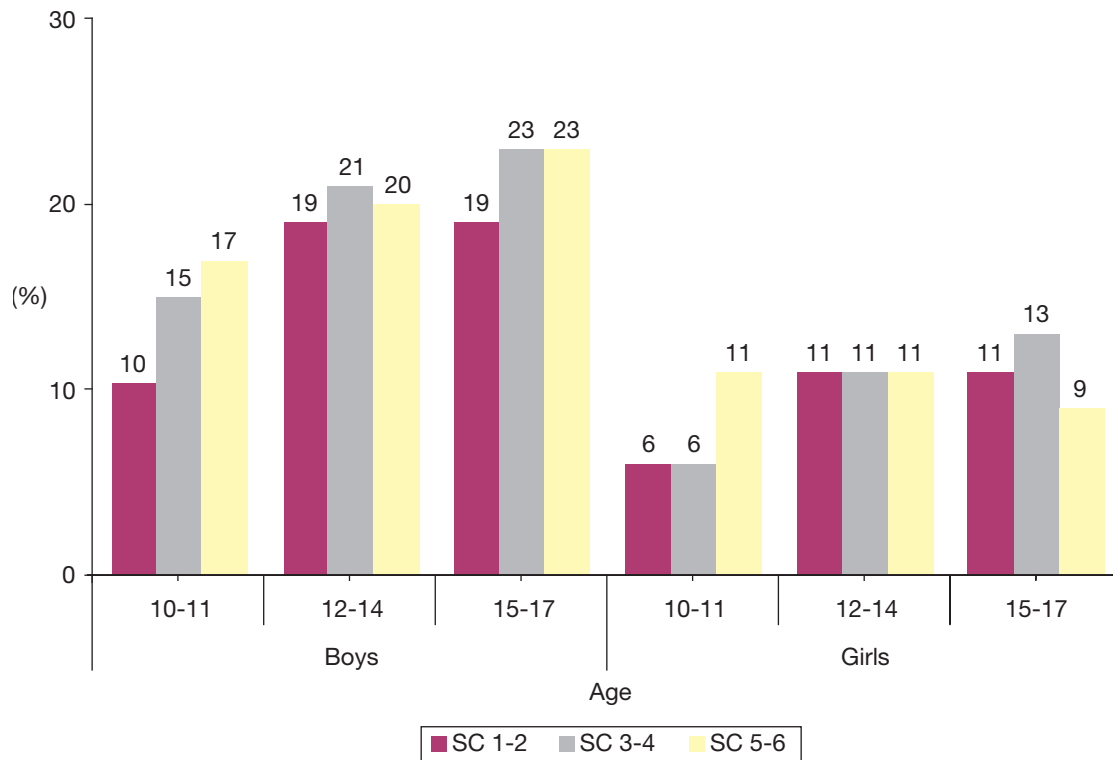
Loss of work or any other daily activity was used as an indicator of injury severity. While people may seek medical care for relatively minor injuries, injuries that result in the loss of 3 or more days of activity are deemed more serious medically, with a higher impact on the economic burden of injury for individuals and society at large. Overall, 4% of SLÁN 2007 respondents reported that their most serious injury in the past 12 months had resulted in the loss of 3 or more days of activity. This represents 52% of those injured, suggesting that 1 in 2 medically attended injuries is a severe injury. No significant differences were evident in relation to age (age 18-29: 50%; 30-44: 47%; 45-64: 57%; 65+: 52%) or gender (50% men and 51% women). Social class differences were evident, but without a clear trend (SC 1-2: 42%; SC 3-4: 57%; SC 5-6: 50%; $p < 0.001$).

Income was significantly associated with injuries resulting in activity loss, but here too, no clear trend was evident (lowest income: 59%; 2nd: 68%; 3rd: 55%; 4th: 38%; highest income: 46%; $p < 0.001$). The occurrence of injuries resulting in activity loss was found to be associated with employment: people in paid employment were less likely than those not in paid employment to report such injury (47% compared to 59%; $p < 0.01$).

There was a clear education gradient for days of activity lost due to injury, with 61% of those with primary education reporting at least 3 days of activity loss, compared to 57% of those with post-primary education and 42% of those with third-level education ($p < 0.001$). No significant differences were found in activity loss by residential location (54% rural and 50% urban). However, clear differences in relation to medical card access were apparent, with 48% of those without a medical card reporting 3 or more days of activity loss due to injury compared to 59% of medical card holders ($p < 0.05$).

Among adolescents, 11% of HBSC 2006 respondents reported that their most serious injury in the past 12 months had resulted in 3 or more days of activity loss (see *Figure 5*). This represents 37% of those injured, suggesting that about 1 in 3 medically attended injuries is a severe injury. More boys reported a severe injury compared to girls (39% boys and 34% girls; $p < 0.01$) and injuries resulting in activity loss were more common among older school children (age 10-11: 27%; 12-14: 37%; 15-17: 41%; $p < 0.001$). There was no statistically significant evidence of social class differences (SC 1-2: 35%; SC 3-4: 39%; SC 5-6: 37%) or of residential location differences (38% in both rural and urban).

Figure 5: HBSC 2006: Percentage of adolescents who reported missing 3 or more days of activity due to injury, by gender, age and social class



