Review 2:

A systematic review of risk factors for unintentional Injuries among children and young people aged under 15 years

Quantitative correlates review of unintentional injury in children

FINAL REPORT

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ABOUT THE CPHE Collaborating Centre

This project was conducted by PenTAG. For more information about PenTAG please go to our web pages at:

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None

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Glossary

Case-control study	A study that starts with the identification of a group of individuals sharing the same characteristics (for example people with a particular disease) and a suitable comparison (control) group (for example people without the disease). All subjects are then assessed with respect to things that happened to them in the past, for example things that might be related to getting the disease under investigation. Such studies are also called *retrospective* as they look back in time from the outcome to the possible causes.
Cohort	A group of people sharing some common characteristic (for example pupils in a school year), followed up in a research study for a specified period of time.
Cohort study	An observational study that takes a group (cohort) of people and follows their progress over time in order to measure outcomes such as disease or mortality rates and make comparisons according to the treatments or interventions that people received. Thus within the study group, subgroups of people are identified (from information collected about patients) and these groups are compared with respect to outcome, for example comparing mortality between one group that received a specific treatment and one group which did not (or between two groups that received different levels of treatment). Cohorts can be assembled in the present and followed into the future (a 'concurrent' or 'prospective' cohort study) or identified from past records and followed forward from that time up to the present (a 'historical' or 'retrospective' cohort study). Because people are not randomly allocated to groups, the study is subject to confounding as the groups may be quite different in their characteristics and some **adjustment** must be made when analysing the results to ensure that the comparison between groups is as fair as possible (the same limitation is true for a case-control study).
Confidence interval (CI)	A way of expressing certainty about the findings from a study or group of studies, using statistical techniques. A confidence interval describes a range of possible effects (of a treatment or intervention) that are consistent with the results of a study or group of studies. A wide confidence interval indicates a lack of certainty or precision about the true size of the effect and is seen in studies with too few participants. Where confidence intervals are narrow they indicate more precise estimates of effects and a larger sample of people studied. It is usual to interpret a '95%' confidence interval as the range of effects within which we are 95% confident that the true effect lies. e.g. for a relative risk or odds ratio, if the 95% CI includes 1.00 ('no effect') then this suggests there is evidence that the effect across 2 groups is NOT statistically significant at P≤0.05. When the 95% CI does not include 1.00 then this suggests there is evidence that the effect across 2 groups IS statistically significant at P≤0.05.
Confounder or confounding factor	Something that influences a study and can contribute to misleading findings if it is not understood or appropriately dealt with. For example, age is the confounding factor here and the effect of exercising on heart disease cannot be assessed without adjusting for age differences in some way.
Cross-sectional study	The observation of a defined set of people at a single point in time or time period – a snapshot. (This type of study contrasts with a longitudinal study which follows a set of people over a period of time.)
ICD	Commonly-used abbreviation for the *International Statistical Classification of Diseases and Related Health Problems* (used to classify a wide range of

	health conditions)
Medicaid	Means-tested programme in the United States providing access to health and medical resources for those on low incomes.
Migrant	Used in this review to refer to international migrants.
Odds ratio (OR)	Odds are a way of representing probability, especially familiar for betting. In recent years odds ratios have become widely used in reports of clinical studies. They provide an estimate (usually with a confidence interval) for the effect of a treatment. Odds are used to convey the idea of 'risk' and an odds ratio of 1 between two treatment groups would imply that the risks of an adverse outcome were the same in each group. For rare events the odds ratio and the relative risk (which uses actual risks and not odds) will be very similar.
Rate ratio	Like the relative risk is a ratio but instead based on the rate of a given event or outcome (e.g. 2 deaths per 100 person years of exposure to a risk factor) in one group of subjects compared to another group (e.g. 1 death per 100 person years of exposure, i.e. rate ratio = 2.0).
Relative risk (RR)	A summary measure which represents the ratio of the risk of a given event or outcome (for example an adverse reaction to the drug being tested) in one group of subjects compared to another group. When the 'risk' of the event is the same in the two groups the relative risk is 1. In a study comparing two treatments, a relative risk of 2 would indicate that patients receiving one of the treatments had twice the risk of an undesirable outcome than those receiving the other treatment.
Risk ratio	Ratio of the risk of an undesirable event or outcome occurring in a group of patients receiving experimental treatment compared with a comparison (control) group. The term relative risk is sometimes used as a synonym of risk ratio.

Definitions of methodological terms adapted from NICE Public health guidance development Glossary of technical terms

1. Summary

1.1. Background

Internationally, injuries represent the leading cause of childhood mortality and morbidity. In the UK, about 20% of childhood deaths are due to injury of which 79% have an unintentional cause. Injuries are the second leading cause of hospital episodes among children aged 5–14, and they are the leading cause among boys in this age group.

Various categories of risk factors have been shown to be associated with unintentional injury that can be broadly summarised under three headings – (1) child characteristics e.g. age, gender, behavioural factors; (2) family characteristics e.g. maternal mental health, education, income and (3) neighbourhood characteristics e.g. rural vs urban, deprivation index. The contribution and inter-relationship of these risk factors is an important precursor to the generation of public health guidance on unintentional injury in children.

1.2. Review questions

- What factors are associated with unintentional injury incidence and outcomes in childhood?
- What is the nature (e.g. strength, covariation and interactions) of the association/relationship between these different factors and unintentional injury outcomes?

Potential outcomes (i.e. dependent variables in analyses of observational studies or effectiveness measures in intervention evaluations):

- rates of unintentional injuries.
- rates of hospital admissions and preventable child deaths related to unintentional injuries.
- severity of unintentional injuries.

Although the overall focus of this Programme is legislation, regulation, enforcement and compliance, this review will not explicitly seek evidence about the impact of these factors (since they exist at the level of countries or administrative regions).

1.3. Review methods

A systematic review of risk factors for unintentional Injuries among children and young people aged under 15 years was undertaken.

Electronic searches were conducted in bibliographic databases (ASSIA, CINAHL, DARE; EMBASE, HMIC, MEDLINE, PsycINFO, Social Science Citation Index) to identify primary quantitative research addressing factors associated with unintentional childhood injury, which was supplemented with a search of additional databases that were searched for reviews (EPPI Centre databases, Campbell Collaboration, TRIS, ITRD) and websites were searched for reviews (Injury Prevention, ROPSA, Child Accident Prevention Trust, DfT, TRL). Because of time and resource constraints we were unable to undertake communication with experts and/or organisations involved in the relevant research or policy areas as originally planned.

Studies published from 1997 (based on PDG 1 report) were included if they: were published in English language; included young people age 0 to 14 yrs; reported observational research (e.g. cross-sectional studies) which quantified the association/relationship between unintentional injury in children and explanatory variables; reported injury prevention intervention research (e.g. randomised controlled trials (RCTs)) which quantified the association/relationship between study outcomes (i.e. unintentional injury in children) and study covariates (e.g. children or intervention subgroups).

Studies were excluded if they: were not published in English, were published prior to 1997, were not conducted in an OECD country, did not quantify the association between unintentional injuries in children aged 0 to 14 and potential explanatory variables, or reported unintentional injuries outside of the review's scope (i.e. unrelated to highways, roads or streets; the home (up to and including the boundary of a property); or the external environment (including schools and other institutions)).

Assessment for inclusion was undertaken initially at title and/or abstract level (to identify likely or possibly includable papers/reports), and then by examination of full

papers. Inclusion decisions were made by a single reviewer and 10 percent of these checked independently by a second reviewer.

Unintentional injuries, like many public health problems, are typically a result of multiple and sometimes interacting causes. Following an initial screening, and discussion with the NICE Public Health team, it was decided to include only studies that were multivariable (i.e. based on ≥1 potential predictor factor) and undertook a multivariate analysis (i.e. an analysis that adjusts for possible confounders using methods such as regression analysis). Data was extracted at a level of detail to allow the reader to form a qualitative judgement on the representativeness of population selection (and sample size), the type or quality of injury outcome definition and the degree of multivariate analysis.

Findings are presented as tabular summaries of the direction and strength of association between each category of unintentional injury:

- **Road** - passenger, pedestrian/cyclist, undefined;
- **Home** – burns/fire, drowning, falls, poisoning;
- **Other environments:** falls;
- **All environments** - drowning, falls, poisonings, injury undifferentiated, injury not defined

and predictors classified as:

- **Child characteristics** - age, sex, ethnicity, behavioural;
- **Family characteristics** - socio-economic status, education, income, lone parent, parental unemployment, teenage mother, housing tenure, overcrowded housing;
- **Neighbourhood characteristics** - socio-economic status, parks/play areas, road safety measures, additional factors (e.g. driver characteristics for road injuries)

For the purposes of this review the strength of associations were classified as:

- 'non-significant': a non statistically significant ($p > 0.05$ or equivalent) association
- 'weak to moderate': a statistically significant ($p \leq 0.05$ or equivalent) association AND relative risk equivalent of < 2.00
- 'Strong' a statistically significant ($p \leq 0.05$ or equivalent) association AND relative risk equivalent of ≥ 2.00

Whilst applied this categorisation was consistently applied across the identified evidence base in this report, it is important to emphasise that the relative risk equivalent of ≥ 2.00 cutoff is arbitrary. Associations should also be interpreted in the context of the severity of outcome (e.g. mortality vs. morbidity) and their precision (e.g. width of the 95% confidence interval where reported).

1.4. Review Findings

Of 272 potentially includable studies examined in full text version, 92 met our review's inclusion criteria and addressed multivariable factors and undertook multivariate analysis. Of these, 21 were cohort studies, 63 were cross-sectional studies and 8 were case control studies. No intervention studies with appropriate association data were identified. Only seventeen studies were undertaken in UK.

Evidence statement 1: Nature of included evidence

The most important quality factor in studies examining associations is likely to be control for confounding. Therefore it was agreed with NICE that only multivariable (i.e. >1 risk factor examined) and multivariate (i.e. reported measure of association adjusted for confounders) were included for review. However, across the 92 included studies, there was little consistency in the choice of confounders used in the adjusted analysis. Furthermore, few studies used formal multilevel methods to deal with the mix of variables across child, family and neighbourhood level characteristics.

The risk of selection and case ascertainment bias in the included studies is likely to be relatively low. Most studies used large regional or national databases (e.g. birth cohorts or registries or censuses) to identify the population of children to be studied and identified injuries using existing institutional databases, such as hospital records or insurance claims, categorising injury type according to individual ICD codes.

Evidence statement 2: Road - Passenger

There is evidence from 10 studies (1 UK). There is evidence of a strong association (i.e. relative risk equivalent of >2.0) of injuries being associated with travelling in a car driven by a non-sibling teenager. There is evidence of weak to moderate association (i.e. relative risk equivalent of >1.0 to <2.0) of injuries with lower parental

income, employment status, educational status, socio-economic status, and with travelling in a car with a female driver (when the injured child was appropriately restrained). The increased risk in females may well reflect their longer periods of time in the presence of children. There is mixed evidence regarding the association of injuries with ethnicity.

Evidence statement 3: Road – Pedestrian and cyclist

There is evidence from 18 studies (5 UK). There is evidence of a strong association between the lowest socio-economic quintiles, being of Native American descent (for pedestrians), having parents who were migrants, hyperactivity, behavioural difficulties, or bicycle riding (riding slowly or only on the pavement) and injuries. There is evidence of weak to moderate association of injuries with membership of the 2nd socio-economic quintile, social deprivation, non-professional parental occupation, rural and mixed-urban environments, being male, or.behavioural disorders. There was no statistical evidence of injuries being associated with social fragmentation or ethnicity (for cyclists).

Evidence statement 4: Road – Undefined cause of injury

There is evidence from 7 studies (1 UK). There is evidence of weak to moderate association of injuries with socio-economic deprivation and being African-American. There is mixed evidence regarding the association of socio-economic status (measured by parental occupation) with injuries. There was no statistical evidence of injuries being associated with autism.

Evidence statement 5: Home – Burns/fires

There is evidence from 6 studies (1 UK). Two studies reported burn-related deaths. There is evidence of a strong association between child's age (< 1 year), low mother education and age, and areas of concentrated poverty (and high numbers of African American population) and injuries. There is evidence of weak to moderate association of burn injuries with children being male, from an ethnic minority, having behavioural problems and a poor reading score, low parental education, lower home income, a larger number of children in the home, and rural location. There was no statistical evidence of burn injuries being associated with type of home ownership.

Evidence statement 6: Home - Drowning

No multivariate evidence was found that examined risk factors for drowning.

Evidence statement 7: Home - Falls

There is evidence from 3 studies (0 UK). There is evidence of a strong association between greater child's age (once older than 1 year) and injuries. There is evidence of weak to moderate association of injuries with being male, being of African-American descent, families being in receipt of social welfare benefits, lower educational status of parents, lower income, single parent households, lower mother's age at childbirth, non-owner housing occupancy, living in a flat or farmhouse, older housing and being a migrant. Being lone parent status, neighbourhood poverty and urbanality were not statistically associated with falls.

Evidence statement 8: Home - Poisoning

There is evidence from 7 studies (1 UK). There is evidence of a strong association between child's age (from age 1 to 4 years), behavioural problems, and autism and injuries. There is evidence of weak to moderate association of injuries being associated with being male, having a lower reading score, lower educational status of parents, lower income, larger families, being in receipt of social welfare benefits, younger age of mother at childbirth, being of Native American descent, rurality, and the birth of a sibling within 12 months (for iron tablet poisoning). There was no statistical evidence of injuries being associated with single parent households, family size, overcrowding, or house type. **Evidence statement 9: Home – Undefined cause of injury**

There is evidence from 2 studies (1 UK). There is evidence of weak to moderate association of injuries with lower educational status of parents and lower family income. There was no statistical evidence of injuries being associated with parental marital status or of being in receipt of social welfare benefits.

Evidence statement 10: Other Environments - Falls

There is evidence from 4 studies (0 UK). There is evidence of a strong association between the use of public playgrounds or being of African-American descent and injuries. There is evidence of weak to moderate association of injuries being with being of Latin American descent, location of a school within an urban area, schools with larger numbers of classes (>=24), longer school hours, and the levels of physical activity engaged in outside of school. There was no statistical evidence of injuries being associated with the levels of physical activity engaged in within school.

Evidence statement 11: All Environments – Burns/fire

There is evidence from 6 studies (1 UK). There is evidence of a strong association between the most socio-economically deprived families, living in a house with 1 or >=3 bedrooms, Attention Deficit Hyperactivity Disorder, and being of Native American descent and injuries. There was no statistical evidence of injuries being associated with autism, having previously endured an unintentional burn/fire injury, parental employment status, entitlement to Medicaid, or order of sibling birth.

Evidence statement 12: All Environments - Drowning

There is evidence from 3 studies (0 UK). There is evidence of weak to moderate association of injuries with entitlement to Medicaid (in 5 to 14 year olds) and with non-entitlement to Medicaid (in 0 to 4 year olds). There was no statistical evidence of injuries being associated with being of Native American descent or the presence of behavioural disorders.

Evidence statement 13: All Environments - Falls

There is evidence from 9 studies (1 UK). There is evidence of a strong association between a child being dropped previously by a carer and subsequently being injured again in the same way. There is evidence of weak to moderate association of injuries with the presence of behavioural disorders. There was mixed evidence regarding the association of socio-economic status and deprivation, and entitlement to Medicaid and injuries. There was no statistical evidence of injuries being associated with children's age or sex, autism, social fragmentation, or being of Native American descent.

Evidence statement 14a: All Environments – All Injuries – Child age

There is evidence from 12 studies (4 UK). There is evidence of a strong association (compared with newborns aged up to 6 weeks) between children aged 7-24 months and injuries. There is evidence of weak to moderate association of injuries with increasing age (>=4 years versus <4 years), children aged 15-54 months (versus < 6 months), and increasing age amongst children with a disability, There was no statistical evidence of injuries being associated with increasing age in the case of head injuries.

Evidence statement 14b: All Environments – All Injuries – Sex of child

There is evidence from 16 studies (4 UK). There is evidence of weak to moderate association of injuries (of all severities, including fatalities) with being male.

Evidence statement 14c: All Environments – All Injuries – Child ethnicity

There is evidence from 8 studies (1 UK). There is mixed evidence regarding the association of child ethnicity with injuries. There is evidence of weak to moderate association of injuries with being of Black or Native American descent. There was no statistical evidence of injuries being associated with being of Asian descent or a wide range of other ethnicities.

Evidence statement 14d: All Environments – All Injuries – Child behavioural factors

There is evidence from 9 studies (5 UK). There is evidence of weak to moderate association of injuries with borderline hyperactivity, high emotional symptoms, high conduct disorder, and behavioural difficulties.

Evidence statement 14e: All Environments – All Injuries – Other Behavioural Characteristics

There is evidence from 9 studies (1 UK). There is evidence of a strong association between life events (such as exams), Attention Deficit Hyperactivity Disorder, and psychopathology and injuries. There is evidence of weak to moderate association of injuries with children's consumption of alcohol, being ill in the past month, the period of time 10 to 90 days after an unintentional injury occurring to a sibling, greater physical development and physical activity, and emotional and behavioural problems. There was no statistical evidence of injuries being associated with autism, medical problems, or developmental issues.

Evidence statement 14f: All Environments – All Injuries – Family's Socio-Economic Status

There is evidence from 27 studies (6 UK). There is evidence of weak to moderate association of injuries with socio-economic deprivation. There is no statistical evidence of injuries (reported in some studies) being associated with socio-economic deprivation within certain age categories. There is mixed evidence regarding the association of parental educational attainment and household income with injuries.

Evidence statement 14g: All Environments – All Injuries – Household Members

There is evidence from 14 studies (3 UK). There is evidence of weak to moderate association of injuries with unmarried parents and a greater number of children in the household. There was no statistical evidence of injuries being associated with presence of either single parents, two parents, biological or step-parents, female head of households, or a higher number of household members.

Evidence statement 14h: All Environments – All Injuries – Parental Characteristics

There is evidence from 22 studies (6 UK). There is evidence of weak to moderate association of injuries with mental illness, maternal perception of locus of control, community social support, post-natal or maternal depression, adverse life events, parental substance misuse, mother's age of <20 years at time of child's birth, and below average consistency parenting. There was no statistical evidence of injuries being associated with parental unemployment, family functioning or positive parenting. There is mixed evidence regarding the association of mother's age at the time of child's injury with the occurrence of injuries.

Evidence statement 14i: All Environments – All Injuries – Neighbourhood Characteristics – Socio-Economic Status

There is evidence from 8 studies (4 UK). There is evidence of weak to moderate association of injuries with socio-economic deprivation, but no evidence of association between other indicators of neighbourhood disadvantage and the occurrence of unintentional injuries.

Evidence statement 14j: All Environments – All Injuries – Neighbourhood Characteristics – Urban/Rural

There is evidence from 4 studies (0 UK). There is mixed evidence regarding the association of urban or rural location with the occurrence of injuries.

Evidence statement 14k: All Environments – All Injuries – Institutional Characteristics

There is evidence from 2 studies (0 UK). There is evidence of weak to moderate association of a *reduction* in injuries (in children aged 1-6 years) with the implementation of municipality level safety measures. There was no statistical evidence of injuries being associated with the time spent by children in child or family day care centres or of a *reduction* in injuries (in children aged 7-15 years) with the implementation of municipality level safety measures.

1.5. Conclusions

Knowledge of risk factors for unintentional injuries can assist injury practitioners, programme developers and policy makers in determining appropriate interventions. Approaches may vary depending on whether risk factors are modifiable or fixed. Modifiable risk factors (e.g., overcrowded housing, road safety measures,

playgrounds) describe targets for specific intervention, whereas fixed risk factors (e.g., child gender, child age and family or area socioeconomic status) aid in identifying populations in which to intervene. From a population health perspective, the results from this review suggest targeting interventions to families with a low socioeconomic status taking into account the gender and age of children.

Future studies of the association of risk factors and unintentional injury in children need more emphasis on longitudinal designs. Such studies will allow clearer identification of true 'determinants' and separate them out from factors that are simply statistically associated 'correlates'.

2. Background

2.1. Introduction

Internationally, injuries represent the leading cause of childhood mortality and morbidity. In the UK, about 20% of childhood deaths and are due to injury, of which 79% have an unintentional cause (Roberts et al, 1998; Sibert et al, 1981). Injuries are the second leading cause of hospital episodes among children aged 5–14, and they are the leading cause among boys in this age group (Roberts et al, 1998).

Various categories of risk factors have been shown to be associated with unintentional injury that can be broadly summarised under three headings – (1) **child characteristics** e.g. age, gender, behavioural factors; (2) **family characteristics** e.g. maternal mental health, education, income and (3) **neighbourhood characteristics** e.g. rural vs urban, deprivation index. The contribution and inter-relationship of these risk factors is an important precursor to the generation of public health guidance on unintentional injury in children.

2.1.1. Context of this review

This review is the second in a series of reviews of evidence which will inform NICE Public Health Guidance on Strategies to reduce unintentional injuries in children. These reviews, and the Guidance that will be developed from them, intend to complement a series of other reviews of more specific public health interventions which are also being conducted in the first half of 2009, on preventing unintentional injuries to children:

- **Preventing unintentional road injuries among under 15s: road design** (through the design and modification of highways, roads and streets.).
- **Preventing unintentional injuries among under 15s in the home** (either through the supply and/or installation of home safety equipment and home risk assessments.)
- **Preventing unintentional injuries among under 15s in the external environment** (expected to cover sports and leisure).

The aim of this review is to identify and quantify factors (e.g. cultural, social, economic, environmental and organisational) that have been shown to be related to the incidence of unintentional childhood injury (as outlined above).

2.1.2. Review questions

- What factors are associated with unintentional injury incidence and outcomes in childhood?
- What is the nature (e.g. strength, covariation and interactions) of the association/relationship between these different factors and unintentional injury outcomes?

Potential outcomes (i.e. dependent variables in analyses of observational studies or effectiveness measures in intervention evaluations):

- rates of unintentional injuries.
- rates of hospital admissions and preventable child deaths related to unintentional injuries.
- severity of unintentional injuries.

Although the overall focus of this Programme is legislation, regulation, enforcement and compliance, this review will not explicitly seek evidence about the impact of these factors (since they exist at the level of countries or administrative regions).

3. Methods

3.1. Search strategies

There is a vast amount of literature on unintentional injuries in children covering various settings. In order to focus the studies included, electronic searches were conducted in bibliographic databases to identify primary quantitative research addressing factors associated with unintentional childhood injury, which was supplemented with a search of additional databases and websites for reviews. See Appendix 1, page 184, for full details of the search methodology and an example search strategy (Medline).

Electronic searches for primary studies were conducted in the following databases:

- ASSIA (Applied Social Science Index and Abstracts)
- CINAHL (Cumulative Index of Nursing and Allied Health Literature)
- Database of Abstracts of Reviews of Effectiveness (DARE; 'other reviews' in Cochrane Library)
- EMBASE
- HMIC (or Kings Fund catalogue and DH data)
- MEDLINE
- PsycINFO
- Social Science Citation Index

The following were searched for reviews only:

- SafetyLit
- EPPI Centre databases
- The Campbell Collaboration
- Transport Research Information Service (TRIS)
- International Transport Research Documentation (ITRD)

Because of time and resource constraints we were unable to undertake communication with experts and/or organisations involved in the relevant research or policy areas as originally planned. However, at the Programme Development Group

meeting at which this review was initially presented, two systematic reviews were brought to our attention as a source of references; the Health Development Agency review of health inequalities and injuries in children (Towner et al, 2005) and an in-press systematic review of cohort studies of unintentional injuries in school-aged children (Mytton et al, 2009). Two further studies were identified using these sources and included in the review (see Appendix 7 for details of the screening process).

3.2. Inclusion & exclusion criteria

Studies published from 1997 were included if they:

- were published in English language.
- included young people age 0 to 14 years.
- reported observational research (e.g. cross-sectional studies) which quantified the association/relationship between unintentional injury in children and explanatory variables.
- reported injury prevention intervention research (e.g. randomised controlled trials (RCTs)) which quantified the association/relationship between study outcomes (i.e. unintentional injury in children) and study covariates (e.g. children or intervention subgroups).

The date cutoff was used consistent with PenTAG's PDG1 report.

For the purposes of judging studies for inclusion, papers were included if the relevant outcome information pertained to an age-grouping within or beyond the parameters of the age range for this guidance (e.g. 5 to 18 year-olds) but where it was judged that the majority of people in that age-range were common with the intended age range for this guidance (i.e. children aged 0 to 14 years).

Studies were excluded if they:

- were not published in English
- were published prior to 1997
- were not conducted in an OECD country
- did not quantify the association between unintentional injuries in children aged 0 to 14 and potential explanatory variables
- reported outcomes which were not related to unintentional injuries outlined in the review scope

Assessment for inclusion was undertaken initially at title and/or abstract level (to identify likely or possibly includable papers/reports), and then by examination of full papers. Inclusion decisions were made by a single reviewer (PH, MP or RT) and 10 percent of these checked independently by a second reviewer (MP or RT).