CIRCUMSTANCES OF INJURY

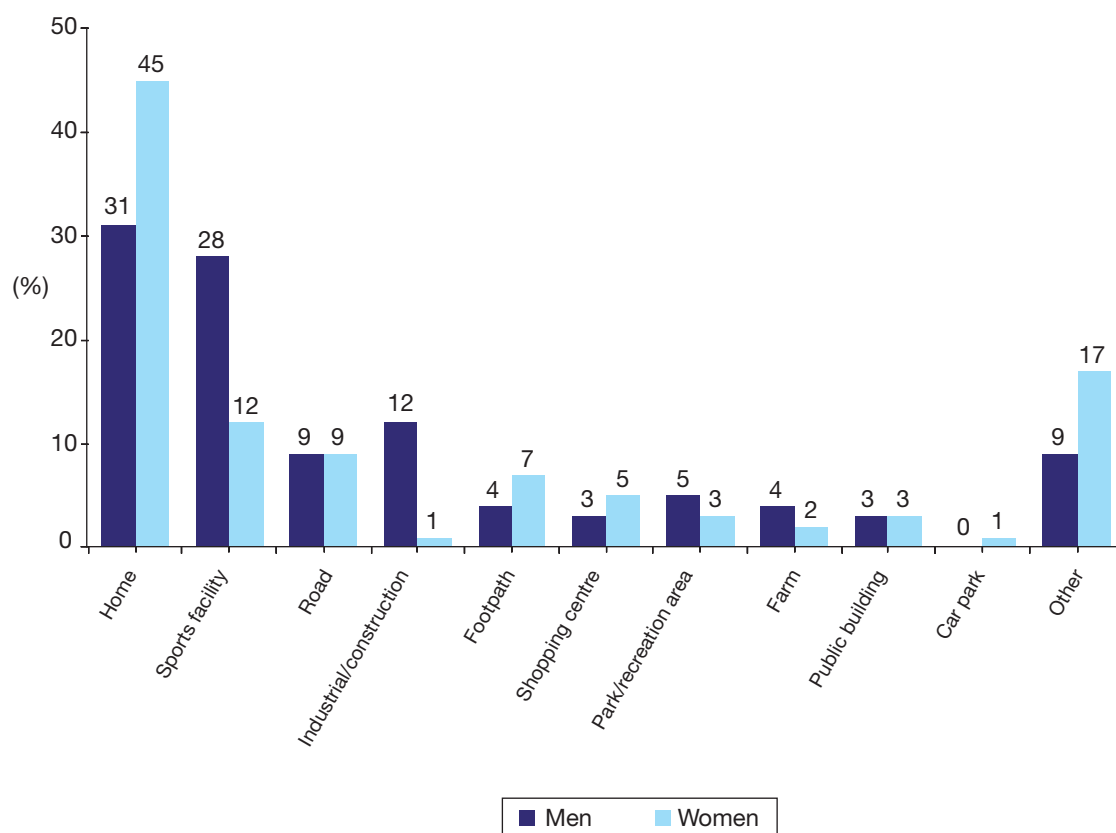
In the field of injury prevention, important elements in understanding an injury event and planning interventions are the circumstances in which an injury occurs – i.e. where the injury happened, during what activity it happened and what caused it.

Injury locations

Among the adult population, the most common locations¹ in which medically attended injuries occurred were at home (37%), in a sports facility (22%) and on the road (9%) (see Figure 6). There were clear gender differences in injury locations, with more women injured at home and on footpaths, and more men injured in sports facilities and on industrial/construction sites. Of those reporting an injury, 12% chose 'other' injury locations than those in the pre-specified list (see footnote) as their answer, but the vast majority did not specify the location.

¹ From a pre-specified list, including home (inside); home (outside); farm; industrial/construction area; other public area; shopping centre or other trade and service area; road or motorway; footpath; car park; sports centre/facility; park/recreation area; river/lake/ocean/stream.

Figure 6: SLÁN 2007: Injury locations of adults reporting an injury, by gender

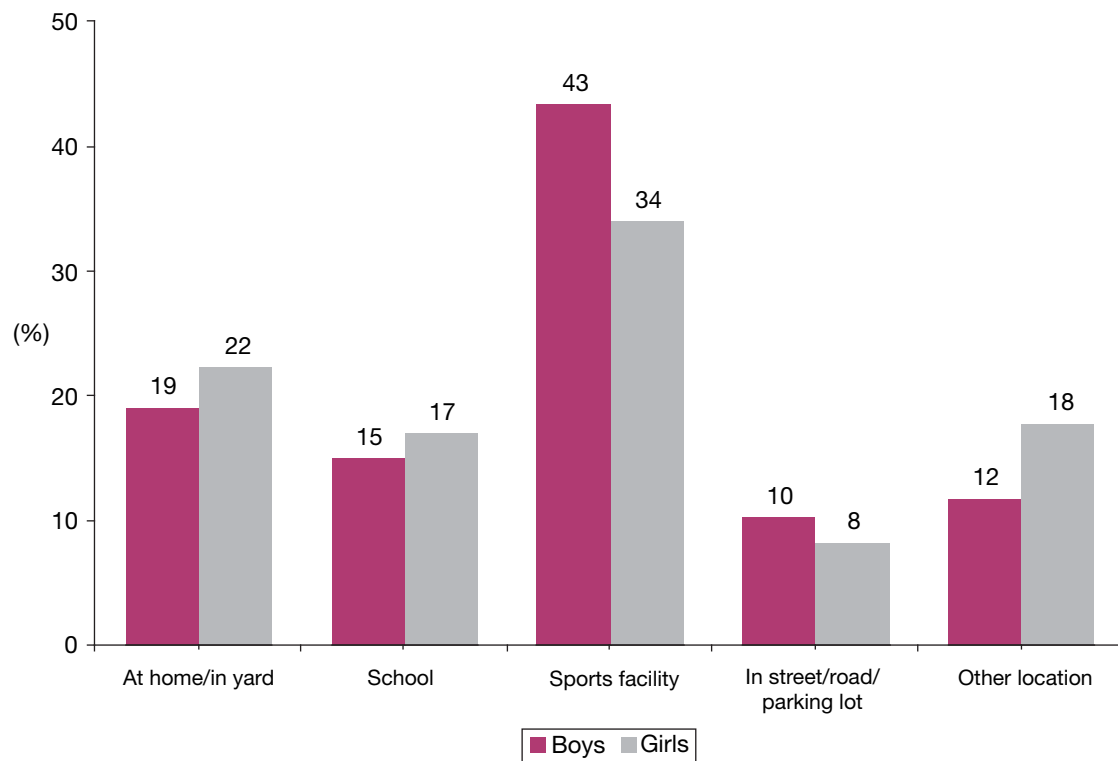


Among adolescents, the most common locations² in which medically attended injuries occurred were at sport facilities (40%), at home or in the yard (20%) and in school (15%) (see Figure 7). There were clear gender differences in injury locations, with more boys injured in a sports facility than girls (43% boys and 34% girls; $p < 0.01$). Of those reporting an injury, 14% chose 'other' injury locations as their answer, with more girls than boys choosing this response category (18% compared to 12%).

It is important to note that the pre-specified lists of injury locations used in the SLÁN 2007 and HBSC 2006 surveys were different (compare footnotes 1 and 2).

² From a pre-specified list, including at home/in yard; school, including school grounds, during school hours; school, including school grounds, after school hours; at a sports facility or field; in the street/road/parking lot.

Figure 7: HBSC 2006: Injury locations of adolescents reporting an injury, by gender

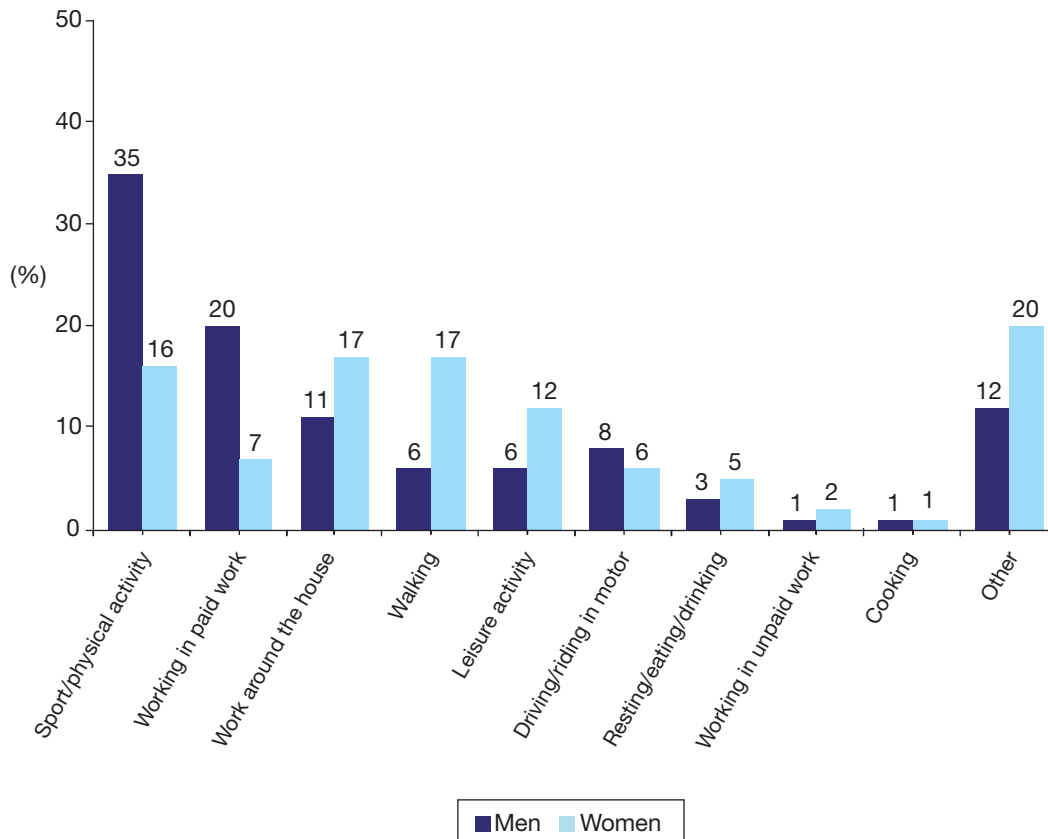


Injury activities

Among adults, the most common activities³ during which a medically attended injury occurred were in sport/physical activity (28%), a work-related injury (15%) and injury during work around the house (13%) (see *Figure 8*). Gender differences were evident here: more men than women were injured during sport/physical activity and during work in paid employment, whereas more women than men were injured while working around the house or while walking or during leisure activity (excluding sport). Of those reporting an injury, 16% reported 'other' activities (i.e. not in the pre-specified list provided, see *footnote*).

³ From a pre-specified list, including driving or riding a motor vehicle; working in paid work; working around the house or yard; working in unpaid work; sport or physical activity; leisure activity (excluding sport); resting, eating or drinking; cooking; walking (as a pedestrian).

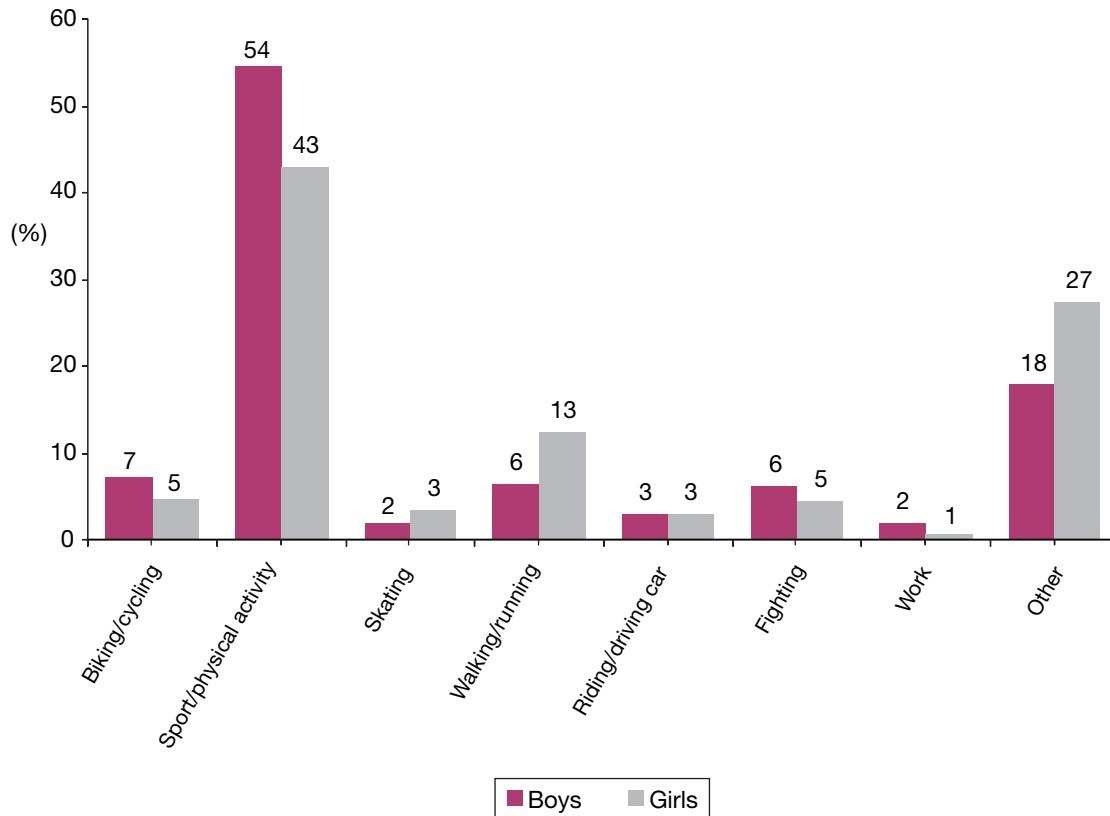
Figure 8: SLÁN 2007: Among adults reporting an injury, activity during which the injury occurred, by gender



Sport/physical activity (50%) was the most common activity⁴ during which adolescents suffered injuries, followed by walking or running not for sport (9%) and fighting (6%) (see Figure 9). Of those reporting a medically attended injury, 27% reported activities during which they were injured 'other' than those on the pre-specified list (see footnote), with more girls than boys choosing this response category (27% compared to 18%).