Unintentional injuries, like many public health problems, are typically a result of multiple and sometimes interacting causes. Following an initial screening, and discussion with the NICE Public Health team it was decided to include only studies that were multivariable (i.e. based on ≥1 potential predictor factor) and undertook a multivariate analysis (i.e. an analysis that adjusts for possible confounders using methods such as regression analysis).

3.3. Quality assessment and data extraction

We could not identify any previously developed set of quality assessment criteria, or questions, for aiding assessment of studies examining risk factors or correlates. The most important single quality factor in such studies is likely to be the control for confounding (i.e. a multivariable and multivariate adjusted analysis). Given that we applied this quality criterion as a secondary inclusion criterion to studies, we did not deem it applicable to attempt a formal quality assessment of the included studies. However, we extracted a level of detail from studies to allow the reader to form a qualitative judgement on the representativeness of population selection (and sample size), the quality of injury outcome definition and the degree of multivariate analysis (see Tables 2-13).

3.4. Data synthesis and presentation

In accordance with previous NICE Public Health correlates reviews, we undertook a qualitative approach to data synthesis rather than a formal pooling of outcomes using meta-analysis. We undertook detailed tabular summaries of the direction and strength of association between predictors and each category of unintentional injury:

- **Road** - passenger, pedestrian/cyclist, undefined
- **Home** – burn/fire, drowning, falls, poisoning
- **Other environments** – falls
- **All environments** - drowning, falls, poisonings, injury undifferentiated, injury not defined

Predictors were classified into three main categories:

- **Child characteristics** - age, sex, ethnicity, behavioural
- **Family characteristics** - socio-economic status, education, income, lone parent, parental unemployment, teenage mother, housing tenure, overcrowded housing
- **Neighbourhood characteristics** - socio-economic status, parks/play areas, road safety measures, urban/rural

This list was supplemented with **additional factors** to include potential relevant predictors that were not covered by the above categories e.g. driver characteristics for road injuries.

For the purposes of this review the strength of associations were classified as:

- 'non-significant': a non statistically significant ($p > 0.05$ or equivalent) association
- 'weak to moderate': a statistically significant ($p \leq 0.05$ or equivalent) association AND relative risk equivalent of < 2.00
- 'Strong' a statistically significant ($p \leq 0.05$ or equivalent) association AND relative risk equivalent of ≥ 2.00

Whilst applied consistently across the identified evidence base in this report, it is important to emphasise that the cut off of a relative risk equivalent of ≥ 2.00 is arbitrary. Furthermore, associations need to be interpreted in the context of the severity of outcome (e.g. mortality vs. morbidity).

4. Results

4.1. Quantity and quality of research

Of 272 potentially includable studies examined in full text version, 92 met our review's inclusion criteria and were multivariable factors and multivariate analysis. Of these, 21 were cohort studies, 63 were cross-sectional studies and 8 were case control studies. No intervention studies with appropriate association data were identified. Seventeen studies were undertaken in UK.

A summary of the study inclusion and exclusion is shown in the QUORUM diagram Appendix 2, page 187. Studies excluded on full paper review with the reason for exclusion are listed in Appendices 3 and 4.

4.2. Characteristics of included studies

The characteristics of included studies are summarised in Table 1. A more detailed overview of these studies is provided in Appendix 5.

A number of studies considered more than one injury type and setting. The included studies are summarised by injury setting and type of injury in Table 1.

4.3. Quality of included studies

All included studies were multivariable (i.e. >1 risk factor examined) and multivariate (i.e. reported measure of association adjusted for potential confounders). However, the range and comprehensiveness of risk factors considered by individual studies varied enormously with only a small number of studies assessing and analysing child, family and neighbourhood level characteristics at the same time. Furthermore, there was little consistency across studies in the choice of explanatory variables used in the adjusted analysis. Few studies used formal multilevel methods to deal with the hierarchical structure of variables at child, family and neighbourhood levels.

Evidence statement 1: Nature of included evidence

The most important quality factor in studies examining associations is likely to be control for confounding. Therefore it was agreed with NICE that only multivariable (i.e. >1 risk factor examined) and multivariate (i.e. reported measure of association adjusted for confounders) were included for review. However, across the 92 included studies, there was little consistency in the choice of confounders used in the adjusted analysis. Furthermore, few studies used formal multilevel methods to deal with the mix of variables across child, family and neighbourhood level characteristics.

The risk of selection and case ascertainment bias in the included studies is likely to be relatively low. Most studies used large regional or national databases (e.g. birth cohorts or registries or censuses) to identify the population of children to be studied and identified injuries using existing institutional databases, such as hospital records or insurance claims, categorising injury type according to individual ICD codes.

Table 1. Study characteristics of included studies

Key:
F: falls; B: burns, D: downing; UD: undefined; Pa: passenger; Pd: pedestrian/cyclist

	Study	Country in which study conducted	Injury type												
			Home					Road			Other	All			
			F	B	D	P	UD	Pa	Pd	UD	F	F	D	B	UD
1	Abdel-Aty (2007)	USA							X						
2	Badger (2008)	USA												X	
3	Bancej (2000)	Canada													X
4	Bishai (2008)	USA													X
5	Blakely (2003),	New Zealand													X
6	Bradbury (1999)	USA													X
7	Braun (2005),	USA													X
8	Brehaut (2003)	Canada								X		X	X		
9	Brenner (1999)	USA													X

	Study	Country in which study conducted	Injury type												
			Home					Road			Other	All			
			F	B	D	P	UD	Pa	Pd	UD	F	F	D	B	UD
10	Chen (2005)	USA						X							
11	Chen (2006)	USA						X							
12	Damashek (2005)	USA													X
13	Department for Transport (1998)	UK							X						
14	D'Souza (2008):	New Zealand													X
15	Duncanson (2000),	New Zealand		X											
16	Ekeus (2004)	Sweden													X
17	Engstrom (2002)	Sweden								X		X			
18	Faelker (2000)	Canada					X			X		X			X
19	Flower (2006)	USA													X
20	Graham (2008)	UK							X						
21	Hansen (2005)	Norway							X						
22	Harrop (2007)	Canada				X		X	X			X	X	X	

	Study	Country in which study conducted	Injury type												
			Home					Road			Other	All			
			F	B	D	P	UD	Pa	Pd	UD	F	F	D	B	UD
23	Hasselberg et al (2001)	Sweden							X						
24	Hasselberg & LaFlamme (2004)	Sweden						X	X						
25	Haynes (1999)	UK													X
26	Haynes (2003)	UK													X
27	Haynes (2008)	UK													X
28	Hippisley-Cox (2002)	UK							X	X		X		X	X
29	Hjern (2001)	Sweden	X	X		X									
30	Hussey (1997)	USA													X
31	Janssen (2007)	Canada									X				
32	Jiang (2008)														X
33	Johnston (2000)	USA													X
34	Jones et al (2002)	New Zealand													X
35	Juurlink (2003)	Canada				X									

	Study	Country in which study conducted	Injury type												
			Home					Road			Other	All			
			F	B	D	P	UD	Pa	Pd	UD	F	F	D	B	UD
36	Kendrick (2001)	UK													X
37	Klimentopolou (2004)	Greece							X						
38	Kmet (2006)	Canada						X							
39	Koroukian (2007)	USA								X		X	X	X	
40	Lallo et al (2003)	UK							X						X
41	Lallo & Sheiham (2003)	UK													X
42	LaScala (2004)	USA							X						
43	Lee (2008)	USA													X
44	Li (2008)	Sweden													X
45	Laursen (2008)	Denmark	X	X		X									
46	Macpherson (2006)	Canada							X						
47	McDermott (2008),	USA				X				X		X		X	X
48	Malhotra (2008)	UK						X	X						

	Study	Country in which study conducted	Injury type												
			Home					Road			Other	All			
			F	B	D	P	UD	Pa	Pd	UD	F	F	D	B	UD
49	Marcin (2003)	USA													X
50	Nakahara (2004)	Japan							X						
51	Ni (2002)	USA													X
52	Ordonana (2008)	UK													X
53	Ostberg (1997)	Norway													X
54	Otters (2005)	Netherlands													X
55	Overpeck (1997)	USA													X
56	Petridou et al (1998a):	Greece													X
57	Petridou et al (1998b):	Greece												X	
58	Petridou (2002)	Greece									X				
59	Petridou (2003)	Greece													X
60	Petridou (2005)	Greece													X
61	Petrou (2006)	UK													X

	Study	Country in which study conducted	Injury type												
			Home					Road			Other	All			
			F	B	D	P	UD	Pa	Pd	UD	F	F	D	B	UD
62	Ramsay (2003)	UK					X								
63	Reading (1999)	UK													X
64	Reading (2008)	UK													X
65	Reimers (2008)	Sweden						X	X			X			
66	Rowe (2004)	UK		X		X									
67	Schluter (2006)	New Zealand													X
68	Scholer (1998)	USA		X											
69	Senserrick (2007)	Usa						X							
70	Schmertmann (2008)	Australia				X									
71	Shenassa (2004):	USA	X	X											
72	Schwebel (2004)	USA													X
73	Schwebel (2005)	USA													X
74	Schwebel (2006)	USA													X

	Study	Country in which study conducted	Injury type												
			Home					Road			Other	All			
			F	B	D	P	UD	Pa	Pd	UD	F	F	D	B	UD
75	Schwebel (2006)	USA													X
76	Schwebel (2008)	USA													X
77	Sellstrom (2003)	Sweden													X
78	Senturia (1997)	USA							X						
79	Simon (2004)	USA													X
80	Simon (2006)	USA								X	X				X
81	Simpson (2005)	Canada													X
82	Sinclair (2008):	USA													X
83	Sosnowska (2003)	Poland									X				
84	Soubhi (2004)	Canada													X
85	Soubhi et al (2004)	Canada													X
86	Spinks (2008)	Australia													X
87	Tarantino (1999)	USA										X			

	Study	Country in which study conducted	Injury type												
			Home					Road			Other	All			
			F	B	D	P	UD	Pa	Pd	UD	F	F	D	B	UD
88	Tobin (2002)	UK													X
89	Voas (2002)	USA						X							
90	von Kries (1998)	Germany							X						
91	Winston (2006)	USA						X							
92	Xiang (2008)	USA							X						X
	Totals		**3**	**6**	**0**	**7**	**2**	**10**	**18**	**7**	**4**	**9**	**3**	**6**	**52**

Key: F falls; B: burns, D: downing; UD: undefined; Pa: passenger; Pd: pedestrian/cyclist

The majority of studies used large regional or national databases (e.g. birth cohorts or registries or censuses) to identify the population of children to be studied. These studies included either the entire potential population of children or a sub-population of children based on some form of probabilistic sampling. Most studies identified injuries using existing institutional databases such as hospital records or insurance claims, categorising injury type according to individual ICD codes. Similarly, deaths were identified using national or regional mortality registries. Injuries and death registry data and population databases were then linked at a level of the individual child based on a common identifier. Thus, overall, the risk of selection and case ascertainment bias in the included studies is likely to be relatively low.

4.4. Findings

4.4.1. Road injuries

4.4.1.1. Road - passenger

Table 2 reports findings from 11 studies, one of which was UK based (Malhotra et al, 2008) on multivariate associations between risk factors and child passenger injury. The most notable factors, as reported by Chen et al (2005) and Senserrick et al (2007) (reporting serious injury and injuries with an Abbreviated Injury Scale of at least 2 respectively), were found to relate to young children injured while being driven by a teenage driver, especially where that driver was not a sibling. The latter study reported an odds ratio (OR) for that worst case scenario of 2.62 (95% CI 1.83, 3.76) when comparing non-sibling teen drivers with adult drivers.

There was significant evidence, but with generally modest effect sizes, to indicate that various family characteristics were associated with injury risk. For example, while examining injuries requiring hospitalisation, income was reported by Hasselberg and Laflamme (2004), whereby third quartile disposable income versus fourth quartile (wealthiest) had relative risk (RR) 1.11 (95% CI 1.03, 1.19), second quartile disposable income versus fourth quartile had RR 1.09 (95% CI 1.02, 1.17) and first quartile versus fourth quartile had RR 1.07 (95% CI 1.00, 1.15). Employment status was also reported by Hasselberg and Laflamme (2004) in relation to self employed versus intermediate and high salaried employees with a RR of 1.29 (95% CI 1.02, 1.63) and farmers versus intermediate and high salaried employees with a RR of 2.13 (95% CI 1.56, 2.91). Winston et al (2006) reported that basic

education versus higher education had a RR of 1.39 (95% CI 1.13, 1.71) when considering injury to sub-optimally restrained children.

One study of mortality (Voas et al, 2002) reported a RR for female drivers relative to male drivers of 1.714 for injuries incurred when the child had been restrained. This increased risk may be reflective of longer periods of time mothers spend in the presence of their children.

There is very limited evidence that neighbourhood plays a role in child passenger injury. Reimers et al (2008) found only weak evidence of partial correlation between socio-economic status and injury risk for boys aged 11-14 in 2003-2005 (p=0.17), and no significant association for boys in 1993-1995 or girls in either period.

Malhotra et al (2008) found no statistically significant evidence of ethnic differences in child passenger injury rates in the UK (mortality and morbidity). Harrop et al (2007) found increased mortality risk for native versus non-native Americans, with a RR of 3.4 (95% CI 2.5, 4.4), while Winston et al (2006) found no evidence for ethnicity in relation to Hispanic, Black and White when considering injury. Voas et al (2002) found no evidence of ethnic group differences when considering fatalities to restrained children, but did report significance when the driver's blood alcohol was positive, such as a risk ratio of 1.19 when comparing Black and White fatally injured American children.

Other non-significant findings reported in relation to injury mortality include age and gender of child, urban versus rural comparisons (Kmet and Macarthur, 2006), age of child restrained in vehicle (Voas et al, 2002).

Evidence statement 2: Road - Passenger

There is evidence from 10 studies (1 UK). There is evidence of a strong association (i.e. relative risk equivalent of >2.0) of injuries being associated with travelling in a car driven by a non-sibling teenager. There is evidence of weak to moderate association (i.e. relative risk equivalent of >1.0 to <2.0) of injuries with lower parental income, employment status, educational status, socio-economic status, and with travelling in a car with a female driver (when the injured child was appropriately restrained). The increased risk in females may well reflect their longer periods of time in the presence of children. There is mixed evidence regarding the association of injuries with ethnicity.

4.4.1.2. Road – pedestrian and cyclist

Table 3 reports findings from 18 studies, five of which were UK based (Malhotra et al, 2008; Department for Transport, 1998; Lallo et al, 2003; Hippisley-Cox et al, 2002; Graham and Stephens, 2008) on multivariate associations between risk factors and children injured as pedestrians or pedal cyclists.

When considering deprivation measures associated with child hospitalisation due to injury, a UK study (Hippisley-Cox et al, 2002) reported a gradient for the association between deprivation (as measured by the Townsend score) and pedestrian injury. Comparing second quintile with lowest quintile Townsend score had a rate ratio 1.68 (95% CI 1.30, 2.16); the third quintile in comparison with the lowest quintile had a rate ratio 2.03 (95% CI 1.60, 2.57); the fourth quintile versus the lowest quintile had a rate ratio 2.32 (95% CI 1.85, 2.91) and the fifth quintile versus the lowest quintile had a rate ratio 3.65 (95% CI 2.94, 4.54). However, when examining the deprivation measure associated with children hospitalised as a result of bicycle injury, only the fourth quintile versus the lowest quintile and fifth versus lowest quintile had a significant risk ratio with values 1.38 (95% CI 1.21, 1.57) and 1.61 (95% CI 1.42, 1.82) respectively.

When considering deprivation measures associated with the location of the crash rather than the child, a UK study (Graham and Stephens, 2008) found an association with a composite deprivation indicator for a number of localities with a RR for that measure of 1.91 (95% CI 1.79, 2.04) for killed and seriously injured child pedestrians in London. Similar values were reported for other urban conurbations. For rural areas, the lowest had an OR for this composite deprivation indicator of 1.79 (95% CI 1.59, 2.01). Reimers et al (2008) reported partial correlation coefficients of 0.20 for boys and 0.23 for girls when relating injury with economic deprivation for the time period 2003-2005 (but no significant association was reported between a social fragmentation index, or for either measure from the time period 1993-1995). Von Kries et al (1998) examined a number of environmental variables and found an inverse association between injury risk and the number of 30kph streets and pelican crossings. Macpherson et al (2006) found a weak association between various non-urban environments (mixed urban through to rural) and bicycle related hospitalisation with results such as "mixed urban" versus "urban" having rate ratio 1.24 (95% CI 1.06, 1.40), "mixed rural" versus "urban" having rate ratio 1.40 (95% CI 1.20, 1.55) and "rural" versus "urban" having rate ratio 1.67 (95% CI 1.45, 1.81). Results for hospitalisation due to head injury alone gave slightly larger rate ratios. Nakahara et

al (2004) reported that public parks reduced area-wide vehicle related mortality with a relative risk 0.99 for children aged 0-4. No statistically significant results were reported for children aged 5-14 years.

One study (Xiang et al, 2006) reported gender as a risk factor for pedestrian or cyclist injury with odds ratio 6.88 (95% CI 1.52, 31.2). Non-statistically significant results were reported for age band (12-17 years versus 5-11 years) and ethnicity with White versus other. In the UK, Malhotra et al (2008) failed to find a significant association between ethnicity and injury risk for cyclists. Klimentopolou et al (2004) reported an association with migrant status having a odds ratio 2.30 (95% CI 1.40, 3.79) with respect to bicycle injury. Harrop et al (2007) reported a significant association between Native American versus non-Native American for pedestrian mortality with a RR of 6.9 (95% CI 4.1, 11.2) but no statistically significant association was found for cyclists.

Four studies reported family characteristics as a risk factor. Hasselberg and Laflamme (2004) reported modest effect sizes (generally below 1.5) for injury risk of children from a family of status "unskilled" when compared with "intermediate and high-level salaried employees" - an association also seen with income levels. Similar results, with a similar magnitude of association were also noted in Hasselberg et al (2001) for a number of "low status" occupations.

Two UK studies report on the association between various behavioural measures and injury risk. Lallo et al (2003) report "high" versus "normal" hyperactivity having an odds ratio 2.75 (95% CI 1.49, 5.07) and, on the total difficulties scale, "borderline" versus "normal" having odds ratio 2.31 (95% CI 1.17, 4.55). Department for Transport (1998) reports self-reported propensity to anger having a significant regression coefficient 0.1 in terms of injury risk. In addition, Brehaut et al (2003) report "behavioural disorders" versus "non-behavioural disorders" having an OR of 1.71 (95% CI, 1.33, 2.22) for the occurrence of injuries. Senturia et al (1997) report a number of bicycle specific behaviours having significant injury risk: "slow riding" versus "normal riding" had OR 10.3 (95% CI 1.6, 66.8), "only riding on the pavement" versus "mixed pavement / street riding" had an OR 6.1 (95% CI 1.8, 20.5) and "riding more than three quarters of mile from home" versus riding nearer home had OR 3.7 (95% CI 1.1, 12.5). Notably, significant evidence as not reported for "fast" versus "normal" riding, riding a BMX versus riding another type of bike, riding alone versus

riding with other children or adults, riding in order to play versus riding in order to travel, no stunt riding versus stunt riding.

Evidence statement 3: Road – Pedestrian and cyclist

There is evidence from 18 studies (5 UK). There is evidence of a strong association between the lowest socio-economic quintiles, being of Native American descent (for pedestrians), having parents who were migrants, hyperactivity, behavioural difficulties, or bicycle riding (riding slowly or only on the pavement) and injuries. There is evidence of weak to moderate association of injuries with membership of the 2nd socio-economic quintile, social deprivation, non-professional parental occupation, rural and mixed-urban environments, being male, or behavioural disorders. There was no statistical evidence of injuries being associated with social fragmentation or Native American ethnicity (for cyclists).

4.4.1.3. Road: Undefined cause of injury

Table 4 reports findings from seven studies, one of which was UK based (Hippisley-Cox et al, 2002), on multivariate associations between risk factors and children injured on the road in an undefined manner. Hippisley-Cox et al (2002) found that "all road related injury" types were weakly associated with children having the highest levels of deprivation (as measured by the Townsend score), with rate ratio for the highest deprivation score quintile versus the lowest quintile of 1.25 (95% CI 1.06, 1.47). Faelker et al (2000) found an association for traffic injury between the poorest quintile income category and richest quintile income category, with rate ratio 1.51 (95% CI 1.08, 2.10).

Ethnicity was found to be associated with injury in one study (Simon et al, 2006) when comparing African-American versus non-Latino White attending emergency departments with a rate ratio of 1.9 (95% CI 1.5, 2.3).

Engstrom et al (2002) found associations with family characteristics for injured girls when comparing "skilled" with "high/intermediate" salaried employees with a rate ratio of 1.41 (95% CI 1.03, 1.91) and "unskilled" versus "high/intermediate" with a rate ratio 1.59 (95% CI 1.15, 2.28) for injuries in 1990 and 1993 but not in 1991, 1992 or 1994.

McDermott et al (2008) found no evidence of an association between autism and injury risk.

Evidence statement 4: Road – Undefined cause of injury

There is evidence from 7 studies (1 UK). There is evidence of weak to moderate association of injuries with socio-economic deprivation and being African-American. There is mixed evidence regarding the association of socio-economic status (measured by parental occupation) with injuries. There was no statistical evidence of injuries being associated with autism.