⁴ From a pre-specified list, including biking/cycling; playing or training for sports/recreational activity; skating; walking/running (not for a sports team or exercise); riding/driving in a car or other motor vehicle; fighting; paid or unpaid work.

Figure 9: HBSC 2006: Among adolescents reporting an injury, activity during which the injury occurred, by gender

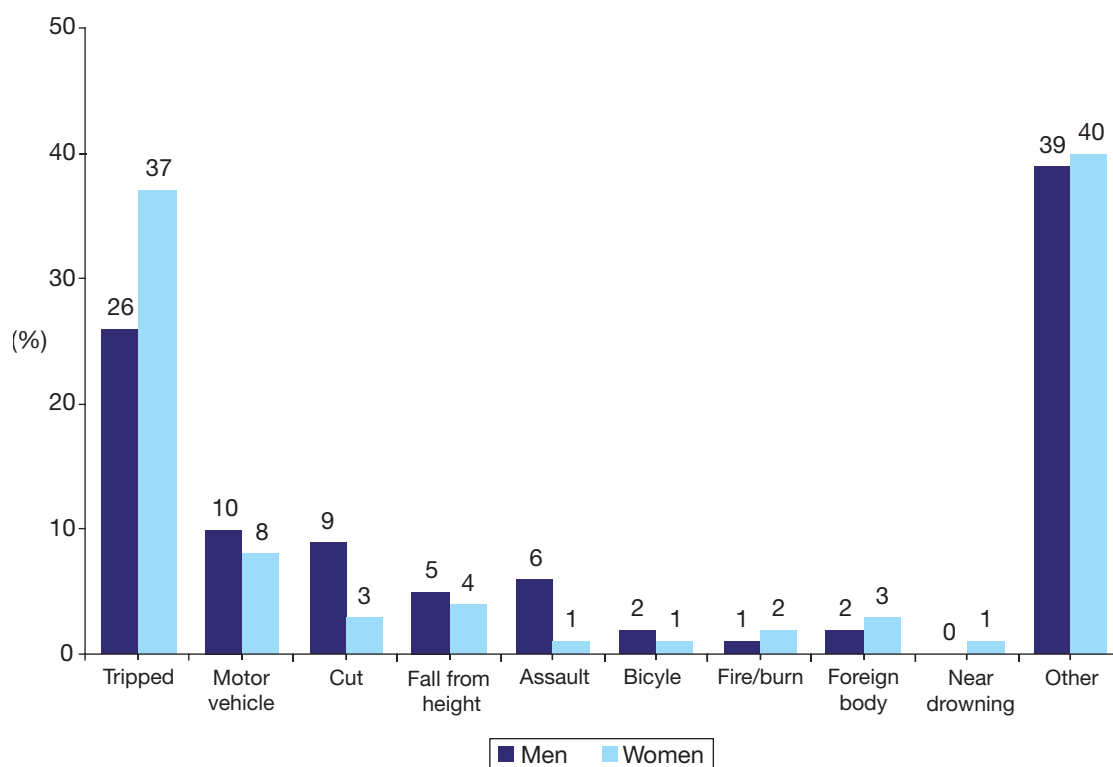


Injury mechanisms

Lastly, among adults, mechanisms or causes leading to a medically attended injury were examined.⁵ Most injuries occurred due to falling or tripping (30%), motor vehicle accidents (9%) and cuts (7%) (see Figure 10). The majority of injury events, however, were not categorised according to the mechanisms in the pre-specified list (see footnote), with 39% choosing 'other' as their answer. Of those specifying the injury mechanism in their own words (fewer than 4%), the majority reported injury due to slips, falls or lifting. When looking at gender differences, more women than men reported that the mechanism of the injury event was tripping, while more men than women reported a cut or an assault. This question was not asked in the HBSC 2006 survey of school children.

⁵ From a pre-specified list, including motor vehicle; pedestrian-vehicle crash; motorcycle; bicycle; fall from height; fall-tripped; gunshot, firearm-related; cut/pierce/stab; punch or other assault; fire/burn; smoke inhalation; poisoning; near drowning/submersion; foreign body (e.g. dog/insect bite).

Figure 10: SLÁN 2007: Injury mechanisms of adults reporting injury events, by gender



INJURY RATES

An alternative way of presenting injury data is to describe rates of injury. Injury rates estimate the number of people (per 100,000) that were injured during a certain time period, adding to the understanding of the burden of injury in society.

For the purpose of this section, 4 data sources are used to estimate injury rates:

- **2007 self-reported injury data from SLÁN 2007 among the general adult population** (i.e. not in a medical setting). SLÁN 2007 data were weighted to produce population estimates.
- **2005 data from the Injury Data Base (IDB)**. The IDB pilot, run by the National Suicide Research Foundation, took place in the emergency departments of 3 hospitals in Cork. Data were collected over a 6-month period in 2005, with a sampling strategy of data recorded every 8 days to present all the days of the week. Data collected were adjusted to compensate for the sampling procedure and were then extrapolated to give national estimates.
- **2006 HIPE data**. The Hospital In-Patient Enquiry (HIPE) scheme is the main source of national data on discharges from acute hospitals in Ireland. Each HIPE record represents one discharge. Raw data were received from HIPE on hospital discharges due to injury and then converted to present rates per 100,000.

- **2006 mortality data from the Central Statistics Office (CSO).** Routine mortality data for 2006 were obtained from the CSO using interactive web tools. This report presents all injury-related fatalities occurring in 2006, converted to present rates per 100,000.

Data from the IDB for 2005 and HIPE and CSO for 2006 were coded using the ICD-10 coding system.

Table 2 presents total injury rates (per 100,000) by age group and source of information. The highest overall injury rates were reported in emergency departments, followed by self-reported medically attended injury, injury discharges and injury mortality. The ratios between self-reported injuries/emergency department presentations and injury-related discharges were highest among the 15-34 age group, but they decreased significantly with increasing age. Among those aged 85 years and over, there were more injury discharges than self-reported medically treated injuries. Similar patterns are apparent in relation to the ratio between self-reported injuries and injury-related mortality. Similarly, the ratio of injury discharges to injury deaths was very high among the younger population (0-14 year-olds), but the ratio decreased with age, with a proportion of 1 death per 30 discharges among the older population (aged 85+). These patterns were similar among men and women (see Table 3).

Table 2: Injury rates for all types of injury (per 100,000), by age group and data source

| Age | Self-report (SLÁN)* | Emergency department (IDB) | Hospital discharges (HIPE) | Mortality (CSO) |
|-------------|------------------------|----------------------------------|----------------------------------|--------------------|
| 0-4 years | | 10,883 | 1,725 | 2 |
| 5-14 years | | 9,463 | 1,202 | 4 |
| 15-24 years | 15,767 | 18,080 | 1,738 | 38 |
| 25-34 years | 11,912 | 16,091 | 1,212 | 30 |
| 35-44 years | 6,911 | 8,330 | 1,082 | 23 |
| 45-54 years | 7,803 | 7,509 | 1,212 | 31 |
| 55-64 years | 4,947 | 5,864 | 1,560 | 33 |
| 65-74 years | 4,185 | 6,943 | 2,474 | 46 |
| 75-84 years | 6,787 | 6,559 | 4,654 | 78 |
| 85+ years | 2,137 | 11,115 | 7,581 | 254 |

* SLÁN data is calculated for 18+ year-olds.

Table 3: Injury rates for all types of injury (per 100,000), by gender, age group and data source

| Age | MEN | | | WOMEN | | |
|-------------|---------------------|----------------------------|----------------------------|---------------------|----------------------------|----------------------------|
| | Self-report (SLÁN)* | Emergency department (IDB) | Hospital discharges (HIPE) | Self-report (SLÁN)* | Emergency department (IDB) | Hospital discharges (HIPE) |
| 0-4 years | | 11,307 | 1,948 | | 10,442 | 1,491 |
| 5-14 years | | 11,184 | 1,436 | | 7,594 | 956 |
| 15-24 years | 22,149 | 25,763 | 2,523 | 9,245 | 10,297 | 929 |
| 25-34 years | 14,348 | 22,983 | 1,727 | 9,401 | 9,149 | 680 |
| 35-44 years | 8,778 | 11,380 | 1,383 | 4,999 | 5,210 | 774 |
| 45-54 years | 10,072 | 8,124 | 1,447 | 5,506 | 6,883 | 974 |
| 55-64 years | 4,643 | 6,043 | 1,678 | 5,258 | 5,684 | 1,440 |
| 65-74 years | 4,629 | 6,132 | 2,488 | 3,767 | 7,696 | 2,462 |
| 75-84 years | 4,722 | 5,212 | 4,194 | 8,233 | 7,456 | 4,977 |
| 85+ years | 4,964 | 6,468 | 6,278 | 872 | 13,095 | 8,164 |

* SLÁN data is calculated for 18+ year-olds.

Table 4 presents injury rates (per 100,000) from falls by age group and data source. Falls were more common among young people (0-24 year-olds) and among those older than 65 years. In all age groups, the similarities between self-reported medically attended injuries and emergency department presentations are striking. Among the younger population, falls were not likely to translate into hospitalisation and fatalities were very rare. Among the older population, however, fall-related injuries requiring hospitalisation were as common as self-reported fall-related injuries (and in some age groups, more common). Among 75-year-olds and over, fall-related deaths were the highest compared to all other age groups (1 death for every 25 discharges). Falls among young people were more common among men; however, among the older population, fall-related injuries (based on discharge data) were much more common among women (see Table 5).

Table 4: Injury rates from falls (per 100,000), by age group and data source

| Age | Self-report (SLÁN)* | Emergency department (IDB) | Hospital discharges (HIPE) | Mortality (CSO) |
|-------------|---------------------|----------------------------|----------------------------|-----------------|
| 0-4 years | | 5,668 | 779 | 0 |
| 5-14 years | | 4,377 | 554 | 0 |
| 15-24 years | 5,382 | 4,290 | 343 | 1 |
| 25-34 years | 3,057 | 4,229 | 299 | 1 |
| 35-44 years | 2,058 | 2,024 | 293 | 3 |
| 45-54 years | 2,583 | 2,816 | 405 | 4 |
| 55-64 years | 2,043 | 2,502 | 617 | 7 |
| 65-74 years | 1,982 | 3,989 | 1,063 | 17 |
| 75-84 years | 4,392 | 4,630 | 2,657 | 46 |
| 85+ years | 1,319 | 8,457 | 5,584 | 225 |

* SLÁN data is calculated for 18+ year-olds.

Table 5: Injury rates from falls (per 100,000), by gender, age group and data source

| Age | MEN | | | WOMEN | | |
|-------------|------------------------|----------------------------------|----------------------------------|------------------------|----------------------------------|----------------------------------|
| | Self-report (SLÁN)* | Emergency department (IDB) | Hospital discharges (HIPE) | Self-report (SLÁN)* | Emergency department (IDB) | Hospital discharges (HIPE) |
| 0-4 years | | 5,801 | 841 | | 5,528 | 714 |
| 5-14 years | | 5,017 | 667 | | 3,700 | 434 |
| 15-24 years | 6,820 | 5,551 | 490 | 3,912 | 3,017 | 190 |
| 25-34 years | 3,962 | 5,746 | 392 | 2,123 | 2,701 | 202 |
| 35-44 years | 2,249 | 2,442 | 371 | 1,862 | 1,595 | 213 |
| 45-54 years | 3,311 | 2,990 | 460 | 1,847 | 2,639 | 350 |
| 55-64 years | 1,014 | 2,537 | 558 | 3,092 | 2,468 | 676 |
| 65-74 years | 1,502 | 3,550 | 846 | 2,435 | 4,388 | 1,267 |
| 75-84 years | 2,863 | 3,282 | 1,890 | 5,463 | 5,528 | 3,195 |
| 85+ years | 3,759 | 4,042 | 4,143 | 227 | 10,338 | 6,229 |

* SLÁN data is calculated for 18+ year-olds.

Traffic-related injuries, especially among men, were the leading cause of injury mortality. Table 6 presents rates (per 100,000) of traffic-related injury by age group and source of information. Traffic-related injuries were most common among young people (0-34 year-olds), with mortality rates peaking among 15-24 year-olds and among 75-84 year-olds. Overall, the ratios between self-reported medically attended injuries, emergency department presentations and discharges were relatively low (compared to general injuries and fall injuries), with a relatively low ratio between discharge rates and mortality rates, possibly suggesting that traffic-related injuries tend to be more severe, often resulting in hospitalisation or death. Rates of traffic-related injury are higher among men than women in most age groups (see Table 7).