Table 2. Associations with road-passenger injuries

Characteristics	**Road-passenger injuries: Author (year) (* indicates UK study)** **Associations (95% CI unless otherwise stated)** *(positive associations are italicised; positive associations with relative risk equivalent >2.0 are highlighted)*
Child characteristics	
Age	Voas et al (2002), child passenger mortality where driver's blood was alcohol positive: *3-5 years vs. 0-2 years B 0.0784 (p 0.3374) Exp (B) 1.0816* *6-8 years vs. 0-2 years B 0.0293 (p 0.7401) Exp (B) 1.0298* 9-11 years vs. 0-2 years B -0.1590 (p 0.0962) Exp (B) 0.8530 *12-15 years vs. 0-2 years B 0.1401 (p 0.0459) Exp (B) 1.1503*
	Voas et al (2002), child passenger mortality where the child was restrained in the vehicle: 3-5 years vs. 0-2 years B -0.4390 (p 0.0000) Exp (B) 0.6447 6-8 years vs. 0-2 years B -0.5184 (p 0.0000) Exp (B) 0.5955 9-11 years vs. 0-2 years B -0.6821 (p 0.0000) Exp (B) 0.5055 12-15 years vs. 0-2 years B -1.2854 (p 0.0000) Exp (B) 0.2765
Sex	Kmet & Macarthur (2006), Injury mortality in children aged 0-14 in rural locations: Male vs. female RR 1.0 (0.7, 1.6)
	Kmet & Macarthur (2006), Injury mortality in children aged 0-14 in urban locations: Male vs. female RR 1.2 (0.5, 3.3)
	Kmet & Macarthur (2006), Injuries requiring hospitalisation in children aged 0-14 in rural locations: Male vs. female RR 1.1 (0.9, 1.3)
	Kmet & Macarthur (2006), Injuries requiring hospitalisation in children aged 0-14 in urban locations: Male vs. female RR 0.9 (0.7, 1.2)

Characteristics	**<u>Road-passenger injuries:</u> Author (year) (* indicates UK study)** **Associations (95% CI unless otherwise stated)** *(positive associations are italicised; positive associations with relative risk equivalent >2.0 are highlighted)*
Ethnicity	Harrop et al (2007), Injury mortality: *Native American vs. non-Native American RR 3.4 (2.5, 4.4)*
	Malhotra et al (2008)*, Rate ratios of average annual changes in injuries (both mortality and morbidity): White 0.845 (0.825, 0.866) Black 0.860 (0.828, 0.893) Asian 0.860 (0.825, 0.898) Black vs. White p=0.455 Asian vs. White p=0.478
	Voas et al (2002), child passenger mortality where driver's blood was alcohol positive: *Black American vs. White American B 0.1728 (p 0.0140) Exp (B) 1.1887* *Native American vs. White American B 0.7619 (p 0.0000) Exp (B) 2.1424* Asian/Pacific Islander American vs. White American B -0.8097 (p 0.0002) Exp (B) 0.4450 *Hispanic American vs. White American B 0.2680 (p 0.0002) Exp (B) 1.3074*
	Voas et al (2002), child passenger mortality where the child was restrained in the vehicle: Black American vs. White American B- 0.6351 (p 0.0000) Exp (B) 0.5299 Native American vs. White American B- 0.7456 (p 0.0002) Exp (B) 0.4744 Asian/Pacific Islander American vs. White American B -0.7002 (p 0.0000) Exp (B) 0.4965 Hispanic American vs. White American B -0.7821 (p 0.0000) Exp (B) 0.4574
	Winston et al (2006), Injured children aged under 1 year who were 'sub-optimally restrained': Hispanic vs. non-Hispanic White RR 1.40 (0.19, 3.34) Non-Hispanic Blank vs. non-Hispanic White RR 1.59 (0.55, 3.36) Other vs. non-Hispanic White RR 1.18 (0.38, 2.37)

Characteristics	**<u>Road-passenger injuries:</u> Author (year) (* indicates UK study)** **Associations (95% CI unless otherwise stated)** *(positive associations are italicised; positive associations with relative risk equivalent >2.0 are highlighted)*
	Winston et al (2006), Injured children aged 1-3 years who were 'sub-optimally restrained': Hispanic vs. non-Hispanic White RR 1.57 (0.53, 3.40) Non-Hispanic Blank vs. non-Hispanic White RR 1.82 (0.73, 3.56) Other vs. non-Hispanic White RR 1.32 (0.50, 2.65)
	Winston et al (2006), Injured children aged 4-8 years who were 'sub-optimally restrained': Hispanic vs. non-Hispanic White RR 1.05 (0.88, 1.20) *Non-Hispanic Blank vs. non-Hispanic White RR 1.19 (1.02, 1.34)* Other vs. non-Hispanic White RR 1.01 (0.88, 1.15)
Family characteristics	
Socio-economic status	Hasselberg & Laflamme (2004), Injuries requiring hospitalisation: Assistant non-manual employees vs. intermediate & high-level salaried employees RR 1.09 (0.90, 1.34) Skilled workers vs. intermediate & high-level salaried employees RR 0.98 (0.81, 1.19) Unskilled workers vs. intermediate & high-level salaried employees RR 1.10 (0.90, 1.34) *Self-employed vs. intermediate & high-level salaried employees RR 1.29 (1.02, 1.63)* *Farmers vs. intermediate & high-level salaried employees RR 2.13 (1.56, 2.91)* Unspecified population vs. intermediate & high-level salaried employees RR 1.12 (0.86, 1.47)
Education	Hasselberg & Laflamme (2004), Injuries requiring hospitalisation: Secondary education (10-12years) vs. higher education (university) RR 1.15 (0.99, 1.35) *Basic education (9 years or less) vs. higher education (university) RR 1.39 (1.13, 1.71)*

Characteristics	**<u>Road-passenger injuries:</u> Author (year) (* indicates UK study)** **Associations (95% CI unless otherwise stated)** *(positive associations are italicised; positive associations with relative risk equivalent >2.0 are highlighted)*
Income	Hasselberg & Laflamme (2004), Injuries requiring hospitalisation: *Third quartile of disposable income vs. fourth quartile (highest) RR 1.11 (1.03, 1.19)* *Second quartile of disposable income vs. fourth quartile (highest) RR 1.09 (1.02, 1.17)* *First quartile of disposable income vs. fourth quartile (highest) RR 1.07 (1.00, 1.15)*
Neighbourhood characteristics	
Socio-economic status	Reimers et al (2008), Partial correlation between economic deprivation and injuries: Girls aged 10-14 years (1993-1995) 0.04 Girls aged 10-14 years (2003-2005) 0.12 Boys aged 10-14 years (1993-1995) -0.10 *Boys aged 10-14 years (2003-2005) 0.17 (p <0.05)*
	Reimers et al (2008), Partial correlation between social fragmentation and injuries: Girls aged 10-14 years (1993-1995) 0.02 Girls aged 10-14 years (2003-2005) -0.08 Boys aged 10-14 years (1993-1995) 0.12 Boys aged 10-14 years (2003-2005) -0.12
Driver characteristics	
Driver's age	Chen et al (2006), Child's injury risk when driver aged <=19: 6pm-5:59am vs. 6am-5:59pm (adjusted for child age group) OR 1.32 (0.82, 2.15) 6pm-5:59am vs. 6am-5:59pm (adjusted for child age group + collision type) OR 1.05 (0.63, 1.75) 6pm-5:59am vs. 6am-5:59pm (adjusted for child age group + collision type + child restraint status) OR 0.79 (0.46, 1.35)

Characteristics	**<u>Road-passenger injuries:</u> Author (year) (* indicates UK study)** **Associations (95% CI unless otherwise stated)** *(positive associations are italicised; positive associations with relative risk equivalent >2.0 are highlighted)*
	Chen et al (2006), Child's injury risk when driver aged >19: 6pm-5:59am vs. 6am-5:59pm (adjusted for child age group) OR 0.92 (0.71, 1.19) 6pm-5:59am vs. 6am-5:59pm (adjusted for child age group + collision type) OR 0.93 (0.70, 1.23) 6pm-5:59am vs. 6am-5:59pm (adjusted for child age group + collision type + child restraint status) OR 0.90 (0.68, 1.20)
	Chen et al (2005), Child's serious injury risk: *Older teens vs. adults (adjusted for child age group) OR 2.83 (1.90, 4.21)* *Novice teens vs. adults (adjusted for child age group) OR 2.76 (2.10, 3.63)*
	Chen et al (2005), Child's serious injury risk: *Older teens vs. adults (adjusted for child age group + crash severity) OR 2.15 (1.42, 3.26)* *Novice teens vs. adults (adjusted for child age group + crash severity) OR 1.58 (1.14, 2.19)*
	Chen et al (2005), Child's serious injury risk: *Older teens vs. adults (adjusted for child age group + crash severity + vehicle type + front row status + restraint status) OR 1.74 (1.14, 2.66)* Novice teens vs. adults (adjusted for child age group + crash severity + vehicle type + front row status + restraint status) OR 1.37 (1.00, 1.88)
	Senserrick et al (2007), Abbreviated Injury Scale >=2: *Sibling teen vs. adult Adjusted OR 1.57 (1.09, 2.26)* *Non-sibling teen vs. adult Adjusted OR 2.62 (1.83, 3.76)* Sibling teen vs. non-sibling teen Adjusted OR 0.60 (0.40, 0.90)

Characteristics	**<u>Road-passenger injuries:</u> Author (year) (* indicates UK study)** **Associations (95% CI unless otherwise stated)** *(positive associations are italicised; positive associations with relative risk equivalent >2.0 are highlighted)*
	Winston et al (2006), Injured children aged 1-3 who were 'sub-optimally restrained': 25-34 years vs. under 24 years RR 1.65 (0.87, 3.83) Over 35 years vs. under 24 years RR 1.32 (0.52, 3.39)
	Winston et al (2006), Injured children aged 4-8 who were 'sub-optimally restrained': 25-34 years vs. under 24 years RR 1.24 (0.98, 1.64) *Over 35 years vs. under 24 years RR 1.33 (1.05, 1.79)*
	Winston et al (2006), Injured children aged under 1 year who were 'sub-optimally restrained': 25-34 years vs. under 24 years RR 0.73 (0.37, 1.51) Over 35 years vs. under 24 years RR 1.43 (0.70, 2.98)
Driver's education	Voas et al (2002), child passenger mortality where the child was restrained in the vehicle: *Percent of adults with at least high school diploma B 0.0117 (p 0.000) Exp (B) 1.0117*
	Winston et al (2006), Injured children aged under 1 year who were 'sub-optimally restrained': Vocational training vs. college or above RR 2.05 (0.91, 6.26) *High school vs. college or above RR 2.81 (1.31, 9.05)* Less than high school vs. college or above RR 3.66 (0.88, 12.58)
	Winston et al (2006), Injured children aged 1-3 who were 'sub-optimally restrained': Vocational training vs. college or above RR 1.31 (0.61, 3.09) High school vs. college or above RR 1.56 (0.69, 4.08) Less than high school vs. college or above RR 2.28 (0.40, 7.09)

Characteristics	**<u>Road-passenger injuries:</u> Author (year) (* indicates UK study)** **Associations (95% CI unless otherwise stated)** *(positive associations are italicised; positive associations with relative risk equivalent >2.0 are highlighted)*
	Winston et al (2006), Injured children aged 4-8 who were 'sub-optimally restrained': *Vocational training vs. college or above RR 1.15 (1.04, 1.29)* *High school vs. college or above RR 1.20 (1.08, 1.36)* *Less than high school vs. college or above RR 1.26 (1.03, 1.49)*
Driver's household income	Voas et al (2002), child passenger mortality where driver's blood was alcohol positive: Median household income B -0.4306 (p 0.0000) Exp (B) 0.6501
	Winston et al (2006), Injured children aged under 1 year who were 'sub-optimally restrained': $30,000-$49,999 vs. >$50,000 RR 1.15 (0.62, 2.25) $20,000-$29,999 vs. >$50,000 RR 0.90 (0.31, 2.06) <$20,000 vs. >$50,000 RR 0.69 (0.27, 1.69)
	Winston et al (2006), Injured children aged 1-3 who were 'sub-optimally restrained': *$30,000-$49,999 vs. >$50,000 RR 3.18 (1.54, 6.90)* *$20,000-$29,999 vs. >$50,000 RR 2.67 (1.06, 6.44)* <$20,000 vs. >$50,000 RR 2.07 (0.61, 5.26)
	Winston et al (2006), Injured children aged 4-8 who were 'sub-optimally restrained': $30,000-$49,999 vs. >$50,000 RR 1.05 (0.96, 1.15) $20,000-$29,999 vs. >$50,000 RR 0.97 (0.83, 1.13) *<$20,000 vs. >$50,000 RR 1.26 (1.10, 1.42)*
Driver's sex	Voas et al (2002), child passenger mortality where driver's blood was alcohol positive: Female vs. male B -0.7520 (p 0.0000) Exp (B) 0.4714

Characteristics	**<u>Road-passenger injuries:</u> Author (year) (* indicates UK study)** **Associations (95% CI unless otherwise stated)** *(positive associations are italicised; positive associations with relative risk equivalent >2.0 are highlighted)*
	Voas et al (2002), child passenger mortality where the child was restrained in the vehicle: *Female vs. male B 0.5390 (p 0.0000) Exp (B) 1.7142*
Driver's blood alcohol concentration	Voas et al (2002), child passenger mortality where the child was restrained in the vehicle: Driver's blood alcohol concentration positive vs. driver's blood alcohol concentration negative B -0.5889 (p 0.0000) Exp (B) 0.5550

Table 3. Associations with road-pedestrian/cyclist injuries

Characteristics	**Road-Pedestrian/Cyclist injuries: Author (year) (* indicates UK study)** **Associations (95% CI unless otherwise stated)** *(positive associations are italicised; positive associations with relative risk equivalent >2.0 are highlighted)*
Child characteristics	
Age	Abdel-Aty et al (2007), Likelihood of child crash occurrence: Age 12-14 years vs. 4-11 years where <=2 lane road Odds multiplier 1.4 Age 12-14 years vs. 4-11 years where >2 lane road Odds multiplier 2.0 Age 12-14 years vs. 4-11 years where driver's speed ratio <=0.9 of speed limit Odds multiplier 0.8 Age 12-14 years vs. 4-11 years where driver's speed ratio >0.9 <=1.1 of speed limit Odds multiplier 0.4 Age 12-14 years vs. 4-11 years where driver's speed ratio >1.1 of speed limit Odds multiplier 2.3 Age 12-14 years vs. 4-11 years where speed limit <=25mph Odds multiplier 0.8 Age 12-14 years vs. 4-11 years where speed limit 26-40mph Odds multiplier 1.3 Age 12-14 years vs. 4-11 years where speed limit >40mph Odds multiplier 1.3
	Xiang et al (2006), risk of pedestrian or cyclist injury: Age 12-17 years vs. age 5-11 years OR 4.99 (0.70, 31.42)
Sex	Xiang et al (2006), risk of pedestrian or cyclist injury: *Male vs. female OR 6.88 (1.52, 31.2)*
Ethnicity	Harrop et al (2007), Injury mortality for pedal cyclists: Native American vs. non-Native American RR 2.3 (0.5, 7.3)
	Harrop et al (2007), Injury mortality for pedestrians: *Native American vs. non-Native American RR 6.9 (4.1, 11.2)*

Characteristics	**<u>Road-Pedestrian/Cyclist injuries:</u> Author (year) (* indicates UK study)** **Associations (95% CI unless otherwise stated)** *(positive associations are italicised; positive associations with relative risk equivalent >2.0 are highlighted)*
	Malhotra et al (2008)*, Rate ratios of average annual changes in pedestrian injuries (both mortality and morbidity): White 0.876 (0.860, 0.892) Black 0.874 (0.853, 0.895) Asian 0.872 (0.841, 0.904) Black vs. White p=0.873 Asian vs. White p=0.827
	Malhotra et al (2008)*, Rate ratios of average annual changes in cyclist injuries (both mortality and morbidity): White 0.908 (0.875, 0.942) Black 0.888 (0.840, 0.939) Asian 0.928 (0.860, 1.001) Black vs. White p=0.508 Asian vs. White p=0.615
	Xiang et al (2006), risk of pedestrian or cyclist injury: White vs. other OR 1.08 (0.17, 6.83)
Behavioural	Department for Transport (1998), risk of injury: Problem behaviour (parental report) vs. non-problem behaviour 1.11 (p 0.13) Problem behaviour (teacher report) vs. non-problem behaviour 1.18 (p <.001) High social responsibility values vs. low social responsibility values 0.73 (p<.001)

Characteristics	**<u>Road-Pedestrian/Cyclist injuries:</u> Author (year) (* indicates UK study)** **Associations (95% CI unless otherwise stated)** *(positive associations are italicised; positive associations with relative risk equivalent >2.0 are highlighted)*
	Department for Transport (1998), stepwise regression of risky road user behaviour onto psychological variables: Self-reported impulsiveness b 0.23 (T 7.50, p<.0001) Self-reported propensity to anger b 0.10 (T 3.22, p 0.001) Self-reported danger seeking b 0.11 (T 3.45, p 0.0006)

Characteristics	**<u>Road-Pedestrian/Cyclist injuries:</u> Author (year) (* indicates UK study)** **Associations (95% CI unless otherwise stated)** *(positive associations are italicised; positive associations with relative risk equivalent >2.0 are highlighted)*
	Lallo et al (2003)*, Major accident involving a moving vehicle (behavioural traits assessed using Strengths & Difficulties questionnaire scale): Prosocial: Borderline vs. normal OR 1.11 (0.44, 2.00) High vs. normal OR 1.26 (0.39, 4.12) Hyperactive: Borderline vs. normal OR 1.61 (0.67, 3.87) *High vs. normal OR 2.75 (1.49, 5.07)* Emotional symptoms: Borderline vs. normal OR 1.52 (0.67, 3.40) High vs. normal OR 1.64 (0.81, 3.30) Conduct disorder: Borderline vs. normal OR 1.84 (0.93, 3.65) High vs. normal OR 1.76 (0.88, 3.54) Peer problems: Borderline vs. normal OR 1.55 (0.79, 3.03) High vs. normal OR 0.71 (0.30, 1.69) Total difficulties: *Borderline vs. normal OR 2.31 (1.17, 4.55)* High vs. normal OR 1.55 (0.68, 3.55)
	Brehaut et al (2003), occurrence of injuries: *Behavioural disorders vs. Non-behavioural disorders OR 1.71 (1.33 to 2.22)*

Characteristics	**<u>Road-Pedestrian/Cyclist injuries:</u> Author (year) (* indicates UK study)** **Associations (95% CI unless otherwise stated)** *(positive associations are italicised; positive associations with relative risk equivalent >2.0 are highlighted)*
Disabilities or medical conditions	Xiang et al (2006), risk of pedestrian or cyclist injury: *Children with disabilities vs. children without disabilities OR 5.53 (1.43, 21.41)*
Time spent cycling per week	Hansen et al (2005), time to first bicycle related injury: 1-3 hours vs. <1 hour Hazard ratio 1.96 (0.92, 4.19) *>3 hours vs. <1 hour Hazard ratio 2.75 (1.29, 5.87)*
Bike-riding behaviour	Senturia et al (1997), injuries resulting from bike-riding : Fast riding vs. normal riding OR 3.2 (0.9 to 11.8) *Slow riding vs. normal riding OR 10.3 (1.6 to 66.8)*
	Senturia et al (1997), injuries resulting from bike-riding : *Riding on the pavement only vs. riding always or sometimes on the street OR 6.1 (1.8 to 20.5)*
	Senturia et al (1997), injuries resulting from bike-riding : *Riding >0.75 miles from home vs. riding <0.75 miles from home OR 3.7 (1.1 to 12.5)*
	Senturia et al (1997), injuries resulting from bike-riding : Riding a BMX vs. riding another style of bike OR 2.4 (0.07 to 8.4)
	Senturia et al (1997), injuries resulting from bike-riding : Riding alone vs. riding with adults OR 0.44 (0.1 to 1.0) Riding with other children vs. riding with adults OR 0.91 (0.1 to 1.8)
	Senturia et al (1997), injuries resulting from bike-riding : Riding in order to play vs. riding in order to travel somewhere OR 4.0 (0.3 to 47.3)
	Senturia et al (1997), injuries resulting from bike-riding : No stunt riding vs. stunt riding OR 2.6 (0.5 to 10.5)

Characteristics	**<u>Road-Pedestrian/Cyclist injuries:</u> Author (year) (* indicates UK study)** **Associations (95% CI unless otherwise stated)** *(positive associations are italicised; positive associations with relative risk equivalent >2.0 are highlighted)*
Family characteristics	
Socio-economic status	Hasselberg et al (2001), child pedestrian injuries: Assistant non-manual employees vs. intermediate & high-level salaried employees OR 1.14 (0.98, 1.33) *Skilled workers vs. intermediate & high-level salaried employees OR 1.20 (1.04, 1.38)* *Unskilled workers vs. intermediate & high-level salaried employees OR 1.30 (1.13, 1.50)* Self-employed vs. intermediate & high-level salaried employees OR 1.15 (0.94, 1.40) Farmers vs. intermediate & high-level salaried employees OR 0.77 (0.54, 1.10) *Unspecified population vs. intermediate & high-level salaried employees OR 1.72 (1.43, 2.07)*
	Hasselberg et al (2001), child cyclist injuries: *Assistant non-manual employees vs. intermediate & high-level salaried employees OR 1.18 (1.11, 1.26)* *Skilled workers vs. intermediate & high-level salaried employees OR 1.27 (1.20, 1.35)* *Unskilled workers vs. intermediate & high-level salaried employees OR 1.34 (1.26, 1.42)* *Self-employed vs. intermediate & high-level salaried employees OR 1.17 (1.08, 1.27)* Farmers vs. intermediate & high-level salaried employees OR 0.94 (0.82, 1.08) *Unspecified population vs. intermediate & high-level salaried employees OR 1.52 (1.41, 1.65)*

Characteristics	**<u>Road-Pedestrian/Cyclist injuries:</u> Author (year) (* indicates UK study)** **Associations (95% CI unless otherwise stated)** *(positive associations are italicised; positive associations with relative risk equivalent >2.0 are highlighted)*
	Hasselberg et al (2001), child pedestrian injuries: Assistant non-manual employees vs. intermediate & high-level salaried employees OR Girls 1.09 (0.88, 1.36) OR Boys 1.19 (0.97, 1.46) *Skilled workers vs. intermediate & high-level salaried employees* OR Girls 1.01 (0.81, 1.26) *OR Boys 1.36 (1.13, 1.64)* *Unskilled workers vs. intermediate & high-level salaried employees* OR Girls 1.13 (0.91, 1.39) *OR Boys 1.46 (1.21, 1.75)* Self-employed vs. intermediate & high-level salaried employees OR Girls 1.14 (0.85, 1.52) OR Boys 1.16 (0.88, 1.52) Farmers vs. intermediate & high-level salaried employees OR Girls 0.57 (0.31, 1.04) OR Boys 0.95 (0.61, 1.48) *Unspecified population vs. intermediate & high-level salaried employees OR Girls 1.42 (1.06, 1.89) OR Boys 1.99 (1.57, 2.52)*

Characteristics	**<u>Road-Pedestrian/Cyclist injuries:</u> Author (year) (* indicates UK study)** **Associations (95% CI unless otherwise stated)** *(positive associations are italicised; positive associations with relative risk equivalent >2.0 are highlighted)*
	Hasselberg et al (2001), child cyclist injuries: *Assistant non-manual employees vs. intermediate & high-level salaried employees* OR Girls 1.08 (0.98, 1.20) *OR Boys 1.25 (1.15, 1.35)* *Skilled workers vs. intermediate & high-level salaried employees OR Girls 1.17 (1.06, 1.28) OR Boys 1.34 (1.25, 1.45)* *Unskilled workers vs. intermediate & high-level salaried employees OR Girls 1.22 (1.11, 1.34) OR Boys 1.42 (1.32, 1.53)* *Self-employed vs. intermediate & high-level salaried employees OR Girls 1.17 (1.02, 1.33) OR Boys 1.17 (1.06, 1.31)* Farmers vs. intermediate & high-level salaried employees OR Girls 0.88 (0.70, 1.11) OR Boys 0.98 (0.82, 1.16) *Unspecified population vs. intermediate & high-level salaried employees OR Girls 1.30 (1.41, 1.65) OR Boys 1.68 (1.52, 1.85)*
	Hasselberg & Laflamme (2004), Child pedestrian injuries requiring hospitalisation: Assistant non-manual employees vs. intermediate & high-level salaried employees RR 1.00 (0.79, 1.27) Skilled workers vs. intermediate & high-level salaried employees RR 1.05 (0.83, 1.31) *Unskilled workers vs. intermediate & high-level salaried employees RR 1.27 (1.01, 1.59)* Self-employed vs. intermediate & high-level salaried employees RR 1.18 (0.89, 1.56) Farmers vs. intermediate & high-level salaried employees RR 0.83 (0.48, 1.41) Unspecified population vs. intermediate & high-level salaried employees RR 1.22 (0.91, 1.65)

Characteristics	**<u>Road-Pedestrian/Cyclist injuries:</u> Author (year) (* indicates UK study)** **Associations (95% CI unless otherwise stated)** *(positive associations are italicised; positive associations with relative risk equivalent >2.0 are highlighted)*
	Hasselberg & Laflamme (2004), Child cyclist injuries requiring hospitalisation: Assistant non-manual employees vs. intermediate & high-level salaried employees RR 1.06 (0.98, 1.15) *Skilled workers vs. intermediate & high-level salaried employees RR 1.10 (1.02, 1.19)* *Unskilled workers vs. intermediate & high-level salaried employees RR 1.20 (1.11, 1.29)* Self-employed vs. intermediate & high-level salaried employees RR 1.03 (0.93, 1.14) Farmers vs. intermediate & high-level salaried employees RR 0.87 (0.73, 1.04) Unspecified population vs. intermediate & high-level salaried employees RR 1.21 (1.09, 1.35)
	Hippisley-Cox et al (2002)*, child pedestrian hospitalisations due to injuries: *2nd Townsend deprivation score quintile vs. lowest quintile Rate ratio 1.68 (1.30, 2.16)* *3rd Townsend deprivation score quintile vs. lowest quintile Rate ratio 2.03 (1.60, 2.57)* *4th Townsend deprivation score quintile vs. lowest quintile Rate ratio 2.32 (1.85, 2.91)* *Highest Townsend deprivation score quintile vs. lowest quintile Rate ratio 3.65 (2.94, 4.54)*
	Hippisley-Cox et al (2002)*, child cyclist hospitalisations due to injuries: 2nd Townsend deprivation score quintile vs. lowest quintile Rate ratio 1.06 (0.92, 1.22) 3rd Townsend deprivation score quintile vs. lowest quintile Rate ratio 1.08 (0.94, 1.24) *4th Townsend deprivation score quintile vs. lowest quintile Rate ratio 1.38 (1.21, 1.57)* *Highest Townsend deprivation score quintile vs. lowest quintile Rate ratio 1.61 (1.42, 1.82)*
Education	Hasselberg & Laflamme (2004), Child pedestrian injuries requiring hospitalisation: Secondary education (10-12years) vs. higher education (university) RR 0.95 (0.79, 1.14) Basic education (9 years or less) vs. higher education (university) RR 1.21 (0.95, 1.54)