Table 6: Traffic-related injury rates (per 100,000), by age group and data source

| Age | Self-report (SLÁN)* | Emergency department (IDB) | Hospital discharges (HIPE) | Mortality (CSO) |
|-------------|------------------------|----------------------------------|----------------------------------|--------------------|
| 0-4 years | | 301 | 83 | 1 |
| 5-14 years | | 686 | 188 | 1 |
| 15-24 years | 1,508 | 1,859 | 328 | 15 |
| 25-34 years | 1,483 | 1,153 | 182 | 9 |
| 35-44 years | 921 | 526 | 140 | 5 |
| 45-54 years | 1,066 | 427 | 112 | 3 |
| 55-64 years | 314 | 598 | 93 | 5 |
| 65-74 years | 332 | 570 | 119 | 10 |
| 75-84 years | 263 | 540 | 141 | 12 |
| 85+ years | 0 | 242 | 40 | 6 |

* SLÁN data is calculated for 18+ year-olds.

Table 7: Traffic-related injury rates (per 100,000), by gender, age group and data source

| Age | MEN | | | WOMEN | | |
|-------------|------------------------|----------------------------------|----------------------------------|------------------------|----------------------------------|----------------------------------|
| | Self-report (SLÁN)* | Emergency department (IDB) | Hospital discharges (HIPE) | Self-report (SLÁN)* | Emergency department (IDB) | Hospital discharges (HIPE) |
| 0-4 years | | 393 | 107 | | 205 | 59 |
| 5-14 years | | 828 | 216 | | 536 | 158 |
| 15-24 years | 2,130 | 2,894 | 452 | 872 | 814 | 204 |
| 25-34 years | 1,624 | 1,313 | 241 | 1,338 | 992 | 121 |
| 35-44 years | 1,157 | 780 | 188 | 680 | 266 | 91 |
| 45-54 years | 2,047 | 677 | 147 | 73 | 172 | 77 |
| 55-64 years | 403 | 597 | 111 | 223 | 598 | 75 |
| 65-74 years | 586 | 538 | 145 | 93 | 600 | 93 |
| 75-84 years | 0 | 579 | 167 | 447 | 514 | 123 |
| 85+ years | 0 | 0 | 202 | 0 | 345 | 148 |

* SLÁN data is calculated for 18+ year-olds.

4. Conclusions and Policy Implications

In Ireland, injuries are the leading cause of death and disability among young people and the 3rd leading cause of death across all age groups (Scallan *et al*, 2001). Each year, it is estimated that injuries are responsible for 1,500 fatalities (Scallan *et al*, 2001), with 1,292 fatalities from both intentional and unintentional injuries in 2006 (see statistics on 'Principal causes of death', available at: www.cso.ie/statistics/principalcausesofdeath.htm). The present report is the first attempt to describe injuries in Ireland based on 5 data sources, looking at all levels of injury. Findings and their implications for policy are now considered.

MEDICALLY ATTENDED INJURY

Findings from SLÁN 2007 reveal that nearly 1 in 10 respondents surveyed reported a medically attended injury in the last 12 months, compared to 43% of 10-17 year-olds surveyed in HBSC 2006. When focusing on the two most comparable age groups between the two surveys, data from the HBSC 2006 study indicate that about half (42%) of young respondents aged 15-17 years reported a medically attended injury compared to 14% of 18-29 year-olds in the SLÁN 2007 survey, suggesting a much higher proportion of self-reported medically attended injuries among adolescents compared to the young adult population. Some possible explanations for this large difference could include different interpretations of the term 'medical treatment' among adolescents and adults, or it could relate to the fact that responsibility for the health of those under 18 lies with the parents, whereas adults are responsible for their own health and therefore potentially may not seek medical treatment for injuries that they perceive as minor.

Among both young people and adults, self-reported medically attended injuries are more prevalent among boys and men. Among young people, injuries were more prevalent among adolescents aged 12-17. Among adults, injuries were most prevalent among those aged 18-29. These findings coincide with the literature, which points to young people and young adults being at highest risk for injury (WHO, 2006b). However, whereas the international literature suggests that injuries are more prevalent among populations from lower socio-economic social classes, among adolescents in Ireland there is no evidence of class differences in injuries, while among adults in Ireland, self-reported injuries are more prevalent among the higher social classes (SC 1-4), among respondents with third-level education, among non-medical card holders and among those with the highest level of income. This is likely to be attributed to higher engagement in sports activities among these groups. The only socio-economic measure that does point towards inequities in injury is the slightly elevated prevalence among those who are unemployed. Another deviation from previous findings is in relation to residential location. Previous studies in Ireland indicated that injuries are more common in rural areas (Boland *et al*, 2005). However, HBSC 2006 data indicate no such differences among adolescents, while SLÁN 2007 data indicate that injuries among adults were more prevalent in urban settings.

There are few possible explanations for the differences between findings reported here and those previously reported. All the previous studies reviewed here, nationally and internationally, used mortality or hospital discharge data, whereas the survey data presented here are unique in that they are based on self-reported injury in the community and not in medical settings. It is possible that injuries expressed in community settings bear different socio-economic characteristics than those that are more severe and require treatment in hospitals. The survey data presented here may suggest that self-reported injuries treated by a health professional are more prevalent among the more affluent population due to the structure of the health system,

which could be perceived as too expensive for people who are less well-off. The latter may be more reluctant to seek medical help for injuries that are not perceived as severe. Alternatively, people who are more affluent may be more exposed to activities that carry with them a higher risk of injury, like sports.

ACTIVITY LOST THROUGH INJURY

Unlike the patterns found in 'any' medically attended injury, there is clear evidence of social inequity among adults in relation to activity or time lost through injury. Overall, 4% of adults reported that their most serious injury in the previous 12 months had resulted in 3 or more days of activity loss, representing half of all self-reported injuries. Such activity loss due to injury was more prevalent among those with primary education, medical card holders and the unemployed. It was particularly prevalent among adults in social classes SC 3-4, perhaps reflecting the occupational diversity in this group, with men in SC 4 (skilled manual workers) being particularly exposed to job-related injury. Despite the potential differences in exposure, activity loss injuries are, however, equally disturbed across age groups, gender and residential location. These findings support the hypothesis that people who are less affluent seek medical attention only for more severe injuries, hence they are under-represented in the overall figures of 'any' medically attended injury.

Unlike the adult population, severe injuries among adolescents were more prevalent among boys and older children, but they are equally distributed across groups defined by social class and residential location.

INJURY CIRCUMSTANCES

Among the adult population, the home is the location where the majority of injuries occur (37% overall, 45% of women), followed by sports facilities (22% overall, 28% for men). Among adolescents, sports facilities are the leading location (40%) where injuries happen, followed by home (20%) and school (15%). Coinciding with injury location, for men the activities during which injuries occur are sport/physical activity (35%) and work (20%), whereas for women injuries mainly occur while working around the house and out walking. Among adolescents, the main activity leading to injury for both boys and girls is sport/physical activity (50%), followed by cycling for boys and walking/running (not for the purpose of physical activity) for girls.

Among adults, falling or tripping is the cause for 34% of all self-reported medically attended injuries, with the second leading cause being motor vehicle-related injury (9%). These findings are consistent with hospital-based morbidity data in the USA (Centers of Disease Control, 2006) and in Europe (Peden *et al*, 2002). The latter authors also point out that falls in the UK and Ireland are more prevalent than in any other region in the world. Similar findings have also been reported in Ireland (Scallan *et al*, 2004).

INJURY RATES

Injury rates (per 100,000 persons) have been explored in this report in four settings: self-reported injury in the community; injury presentations in emergency departments; injury-related hospital discharges; and injury-related mortality. Data were analysed on all injuries, fall-related injuries and traffic-related injuries. The highest overall injury rates were reported in emergency departments, followed by self-reported injury, injury discharges and injury mortality. Self-reported injuries and emergency department presentations were higher among younger

people, whereas hospital discharges and mortality were higher among the older population. These findings correspond with the literature in relation to the relative injury vulnerability of the young population (aged 15-44) and of the older population (aged 65+). The large proportion of emergency department presentations and hospital discharges among the older population, compared to self-reported injuries, could stem from many of the older population living in institutions, such as nursing homes. This population could be more frail and thus more prone to injuries (Todd and Skelton, 2004), but people in care are not captured by the survey data. Similar patterns were evident in fall-related and traffic-related injuries. However, the ratios between traffic-related injuries in the community, emergency department presentations and hospital discharges were relatively low (compared to general injuries and fall injuries), with a relatively low ratio between discharge rates and mortality rates. This possibly suggests that traffic-related injury tends to be more severe, often resulting in hospitalisation or death.

The higher proportion of emergency department presentations compared to self-reported injuries could suggest either that the extrapolation of IDB data from the sample to the population was inaccurate or that there was under-reporting of medically attended injuries self-reported in the SLÁN 2007 survey.

LIMITATIONS OF EXISTING INJURY DATA

Several limitations of the injury data reported here should be noted:

- Both the SLÁN and HBSC surveys cover a broad range of topics related to the health of the surveyed population. As such, the information gathered on injury is limited.
- Data were collected in the community through face-to-face interviews in the home (SLÁN 2007) or through self-administered questionnaires during school class period (HBSC 2006). Thus, those who were not in attendance were not represented.
- Both surveys rely on self-reporting and this involves individuals' perceptions of what constitutes 'medical treatment' for an injury; these perceptions could vary between individuals.
- In both surveys, the pre-specified lists of activities, locations and mechanisms to describe the circumstances of an injury were not detailed enough, resulting in a large proportion of respondents answering 'other' to each of these questions.
- Lastly, data collected through these surveys are referred to as 'injury in the community', although some of the self-reported cases could have been treated in emergency departments or in hospitals, resulting in some potential overlap between these data and those of the Injury Data Base (IDB) and the Hospital In-Patient Enquiry (HIPE) scheme (see *below*).

Data collected as part of the IDB pilot were collected in one region only (Cork) during a 6-month sampling period and then extrapolated to create national estimates. However, these estimates assume that Cork County is similar to other counties in relation to injury prevalence and that seasonality is not playing an important role in injury in Ireland. In addition, the documentation on which the data were based was incomplete and in many cases no information was provided on key aspects of injury prevention. In 44% of the IDB cases, the injury's place of occurrence was unidentified and in 46% of injuries, the activity during which the injury occurred was unidentified (Meaney *et al*, 2007).

HIPE data are documented per discharge and not per person. Cases of multiple discharges of the same person, therefore, cannot be cleaned from the data, potentially biasing the reported

rates. If an injury event was serious enough to require more than one episode of hospitalisation, this event would be recorded at least twice. In addition, only 40% of HIPE records include information about place of injury (Scallan *et al*, 2001), limiting the type of information that can be extracted from the data.

Mortality data, from the Central Statistics Office, are routinely collected and considered to be the most reliable source of data on injury. However, similar to discharge data (HIPE) and IDB data, many of the mortality records do not include the ICD External Codes for injuries, limiting the type of information that can be extracted from the data in relation to fatal injury. In addition, mortality data present only the extreme end result of injury. Injuries resulting in death are different to non-fatal injuries, but these differences are not visible when presenting mortality data. Whereas mortality data give extremely important information on injury, it is not enough to present just these figures.

POLICY IMPLICATIONS

The SLÁN 2007 survey gives estimates of the extent of medically attended injuries in Ireland. Combined with data from other sources, this report presents the extent of the injuries problem in the country. Every year, thousands of people are injured and seek medical care; about half of the presentations in emergency departments are injury-related and about 1,500 people die of their injuries each year (Scallan *et al*, 2001), with less affluent people being more at risk for severe injuries.

This report is the first attempt to describe injuries in Ireland from all existing sources of information and, as such, it adds to existing knowledge in the field. Yet, as has been shown, all existing data sources have serious limitations, while information on injury-related absenteeism or disability does not exist, thus limiting the ability to calculate the burden of injury on Irish society.

The lack of more accurate information and the lack of more routinely collected data limit the ability to devise and monitor injury prevention programmes. The international literature has pointed to the effectiveness of prevention programmes, but prevention efforts need to be well targeted at 'at risk' populations, as well as at risky locations and mechanisms of injury. Prevention programmes also require evaluation to assess their effectiveness. Both identifying the risks and evaluating programmes could be achieved through high-quality, routinely collected injury data. The need for more data and better strategies has been highlighted in the past (Scallan *et al*, 2001); however, little has been done to follow up these recommendations.

This report calls for more injury-specific research that will inform policy-makers about the priorities for intervention and for policies that will assist in the prevention of injuries and the promotion of safety. Injury prevention is a complex task, requiring one body to be responsible for the coordinated collection of data and the planning and delivery of prevention programmes. Similar efforts have been made in relation to cancer and diseases of the circulatory system. As the third leading cause of death in Ireland today, injury prevention deserves similar attention.