Characteristics	**<u>Road-Pedestrian/Cyclist injuries:</u> Author (year) (* indicates UK study)** **Associations (95% CI unless otherwise stated)** *(positive associations are italicised; positive associations with relative risk equivalent >2.0 are highlighted)*
	Hasselberg & Laflamme (2004), Child cyclist injuries requiring hospitalisation: Secondary education (10-12years) vs. higher education (university) RR 1.13 (1.06, 1.20) Basic education (9 years or less) vs. higher education (university) RR 1.22 (1.12, 1.32)
Income	Hasselberg & Laflamme (2004), Child pedestrian injuries requiring hospitalisation: Third quartile of disposable income vs. fourth quartile (highest) RR 1.15 (0.94, 1.41) *Second quartile of disposable income vs. fourth quartile (highest) RR 1.23 (1.01, 1.51)* First quartile of disposable income vs. fourth quartile (highest) RR 1.23 (1.00, 1.52)
	Hasselberg & Laflamme (2004), Child cyclist injuries requiring hospitalisation: *Third quartile of disposable income vs. fourth quartile (highest) RR 1.11 (1.03, 1.19)* *Second quartile of disposable income vs. fourth quartile (highest) RR 1.09 (1.02, 1.17)* First quartile of disposable income vs. fourth quartile (highest) RR 1.07 (1.00, 1.15)
	Xiang et al (2006), risk of pedestrian or cyclist injury: <=US$15,000 vs. >US$50,000 OR 2.44 (0.42, 14.11) US$15,001-50,000 vs. >US$50,000 OR 0.72 (0.12, 4.47)
Migrant status	Klimentopolou et al (2004), contrasting on-road from off-road bicycle injuries: *Migrants vs. native Greeks OR 2.30 (1.40, 3.79)*
Neighbourhood characteristics	

Characteristics	**<u>Road-Pedestrian/Cyclist injuries:</u> Author (year) (* indicates UK study)** **Associations (95% CI unless otherwise stated)** *(positive associations are italicised; positive associations with relative risk equivalent >2.0 are highlighted)*
Socio-economic status	Graham & Stephens (2008)*, impact of composite de privation index on child pedestrian casualties (RRs calculated from the reported estimates and standard errors): *London RR 1.91 (1.79, 2.04)* *Other conurbation RR 1.92 (1.74, 2.10)* *Urban RR 1.86 (1.75, 1.97)* *Rural RR 1.79 (1.59, 2.01)*
	Graham & Stephens (2008)*, impact of composite deprivation index on child pedestrians who were killed or seriously injured (RRs calculated from the reported estimates and standard errors): *London RR 1.71 (1.56, 1.87)* *Other conurbation RR 1.73 (1.64, 1.82)* *Urban RR 1.75 (1.69, 1.80)* *Rural RR 1.72 (1.61, 1.85)*
	LaScala et al (2004), child pedestrian injury collisions near schools, annual rates per km of road (combined model of sociodemographic and environmental factors): Community 1 b -0.0858 (p 0.012) Exp (b) 0.9178 *Community 2 b 0.1166 (p <0.001) Exp (b) 1.1237* Community 3 b -0.0504 (p 0.081) Exp (b) 0.9508
	Reimers et al (2008), Partial correlation between social fragmentation and injuries: Girls aged 10-14 years (1993-1995) 0.04 Girls aged 10-14 years (2003-2005) -0.10 Boys aged 10-14 years (1993-1995) 0.12 Boys aged 10-14 years (2003-2005) -0.10

Characteristics	**<u>Road-Pedestrian/Cyclist injuries:</u> Author (year) (* indicates UK study)** **Associations (95% CI unless otherwise stated)** *(positive associations are italicised; positive associations with relative risk equivalent >2.0 are highlighted)*
	Reimers et al (2008), Partial correlation between economic deprivation and injuries: Girls aged 10-14 years (1993-1995) 0.06 *Girls aged 10-14 years (2003-2005) 0.20 (p <0.05)* Boys aged 10-14 years (1993-1995) 0.12 *Boys aged 10-14 years (2003-2005) 0.23 (p <0.01)*
Parks/play areas	Nakahara et al (2004), vehicle related mortalities (coefficients derived from a Poisson generalised linear model), model 1 (details of models not reported): *Italics show <u>decreases</u> relative to baseline* *Children aged 0-4 years, public parks B -0.0076 (-0.0139, -0.0013)* Children aged 5-14 years, public parks B -0.0022 (-0.0113, 0.0069)
	von Kries et al (1998), Injury risk by number of playgrounds within 500m of injured child's home address: 0 vs. >3 OR 1.8 (0.9, 3.5) 1-3 vs. >3 OR (0.7, 2.5)
Road safety measures	Nakahara et al (2004), vehicle related mortalities (coefficients derived from a Poisson generalised linear model): *Italics show <u>decreases</u> relative to baseline* Children aged 0-4 years, traffic law infringement notices (model 1) B -0.00001 (-0.0001, 0.0001) Children aged 0-4 years, traffic law infringement notices (model 2) B -0.00002 (-0.0001, 0.0001) Children aged 0-4 years, traffic law infringement notices (model 3) B -0.00002 (-0.0001, 0.0001) Children aged 5-14 years, traffic law infringement notices (model 1) B -0.00006 (-0.0002, 0.0001) Children aged 5-14 years, traffic law infringement notices (model 2) B -0.00002 (-0.0001, 0.0001) Children aged 5-14 years, traffic law infringement notices (model 3) B -0.00006 (-0.0002, 0.0001)

Characteristics	**<u>Road-Pedestrian/Cyclist injuries:</u> Author (year) (* indicates UK study)** **Associations (95% CI unless otherwise stated)** *(positive associations are italicised; positive associations with relative risk equivalent >2.0 are highlighted)*
	Nakahara et al (2004), vehicle related mortalities (coefficients derived from a Poisson generalised linear model): *Italics show <u>decreases</u> relative to baseline* Children aged 0-4 years, traffic volume (model 1) B -0.0032 (-0.0164, 0.0100) *Children aged 0-4 years, traffic volume (model 2) B -0.0114 (-0.0229, -0.00001)* Children aged 0-4 years, traffic volume (model 3) B -0.0128 (-0.0244, 0.0011) Children aged 5-14 years, traffic volume (model 1) B -0.0031 (-0.0222, 0.0160) Children aged 5-14 years, traffic volume (model 2) B -0.0053 (-0.0212, 0.0106) Children aged 5-14 years, traffic volume (model 3) B -0.0071 (-0.0227, 0.0086)
	von Kries et al (1998), Injury risk by number of a streets with a 30kph speed limit within 500m of injured child's home address: *0-5 vs. >15 OR 5.3 (1.6, 17.6)* *6-10 vs. >15 OR 4.3 (1.4, 13.4)* 11-15 vs. >15 OR 2.5 (0.8, 8.1)
	von Kries et al (1998), Injury risk by mean number of pelican crossings per street within 500m of injured child's home address: *0-1 vs. >3 OR 2.3 (1.2, 4.5)* *>1-2 vs. >3 OR 2.4 (1.3, 4.3)* >2-3 vs. >3 OR 1.1. (0.6, 1.9)
Urban/rural	Klimentopolou et al (2004), contrasting on-road from off-road bicycle injuries: *Athens vs. other OR 1.78 (1.32, 2.38)*

Characteristics	**<u>Road-Pedestrian/Cyclist injuries:</u> Author (year) (* indicates UK study)** **Associations (95% CI unless otherwise stated)** *(positive associations are italicised; positive associations with relative risk equivalent >2.0 are highlighted)*
	Macpherson et al (2006), bicycle-related injury hospitalisation: *Mixed urban vs. urban (head injuries) RR 1.42 (1.17, 1.61)* *Mixed rural vs. urban (head injuries) RR 1.59 (1.32, 1.78)* *Rural vs. urban (head injuries) RR 1.69 (1.41, 1.87)* Mixed urban vs. urban (other injuries) RR 1.08 (0.93, 1.22) *Mixed rural vs. urban (other injuries) RR 1.22 (1.05, 1.36)* *Rural vs. urban (other injuries) RR 1.37 (1.20, 1.51)*
	Macpherson et al (2006), bicycle-related injury hospitalisation: *Mixed urban vs. urban (all hospitalisations <=1 day) RR 1.24 (1.06, 1.40)* *Mixed rural vs. urban (all hospitalisations <=1 day) RR 1.40 (1.20, 1.55)* *Rural vs. urban (all hospitalisations <=1 day) RR 1.67 (1.45, 1.81)* *Mixed urban vs. urban (head injury hospitalisations <=1 day) RR 1.49 (1.18, 1.73)* *Mixed rural vs. urban (head injury hospitalisations <=1 day) RR 1.71 (1.36, 1.94)* *Rural vs. urban (head injury hospitalisations <=1 day) RR 1.85 (1.49, 2.07)* Mixed urban vs. urban (other injury hospitalisations <=1 day) RR 1.08 (0.88, 1.29) Mixed rural vs. urban (other injury hospitalisations <=1 day) RR 1.20 (0.98, 1.41) *Rural vs. urban (*other injury hospitalisations <=1 day*) RR 1.55 (1.29, 1.74)*

Characteristics	**<u>Road-Pedestrian/Cyclist injuries:</u> Author (year) (* indicates UK study)** **Associations (95% CI unless otherwise stated)** *(positive associations are italicised; positive associations with relative risk equivalent >2.0 are highlighted)*
	Macpherson et al (2006), bicycle-related injury hospitalisation: Mixed urban vs. urban (all hospitalisations >1 day) RR 1.13 (0.95, 1.30) *Mixed rural vs. urban (all hospitalisations >1 day) RR 1.27 (1.07, 1.44)* *Rural vs. urban (all hospitalisations >1 day) RR 1.26 (1.07, 1.42)* Mixed urban vs. urban (head injury hospitalisations >1 day) RR 1.28 (0.93, 1.61) Mixed rural vs. urban (head injury hospitalisations >1 day) RR 1.38 (1.00, 1.71) *Rural vs. urban (head injury hospitalisations >1 day) RR 1.41 (1.03, 1.73)* Mixed urban vs. urban (other injury hospitalisations >1 day) RR 1.07 (0.88, 1.27) *Mixed rural vs. urban (other injury hospitalisations >1 day) RR 1.23 (1.01, 1.42)* Rural vs. urban (other injury hospitalisations >1 day) RR 1.21 (0.99, 1.40)
Road characteristics	
Road characteristics	Abdel-Aty et al (2007), Likelihood of child crash occurrence: >2 lanes vs. <=2 lanes on divided roads Odds multiplier 2.7 >2 lanes vs. <=2 lanes on undivided roads Odds multiplier 0.3 >2 lanes vs. <=2 lanes on roads where driver's speed ratio <=0.9 of speed limit Odds multiplier 1.1 >2 lanes vs. <=2 lanes on roads where driver's speed ratio >0.9 <=1.1 of speed limit Odds multiplier 0.6 >2 lanes vs. <=2 lanes on roads where driver's speed ratio >1.1 of speed limit Odds multiplier 2.1

Table 4. Associations with road injuries – undefined

Characteristics	**Road-Undefined injuries: Author (year) (* indicates UK study)** **Associations (95% confidence interval unless otherwise stated)** *(positive associations are italicised; positive associations with relative risk equivalent >2.0 are highlighted)*
Child characteristics	
Ethnicity	Simon et al (2006), rates of injury visits to emergency departments: *African American vs. non-Latino White 1.9 (1.5, 2.3)* Latino vs. non-Latino White 0.8 (0.5, 1.1)
Behavioural	Brehaut et al (2003) : *Behavioural disorders vs. Non-behavioural disorders OR 1.56 (1.23 to 1.99)*
Disabilities or medical conditions	McDermott et al (2008), motor vehicle injuries: Autism vs. no disability Relative rate 0.76 (0.34, 1.71)
Family characteristics	
Socio-economic status	Engstrom et al (2002) Child injuries by socio-economic status of parents: *Low employees vs. High/intermediate employees RR 1.14 (1.05 to 1.24)* *Skilled workers vs. High/intermediate employees RR 1.17 (1.08 to 1.27)* *Unskilled workers vs. High/intermediate employees RR 1.23 (1.14 to 1.34)*

Characteristics	**<u>Road-Undefined injuries:</u> Author (year) (* indicates UK study)** **Associations (95% confidence interval unless otherwise stated)** *(positive associations are italicised; positive associations with relative risk equivalent >2.0 are highlighted)*
	Engstrom et al (2002), traffic injuries in girls: 1990: Low level salaried employees vs. high/intermediate level salaried employees RR 1.06 (0.72, 1.52) *Skilled workers vs. high/intermediate level salaried employees RR 1.41 (1.03, 1.91)* *Unskilled workers vs. high/intermediate level salaried employees RR 1.59 (1.15, 2.28)* 1991: Low level salaried employees vs. high/intermediate level salaried employees RR 0.88 (0.57, 1.32) Skilled workers vs. high/intermediate level salaried employees RR 1.35 (0.96, 1.87) Unskilled workers vs. high/intermediate level salaried employees RR 1.23 (0.86, 1.72) 1992: Low level salaried employees vs. high/intermediate level salaried employees RR 1.30 (0.91, 1.83) Skilled workers vs. high/intermediate level salaried employees RR 1.14 (0.81, 1.59) Unskilled workers vs. high/intermediate level salaried employees RR 1.20 (0.85, 1.66) 1993: Low level salaried employees vs. high/intermediate level salaried employees RR 1.07 (0.73, 1.52) Skilled workers vs. high/intermediate level salaried employees RR 0.80 (0.55, 1.15) *Unskilled workers vs. high/intermediate level salaried employees RR 1.43 (1.05, 1.94)* 1994: Low level salaried employees vs. high/intermediate level salaried employees RR 1.21 (0.88, 1.63) Skilled workers vs. high/intermediate level salaried employees RR 0.97 (0.71, 1.31) Unskilled workers vs. high/intermediate level salaried employees RR 1.09 (0.92, 1.46)

Characteristics	**<u>Road-Undefined injuries:</u> Author (year) (* indicates UK study)** **Associations (95% confidence interval unless otherwise stated)** *(positive associations are italicised; positive associations with relative risk equivalent >2.0 are highlighted)*
	Faelker et al (2000), traffic injuries: Income category II vs. income category I (richest) Rate ratio 1.12 (0.86, 1.45) Income category III vs. income category I (richest) Rate ratio 0.83 (0.57, 1.21) Income category IV vs. income category I (richest) Rate ratio 1.18 (0.84, 1.64) *Income category V (poorest) vs. income category I (richest) Rate ratio 1.51 (1.08, 2.10)*
	Hippisley-Cox et al (2002)*, hospitalisations due to other transport injuries: 2nd Townsend deprivation score quintile vs. lowest quintile Rate ratio 0.87 (0.73, 1.05) 3rd Townsend deprivation score quintile vs. lowest quintile Rate ratio 0.92 (0.78, 1.10) 4th Townsend deprivation score quintile vs. lowest quintile Rate ratio 1.05 (0.89, 1.25) *Highest Townsend deprivation score quintile vs. lowest quintile Rate ratio 1.25 (1.06, 1.47)*
Medicaid status	Koroukian et al (2007), motor vehicle crash injuries in age group 0-4 years: Non Medicaid had higher probability (0.224) than Medicaid (0.138)
	Koroukian et al (2007), motor vehicle crash injuries in age group 5-14 years: Non Medicaid had higher probability (0.448) than Medicaid (0.348)

4.4.2. Home injuries

4.4.2.1. Home: Burns/fire

Results are reported in Table 5. Six studies reported the multivariate association between risk factors and burn/fire-related injury, one of which was UK-based (Rowe et al, 2004). Two studies assessed mortality due to burns (Duncanson et al, 2000; Scholer et al, 1998) and four examined various morbidity associated with burns and fires (Hjern et al, 2001; Laursen & Nielsen, 2008; Rowe et al, 2004; Shenassa et al, 2004).

The strongest factor associated with the risk of burns was child age (rate ratio of 8.16, 95% CI: 6.77 to 9.83 for children aged <1 vs 5-6 years, Shenassa et al, 2004). Other child characteristics that were significant included male gender, being Maori or African American, behavioural problems (oppositional defiant disorder) and poor reading score.

Family characteristics that were statistically associated with injuries through burns included low parental education, lower home income, more children, lone parent, crowded dwellings, step parents, housing age, mother's age, mother's age at birth, and migrant status.

A number of neighbourhood characteristics were also significant predictors. These included lower area socioeconomic status (rate ratio: 2.10. 95% CI: 1.56 to 2.83 for high concentrated poverty vs. low and rate ratio: 1.79, 95% CI: 1.35 to 2.36 for middle concentrated poverty vs low, Shenassa et al, 2004), rural settings, areas of high African American or Middle African populations. There was no significant association between home ownership and risk of burns.

Although statistically significant, with the exception of child's age, child oppositional defiant disorder, being Maori, mother's age and areas of high African-American, associations were weak to moderate in strength (i.e. relative risk equivalent <2.0). Male gender was shown to be a risk factor for burns death or injury by three studies (Hjern et al, 2001; Scholer et al, 1998; Shenessa et al, 2004). Each factor was assessed by one or two studies and therefore it is not possible to comment on consistency of risk factor associations across studies.

Evidence statement 5: Home – Burns/fires

There is evidence from 6 studies (1 UK). Two studies reported burn-related deaths. There was evidence of a strong association between child's age (< 1 year), low mother education and age, and areas of concentrated poverty and high African American population and injuries. There is evidence of weak to moderate association of burn injuries with children being male, from an ethnic minority, having behavioural problems and a poor reading score, low parental education, lower home income, a larger number of children in the home, and rural location. There was no statistical evidence of burn injuries being associated with type of home ownership.

4.4.2.2. Home: Drowning

No multivariate studies were found that examined risk factors for drowning.

Evidence statement 6: Home - Drowning

No multivariate evidence was found that examined risk factors for drowning.

4.4.2.3. Home – Falls

Results are reported in Table 6. Three studies assessed risk factors for injuries due to falls in the home (Hjern et al 2001; Laursen & Nielsen 2008; Shenassa et al, 2004). None were UK-based.

Increasing age was strongly associated with the risk of fall injury (<1 year vs 5-6 years: rate ratio 2.13, 95%CI: 1.94 to 2.34, Shenassa et al, 2004). Other child characteristics with weak to moderate association with risk of fall injury were male gender and African Americans.

Significant family characteristics associated (all weak to moderate) with injury included families in receipt of social benefits, lower educational status of parent, lower income, more than one child in the household, younger mothers at childbirth, non-owner housing occupancy, living in a flat or farmhouse versus detached or row house, older housing and migrant status. Being a lone parent was not significantly associated with fall injury.

Neighbourhood poverty and urbanality were not statistically associated with falls,

The majority of factors were assessed by only one or two studies so it is not possible to comment on consistency of predictors across studies.

Evidence statement 7: Home - Falls

There is evidence from 3 studies (0 UK). There is evidence of a strong association between greater child's age (once older than 1 year) and injuries. There is evidence of weak to moderate association of injuries with being male, being of African-American descent, families being in receipt of social welfare benefits, lower educational status of parents, lower income, single parent households, lower mother's age at childbirth, non-owner housing occupancy, living in a flat or farmhouse, older housing and being a migrant. Being lone parent status, neighbourhood poverty and urbanality were not statistically associated with falls.

4.4.2.4. Home – Poisoning

Results are reported in Table 7. Seven multivariate studies examined factors associated with poisonings in the home. Five studies reported poisoning related morbidity (Hjern et al, 2001; Juurlink et al, 2003; McDermott et al, 2008; Rowe et al, 2004; Schmertmann et al, 2008) and one reported deaths due to poisoning (Harrop et al, 2007). One study was UK based (Rowe et al, 2004). Juurlink et al (2003) specifically studied risk of poisoning in siblings due to iron supplements used by perinatal mothers.

Increasing age up to 4-years (e.g. 3 years vs, <1 year, relative risk: 6.9, 95% CI: 4.7 to 10.1, Schmertmann et al, 2008), presence of behavioural problem (oppositional defiant disorder vs. no psychiatric condition: odds ratio 3.4, 95% CI: 2.0 to 5.8 (Rowe et al, 2004)), presence of autism (relative risk 7.59, 95% CI:: 3.76 to 15.30 McDermott et al, 2008) and child ethnicity (native American vs non-native American, relative risk: 15.4 95% CI: 6.3, 35.5) were strongly associated with the risk of poisoning. Weak to moderately associated child predictors were male gender and poor reading score,

Family characteristics predictive (weak to moderate) of poisonings were: lower level of parental education, low income, larger families, in receipt of social welfare benefits, younger age of mother at child birth, migrant status and the birth of sibling within 12-months for iron supplement poisoning.

Rurality was the only neighbourhood characteristic reported and was significantly associated with increased risk of poisoning injury.

Single parent status, size of family, overcrowding and house type were not found to be significant predictors.

As predictors were studied by only one or two studies it is not possible to comment on their consistency.

Evidence statement 8: Home - Poisoning

There is evidence from 7 studies (1 UK). There is evidence of a strong association between child's age (from age 1 to 4 years), behavioural problems, and autism and injuries. There is evidence of weak to moderate association of injuries being associated with being male, having a lower reading score, lower educational status of parents, lower income, larger families, being in receipt of social welfare benefits, younger age of mother at childbirth, being of Native American descent, rurality, and the birth of a sibling within 12 months (for iron tablet poisoning). There was no statistical evidence of injuries being associated with single parent households, overcrowding, or house type.

4.4.2.5. Home - undefined cause of injury

Two multivariate studies reported unintentional injuries and risk factors in the home setting but did not report the specific cause of injury (Faelker et al, 2000; Ramsay et al, 2003). One study was UK-based (Ramsay et al, 2003).

These studies limited their assessment to family characteristics. Statistically significant associations (weak to moderate) included lower parental educational attainment and lower family income. Parental marital status and receipt of welfare benefits were not significantly associated with injury.

Evidence statement 9: Home – Undefined cause of injury

There is evidence from 2 studies (1 UK). There is evidence of weak to moderate association of injuries with lower educational status of parents and lower family income. There was no statistical evidence of injuries being associated with parental marital status or of being in receipt of social welfare benefits.