Despite the shortcomings of the existing sources of information, data presented in this report allow us to identify key vulnerable groups and key vulnerable circumstances leading to injury. The groups most vulnerable to injury are young people and elderly people. For both, falling and tripping is the main mechanism leading to an injury. However, while among young people these injuries are less likely to translate into hospitalisation or death, among the elderly these injuries are more severe and more likely to lead to urgent treatment in emergency departments and to

hospitalisation. The costs of falls among the elderly has been reported (Gannon *et al*, 2007) and the problem was recognised and addressed in the *Strategy to prevent falls and fractures in Ireland's ageing population* (Laffoy, 2008). Although not as costly, falls and fractures should also be addressed among the young population.

Across all age groups, the leading locations for injury are in the home and at sports facilities. These two different locations highlight two different phenomena. While home injuries are seen to be associated with deprived populations, sports-related injuries are often more prevalent among those who are more affluent. Many interventions exist to tackle home-related injuries, such as fires, falls or poisoning. These interventions are aimed at the level of the individual, family and community, and are important in targeting these populations. Fewer interventions exist in relation to sports-related activities, although these activities are normally carried out in public areas and should therefore be more accessible to interventions.

SLÁN 2007 has provided us with a unique opportunity to learn more about injuries in the Irish adult population. The survey has provided us with a more in-depth understanding of the mechanisms and locations of injury events in the general population and also addressed the relatively understudied area of injuries leading to activity loss in the young population. This information, even if not complete, could assist with the development of national prevention policies and highlight 'at risk' populations. When such policies are introduced, evaluation studies should complement them, in order to assess their implementation and effectiveness. To obtain a more complete understanding of the injury problem, information on the location, activity and mechanisms of injury should be collected in all settings, with measures to ensure the completeness of the information collected.

A more complete understanding of the injury problem, coupled with appropriate prevention initiatives, could not only prevent or reduce the pain and suffering of the victims of injury, but could also prove to be cost-effective, even in the short-term, at national level.

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APPENDIX 1:

QUESTIONS RELATING TO INJURY IN SLÁN 2007 QUESTIONNAIRE (SECTION F)

Note: The full SLÁN 2007 Questionnaire is available at www.slan07.ie

F2 During the past 12 months, how many times were you injured in a way that required you to receive treatment from a health professional?

_____ times

If 0, go to F7

Please answer the following questions in relation to the most serious injury you had in the last 12 months (i.e. the injury that took the most time to get better/recover from).

F3 Where did the injury occur? [Tick all that apply]

- | | |
|---|--------------------------|
| Home (inside) | <input type="checkbox"/> |
| Home (outside) | <input type="checkbox"/> |
| Farm | <input type="checkbox"/> |
| Industrial/construction area | <input type="checkbox"/> |
| Other public building | <input type="checkbox"/> |
| Shopping centre, restaurant, shop, petrol station or other trade and service area | <input type="checkbox"/> |
| Road or motorway | <input type="checkbox"/> |
| Footpath | <input type="checkbox"/> |
| Car park | <input type="checkbox"/> |
| Sports centre/facility | <input type="checkbox"/> |
| Park/recreation area | <input type="checkbox"/> |
| River/lake/ocean/stream | <input type="checkbox"/> |
| Other (specify) | <input type="checkbox"/> |
-

F4 What were you doing when the injury occurred? [Tick all that apply]

- | | |
|------------------------------------|--------------------------|
| Driving or riding a motor vehicle | <input type="checkbox"/> |
| Working in paid work | <input type="checkbox"/> |
| Working around the house or yard | <input type="checkbox"/> |
| Working in unpaid work | <input type="checkbox"/> |
| Sport or physical activity | <input type="checkbox"/> |
| Leisure activity (excluding sport) | <input type="checkbox"/> |
| Resting, eating or drinking | <input type="checkbox"/> |
| Cooking | <input type="checkbox"/> |
| Walking (as pedestrian) | <input type="checkbox"/> |
| Other (specify) | <input type="checkbox"/> |
-

F5 What was the cause of your injury?

[Interviewer: This is the primary means of injury, e.g. if a broken arm is a consequence of being hit by car, then 'motor vehicle' is the correct response option]

[Tick 1, Main means]

- | | |
|-------------------------------------|--------------------------|
| Motor vehicle | <input type="checkbox"/> |
| Pedestrian-vehicle crash | <input type="checkbox"/> |
| Motorcycle | <input type="checkbox"/> |
| Bicycle | <input type="checkbox"/> |
| Fall – from a height, e.g. ladder | <input type="checkbox"/> |
| Fall – tripped | <input type="checkbox"/> |
| Gunshot, firearm-related | <input type="checkbox"/> |
| Cut/pierce/stab | <input type="checkbox"/> |
| Punch or other assault | <input type="checkbox"/> |
| Fire/burn | <input type="checkbox"/> |
| Smoke inhalation | <input type="checkbox"/> |
| Poisoning | <input type="checkbox"/> |
| Near drowning/submersion | <input type="checkbox"/> |
| Foreign body (e.g. dog/insect bite) | <input type="checkbox"/> |
| Other (specify) | <input type="checkbox"/> |

F6 As a result of this injury, how many days of work or other daily activity did you miss?

_____ days None

APPENDIX 2:

QUESTIONS RELATING TO INJURY IN HBSC 2006 QUESTIONNAIRE

Many young people get hurt or injured from activities such as playing sports or fighting with others at different places, such as the street or home. Injuries can include being poisoned or burned. Injuries do not include illnesses such as measles or the flu. The following questions are about injuries you may have had during the past 12 months.

During the past 12 months, how many times were you injured and had to be treated by a doctor or nurse?

- I was not injured in the past 12 months
- 1 time
- 2 times
- 3 times
- 4 times or more

If you had more than one injury, think only about the one most serious injury (the injury that took the most time to get better) that you had during the past 12 months.

Where were you when this one most serious injury happened?

(Check the one best answer to describe your most serious injury)

- I was not injured in the past 12 months
- At home/in yard (yours or someone else's)
- School, including school grounds, during school hours
- School, including school grounds, after school hours
- At a sports facility or field (not at school)
- In the street/road/parking lot
- Other location

What were you doing when this one most serious injury happened?

(Check the one best answer to describe your most serious injury)

- I was not injured in the past 12 months
- Biking/cycling
- Playing or training for sports/recreational activity
- Skating (including roller blades, skateboards, ice skating)
- Walking/running (not for a sports team or exercise)
- Riding/driving in a car or other motor vehicle
- Fighting
- Paid or unpaid work
- Other activity

Did this one most serious injury cause you to miss at least one full day from school or other usual activities, such as sports or lessons?

I was not injured in the past 12 months

Yes, lost at least one day of activity

How many full days did you miss? _____ days

(Please write the number of full days you missed from school or other usual activities as a result of this one most serious injury)

No, did not lose a day of activity