Table 5. Associations with burns/fire in the home

Characteristics	**<u>Home-Burn/fire injuries:</u> Author (year) (* indicates UK study)** **Associations (95% CI unless otherwise stated)** *(positive associations are italicised; positive associations with relative risk equivalent >2.0 are highlighted)*
Child characteristics	
Age	Shenassa et al (2004): *<1 year vs. 5-6 years Rate ratio 8.16 (6.77, 9.83)* *1-2 years vs. 5-6 years Rate ratio 8.28 (6.92, 9.92)* *3-4 years vs. 5-6 years Rate ratio 2.02 (1.64, 2.49)*
Sex	Hjern et al (2001), scalds: *Male vs. female OR 1.5 (1.3, 1.7)*
	Scholer et al (1998), mortality: *Male vs. female Relative risk 1.34 (1.03, 1.75)*
	Shenassa et al (2004): *Male vs. female Rate ratio 1.32 (1.18, 1.48)*
Ethnicity	Duncanson et al (2000), mortality: *Maori vs. non-Maori RR 4.1 (1.4, 12.6)*
	Scholer et al (1998), mortality: African American vs. White/other Relative risk 1.13 (0.79, 1.62)
Behavioural	Rowe et al (2004)*: *Oppositional defiant disorder vs. no psychiatric condition OR 2.7 (1.6, 4.5)*
Intellectual functioning	Rowe et al (2004)*: *Poor child reading score vs. normal intellectual functioning OR 1.6 (1.2, 2.2)*

Characteristics	**<u>Home-Burn/fire injuries:</u> Author (year) (* indicates UK study)** **Associations (95% CI unless otherwise stated)** *(positive associations are italicised; positive associations with relative risk equivalent >2.0 are highlighted)*
Family characteristics	
Social welfare benefits	Hjern et al (2001), scalds: *In receipt of social welfare benefits vs. not in receipt OR 1.3 (1.1, 1.5)*
Education	Hjern et al (2001) (educational level of mother), scalds: *Primary vs. university OR 1.3 (1.03, 1.5)* Secondary vs. university OR 1.1 (0.98, 1.3)
	Laursen & Nielsen (2008), all burns: *Highest education primary vs. highest education tertiary Rate ratio 1.6 (1.4, 1.9)* Highest education secondary vs. highest education tertiary Rate ratio 1.2 (1.0, 1.3*)*
	Laursen & Nielsen (2008), scalding by hot water, tea, or coffee: *Highest education primary vs. highest education tertiary Rate ratio 1.6 (1.3, 2.1)* Highest education secondary vs. highest education tertiary Rate ratio 0.9 (0.8, 1.2)
	Laursen & Nielsen (2008), burns on cooker: *Highest education primary vs. highest education tertiary Rate ratio 1.8 (1.4, 2.3)* Highest education secondary vs. highest education tertiary Rate ratio 1.2 (0.9, 1.4)
	Scholer et al (1998) (educational level of mother), mortality: *<12 years of education vs. >=16 years Relative risk 19.36 (2.63, 142.39)* *12 years of education vs. >=16 years Relative risk 10.20 (1.40, 74.61)* 13-15 years of education vs. >=16 years Relative risk 5.04 (0.64, 39.62)

Characteristics	**<u>Home-Burn/fire injuries:</u> Author (year) (* indicates UK study)** **Associations (95% CI unless otherwise stated)** *(positive associations are italicised; positive associations with relative risk equivalent >2.0 are highlighted)*
Income	Laursen & Nielsen (2008), all burns: (DKK – Danish Kroner): *<DK100,000 vs. >DK300,000 Rate ratio 1.9 (1.6, 2.3)* *DK100,000-199,999 vs. >DK300,000 Rate ratio 1.4 (1.2, 1.7)* DK200,000-299,999 vs. >DK300,000 Rate ratio 1.1 (0.9, 1.3)
	Laursen & Nielsen (2008), scalding by hot water, tea, or coffee: *<DK100,000 vs. >DK300,000 Rate ratio 2.4 (1.8, 3.2)* *DK100,000-199,999 vs. >DK300,000 Rate ratio 1.4 (1.1, 1.9)* DK200,000-299,999 vs. >DK300,000 Rate ratio 1.0 (0.7, 1.4)
	Laursen & Nielsen (2008), burns on cooker: *<DK100,000 vs. >DK300,000 Rate ratio 2.4 (1.7, 3.5)* *DK100,000-199,999 vs. >DK300,000 Rate ratio 1.8 (1.3, 2.5)* DK200,000-299,999 vs. >DK300,000 Rate ratio 1.3 (0.9, 1.9)
Family unit	Hjern et al (2001), scalds: *Lone-parent household vs. other OR 1.2 (1.03, 1.5)*
	Laursen & Nielsen (2008), all burns: Step-family vs. two parents Rate ratio 1.0 (0.8, 1.4) *Single parent vs. two parents Rate ratio 1.3 (1.1, 1.5)*
	Laursen & Nielsen (2008), scalding by hot water, tea, or coffee: Step-family vs. two parents Rate ratio 0.8 (0.4, 1.6) Single parent vs. two parents Rate ratio 0.9 (0.6, 1.2)

Characteristics	**<u>Home-Burn/fire injuries:</u> Author (year) (* indicates UK study)** **Associations (95% CI unless otherwise stated)** *(positive associations are italicised; positive associations with relative risk equivalent >2.0 are highlighted)*
	Laursen & Nielsen (2008), burns on cooker: Step-family vs. two parents Rate ratio 1.4 (0.7, 2.7) *Single parent vs. two parents Rate ratio 2.0 (1.6, 2.5)*
	Rowe et al (2004)*: Stepparent family vs. two-parent family OR 1.4 (0.9, 2.1)
	Scholer et al (1998), mortality: *Unmarried parents vs. married parents Relative risk 1.49 (1.08, 2.06)*
No. of children in family	Hjern et al (2001), scalds: *Two siblings vs. <2 siblings OR 1.2 (1.02, 1.0)*
	Laursen & Nielsen (2008), all burns: 2 children in family vs. 1 child in family Rate ratio 0.8 (0.7, 1.0) >=3 children in family vs. 1 child in family Rate ratio 1.1 (1.0, 1.3)
	Laursen & Nielsen (2008), scalding by hot water, tea, or coffee: 2 children in family vs. 1 child in family Rate ratio 0.7 (0.6, 0.9) >=3 children in family vs. 1 child in family Rate ratio 1.2 (1.0, 1.5)
	Laursen & Nielsen (2008), burns on cooker: 2 children in family vs. 1 child in family Rate ratio 0.9 (0.7, 1.1) >=3 children in family vs. 1 child in family Rate ratio 1.0 (0.8, 1.4)

Characteristics	**<u>Home-Burn/fire injuries:</u> Author (year) (* indicates UK study)** **Associations (95% CI unless otherwise stated)** *(positive associations are italicised; positive associations with relative risk equivalent >2.0 are highlighted)*
	Scholer et al (1998), mortality: *>=3 other children vs. no other children Relative risk 6.09 (3.79, 9.79)* *2 other children vs. no other children Relative risk 2.94 (1.91, 4.55)* *1 other child vs. no other children Relative risk 2.30 (1.63, 3.27)*
Housing tenure	Hjern et al (2001), scalds: Chainhouse vs. own house OR 1.0 (0.8, 1.2) Apartment vs. own house OR 1.1 (0.98, 1.3)
	Shenassa et al (2004): Percentage owner-occupied Rate ratio per 10% increase 0.92 (0.84, 1.00)
Dwelling type	Laursen & Nielsen (2008), all burns: *Flat vs. detached or row house Rate ratio 1.7 (1.5, 1.9)* Farmhouse vs. detached or row house Rate ratio 1.2 (0.9, 1.7)
	Laursen & Nielsen (2008), scalding by hot water, tea, or coffee: *Flat vs. detached or row house Rate ratio 2.0 (1.7, 2.4)* Farmhouse vs. detached or row house Rate ratio 0.6 (0.3, 1.3)
	Laursen & Nielsen (2008), burns on cooker: *Flat vs. detached or row house Rate ratio 2.1 (1.6, 2.8)* Farmhouse vs. detached or row house Rate ratio 1.2 (0.6, 2.7)
Overcrowded housing	Laursen & Nielsen (2008), all burns: *Crowded dwelling vs. not crowded dwelling Rate ratio 1.2 (1.1, 1.4)*

Characteristics	**<u>Home-Burn/fire injuries:</u> Author (year) (* indicates UK study)** **Associations (95% CI unless otherwise stated)** *(positive associations are italicised; positive associations with relative risk equivalent >2.0 are highlighted)*
	Laursen & Nielsen (2008), scalding by hot water, tea, or coffee: *Crowded dwelling vs. not crowded dwelling Rate ratio 1.6 (1.3, 1.9)*
	Laursen & Nielsen (2008), burns on cooker: Crowded dwelling vs. not crowded dwelling Rate ratio 1.2 (1.0, 1.6)
Housing age	Shenassa et al (2004): *Percentage housing built before 1950 Rate ratio per 10% increase 1.11 (1.04, 1.18)*
Mother's age at childbirth	Hjern et al (2001), scalds: <=23 years vs. >=34 years OR 1.2 (0.99, 1.5) 24-28 years vs. >=34 years OR 1.0 (0.8, 1.2) 29-33 years vs. >=34 years OR 1.0 (0.8, 1.2)
	Laursen & Nielsen (2008), all burns: *Mother's age at childbirth <25 years vs. >30 years Rate ratio 1.6 (1.4, 1.9)* Mother's age at childbirth 25-29 years vs. >30 years Rate ratio 1.1 (1.0, 1.2)
	Laursen & Nielsen (2008), scalding by hot water, tea, or coffee: *Mother's age at childbirth <25 years vs. >30 years Rate ratio 1.7 (1.3, 2.2)* Mother's age at childbirth 25-29 years vs. >30 years Rate ratio 1.2 (1.0, 1.5*)*
	Laursen & Nielsen (2008), burns on cooker: *Mother's age at childbirth <25 years vs. >30 years Rate ratio 1.9 (1.5, 2.4)* Mother's age at childbirth 25-29 years vs. >30 years Rate ratio 1.1 (0.8, 1.3)

Characteristics	**<u>Home-Burn/fire injuries:</u> Author (year) (* indicates UK study)** **Associations (95% CI unless otherwise stated)** *(positive associations are italicised; positive associations with relative risk equivalent >2.0 are highlighted)*
Mother's age at time of injury	Scholer et al (1998), mortality: *<20 years vs. >=30 years Relative risk 3.91 (2.17, 7.05)* *20-24 years vs. >=30 years Relative risk 2.70 (1.62, 4.51)* 25-29 years vs. >=30 years Relative risk 1.35 (0.77, 2.36)
Migrant status	Hjern et al (2001) (mother's country of birth), scalds: Western vs. Sweden OR 1.0 (0.8, 1.4) *Non-western vs. Sweden OR 1.7 (1.4, 2.1)*
Neighbourhood characteristics	
Socio-economic status	Shenassa et al (2004): *High concentrated poverty vs. low Rate ratio 2.10 (1.56, 2.83)* *Middle concentrated poverty vs. low Rate ratio 1.79 (1.36, 2.36)*
	Scholer et al (1998) (neighbourhood income), mortality: Lowest quintile (<US$8159) vs. highest quintile (>US$14007) Relative risk 1.44 (0.82, 2.51) 2nd quintile (US$8159-9790) vs. highest quintile (>US$14007) Relative risk 1.37 (0.78, 2.43) 3rd quintile (<US$9791-11514) vs. highest quintile (>US$14007) Relative risk 1.46 (0.83, 2.59) 4th quintile (<US$11515-14007) vs. highest quintile (>US$14007) Relative risk 1.18 (0.66, 2.12)
Urban/rural	Hjern et al (2001), scalds: *Rural vs. urban OR 1.4 (1.2, 1.6)*
Ethnicity	Shenassa et al (2004): *High African American population vs. low Rate ratio 2.64 (1.84, 3.79)* Middle African American population vs. low Rate ratio 1.24 (0.88, 1.74)

Table 6. Associations with falls in the home

Characteristics	**Home-Fall injuries: Author (year) (* indicates UK study)** **Associations (95% CI unless otherwise stated)** *(positive associations are italicised; positive associations with relative risk equivalent >2.0 are highlighted)*
Child characteristics	
Age	Shenassa et al (2004): *<1 year vs. 5-6 years Rate ratio 2.13 (1.94, 2.34)* *1-2 years vs. 5-6 years Rate ratio 1.11 (1.01, 1.23)* 3-4 years vs. 5-6 years Rate ratio 0.97 (0.88, 1.07)
Sex	Hjern et al (2001), falls: *Male vs. female OR 1.2 (1.1, 1.2)*
	Shenassa et al (2004): *Male vs. female Rate ratio 1.45 (1.35, 1.55)*
Ethnicity	Shenassa et al (2004): *High African American population vs. low Rate ratio 1.92 (1.55, 2.36)* *Middle African American population vs. low Rate ratio 1.43 (1.17, 1.74)*
Family characteristics	
Social welfare benefits	Hjern et al (2001), falls: *In receipt of social welfare benefits vs. not in receipt OR 1.3 (1.2, 1.4)*
Education	Hjern et al (2001) (educational level of mother), falls: Primary vs. university OR 0.9 (0.8, 0.9) Secondary vs. university OR 1.0 (0.9, 1.1)

Characteristics	**<u>Home-Fall injuries:</u> Author (year) (* indicates UK study)** **Associations (95% CI unless otherwise stated)** *(positive associations are italicised; positive associations with relative risk equivalent >2.0 are highlighted)*
	Laursen & Nielsen (2008), falls from >1m: *Highest education primary vs. highest education tertiary Rate ratio 1.4 (1.2, 1.7)* *Highest education secondary vs. highest education tertiary Rate ratio 1.2 (1.1, 1.4)*
	Laursen & Nielsen (2008), fall from bunk bed: Highest education primary vs. highest education tertiary Rate ratio 1.1 (0.8, 1.5) Highest education secondary vs. highest education tertiary Rate ratio 1.3 (1.0, 1.6*)*
Income	Laursen & Nielsen (2008), falls from >1m: (DKK – Danish Kroner): <DK100,000 vs. >DK300,000 Rate ratio 1.2 (1.0, 1.4) DK100,000-199,999 vs. >DK300,000 Rate ratio 1.1 (1.0, 1.3) DK200,000-299,999 vs. >DK300,000 Rate ratio 1.0 (0.9, 1.2)
	Laursen & Nielsen (2008), fall from bunk bed: (DKK – Danish Kroner): <DK100,000 vs. >DK300,000 Rate ratio 1.0 (0.7, 1.4) DK100,000-199,999 vs. >DK300,000 Rate ratio 1.0 (0.7, 1.4) DK200,000-299,999 vs. >DK300,000 Rate ratio 0.7 (0.5, 1.0)
Lone parent	Hjern et al (2001), falls: Lone parent household vs. non-lone parent household OR 1.0 (0.9, 1.2)
Family type	Laursen & Nielsen (2008), falls from >1m: Step-family vs. two parents Rate ratio 0.9 (0.7, 1.1) Single parent vs. two parents Rate ratio 1.1 (1.0, 1.3)

Characteristics	**<u>Home-Fall injuries:</u> Author (year) (* indicates UK study)** **Associations (95% CI unless otherwise stated)** *(positive associations are italicised; positive associations with relative risk equivalent >2.0 are highlighted)*
	Laursen & Nielsen (2008), fall from bunk bed: Step-family vs. two parents Rate ratio 1.1 (0.6, 2.0) Single parent vs. two parents Rate ratio 1.0 (0.7, 1.4)
No. of children in family	Hjern et al (2001), falls: *Two siblings vs. <2 siblings OR 1.1 (1.02, 1.1)*
	Laursen & Nielsen (2008), falls from >1m: *2 children in family vs. 1 child in family Rate ratio 1.2 (1.1, 1.5)* *>=3 children in family vs. 1 child in family Rate ratio 1.5 (1.2, 1.7)*
	Laursen & Nielsen (2008), fall from bunk bed: *2 children in family vs. 1 child in family Rate ratio 3.1 (1.8, 5.4)* *>=3 children in family vs. 1 child in family Rate ratio 3.8 (2.1, 6.8)*
Mother's age at childbirth	Laursen & Nielsen (2008), falls from >1m: *Mother's age at childbirth <25 years vs. >30 years Rate ratio 1.2 (1.1, 1.4)* Mother's age at childbirth 25-29 years vs. >30 years Rate ratio 1.1 (1.0, 1.3)
	Laursen & Nielsen (2008), falls from bunk bed: Mother's age at childbirth <25 years vs. >30 years Rate ratio 1.1 (0.8, 1.5) Mother's age at childbirth 25-29 years vs. >30 years Rate ratio 1.1 (0.9, 1.5)
	Hjern et al (2001), falls: *<=23 years vs. >=34 years OR 1.4 (1.3, 1.5)* *24-28 years vs. >=34 years OR 1.2 (1.1, 1.3)* *29-33 years vs. >=34 years OR 1.1 (1.1, 1.2)*

Characteristics	**<u>Home-Fall injuries:</u> Author (year) (* indicates UK study)** **Associations (95% CI unless otherwise stated)** *(positive associations are italicised; positive associations with relative risk equivalent >2.0 are highlighted)*
Housing tenure	Hjern et al (2001), falls: *Chainhouse vs. own house OR 1.1 (1.02, 1.2)* Apartment vs. own house OR 1.0 (0.98, 1.1)
	Shenassa et al (2004): Percentage owner-occupied Rate ratio per 10% increase 0.94 (0.90, 0.99)
Overcrowded housing	Laursen & Nielsen (2008), falls from >1m: Crowded dwelling vs. not crowded dwelling Rate ratio 1.1 (1.0, 1.3)
	Laursen & Nielsen (2008), fall from bunk bed: *Crowded dwelling vs. not crowded dwelling Rate ratio 1.7 (1.3, 2.1)*
Dwelling type	Laursen & Nielsen (2008), falls from >1m: *Flat vs. detached or row house Rate ratio 1.3 (1.1, 1.5)* *Farmhouse vs. detached or row house Rate ratio 2.1 (1.6, 2.8)*
	Laursen & Nielsen (2008), falls from bunk bed: Flat vs. detached or row house Rate ratio 1.2 (0.9, 1.6) Farmhouse vs. detached or row house Rate ratio 0.6 (0.3, 1.4)
Housing age	Shenassa et al (2004): *Percentage housing built before 1950 Rate ratio per 10% increase 1.10 (1.06, 1.15)*
Migrant status	Hjern et al (2001) (mother's country of birth), falls: Western vs. Sweden OR 0.9 (0.8, 0.96) Non-western vs. Sweden OR 0.8 (0.7, 0.8)
Neighbourhood characteristics	

Characteristics	**<u>Home-Fall injuries:</u> Author (year) (* indicates UK study)** **Associations (95% CI unless otherwise stated)** *(positive associations are italicised; positive associations with relative risk equivalent >2.0 are highlighted)*
Socio-economic status	Shenassa et al (2004): High concentrated poverty vs. low Rate ratio 1.05 (0.86, 1.27) Middle concentrated poverty vs. low Rate ratio 1.02 (0.83, 1.24)
Urban/rural	Hjern et al (2001), falls: Rural vs. urban OR 1.0 (0.98, 1.1)

Table 7. Associations with poisoning in the home

Characteristics	**<u>Home-Poisoning injuries:</u> Author (year) (* indicates UK study)** **Associations (95% CI unless otherwise stated)** *(positive associations are italicised; positive associations with relative risk equivalent >2.0 are highlighted)*
Child characteristics	
Age	Schmertmann et al (2008), poisoning: 1 year vs. <1 year (remote/very remote locations) RR 1.4 (0.5, 4.1) *1 year vs. <1 year (outer regional locations) RR 5.2 (3.5, 7.7)* *1 year vs. <1 year (inner regional locations) RR 3.2 (2.5, 4.2)* *1 year vs. <1 year (metropolitan locations) RR 4.0 (3.4, 4.8)*
	Schmertmann et al (2008), poisoning: 2 years vs. <1 year (remote/very remote locations) RR 0.9 (0.3, 2.7) *2 years vs. <1 year (outer regional locations) RR 6.9 (4.7, 10.1)* *2 years vs. <1 year (inner regional locations) RR 5.3 (4.2, 6.8)* *2 years vs. <1 year (metropolitan locations) RR 5.1 (4.4, 6.1)*
	Schmertmann et al (2008), poisoning: 3 years vs. <1 year (remote/very remote locations) RR 0.8 (0.2, 2.6) *3 years vs. <1 year (outer regional locations) RR 3.6 (2.4, 5.4)* *3 years vs. <1 year (inner regional locations) RR 2.1 (1.6, 2.7)* *3 years vs. <1 year (metropolitan locations) RR 2.3 (1.9, 2.7)*

Characteristics	**<u>Home-Poisoning injuries:</u> Author (year) (* indicates UK study)** **Associations (95% CI unless otherwise stated)** *(positive associations are italicised; positive associations with relative risk equivalent >2.0 are highlighted)*
	Schmertmann et al (2008), poisoning: 4 years vs. <1 year (remote/very remote locations) RR 0.7 (0.2, 3.3) 4 years vs. <1 year (outer regional locations) RR 1.2 (0.8, 1.9) 4 years vs. <1 year (inner regional locations) RR 0.7 (0.5, 1.0) 4 years vs. <1 year (metropolitan locations) RR 1.0 (0.8, 1.2)
Sex	Hjern et al (2001), drug poisoning: *Male vs. female OR 1.2 (1.1, 1.3)*
	Hjern et al (2001), non-drug poisoning: *Male vs. female OR 1.4 (1.3, 1.5)*
Ethnicity	Harrop et al (2007), Injury mortality: *Native American vs. non-Native American RR 15.4 (6.3, 35.5)*
Behavioural	Rowe et al (2004)*: *Oppositional defiant disorder vs. no psychiatric condition OR 3.4 (2.0, 5.8)* *Anxiety vs. no psychiatric condition OR 2.2 (1.3, 3.7)*
Disabilities or medical conditions	McDermott et al (2008), poisoning: *Autism vs. no disability Relative rate 7.59 (3.76, 15.30)*
Intellectual functioning	Rowe et al (2004)*: *Poor child reading score vs. normal intellectual functioning OR 1.6 (1.1, 2.3)*
Family characteristics	

Characteristics	**<u>Home-Poisoning injuries:</u> Author (year) (* indicates UK study)** **Associations (95% CI unless otherwise stated)** *(positive associations are italicised; positive associations with relative risk equivalent >2.0 are highlighted)*
Education	Hjern et al (2001) (educational level of mother), drug poisoning: Primary vs. university OR 1.1 (0.97, 1.3) Secondary vs. university OR 1.0 (0.8, 1.1)
	Hjern et al (2001) (educational level of mother), non-drug poisoning: Primary vs. university OR 1.1 (0.98, 1.3) Secondary vs. university OR 1.1 (0.97, 1.2)
	Laursen & Nielsen (2008), poisoning: *Highest education primary vs. highest education tertiary Rate ratio 1.9 (1.6, 2.3)* *Highest education secondary vs. highest education tertiary Rate ratio 1.4 (1.2, 1.6)*
Income	Laursen & Nielsen (2008), poisoning: (DKK – Danish Kroner): *<DK100,000 vs. >DK300,000 Rate ratio 1.7 (1.4, 2.1)* *DK100,000-199,999 vs. >DK300,000 Rate ratio 1.3 (1.1, 1.6)* DK200,000-299,999 vs. >DK300,000 Rate ratio 1.1 (0.9, 1.4)
Lone parent	Hjern et al (2001), drug poisoning: Lone-parent household vs. non-lone-parent household OR 1.1 (0.97, 1.2)
	Hjern et al (2001), non-drug poisoning: Lone-parent household vs. non-lone-parent household OR 1.1 (0.97, 1.2)
Birth of sibling	Juurlink et al (2003), hospital admissions for iron poisoning: *Within 3 months of sibling's birth vs. mother not postpartum OR 2.6 (1.1, 6.3)* Within 6 months of sibling's birth vs. mother not postpartum OR 1.9 (0.9, 3.9) Within 12 months of sibling's birth vs. mother not postpartum OR 1.8 (1.0, 3.5)

Characteristics	**<u>Home-Poisoning injuries:</u> Author (year) (* indicates UK study)** **Associations (95% CI unless otherwise stated)** *(positive associations are italicised; positive associations with relative risk equivalent >2.0 are highlighted)*
	Juurlink et al (2003), hospital admissions for acetanimophen poisoning: Within 3 months of sibling's birth vs. mother not postpartum OR 0.7 (0.4, 1.4) Within 6 months of sibling's birth vs. mother not postpartum OR 1.5 (1.0, 2.2) Within 12 months of sibling's birth vs. mother not postpartum OR 1.4 (1.0, 1.9)
Family type	Laursen & Nielsen (2008), poisoning: Step-family vs. two parents Rate ratio 1.0 (0.6, 1.6) *Single parent vs. two parents Rate ratio 1.5 (1.2, 1.8)*
	Rowe et al (2004)*: Large family vs. two-parent family OR 1.6 (1.0, 2.4)
No. of children in family	Hjern et al (2001), drug poisoning: >=2 siblings vs. <2 siblings OR 1.1 (0.97, 1.3)
	Hjern et al (2001), non-drug poisoning: *>=2 siblings vs. <2 siblings OR 1.3 (1.2, 1.4)*
	Laursen & Nielsen (2008), poisoning: 2 children in family vs. 1 child in family Rate ratio 1.0 (0.9, 1.1) >=3 children in family vs. 1 child in family Rate ratio 1.2 (1.0, 1.4)
Social welfare benefits	Hjern et al (2001), drug poisoning: *In receipt of welfare benefits vs. not in receipt OR 1.8 (1.7, 2.0)*
	Hjern et al (2001), non-drug poisoning: *In receipt of welfare benefits vs. not in receipt OR 1.4 (1.3, 1.5)*

Characteristics	**<u>Home-Poisoning injuries:</u> Author (year) (* indicates UK study)** **Associations (95% CI unless otherwise stated)** *(positive associations are italicised; positive associations with relative risk equivalent >2.0 are highlighted)*
Mother's age at childbirth	Hjern et al (2001), drug poisoning: *<=23 years vs. >=34 years OR 1.5 (1.2, 1.7)* *24-28 years vs. >=34 years OR 1.2 (1.03, 1.4)* 29-33 years vs. >=34 years OR 1.1 (0.9, 1.2)
	Hjern et al (2001), non-drug poisoning: *<=23 years vs. >=34 years OR 1.6 (1.4, 1.8)* *24-28 years vs. >=34 years OR 1.3 (1.2, 1.5)* *29-33 years vs. >=34 years OR 1.2 (1.1, 1.3)*
	Laursen & Nielsen (2008), poisoning: *Mother's age at childbirth <25 years vs. >30 years Rate ratio 1.6 (1.3, 1.84)* Mother's age at childbirth 25-29 years vs. >30 years Rate ratio 1.2 (1.0, 1.3)
Overcrowded housing	Laursen & Nielsen (2008), poisoning: Crowded dwelling vs. not crowded dwelling Rate ratio 1.0 (0.9, 1.2)
Dwelling type	Hjern et al (2001), drug poisoning: Chainhouse vs. own house OR 1.0 (0.8, 1.2) Apartment vs. own house OR 1.1 (0.9, 1.2)
	Hjern et al (2001), non-drug poisoning: Chainhouse vs. own house OR 0.9 (0.8, 1.04) Apartment vs. own house OR 0.8 (0.8, 0.9)

Characteristics	**<u>Home-Poisoning injuries:</u> Author (year) (* indicates UK study)** **Associations (95% CI unless otherwise stated)** *(positive associations are italicised; positive associations with relative risk equivalent >2.0 are highlighted)*
	Laursen & Nielsen (2008), poisoning: Flat vs. detached or row house Rate ratio 1.1 (1.0, 1.3) Farmhouse vs. detached or row house Rate ratio 1.1 (0.8, 1.6)
Migrant status	Hjern et al (2001) (mother's country of birth), drug poisoning: Western vs. Sweden OR 1.1 (0.9, 1.4) Non-western vs. Sweden OR 0.8 (0.7, 1.02)
	Hjern et al (2001) (mother's country of birth), non-drug poisoning: Western vs. Sweden OR 0.8 (0.7, 0.9) Non-western vs. Sweden OR 0.5 (0.4, 0.6)
Neighbourhood characteristics	
Urban/rural	Hjern et al (2001), drug poisoning: *Rural vs. urban OR 1.2 (1.1, 1.4)*
	Hjern et al (2001), non-drug poisoning: *Rural vs. urban OR 1.3 (1.2, 1.4)*

Table 8. Associations with injuries (undefined) in the home

Characteristics	**<u>Home-Undefined injuries:</u> Author (year) (* indicates UK study)** **Associations (95% confidence interval unless otherwise stated)** *(positive associations are italicised; positive associations with relative risk equivalent >2.0 are highlighted)*
Family characteristics	
Education	Ramsay et al (2003)*, home injuries in preschool-aged children: Left full time education at age 15 vs. other p=not significant *No qualifications vs. O-level or above p<0.01*
Income	Faelker et al (2000), home injuries: Income category II vs. income category I (richest) Rate ratio 1.06 (0.92, 1.23) *Income category III vs. income category I (richest) Rate ratio 1.29 (1.09, 1.52)* *Income category IV vs. income category I (richest) Rate ratio 1.35 (1.14, 1.60)* *Income category V (poorest) vs. income category I (richest) Rate ratio 1.75 (1.44, 2.13)*
Marital status	Ramsay et al (2003)*, home injuries in preschool-aged children: Married vs. not married p=not significant
Social welfare benefits	Ramsay et al (2003)*, home injuries in preschool-aged children: In receipt of welfare benefits vs. not in receipt p=not significant

4.4.3. Environments other than the home or road

4.4.3.1. Other Environments – Falls

Results are reported in Table 9. Four studies reported the multivariate association between risk factors and falls in environments other than the home. None of these studies took place in the UK. Two studies reported injuries occurring in schools (Sosnowska & Kostka, 2003; Janssen et al, 2007) and three studies reported injuries occurring in other environments (Petridou et al, 2002 (playgrounds); Simon et al, 2006 (location not reported); and Janssen et al, 2007 (injuries occurring outside of schools). Factors found to be statistically significant and positively associated with the risk of falls in environments other than the home and road can be divided into child, neighbourhood, and institutional characteristics. Child characteristics that were statistically significantly associated with injuries occurring through falls were being of African American or Latin American descent (Simon et al, 2006) and taking part in physical activities outside of school (amongst children aged 11-13 years) (RR ranged from 1.39 to 2.6, Janssen et al, 2007). No studies reported on correlations between children's sex and falls, nor upon correlations between family characteristics (such as socio-economic status and parents' educational level) and injuries occurring through falls.

Neighbourhood characteristics that were statistically significantly associated with injuries occurring through falls were children using public (as opposed to private) playgrounds (OR ranging from 2.37 to 7.98, except for sprains and dislocations (for which there was no correlation)), although the highest OR were in the less serious injuries (concussion and open wounds, Petridou et al, 2002). In injuries occurring at school, one study reports an OR of 1.25 for schools located in urban compared to rural areas (Sosnowska & Kostka, 2003).

Institutional characteristics that were reported as statistically significantly associated with injuries occurring through falls were schools with 24 or more classes and with longer school hours (undefined in the study), although the OR were relatively small (ranging from 1.07 to 1.36, Sosnowska & Kostka, 2003). The level of physical activity taken part in at school by 11-16 year olds was not correlated with injuries occurring through falls, whilst the same measures in physical activity injuries outside of school were all statistically significantly positively associated (OR ranging from 1.27 to 2.98) in this age group.

Evidence statement 10: Other Environments - Falls

There is evidence from 4 studies (0 UK). There is evidence of a strong association between the use of public playgrounds or being of African-American descent and injuries. There is evidence of weak to moderate association of injuries being with being of African American or Latin American descent, location of a school within an urban area, schools with larger numbers of classes (>=24), longer school hours, and the levels of physical activity engaged in outside of school. There was no statistical evidence of injuries being associated with the levels of physical activity engaged in within school.

Table 9. Associations with falls in non-home or road settings

Characteristics	**Non-home or road settings-Falls: Author (year) (* indicates UK study)** **Associations (95% CI unless otherwise stated)** *(positive associations are italicised; positive associations with relative risk equivalent >2.0 are highlighted)*
Child characteristics	
Ethnicity	Simon et al (2006), rates of injury visits to emergency departments: *African American vs. non-Latino White 2.6 (2.0, 3.1)* *Latino vs. non-Latino White 1.7 (1.3, 2.2)*
Behavioural	Janssen et al (2007), physical activity injuries at school: Occasional physical activity at Grades 6-8 (approx. age 11-13) vs. never active OR 0.97 (0.75, 1.24) Frequent physical activity at Grades 6-8 (approx. age 11-13) vs. never active OR 0.72 (0.36, 1.28) Occasional physical activity at Grades 9-10 (approx. age 14-16) vs. never active OR 1.23 (0.84, 1.83) Frequent physical activity at Grades 9-10 (approx. age 14-16) vs. never active OR 0.87 (0.46, 1.57)
	Janssen et al (2007), physical activity outside of school: *Occasional physical activity at Grades 6-8 (approx. age 11-13) vs. never active OR 1.39 (1.20, 1.62)* *Frequent physical activity at Grades 6-8 (approx. age 11-13) vs. never active OR 1.45 (1.04, 2.01)* Occasional physical activity at Grades 9-10 (approx. age 14-16) vs. never active OR 1.16 (0.92, 1.47) Frequent physical activity at Grades 9-10 (approx. age 14-16) vs. never active OR 0.99 (0.70, 1.41)
Neighbourhood characteristics	

Characteristics	**<u>Non-home or road settings-Falls:</u> Author (year) (* indicates UK study)** **Associations (95% CI unless otherwise stated)** *(positive associations are italicised; positive associations with relative risk equivalent >2.0 are highlighted)*
Parks/play areas	Petridou et al (2002), Injuries occurring in playgrounds: *Public playgrounds vs. private playgrounds (concussion) OR 7.98 (1.87, 34.16)* *Public playgrounds vs. private playgrounds (open wound) OR 6.47 (3.53, 11.87)* *Public playgrounds vs. private playgrounds (long bone fractures) OR 4.27 (2.01, 9.09)* *Public playgrounds vs. private playgrounds (other fractures) OR 2.37 (1.17, 4.80)* Public playgrounds vs. private playgrounds (sprain/dislocation) OR 0.57 (0.33, 0.99)
Urban/rural	Sosnowska & Kostka (2003), location of school: *Urban vs. rural OR 1.25 (1.14, 1.38)*
Institutional characteristics	
School size	Sosnowska & Kostka (2003): Mid-sized (8-23 classes) schools vs. small schools (<=7 classes) OR 0.93 (0.83, 1.04) *Large schools (24-32 classes) vs. small schools (<=7 classes) OR 1.26 (1.10, 1.43)* *Largest schools (>=33 classes) vs. small schools (<=7 classes) OR 1.36 (1.17, 1.58)*
School hours	Sosnowska & Kostka (2003): *Longer school hours (undefined) vs. shorter school hours (undefined) OR 1.07 (1.02, 1.13)*
Physical activity	Janssen et al (2007), physical activity injuries at school: Moderate physical activity level at Grades 6-8 (approx. age 11-13) vs. low activity level OR 1.22 (0.89, 1.68) High physical activity level at Grades 6-8 (approx. age 11-13) vs. low activity level OR 1.35 (0.99, 1.84) Moderate physical activity level at Grades 9-10 (approx. age 14-16) vs. low activity level OR 1.10 (0.70, 1.75) High physical activity level at Grades 9-10 (approx. age 14-16) vs. low activity level OR 1.46 (0.94, 2.28)

Characteristics	**<u>Non-home or road settings-Falls:</u> Author (year) (* indicates UK study)** **Associations (95% CI unless otherwise stated)** *(positive associations are italicised; positive associations with relative risk equivalent >2.0 are highlighted)*
	Janssen et al (2007), physical activity outside of school: *Moderate physical activity level at Grades 6-8 (approx. age 11-13) vs. low activity level OR 1.27 (1.04, 1.55)* *High physical activity level at Grades 6-8 (approx. age 11-13) vs. low activity level OR 1.97 (1.63, 2.39)* *Moderate physical activity level at Grades 9-10 (approx. age 14-16) vs. low activity level OR 1.65 (1.23, 2.24)* *High physical activity level at Grades 9-10 (approx. age 14-16) vs. low activity level OR 2.98 (2.25, 3.97)*

4.4.4. All environments

Many of the included studies did not differentiate between the environments in which unintentional injuries occurred, simply reporting an injury outcome (such as burns) or all unintentional injuries as a whole.

4.4.4.1. All Environments – Burns/fires

Results are reported in Table 10. Six studies reported the multivariate association between risk factors and burns in all environments, one of which took place in the UK (Hippisley-Cox et al, 2002). One study reported mortalities caused by burns (Harrop et al, 2007) and the remaining five studies reported injuries without defining their severity (Petridou et al, 1998; Hippisley-Cox et al, 2002; Koroukian et al, 2007; Badger et al, 2008; McDermott et al, 2008). One study included fire-related injuries defined as injuries caused by smoke, fire and flames, and so may include injuries caused by a mechanism other than burns (Koroukian et al, 2007). Factors found to be statistically significant and positively associated with the risk of burns in all environments can be divided into child and family characteristics (no studies tested for associations between neighbourhood characteristics and burns).

Child characteristics that were statistically significantly associated with injuries occurring through burns in all environments were being of Native American descent (RR 6.1 in the one study testing for this association, Harrop et al, 2007). No studies reported on associations between the age or sex of children and burns occurring in all environments. Attention Deficit (Hyperactivity) Disorder (AD(H)D) was found to be statistically significantly positively correlated with school behaviour problems and those engaging in high risk behaviour at the time of the injury (OR ranging from 3.44 to 6.45, Badger et al, 2008). No association was found between autism and the occurrence of burns (Badger et al, 2008) or of children who had experienced previous unintentional burn injuries being injured through burns again (Petridou et al, 2008).

Family characteristics that were statistically significantly associated with injuries occurring through burns in all environments were higher socio-economic deprivation scores (rate ratio 1.63 in the median Townsend quintile, rising to 3.49 in the highest quintile. Hippisley-Cox et al, 2002), although less comprehensive indicators of socio-economic status (employment and Medicaid entitlement) showed no association

(Petridou et al, 1998; Koroukian et al, 2007). No studies tested for associations between education or income and the occurrence of burns in all environments. One study tested for association of birth order on the occurrence of burns, but found no significant correlations (Petridou et al, 1998). Households with either one bedroom or 3 or more bedrooms were statistically significantly positively correlated with the occurrence of burns (OR ranging from 2.7 to 3.6, Petridou et al, 1998).

Evidence statement 11: All Environments – Burns/fire

There is evidence from 6 studies (1 UK). There is evidence of a strong association between the most socio-economically deprived families, living in a house with 1 or >=3 bedrooms, Attention Deficit Hyperactivity Disorder, and being of Native American descent and injuries. There was no statistical evidence of injuries being associated with autism, having previously endured an unintentional burn/fire injury, parental employment status, entitlement to Medicaid, or order of sibling birth.

4.4.4.2. All Environments – Drowning

Results are reported in Table 11. Three studies reported the multivariate association between risk factors and drowning in all environments, none of which were conducted in the UK. One study reported mortalities caused by drowning (Harrop et al, 2007) and two studies reported injuries caused by drowning (Brehaut et al, 2003; Koroukian et al, 2007). Factors found to be statistically significant and positively associated with the risk of drowning in all environments can be divided into child and family characteristics (no studies tested for associations between neighbourhood characteristics and drowning). Ethnicity was tested for correlation with risk of drowning in one study, but being of Native American descent was not found to be statistically significantly associated with the risk of drowning (Harrop et al, 2007). The presence of behavioural disorders (versus no behavioural disorders) was reported by one study as having no statistically significant association with the risk of drowning (Brehaut et al, 2003). No studies tested for associations between the age or sex of children and injuries occurring through drowning.

One study reported that children aged 5-14 years from families entitled to Medicaid had a higher probability of sustaining injuries by drowning, but this association was reversed in children aged 0-4 years with those from non-Medicaid entitled families

having a higher probability of drowning (Koroukian et al, 2007). No studies tested for associations between broader indicators of socio-economic status, nor educational level or income, and unintentional injuries occurring through drowning.

Evidence statement 12: All Environments - Drowning

There is evidence from 3 studies (0 UK). There is evidence of weak to moderate association of injuries with entitlement to Medicaid (in 5 to 14 year olds) and with non-entitlement to Medicaid (in 0 to 4 year olds). There was no statistical evidence of injuries being associated with being of Native American descent or the presence of behavioural disorders.

4.4.4.3. All Environments – Falls

Results are reported in Table 12. Nine studies reported the multivariate association between risk factors and falls in all environments, one of which was conducted in the UK (Hippisley-Cox et al, 2002). One study reported mortalities caused by falls (Harrop et al, 2007) and the remaining eight studies reported injuries incurred by falls in all environments (Brehaut et al, 2003; Engstrom et al, 2002; Faelker et al, 2000; Hippisley-Cox et al, 2002; Koroukian et al, 2007; McDermott et al, 2008; Reimers et al, 2008; Tarantino et al, 1999). Factors found to be statistically significant and positively associated with the risk of falls in all environments can be divided into child, family and neighbourhood characteristics. The only child characteristic reported as being statistically significantly associated with injuries from falls was the presence of behavioural disorders (versus no behavioural disorders. OR 1.46 (95% CI 1.29, 1.64). Brehaut et al, 2003).

The association of family characteristics with injuries occurring through falls in all environments was highly mixed. Two studies reported higher socio-economic deprivation scores (rate ratios ranging from 1.14 in the median category to 1.53 in the most deprived category) as being statistically significantly associated (Faelker et al, 2000; Hippisley-Cox et al, 2002), whilst one study found no association between socio-economic status and the occurrence of injuries from falls (Engstrom et al, 2002). Children from families entitled to Medicaid were reported in one study as having a higher probability of enduring injuries from falls than non-Medicaid families (Koroukian et al, 2007), whilst another study reported no association between

Medicaid status and the occurrence of serious injuries from falls. One study reported a statistically significant association between a child receiving an injury through being dropped by a carer and subsequent injuries occurring in the same way (OR 6.5 (95% CI 2.0, 21.8) Tarantino et al, 1999). No studies tested for associations between the educational level of parents and risks of falls in all environments.

The neighbourhood characteristic that was statistically significantly associated with injuries occurring through falls (in boys and girls aged 10-14) in all environments was economic deprivation, although this correlation did not remain significant for a measure of social fragmentation (Reimers et al, 2008).

With regard to child characteristics, neither age, sex or ethnicity, nor being autistic, were found to be correlated with injuries caused by falls in all environments (Harrop et al, 2007; McDermott et al, 2008; Tarantino et al, 1999).

Evidence statement 13: All Environments - Falls

There is evidence from 9 studies (1 UK). There is evidence of a strong association between a child being dropped previously by a carer and subsequently being injured again in the same way. There is evidence of weak to moderate association of injuries with the presence of behavioural disorders. There was mixed evidence regarding the association of socio-economic status and deprivation, and entitlement to Medicaid and injuries. There was no statistical evidence of injuries being associated with children's age or sex, autism, social fragmentation, or being of Native American descent.

4.4.4.4. All Environments – All Injuries

>> Age

Twelve studies reported the multivariate association between age and unintentional injuries (injury types not differentiated), four of which took place in the UK (Haynes et al, 1999; Haynes et al, 2003; Lalloo & Sheiham, 2003; Reading et al, 2008). The severity of injuries in these studies was classified differently, making direct comparisons between the studies problematic. One study reported injuries that resulted in admission to hospital (Petrou et al, 2006), four studies differentiated between injuries that did or did not require medical treatment (Bradbury et al, 1999;

Simon et al, 2004; Lalloo & Sheiham, 2003; Spinks et al, 2008), whilst five studies simply reported all injuries without differentiating between types of injury (Haynes et al, 1999; Haynes et al, 2003; Petridou et al, 2005; Schluter et al, 2006; Reading et al, 2008). One study reported associations between risk factors and unintentional injuries (undifferentiated) in children who were disabled (Petridou et al, 2003).

Statistically significant and positive associations between children's age and the occurrence of unintentional injuries in all environments reported in the study where hospital admission was the outcome found a small OR (calculated for each decrement in social class category) ranging from 1.06 to 1.08 (Petrou et al, 2006). In studies which differentiated between injuries requiring, and not requiring, medical treatment, those in which an emergency department was visited or where medical attention was received showed a statistically significant association between a higher risk of unintentional injury in older age groups (>=4 years) versus younger age groups (OR ranging from 1.58 to 3.05, Haynes et al, 1999; Haynes et al, 2003; Petridou et al, 2005; Schluter et al, 2006; Reading et al, 2008). Exceptions to this were minor and major head injuries, where no statistically significant association between older age groups and higher risk was reported (Lalloo & Sheiham, 2003).

In studies where the severity of the injury was not reported, statistically significant and positive associations were reported between an increase in children's age and the occurrence of unintentional injuries in all environments (RR ranging from 1.07 to 3.19, Haynes et al, 1999; Haynes et al, 2003; Reading et al, 2008; Petridou et al, 2005). One study analysed the occurrence of unintentional injuries that were medically attended within four age bands from 15 to 54 months of age; all of these age categories were statistically significantly more likely to experience an unintentional injury than those aged 6 months or less (RR equivalent 1.82 to 3.19, Reading et al, 2008). Schluter et al (2006) found a statistically significant correlation in very young children, with children aged both 7-12 months and 13-24 months more likely to experience an unintentional injury than those aged 0-6 weeks (RR range from 13.3 to 23.3). Amongst disabled children, one study found a statistically significant correlation between each increment of 5 years in age and the occurrence of unintentional injuries (OR 1.68) (Petridou et al, 2003).

Evidence statement 14a: All Environments – All Injuries – Child age

There is evidence from 12 studies (4 UK). There is evidence of a strong association (compared with newborns aged up to 6 weeks) between children aged 7-24 months and injuries. There is evidence of weak to moderate association of injuries with increasing age (>=4 years versus <4 years), children aged 15-54 months (versus < 6 months), and increasing age amongst children with a disability. There was no statistical evidence of injuries being associated with increasing age in the case of head injuries.

>> Sex

Sixteen studies reported the multivariate association between a child's sex and unintentional injuries (injury types not differentiated), four of which took place in the UK (Haynes et al, 2003; Lalloo & Sheiham, 2003; Ordonana et al, 2008; Reading et al, 1999). Seven studies differentiated between major and minor unintentional injuries (Lalloo & Sheiham, 2003; Spinks et al, 2008; Haynes et al, 2003; Reading et al, 1999; Kendrick & Marsh, 2001; Reading et al, 2008; Sellstrom et al, 2003) and seven studies reported on all unintentional injuries without specifying their severity (Li et al, 2008; Simon et al, 2004; Schluter et al, 2006; Bancej & Arbuckle, 2000; Otters et al, 2005; Schwebel & Brezausek, 2008; Ordonana et al, 2008). Two studies reported mortalities resulting from unintentional injuries (Ostberg, 1997; Brenner et al, 1999).

All seven studies that differentiated between major and minor unintentional injuries reported statistically significant and positive associations between male children and the occurrence of major (but not minor) unintentional injuries in all environments (RR equivalent ranging from 1.34 to 1.83). Similarly, all seven studies that did not differentiate between the severity of injuries reported statistically significant and positive associations between male children and the occurrence of unintentional injuries in all environments (RR equivalent ranging from 1.23 to 3.17). Both studies that reported mortalities also reported statistically significant and positive associations between male children and the occurrence of unintentional injuries in all environments (RR equivalent ranging from 1.20 to 2.21).

Evidence statement 14b: All Environments – All Injuries – Sex of child

There is evidence from 16 studies (4 UK). There is evidence of weak to moderate association of injuries (of all severities, including fatalities) with being male.

>> Ethnicity

Eight studies reported the multivariate association between children's ethnicity and unintentional injuries (injury types not differentiated), one of which took place in the UK (Haynes et al, 2008). One study reported mortalities (Brenner et al, 1997), three reported injuries that had resulted in hospital attendance (one based on hospital admissions and new attendees at a fracture clinic (Tobin et al, 2002) and two reported emergency department attendances (Simon et al 2004; Simon et al, 2006)). Four studies simply reported all injuries without specifying their severity (Overpeck et al, 1997; Ni et al, 2002; Otters et al, 2005; Schluter et al, 2006).

Brenner et al (1997) reported statistically significant and positive associations between being of Black or Native American descent and mortalities as a result of unintentional injuries in all environments (OR ranging from 1.43 to 2.12). However, no correlation was found between being of Asian descent and mortalities as a result of unintentional injuries. The three studies reporting hospital attendance as a result of unintentional injuries found no statistically significant correlations between ethnicity and in-patient stays of >3 days, hospital admissions, new attendances at a fracture clinic, or injury-related visits to an emergency department (Tobin et al, 2002; Simon et al, 2004; Simon et al, 2006).

Studies that did not differentiate between the severity of injuries reported mixed results. Two studies found no statistically significant correlation between ethnicity and unintentional injuries (Overpeck et al, 1997; Otters et al, 2005) and one study found the only minority ethnic group to demonstrate a statistically significant correlation with unintentional injuries was non-Pacific Islanders (Schluter et al, 2006). One study found only one ethnic group to be statistically significantly positively associated with unintentional injuries, this being non-Hispanic Whites (versus Hispanics, OR 1.6), with being of non-Hispanic Black or non-Hispanic other descent showing no correlation with unintentional injuries (Ni et al, 2002).

Evidence statement 14c: All Environments – All Injuries - Child ethnicity

There is evidence from 8 studies (1 UK). There is mixed evidence regarding the association of child ethnicity with injuries. There is evidence of weak to moderate association of injuries with being of Black or Native American descent. There was no statistical evidence of injuries being associated with being of Asian descent or a wide range of other ethnicities.

>> Behavioural

Nine studies reported the multivariate association between children's behavioural characteristics and unintentional injuries (injury types not differentiated), five of which took place in the UK (Haynes et al, 2008; Lalloo et al, 2003; Lalloo & Sheiham, 2003; Ordonana et al, 2008; Reading et al, 2008). Two studies differentiated between major and minor unintentional injuries (Lalloo et al, 2003; Lalloo & Sheiham, 2003) and one study defined injuries as those which required medical treatment (Spinks et al, 2008). Six studies simply reported all injuries without specifying their severity (Haynes et al, 2008; Soubhi, 2004; Soubhi et al, 2004; Schwebel & Brezausck, 2008; Ordonana et al, 2008, Reading et al, 2008).

All three studies that differentiated between the severity of injuries reported borderline hyperactivity, high emotional symptoms and high conduct disorder as being statistically significantly positively associated with major unintentional injuries (OR ranging from 1.33 to 2.04, Lalloo et al, 2003; Lalloo & Sheiham, 2003; Spinks et al, 2008). One study reported both borderline and high hyperactivity, and in addition high conduct disorder, to be statistically significantly positively associated with major unintentional head injuries (OR ranging from 1.60 to 1.94).

Of the six studies that did not differentiate between the severity of injuries, two reported no correlations between behavioural characteristics and unintentional injuries (Schwebel & Brezausck, 2008; Soubhi et al, 2004 (in children aged 2-11)). Four studies reported behavioural difficulties (measured as physical aggression, externalising behaviour, and through ADHD score, Rutter score, and the strengths and difficulties questionnaire) as being statistically significantly positively correlated with unintentional injuries, with RR equivalent ranging from 1.02 to 1.39. (Haynes et al, 2008; Soubhi, 2004; Ordonana et al, 2008; Reading et al, 2008).

Evidence statement 14d: All Environments – All Injuries – Child behavioural factors

There is evidence from 9 studies (5 UK). There is evidence of weak to moderate association of injuries with borderline hyperactivity, high emotional symptoms, high conduct disorder, and behavioural difficulties.

>> Child characteristics - Other behavioural characteristics

Nine studies reported the multivariate association between other children's behavioural characteristics and unintentional injuries (injury types not differentiated), one of which was conducted in the UK (Reading et al, 2008). Four studies focused on unintentional injuries that were defined as 'serious' or which required medical treatment or hospitalisation (Xiang et al, 2008; Petridou et al, 1998; Bradbury et al, 1999; Reading et al, 2008) and five studies reported all injuries without specifying their severity (Johnston et al, 2000; Lee et al, 2008; McDermott et al, 2008; Petridou et al, 2005; Sinclair & Xiang, 2008).

Studies that reported unintentional injuries of greater severity tested for associations between a diverse range of behavioural characteristics and injury outcomes. Xiang et al (2008) report a consistent statistically significant positive correlation between the consumption of any amount of alcohol and an increased risk of serious injury compared with children who did not consume any alcohol at all (OR ranging from 1.07 to 1.42 in children who drank alcohol infrequently, rising to OR ranging from 1.92 to 2.08 in those who drank alcohol frequently). Petridou et al (1998) report statistically significant positive associations between the occurrence of a variety of events and unintentional injuries that resulted in hospital admission for more than 24 hours. At the lower end of the scale, injuries occurring following school examinations and pleasing events had an OR ranging from 3.4 to 3.8, whilst the OR for intellectual exertion and strenuous physical activity were 9.0 and 24.2, respectively. Bradbury et al (1999) report a statistically significant positive correlation between children showing signs and symptoms of illness in the 30 days prior to unintentional injury, as well as between children's susceptibility to illness and the occurrence of unintentional injury. Greater physical development and higher rates of physical activity were reported by Reading et al (2008) to be statistically significantly positively associated

with medically attended unintentional injuries (RR equivalent ranging from 1.14 to 1.22).

Studies that did not report the severity of unintentional injuries also tested for associations between a diverse range of behavioural characteristics and injury outcomes. Johnston et al (2000) report a consistent statistically significant positive correlation between a time span of between 10 and 90 days since the occurrence of an injury to a sibling and the further occurrence of an unintentional injury (RR equivalent decreasing from 2.2 at 10 days to 1.35 at 90 days). Children diagnosed with ADHD or a psychopathology demonstrated a statistically significant positive correlation with higher rates of unintentional injury (OR ranging from 2.06 to 2.74) (Lee et al, 2008), but children with autism had no correlation with higher rates of unintentional injuries (Lee et al, 2008; McDermott et al, 2008). Emotional and behavioural problems were statistically significantly associated with unintentional injuries (Sinclair & Xiang, 2008), whilst a wide range of other medical or developmental issues (ranging from vision problems to learning disabilities to epilepsy) showed no correlation with unintentional injury outcomes (Sinclair & Xiang, 2008; Petridou et al, 2005; Lee et al, 2008).

Evidence statement 14e: All Environments – All Injuries – Other Behavioural Characteristics

There is evidence from 9 studies (1 UK). There is evidence of a strong association between life events (such as exams), Attention Deficit Hyperactivity Disorder, and psychopathology and injuries. There is evidence of weak to moderate association of injuries with children's consumption of alcohol, being ill in the past month, the period of time 10 to 90 days after an unintentional injury occurring to a sibling, greater physical development and physical activity, and emotional and behavioural problems. There was no statistical evidence of injuries being associated with autism, medical problems, or developmental issues.

>> Family characteristics – Socio-economic status and other indicators of socio-economic status

Seven studies reported the multivariate association between families' socio-economic status and unintentional injuries (injury types not differentiated), three of which were conducted in the UK (Hippisley-Cox et al, 2002; Lalloo & Sheiham, 2003;

Ordonana et al, 2008). One study reported on mortalities resulting from unintentional injuries (Ostberg, 1997), two differentiated between major and minor injuries (Faelker et al, 2000; Lalloo & Sheiham, 2003), whilst four did not report the severity of injuries (Hippisley-Cox et al, 2002; Jones et al, 2002; Ordonana et al, 2008; Otters et al, 2005). Across all of these injury severities (as well as across different age ranges within children aged under 15) there is a statistically significant positive association between the most socio-economically deprived and higher rates of unintentional injuries (RR equivalent ranging from 1.30 to 1.96, Faelker et al, 2000; Hippisley-Cox et al, 2002; Jones et al, 2002; Ordonana et al, 2008; Ostberg, 1997; Otters et al, 2005). However, there are exceptions within this general trend; for example, the occurrence of all unintentional injuries is not statistically significantly correlated with socio-economic status in children within the age ranges of 0-4 years and 10-14 years, nor were unintentional injuries that required hospital admission in those aged 0-19 years (Faelker et al, 2000). One study also found no statistically significant correlations at all between socio-economic status and major or minor injuries or head injuries (Lalloo & Sheiham, 2003).

Four studies reported the multivariate association between other indicators of families' socio-economic status and unintentional injuries (injury types not differentiated), two of which were conducted in the UK (Kendrick & Marsh, 2001; Lalloo & Sheiham, 2003). Not having access to a car was found to be statistically significantly positively associated with children who experienced injuries that required medical attention (Kendrick & Marsh, 2001), as was being in receipt of social welfare benefits and the occurrence of injuries resulting in hospital admission in children aged 1-6 (OR 1.32 (95% CI 1.18, 1.47) Sellstrom et al, 2003). Two studies did not find any association between other socio-economic indicators (entitlement to Medicaid and social welfare benefits) and unintentional injuries (Marcin et al, 2003; Lalloo & Sheiham, 2003), except with regard to the occurrence of major head injuries (Lalloo & Sheiham, 2003).

Thirteen studies reported the multivariate association between level of parental education and unintentional injuries (injury types not differentiated), one of which was conducted in the UK (Reading et al, 2008). Three studies reported mortalities resulting from unintentional injuries (Blakely et al, 2003; Brenner et al, 1999; Hussey, 1997), two differentiated between major and minor injuries (Sellstrom et al, 2003; Simpson et al, 2005), and seven simply reported all injuries without specifying their

severity (Bancej & Arbuckle, 2000; Bishai et al, 2008; Li et al, 2008; Ni et al, 2002; Overpeck et al, 1997; Petridou et al, 2005; Reading et al, 2008; Schluter et al, 2006).

Of the studies reporting mortalities resulting from unintentional injuries, two reported a statistically significant positive association between fewer parental years in education (less than 11 or 12 years versus more than 16 years) and the risk of death following unintentional injuries (RR equivalent ranging from 1.65 to 2.31, Brenner et al, 1999; Hussey, 1997). One study reported no statistically significant difference between level of parental education and the risk of death following unintentional injuries (Blakely et al, 2003). One of the studies reporting unintentional injuries that resulted in hospitalisation focused on children whose parents had less than a high school education; within this educational grouping, there was a statistically significant positive association between those with the lowest socio-economic status and injuries that resulted in hospitalisation (Simpson et al, 2005). The other study reporting hospitalisation reported a statistically significant positive correlation between maternal education of less than 11 years (versus more than 13 years) and the occurrence of injuries that resulted in hospital admission in children aged 1-6 (OR 1.45 (95% CI 1.29, 1.63) Sellstrom et al, 2003). There was no such correlation in children aged 7-15 (Sellstrom et al, 2003).

Studies that did not report the severity of unintentional injuries reported a highly mixed picture of associations with the level of parental education. Whilst less than 12 years of parental education was reported as statistically significantly positively associated with the occurrence of unintentional injuries (OR ranging from 1.10 to 1.11) (Li et al, 2008), and an OR of 1.37 was reported for each 6 year decrement in paternal education (Petridou et al, 2005), three other studies reported no statistically significant correlations between the level of parental education and unintentional injuries (Overpeck et al, 1997; Schluter et al, 2006; Ni et al, 2002), although Ni et al (2002) did report (in a model adjusting for age and sex) a statistically significant correlation (OR 1.6) between greater years of parental education and the occurrence of unintentional injuries. Reading et al (2008) reported a statistically significant positive correlation between greater years of maternal education and the occurrence of unintentional injuries (RR equivalent ranging from 1.13 for mothers with O-level qualifications to 1.43 for mothers with degree level qualifications).

Two studies reported findings in distinct populations. Bishai et al (2008) reported unintentional injuries in children aged 30-33 months to be less likely in children

whose mothers were educated to college level, compared to mothers with less than this level of education. Bancej & Arbuckle (2000) reported unintentional injuries in children who lived on farms. There was a consistent statistically significant positive association in all age groups (under 15 years) for higher rates of unintentional injuries where parents had been educated to post-secondary (but not graduate) level, when compared against those with less than high school education.

Ten studies reported the multivariate association between level of household income and unintentional injuries (injury types not differentiated), two of which were conducted in the UK (Ordonana et al, 2008; Reading et al, 2008). One study reported mortalities resulting from unintentional injuries (Blakely et al, 2003) and the remaining nine simply reported all injuries without specifying their severity (D'Souza et al, 2008; Li et al, 2008; Marcin et al, 2003; Ni et al, 2002; Ordonana et al, 2008; Overpeck et al, 1997; Reading et al, 2008; Schluter et al, 2006; Spinks et al, 2008). The study reporting mortalities resulting from unintentional injuries reported a statistically significant positive association with the lowest income band (RR equivalent 3.3 Blakely et al, 2003).

Studies that did not report the severity of unintentional injuries reported a highly mixed picture of associations with level of income. Two studies reported increasing statistically significant positive associations between lower levels of income and rates of unintentional injuries (RR equivalents ranging from 1.09 to 2.34) (Ordonana et al, 2008; Reading et al, 2008), whilst five studies reported no statistically significant correlations (D'Souza et al, 2008; Li et al, 2008; Marcin et al, 2003; Overpeck et al, 1997; Spinks et al, 2008). Two studies reported statistically significant associations between both median income (Schluter et al, 2006) and higher income families (Ni et al, 2002) and unintentional injuries in children where there were no statistically significant correlations between lower income groups and unintentional injuries.

Evidence statement 14f: All Environments – All Injuries – Family's Socio-Economic Status

There is evidence from 27 studies (6 UK). There is evidence of weak to moderate association of injuries with socio-economic deprivation. There was no statistical evidence of injuries (reported in some studies) being associated with socio-economic deprivation within certain age categories. There is mixed evidence regarding the association of parental educational attainment and household income with injuries.

>> Family characteristics – Household members

Eight studies reported the multivariate association between lone parent households and unintentional injuries (injury types not differentiated), two of which were conducted in the UK (Haynes et al, 1999; Reading et al, 1999). All eight studies (Blakely et al, 2003; Braun et al, 2005; Haynes et al, 1999; Ordonana et al, 2008; Ostberg, 1997; Overpeck et al, 1997; Reading et al, 1999; Simpson et al, 2005) reported a statistically significant positive association between lone parent households and the occurrence of unintentional injuries (RR equivalent ranging from 1.23 to 1.8). One of these studies tested for associations with socio-economic status within the lone parent sub-group, reporting the highest OR (1.64) in those in the lowest two socio-economic groups (Simpson et al, 2005).

Four studies reported the multivariate association between family types and unintentional injuries (injury types not differentiated) (Bishai et al, 2008; Brenner et al, 1999; Hussey, 1997; Lallloo & Sheiham, 2003), one of which was conducted in the UK (Lalloo & Sheiham, 2003). Brenner et al (1999) reported a statistically significant positive association between unmarried parents and unintentional injuries in children (OR 1.55), but the remaining studies found no correlations between the child's mother remaining unmarried or staying with a partner (Bishai et al, 2008), female head of households (Hussey, 1997), or the presence of step-parents or the child's biological parents (Lallloo & Sheiham, 2003) and the occurrence of unintentional injuries.

Two studies reported the multivariate association between the number of family members in a households and unintentional injuries (injury types not differentiated), neither of which were conducted in the UK (Petridou et al, 2005; Schluter et al, 2006). Neither of these studies reported a statistically significant correlation between the number of family members in a household and the occurrence of unintentional injuries. Six studies reported the multivariate association between the number of children in a household and unintentional injuries (injury types not differentiated), two of which were conducted in the UK (Bradbury et al, 1999; Flower et al, 2006; Otters et al, 2005; Overpeck et al, 1997; Reading et al, 2008). Three studies reported a statistically significant positive association between the presence of a greater number of children in the household and unintentional injuries (RR equivalent ranging from 1.02 to 2.79) (Bradbury et al, 1999; Flower et al, 2006; Otters et al, 2005), whilst one

study reported no statistically significant correlation (Overpeck et al, 1997). One study focused on the risk of unintentional injury in children with a twin or triplet, reporting no correlation between this and unintentional injuries (Reading et al, 2008). A further study tested for associations between the presence of an older sibling and unintentional injuries, but found no correlation (Ordonana et al, 2008).

Evidence statement 14g: All Environments – All Injuries – Household Members

There is evidence from 14 studies (3 UK). There is evidence of weak to moderate association of injuries with unmarried parents and a greater number of children in the household. There was no statistical evidence of injuries being associated with presence of either single parents, two parents, biological or step-parents, female head of households, or a higher number of household members.

>> Family characteristics – Parental characteristics

Three studies reported the multivariate association between parental unemployment and unintentional injuries (injury types not differentiated. Blakely et al, 2003; Ordonana et al, 2008; Petridou et al, 2005), none of which were conducted in the UK. None of these studies reported a statistically significant correlation with the occurrence of unintentional injuries. Six studies reported the multivariate association between parents' well-being and unintentional injuries (injury types not differentiated), two of which were conducted in the UK (Braun et al, 2005; Damashek et al 2005; Haynes et al, 2008; Reading et al, 2008; Schwebel & Brezausek, 2004; Schwebel & Brezausek, 2008). Five studies reported statistically significant associations between lower scores on a range of well-being indicators (mental illness, maternal perception of locus of control, community social support, post-natal or maternal depression, and life events score) and the occurrence of unintentional injuries (Braun et al, 2005; Damashek et al 2005; Haynes et al, 2008; Reading et al, 2008; Schwebel & Brezausek, 2008). One study found no statistically significant correlations between indicators of parental well-being and the occurrence of unintentional injuries in children aged 6-36 months (Schwebel & Brezausek, 2004). One study reported the multivariate association between parental substance misuse and unintentional injuries (not conducted in the UK), finding a statistically significant correlation between this parental behaviour and the occurrence of unintentional injuries (Braun et al, 2005).

Six studies reported the multivariate association between mother's age at birth and unintentional injuries (injury types not differentiated) (Braun et al, 2005; Ekeus et al, 2004; Kendrick & Marsh, 2001; Flower et al, 2006; Haynes et al, 2008; Ordonana et al, 2008), three of which were conducted in the UK (Kendrick & Marsh, 2001; Haynes et al, 2008; Ordonana et al, 2008). Five studies reported a statistically significant positive correlation between a mother's age of less than 20 years at birth and the occurrence of unintentional injuries (Braun et al, 2005; Ekeus et al, 2004; Kendrick & Marsh, 2001; Flower et al, 2006; Haynes et al, 2008; note that Flower et al reported that the correlation held for a mother's age at birth of up to 25 years). One study reported no statistically significant correlation between a mother's age at birth and the occurrence of unintentional injuries (Ordonana et al, 2008).

Five studies reported the multivariate association between the mother's or parents' age at the time of a child's unintentional injury (injury types not differentiated. Haynes et al, 2003; Petridou et al, 2005; Reading et al, 1999; Reading et al, 2008; Schluter et al, 2006), three of which were conducted in the UK (Haynes et al, 2003; Reading et al, 1999; Reading et al, 2008). Three studies reported a statistically significant association between younger age groups (<25 years) and the occurrence of unintentional injuries (RR equivalent ranging from 1.15 to 1.35, Haynes et al, 2003; Petridou et al, 2005; Reading et al, 2008). Two studies reported no statistically significant correlation between younger age groups and the occurrence of unintentional injuries (Reading et al, 1999; Schluter et al, 2006).

Eight studies reported the multivariate association between characteristics that do not fit any of the above categorisations and unintentional injuries (injury types not differentiated), none of which were conducted in the UK (Blakely et al, 2003; Li et al, 2008; Ostberg, 1997; Petridou et al, 2003; Petridou et al, 2005; Schwebel, et al, 2005; Soubhi et al, 2004). Blakely et al (2003) reported no statistically significant correlation between living in overcrowded housing and the occurrence of unintentional injuries. Petridou et al (2005) reported a statistically significant association between the previous occurrence of two or more unintentional injuries within a family and the occurrence of further unintentional injuries (OR 2.25). Soubhi et al (2004) reported no statistically significant correlation between family functioning and positive parenting and the occurrence of unintentional injuries in children aged 2-11, but did report a statistically significant association between below average consistency parenting and the occurrence of unintentional injuries in children aged 4-11 (OR 1.43). Five studies presented mixed findings on the associations between

immigrants and the occurrence of unintentional injuries; two of these studies reported statistically significant positive associations between being a migrant and the occurrence of unintentional injuries (OR ranging from 1.55 to 1.74) (Ostberg, 1997; Petridou et al, 2003), whilst two studies reported no correlation (Li et al, 2008; Sellstrom et al, 2003). One study reported a statistically significant correlation between children of low income mothers born in the US when compared with low income immigrant mothers (OR 2.40. Schwebel et al, 2005).

Evidence statement 14h: All Environments – All Injuries – Parental Characteristics

There is evidence from 22 studies (6 UK). There is evidence of weak to moderate association of injuries with mental illness, maternal perception of locus of control, community social support, post-natal or maternal depression, adverse life events, parental substance misuse, mother's age of <20 years at time of child's birth, and below average consistency parenting. There was no statistical evidence of injuries being associated with parental unemployment, family functioning or positive parenting. There is mixed evidence regarding the association of mother's age at the time of child's injury with the occurrence of injuries.

>> Neighbourhood characteristics – Socio-economic status

Eight studies reported the multivariate association between the neighbourhood-level socio-economic status and unintentional injuries (injury types not differentiated) (Blakely et al, 2003; Haynes et al, 1999; Haynes et al, 2003; Kendrick & Marsh, 2001; Li et al, 2008; Reading et al, 1999; Soubhi, 2004; Soubhi et al, 2004). Four of these were conducted in the UK (Haynes et al, 1999; Haynes et al, 2003; Kendrick & Marsh, 2001; Reading et al, 1999). Six of the studies reported a statistically significant positive correlation between the most socio-economically deprived neighbourhoods and the occurrence of unintentional injuries (RR equivalent 1.04 to 3.97) (Blakely et al, 2003; Haynes et al, 1999; Haynes et al, 2003; Kendrick & Marsh, 2001; Li et al, 2008; Reading et al, 1999). The trend in all of these seven studies was for the RR to increase consistently towards the most socio-economically deprived neighbourhoods, with the exception of the one study reporting unintentional injury mortalities (Blakely et al, 2003) where the fourth deprivation quintile was reported to be statistically significantly associated with unintentional injuries (RR

equivalent 2.8) whilst the most deprived quintile showed no association. Two studies reported no statistically significant correlation between neighbourhood disadvantage and unintentional injuries in children aged 2-11 years (Soubhi, 2004 (ages 2-3 years); Soubhi et al, 2004) and one study reported no statistically significant correlation between neighbourhood cohesion or social problems and unintentional injuries in children aged 2-11 years (Soubhi et al, 2004).

Evidence statement 14i: All Environments – All Injuries – Neighbourhood Characteristics – Socio-Economic Status

There is evidence from 8 studies (4 UK). There is evidence of weak to moderate association of injuries with socio-economic deprivation, but no evidence of association between other indicators of neighbourhood disadvantage and the occurrence of unintentional injuries.

>> Neighbourhood characteristics – Urban/rural

Four studies reported the multivariate association between the urban or rural location of a neighbourhood and unintentional injuries (injury types not differentiated), none of which were conducted in the UK (Li et al, 2008; Petridou et al, 2003; Otters et al, 2005; Simon et al, 2004). Two studies reported a statistically significant positive association between neighbourhoods located in small towns or rural areas and unintentional injuries (RR equivalent ranging from 1.07 to 1.58) (Li et al, 2008; Otters et al, 2005). One study reported no statistically significant correlation between neighbourhood location and unintentional injury-related visits to an emergency department (Simon et al, 2004). One study reported no statistically significant correlation between neighbourhood location and unintentional injuries in disabled children (Petridou et al, 2003).

Three studies reported the multivariate association between the characteristics of a neighbourhood and unintentional injuries (injury types not differentiated. Soubhi, 2004; Haynes et al, 2008; Ostberg, 1997), one of which was conducted in the UK (Haynes et al, 2008). One study reported a statistically significant positive association between neighbourhood problems and the occurrence of unintentional injuries (Soubhi, 2004). One study reported unintentional injury mortalities to be statistically significantly associated with lower neighbourhood population densities (Ostberg, 1997).

Evidence statement 14j: All Environments – All Injuries – Neighbourhood Characteristics – Urban/Rural

There is evidence from 4 studies (0 UK). There is mixed evidence regarding the association of urban or rural location with the occurrence of injuries.

>> Institutional characteristics

Two studies (neither conducted in the UK) reported the multivariate association between the characteristics of an institution and unintentional injuries (injury types not differentiated) (Schwebel et al, 2006; Sellstrom et al, 2003). No statistically significant correlation was found between the time children spent in child or family day care centres (compared with not attending these centres) and unintentional injuries (Schwebel et al, 2006) or between the number of safety measures (at municipality level) and the occurrence of unintentional injuries in children aged 7-15 years (Sellstrom et al, 2003). However, one study reported a statistically significant positive correlation between the number of safety measures (at municipality level) and lower rates of hospital admission due to unintentional injuries in children aged 1-6 years (OR 1.32 (95% CI 1.18, 1.47)) (Sellstrom et al, 2003).

Evidence statement 14k: All Environments – All Injuries – Institutional Characteristics

There is evidence from 2 studies (0 UK). There is evidence of weak to moderate association of a *reduction* in injuries (in children aged 1-6 years) with the implementation of municipality level safety measures. There was no statistical evidence of injuries being associated with the time spent by children in child or family day care centres or of a *reduction* in injuries (in children aged 7-15 years) with the implementation of municipality level safety measures.

Table 10. Associations with burns/fire in all settings

Characteristics	**<u>All settings-Burn/fire injuries:</u> Author (year) (* indicates UK study)** **Associations (95% CI unless otherwise stated)** *(positive associations are italicised; positive associations with relative risk equivalent >2.0 are highlighted)*
Child characteristics	
Ethnicity	Harrop et al (2007), Injury mortality: *Native American vs. non-Native American RR 6.1 (3.4, 10.4)*
	Petridou et al (1998): Gypsy or recent migrant vs. other Greek OR 5.2 (1.0, 27.3)
Disabilities or medical conditions	Badger et al (2008): (AD(H)D – Attention Deficit (Hyperactivity) Disorder) *School behaviour problems in children with AD(H)D vs. school behaviour problems in children without AD(H)D OR 6.45 (1.732, 24.03)* *High-risk behaviour at time of injury in children with AD(H)D vs. high-risk behaviour at time of injury in children without AD(H)D OR 3.44 (1.32, 8.95)* Mental health disorders in children with AD(H)D vs. mental health disorders in children without AD(H)D OR 2.61 (0.416, 16.38) Developmental disorders in children with AD(H)D vs. developmental disorders in children without AD(H)D OR 1.70 (0.480, 6.05)
	McDermott et al (2008): Autism vs. no disability Relative rate 1.96 (0.62, 6.24)
Previous medically attended injury	Petridou et al (1998): Previous burn injury vs. no previous burn injury OR 0.5 (0.2, 1.5)
Family characteristics	

Characteristics	**<u>All settings-Burn/fire injuries:</u> Author (year) (* indicates UK study)** **Associations (95% CI unless otherwise stated)** *(positive associations are italicised; positive associations with relative risk equivalent >2.0 are highlighted)*
Socio-economic status	Hippisley-Cox et al (2002)*, burns and scalds: 2nd Townsend deprivation score quintile vs. lowest quintile Rate ratio 1.14 (0.87, 1.49) *3rd Townsend deprivation score quintile vs. lowest quintile Rate ratio 1.63 (1.29, 2.07)* *4th Townsend deprivation score quintile vs. lowest quintile Rate ratio 2.37 (1.89, 2.96)* *Highest Townsend deprivation score quintile vs. lowest quintile Rate ratio 3.49 (2.81, 4.34)*
	Petridou et al (1998) (maternal socioeconomic status): Working: schooling <=6 years vs. Housekeeping: schooling >6 years OR 2.6 (0.7, 9.4) Housekeeping: schooling <=6 years vs. Housekeeping: schooling >6 years OR 0.8 (0.4, 1.6) Working: schooling >6 years vs. Housekeeping: schooling >6 years OR 0.8 (0.5, 1.3)
Medicaid status	Koroukian et al (2007), injuries by smoke, fire & flames in age group 0-4 years: Medicaid had higher probability (0.239) than non-Medicaid (0.132)
	Koroukian et al (2007), injuries by smoke, fire & flames in age group 5-14 years: Medicaid had higher probability (0.160) than non-Medicaid (0.073)
Birth order	Petridou et al (1998): 1st born vs. 2nd born OR 1.2 (0.6, 2.3) 3rd (or later) born vs. 2nd born OR 1.6 (0.6, 4.1)
No. of bedrooms in house	Petridou et al (1998): *1 bedroom vs. 2 bedrooms OR 3.6 (1.1, 12.2)* *3+ bedrooms vs. 2 bedrooms OR 2.7 (1.5, 4.8)*

Table 11. Associations with drowning in all settings

Characteristics	**<u>All settings-Drowning injuries:</u> Author (year) (* indicates UK study)** **Associations (95% CI unless otherwise stated)** *(positive associations are italicised; positive associations with relative risk equivalent >2.0 are highlighted)*
Child characteristics	
Ethnicity	Harrop et al (2007), Injury mortality: Native American vs. non-Native American RR 1.7 (0.7, 3.6)
Behavioural	Brehaut et al (2003) : Behavioural disorders vs. Non-behavioural disorders OR 1.75 (0.59 to 5.17)
Family characteristics	
Medicaid status	Koroukian et al (2007), injuries by drowning in age group 0-4 years: Non-Medicaid had higher probability (0.293) than Medicaid (0.220)
	Koroukian et al (2007), injuries by drowning in age group 5-14 years: Medicaid had higher probability (0.142) than non-Medicaid (0.116)

Table 12. Associations with falls in all settings

Characteristics	**<u>All settings-Fall injuries:</u> Author (year) (* indicates UK study)** **Associations (95% CI unless otherwise stated)** *(positive associations are italicised; positive associations with relative risk equivalent >2.0 are highlighted)*
Child characteristics	
Age	Tarantino et al (1999), risk of serious injury : No significant association between age and risk of serious injury (no data reported)
Sex	Tarantino et al (1999), risk of serious injury : No significant association between child's sex and risk of serious injury (no data reported)
Ethnicity	Harrop et al (2007), Injury mortality: Native American vs. non-Native American RR 2.0 (0.4, 6.2)
	Tarantino et al (1999), risk of serious injury : No significant association between ethnicity and risk of serious injury (no data reported)
Behavioural	Brehaut et al (2003) : *Behavioural disorders vs. Non-behavioural disorders OR 1.46 (1.29 to 1.64)*
Disabilities or medical conditions	McDermott et al (2008): Autism vs. no disability Relative rate 1.21 (0.86, 1.70)
Family characteristics	
Socio-economic status	Engstrom et al (2002) Child injuries by socio-economic status of parents: Low employees vs. High/intermediate employees RR 0.97 (0.92 to 1.04) Skilled workers vs. High/intermediate employees RR 1.03 (0.97 to 1.09) Unskilled workers vs. High/intermediate employees RR 0.94 (0.88 to 1.00)

Characteristics	**<u>All settings-Fall injuries:</u> Author (year) (* indicates UK study)** **Associations (95% CI unless otherwise stated)** *(positive associations are italicised; positive associations with relative risk equivalent >2.0 are highlighted)*
	Faelker et al (2000): Income category II vs. income category I (richest) Rate ratio 1.03 (0.90, 1.18) Income category III vs. income category I (richest) Rate ratio 1.09 (0.92, 1.28) *Income category IV vs. income category I (richest) Rate ratio 1.32 (1.13, 1.53)* *Income category V (poorest) vs. income category I (richest) Rate ratio 1.42 (1.21, 1.68)*
	Hippisley-Cox et al (2002)*, hospitalisations due to falls: 2nd Townsend deprivation score quintile vs. lowest quintile Rate ratio 0.99 (0.93, 1.05) *3rd Townsend deprivation score quintile vs. lowest quintile Rate ratio 1.14 (1.08, 1.20)* *4th Townsend deprivation score quintile vs. lowest quintile Rate ratio 1.28 (1.21, 1.34)* *Highest Townsend deprivation score quintile vs. lowest quintile Rate ratio 1.53 (1.46, 1.61)*
Medicaid status	Koroukian et al (2007), injuries from falls in age group 0-4 years: Medicaid had higher probability (0.014) than non-Medicaid (0.009)
	Koroukian et al (2007), injuries from falls in age group 5-14 years: Medicaid had higher probability (0.017) than non-Medicaid (0.012)
	Tarantino et al (1999), risk of serious injury : No significant association between Medicaid status and risk of serious injury (no data reported)
Accident history	Tarantino et al (1999), risk of serious injury : *Child previously injured as a result of being dropped vs. no history of injury as a result of being dropped OR 6.5 (2.0 to 21.8)*
Neighbourhood characteristics	

Characteristics	**<u>All settings-Fall injuries:</u> Author (year) (* indicates UK study)** **Associations (95% CI unless otherwise stated)** *(positive associations are italicised; positive associations with relative risk equivalent >2.0 are highlighted)*
Socio-economic status	Reimers et al (2008), Partial correlation between economic deprivation and injuries: Girls aged 10-14 years (1993-1995) 0.12 *Girls aged 10-14 years (2003-2005) 0.30 (p <0.01)* *Boys aged 10-14 years (1993-1995) 0.17 (p <0.05)* *Boys aged 10-14 years (2003-2005) 0.27 (p <0.01)*
	Reimers et al (2008), Partial correlation between social fragmentation and injuries: Girls aged 10-14 years (1993-1995) 0.11 Girls aged 10-14 years (2003-2005) -0.12 Boys aged 10-14 years (1993-1995) 0.10 Boys aged 10-14 years (2003-2005) -0.10

Table 13. Associations with injuries (undefined) in all settings

Characteristics	**All settings-Undefined injuries: Author (year) (* indicates UK study)** **Associations (95% CI unless otherwise stated)** *(positive associations are italicised; positive associations with relative risk equivalent >2.0 are highlighted)*
Child characteristics	
Age	Bradbury et al (1999), medically treated child injuries: *Child's age Partial R^2 .02 (p<.01 for the F test)*
	Haynes et al (2003)*, all injuries: *Age (years) OR 1.07 (1.06, 1.08)*
	Haynes et al (2003)*, serious injuries: *Age (years) 1.11 (1.09, 1.14)*
	Haynes et al (1999)*, log accident rates regressed onto percentage of population aged 0-4 years: *In enumeration districts R^2 4.5* *In wards R^2 28.4* *In social areas R^2 34.6*
	Lalloo & Sheiham (2003)*, major injuries (requiring medical consultation or visit to hospital): *7-9 years vs. 4-6 years OR 1.79 (1.28, 2.49)* *10-12 years vs. 4-6 years OR 3.00 (2.20, 4.10)* *13-15 years vs. 4-6 years OR 3.45 (2.52, 4.73)*
	Lalloo & Sheiham (2003)*, major head injuries (requiring medical consultation or visit to hospital): 7-9 years vs. 4-6 years OR 0.76 (0.54, 1.08) 10-12 years vs. 4-6 years OR 0.71 (0.49, 1.02) 13-15 years vs. 4-6 years OR 0.83 (0.57, 1.20)

Characteristics	**<u>All settings-Undefined injuries:</u> Author (year) (* indicates UK study)** **Associations (95% CI unless otherwise stated)** *(positive associations are italicised; positive associations with relative risk equivalent >2.0 are highlighted)*
	Lalloo & Sheiham (2003)*, minor injuries (pain/discomfort for >24 hours): 7-9 years vs. 4-6 years OR 1.44 (1.00, 2.07) *10-12 years vs. 4-6 years OR 3.26 (2.36, 4.52)* *13-15 years vs. 4-6 years OR 4.11 (2.97, 5.68)*
	Lalloo & Sheiham (2003)*, minor head injuries (pain/discomfort for >24 hours): 7-9 years vs. 4-6 years OR 0.51 (0.32, 0.82) 10-12 years vs. 4-6 years OR 0.48 (0.29, 0.80) 13-15 years vs. 4-6 years OR 0.57 (0.34, 0.95)
	Petridou et al (2005): 5 year increments OR 1.12 (0.65, 1.93)
	Petridou et al (2003), injuries in disabled children: *5 year age increments OR 1.68 (1.43, 1.97)*
	Petrou et al (2006)*, hospital admissions due to injury or poisoning: 0-3 years OR (calculated for each decrement in social class category) 1.07 (1.05, 1.10) 4-6 years OR (calculated for each decrement in social class category) 1.08 (1.05, 1.12) 7-10 years OR (calculated for each decrement in social class category) 1.06 (1.03, 1.09) 0-10 years OR (calculated for each decrement in social class category) 1.07 (1.06, 1.09)

Characteristics	**<u>All settings-Undefined injuries:</u> Author (year) (* indicates UK study)** **Associations (95% CI unless otherwise stated)** *(positive associations are italicised; positive associations with relative risk equivalent >2.0 are highlighted)*
	Reading et al (2008)*, all accidents: 15 months vs. 6 months Rate ratio 1.05 (0.99, 1.12) *24 months vs. 6 months Rate ratio 1.24 (1.16, 1.32)* 38 months vs. 6 months Rate ratio 0.63 (0.59, 0.68) 54 months vs. 6 months Rate ratio 0.39 (0.36, 0.42)
	Reading et al (2008)*, medically attended accidents: *15 months vs. 6 months Rate ratio 2.05 (1.70, 2.46)* *24 months vs. 6 months Rate ratio 3.19 (2.66, 3.82)* *38 months vs. 6 months Rate ratio 2.42 (2.02, 2.89)* *54 months vs. 6 months Rate ratio 1.82 (1.52, 2.18)*
	Schluter et al (2006): *7 weeks-12 months vs. 0-6 weeks RR 13.3 (7.0, 25.3)* *13-24 months vs. 0-6 weeks RR 23.3 (12.3, 44.1)*
	Simon et al (2004), injury-related visits to emergency departments: *3-5 years vs. 0-2 years OR 1.58 (1.25, 1.99)* *6-12 years vs. 0-2 years OR 2.35 (1.89, 2.93)* *13-18 years vs. 0-2 years OR 3.05 (2.55, 3.65)*
	Spinks et al (2008), all injuries: 4-6 years vs. 10-12 years OR 0.94 (0.60, 1.47) 7-9 years vs. 10-12 years OR 0.88 (0.61, 1.25)

Characteristics	**<u>All settings-Undefined injuries:</u> Author (year) (* indicates UK study)** **Associations (95% CI unless otherwise stated)** *(positive associations are italicised; positive associations with relative risk equivalent >2.0 are highlighted)*
	Spinks et al (2008), all medically treated injuries: 4-6 years vs. 10-12 years OR 0.83 (0.51, 1.34) 7-9 years vs. 10-12 years OR 0.80 (0.55, 1.16)
Sex	Brenner et al (1999), injury mortalities: *Male vs. female OR 1.20 (1.12, 1.28)*
	Bancej & Arbuckle (2000), injuries in farm children aged 0-4 years: *Male vs. female OR 1.53 (1.19, 1.98)*
	Bancej & Arbuckle (2000), injuries in farm children aged 5-9 years: *Male vs. female OR 2.38 (1.68, 3.37)*
	Bancej & Arbuckle (2000), injuries in farm children aged 10-15 years: *Male vs. female OR 3.17 (1.87, 5.39)*
	Haynes et al (2003)*, all injuries: *Male OR 1.35 (1.26, 1.45)*
	Haynes et al (2003)*, serious injuries: *Male OR 1.36 (1.20, 1.54)*
	Kendrick & Marsh (2001), medically attended injuries: *Male vs. female OR 1.52 (1.09, 2.10)*
	Lalloo & Sheiham (2003)*, major injuries (requiring medical consultation or visit to hospital): *Male vs. female OR 1.42 (1.17, 1.72)*

Characteristics	**<u>All settings-Undefined injuries:</u> Author (year) (* indicates UK study)** **Associations (95% CI unless otherwise stated)** *(positive associations are italicised; positive associations with relative risk equivalent >2.0 are highlighted)*
	Lalloo & Sheiham (2003)*, major head injuries (requiring medical consultation or visit to hospital): *Male vs. female OR 1.52 (1.16, 1.98)*
	Lalloo & Sheiham (2003)*, minor injuries (pain/discomfort for >24 hours): *Male vs. female OR 1.34 (1.10, 1.63)*
	Lalloo & Sheiham (2003)*, minor head injuries (pain/discomfort for >24 hours): *Male vs. female OR 1.80 (1.23, 2.61)*
	Li et al (2008), non-fatal injuries (ages 0-14 years): *Male vs. female OR 1.45 (1.40, 1.51)*
	Ordonana et al (2008)*, children ever experiencing an unintentional injury: *Male vs. female OR 1.48 (1.23, 1.78)*
	Ordonana et al (2008)*, children who had experienced >=2 unintentional injuries: *Male vs. female OR 2.20 (1.60, 3.04)*
	Ostberg (1997), mortality from injuries: *Male vs. female OR 2.21 (95% CI does not include 1.00)*
	Otters et al (2005), injuries in children aged 0-4 years: *Male vs. female OR 1.35 (1.19, 1.53)*
	Otters et al (2005), injuries in children aged 5-11 years: *Male vs. female OR 1.23 (1.12, 1.35)*
	Otters et al (2005), injuries in children aged 12-17 years: *Male vs. female OR 1.82 (1.66, 2.01)*

Characteristics	**<u>All settings-Undefined injuries:</u> Author (year) (* indicates UK study)** **Associations (95% CI unless otherwise stated)** *(positive associations are italicised; positive associations with relative risk equivalent >2.0 are highlighted)*
	Schluter et al (2006): *Male vs. female RR 1.34 (1.05, 1.71)*
	Schwebel & Brezausek (2008), injuries in children with mild nocturnal awakening pattern: Male χ^2 9.20, p<.01 (-0.81, -0.18)
	Simon et al (2004), injury-related visits to emergency departments: *Male vs. female OR 1.68 (1.46, 1.93)*
	Spinks et al (2008), all injuries: Female vs. male OR 0.69 (0.53, 0.91)
	Spinks et al (2008), medically treated injuries: Female vs. male OR 0.69 (0.47, 1.01)
	Reading et al (1999)*, all injuries: Female OR 0.75 (0.71, 0.81)
	Reading et al (1999)*, moderate and severe injuries: Female OR 0.70 (0.62, 0.78)
	Reading et al (2008)*, all accidents: *Male vs. female Rate ratio 1.19 (1.13, 1.25)*
	Reading et al (2008)*, medically attended accidents: *15 months vs. 6 months Rate ratio 1.25 (1.15, 1.36)*
	Sellstrom et al (2003), hospital admissions due to injuries in children aged 1-6: *Male vs. female OR 1.35 (1.24 to 1.47)*

Characteristics	**<u>All settings-Undefined injuries:</u> Author (year) (* indicates UK study)** **Associations (95% CI unless otherwise stated)** *(positive associations are italicised; positive associations with relative risk equivalent >2.0 are highlighted)*
	Sellstrom et al (2003), hospital admissions due to injuries in children aged 7-15: *Male vs. female OR 1.83 (1.70 to 1.97)*
Ethnicity	Brenner et al (1999), injury mortalities: *Black vs. White OR 1.43 (1.31, 1.56)* *Native American vs. White OR 2.12 (1.63, 2.75)* Asian vs. White OR 1.16 (0.91, 1.49)
	Ni et al (2002), model 2 (including only ethnicity whilst adjusting for age and sex): *Non-Hispanic White vs. Hispanic OR 1.9 (1.5, 2.6)* Non-Hispanic Black vs. Hispanic OR 1.0 (0.7, 1.4) Non-Hispanic other vs. Hispanic OR 0.8 (0.4, 1.7)
	Ni et al (2002), model 3 (adjusting for age and sex whilst including income, status, education and ethnicity): *Non-Hispanic White vs. Hispanic OR 1.6 (1.2, 2.1)* Non-Hispanic Black vs. Hispanic OR 0.9 (0.6, 1.3) Non-Hispanic other vs. Hispanic OR 0.8 (0.4, 1.5)
	Ni et al (2002), model 4 (excluding children without health insurance): *Non-Hispanic White vs. Hispanic OR 1.6 (1.2, 2.1)* Non-Hispanic Black vs. Hispanic OR 0.9 (0.6, 1.3) Non-Hispanic other vs. Hispanic OR 0.7 (0.3, 1.5)
	Otters et al (2005), injuries in children aged 5-11 years: Non-Western vs. Eastern OR 0.72 (0.59, 0.88)

Characteristics	**<u>All settings-Undefined injuries:</u> Author (year) (* indicates UK study)** **Associations (95% CI unless otherwise stated)** *(positive associations are italicised; positive associations with relative risk equivalent >2.0 are highlighted)*
	Otters et al (2005), injuries in children aged 12-17 years: Non-Western vs. Eastern OR 0.67 (0.54, 0.81)
	Overpeck et al (1997): Black vs. White Rate ratio 0.43 (0.36, 0.53) Mexican-American vs. White Rate ratio 0.67 (0.53, 0.85)
	Schluter et al (2006): Cook Island Maori vs. Samoan RR 1.38 (0.98, 1.94) Niuean vs. Samoan RR 0.73 (0.27, 2.01) Tongan vs. Samoan RR 0.97 (0.70, 1.35) Other Pacific vs. Samoan RR 0.76 (0.34, 1.71) *Non-Pacific vs. Samoan RR 2.42 (1.62, 3.63)*
	Simon et al (2004), injury-related visits to emergency departments: African American vs. White (non-Hispanic) OR 0.73 (0.59, 0.91) Hispanic vs. White (non-Hispanic) OR 0.76 (0.60, 0.96) Other vs. White (non-Hispanic) OR 0.64 (0.44, 0.93)
	Simon et al (2006), rates of injury visits to emergency departments: African American vs. non-Latino White 0.6 (0.4, 0.8) Latino vs. non-Latino White 0.3 (0.2, 0.4)

Characteristics	**<u>All settings-Undefined injuries:</u> Author (year) (* indicates UK study)** **Associations (95% CI unless otherwise stated)** *(positive associations are italicised; positive associations with relative risk equivalent >2.0 are highlighted)*
	Tobin et al (2002)*, hospital admissions resulting from injuries: South Asian OR 0.93 (0.92, 0.94) Black OR 0.94 (0.82, 1.09) Other ethnic group OR 0.95 (0.85, 1.06)
	Tobin et al (2002)*, new attendances at fracture clinic: South Asian OR 0.94 (0.92, 0.96) Black OR 0.94 (0.78, 1.14) Other ethnic group OR 0.89 (0.75, 1.05)
	Tobin et al (2002)*, in-patient stays of >3 days resulting from injuries: South Asian OR 0.95 (0.91, 1.00) Black OR 0.86 (0.65, 1.13) Other ethnic group OR 0.98 (0.72, 1.34)
Behavioural	Bradbury et al (1999), medically treated child injuries: Standard behaviour total score Partial R^2 .05 (p<.001 for the F test) Social competency Partial R^2 .02 (p<.01 for the F test)

Characteristics	**<u>All settings-Undefined injuries:</u> Author (year) (* indicates UK study)** **Associations (95% CI unless otherwise stated)** *(positive associations are italicised; positive associations with relative risk equivalent >2.0 are highlighted)*
	Haynes et al (2008)*, activity score intra-class correlation for all injuries (ICC – provides a measure of the strength of any 'neighbourhood effect'): Activity score ICC% in largest areas (average population 7976): Super-communities (joining adjacent communities with similar deprivation) 0.19 Townsend zones (maximise homogeneity of deprivation scores) 0.12 Tenure zones (maximise homogeneity of house tenure types) 0.02 House-type zones (maximise homogeneity of housing type) 0.20 Activity score ICC% in medium areas (average population 3968): Communities (local identity and similar social characteristics) 0.07 Townsend zones (maximise homogeneity of deprivation scores) 0.18 Tenure zones (maximise homogeneity of house tenure types) 0.05 House-type zones (maximise homogeneity of housing type) 0.07 Activity score ICC% in smaller areas (average population 2598): Sub-communities (subdivision of communities based on deprivation) 0.15 Townsend zones (maximise homogeneity of deprivation scores) 0.24 Tenure zones (maximise homogeneity of house tenure types) 0.11 House-type zones (maximise homogeneity of housing type) 0.23 Activity score ICC% in smallest areas (average population 483): Enumeration districts (census collection convenience with minimum population) 0.04

Characteristics	**<u>All settings-Undefined injuries:</u> Author (year) (* indicates UK study)** **Associations (95% CI unless otherwise stated)** *(positive associations are italicised; positive associations with relative risk equivalent >2.0 are highlighted)*
	Haynes et al (2008)*, development score intra-class correlation for all injuries (ICC – provides a measure of the strength of any 'neighbourhood effect'): Development score ICC% in largest areas (average population 7976): Super-communities (joining adjacent communities with similar deprivation) 0.21 Townsend zones (maximise homogeneity of deprivation scores) 0.12 *Tenure zones (maximise homogeneity of house tenure types) 0.32 (p<0.05)* House-type zones (maximise homogeneity of housing type) 0.16 Development score ICC% in medium areas (average population 3968): Communities (local identity and similar social characteristics) 0.28 *Townsend zones (maximise homogeneity of deprivation scores) 0.40 (p<0.05)* *Tenure zones (maximise homogeneity of house tenure types) 0.52 (p<0.01)* House-type zones (maximise homogeneity of housing type) 0.25 Development score ICC% in smaller areas (average population 2598): Sub-communities (subdivision of communities based on deprivation) 0.32 *Townsend zones (maximise homogeneity of deprivation scores) 0.45 (p<0.05)* Tenure zones (maximise homogeneity of house tenure types) 0.30 House-type zones (maximise homogeneity of housing type) 0.21 Development score ICC% in smallest areas (average population 483): Enumeration districts (census collection convenience with minimum population) 0.34

Characteristics	**<u>All settings-Undefined injuries:</u> Author (year) (* indicates UK study)** **Associations (95% CI unless otherwise stated)** *(positive associations are italicised; positive associations with relative risk equivalent >2.0 are highlighted)*
	Haynes et al (2008)*, conduct difficulties score intra-class correlation for all injuries (ICC – provides a measure of the strength of any 'neighbourhood effect'): Conduct difficulties score ICC% in largest areas (average population 7976): *Super-communities (joining adjacent communities with similar deprivation) 0.69 (p<0.05)* *Townsend zones (maximise homogeneity of deprivation scores) 0.69 (p<0.05)* *Tenure zones (maximise homogeneity of house tenure types) 0.60 (p<0.05)* *House-type zones (maximise homogeneity of housing type) 0.55 (p<0.05)* Conduct difficulties score ICC% in medium areas (average population 3968): *Communities (local identity and similar social characteristics) 0.67 (p<0.05)* *Townsend zones (maximise homogeneity of deprivation scores) 0.79 (p<0.05)* *Tenure zones (maximise homogeneity of house tenure types) 0.59 (p<0.05)* *House-type zones (maximise homogeneity of housing type) 0.91 (p<0.05)* Conduct difficulties score ICC% in smaller areas (average population 2598): *Sub-communities (subdivision of communities based on deprivation) 0.90 (p<0.05)* *Townsend zones (maximise homogeneity of deprivation scores) 1.22 (p<0.01)* *Tenure zones (maximise homogeneity of house tenure types) 0.74 (p<0.05)* *House-type zones (maximise homogeneity of housing type) 0.90 (p<0.05)* Conduct difficulties score ICC% in smallest areas (average population 483): *Enumeration districts (census collection convenience with minimum population) 1.99 (p<0.01)*

Characteristics	**<u>All settings-Undefined injuries:</u> Author (year) (* indicates UK study)** **Associations (95% CI unless otherwise stated)** *(positive associations are italicised; positive associations with relative risk equivalent >2.0 are highlighted)*
	Lallo et al (2003)*, Minor accident (behavioural traits assessed using Strengths & Difficulties questionnaire scale): Prosocial: Borderline vs. normal OR 1.19 (0.83, 1.71) High vs. normal OR 0.61 (0.34, 1.12) Hyperactive: Borderline vs. normal OR 0.97 (0.66, 1.41) *High vs. normal OR 1.41 (1.07, 1.88)* Emotional symptoms: Borderline vs. normal OR 0.99 (0.68, 1.43) *High vs. normal OR 1.52 (1.15, 2.01)* Conduct disorder: Borderline vs. normal OR 1.05 (0.77, 1.44) High vs. normal OR 1.11 (0.82, 1.50) Peer problems: Borderline vs. normal OR 1.07 (0.78, 1.45) High vs. normal OR 1.25 (0.94, 1.65) Total difficulties: Borderline vs. normal OR 1.31 (0.95, 1.82) *High vs. normal OR 1.61 (1.17, 2.22)*

Characteristics	**<u>All settings-Undefined injuries:</u> Author (year) (* indicates UK study)** **Associations (95% CI unless otherwise stated)** *(positive associations are italicised; positive associations with relative risk equivalent >2.0 are highlighted)*
	Lallo et al (2003)*, Major accident (behavioural traits assessed using Strengths & Difficulties questionnaire scale): Prosocial: Borderline vs. normal OR 0.93 (0.66, 1.33) High vs. normal OR 1.02 (0.64, 1.60) Hyperactive: *Borderline vs. normal OR 2.04 (1.54, 2.69)* *High vs. normal OR 1.66 (1.29, 2.14)* Emotional symptoms: Borderline vs. normal OR 1.08 (0.78, 1.49) *High vs. normal OR 1.40 (1.08, 1.81)* Conduct disorder: Borderline vs. normal OR 1.24 (0.95, 1.64) *High vs. normal OR 1.56 (1.22, 2.01)* Peer problems: Borderline vs. normal OR 1.14 (0.87, 1.49) High vs. normal OR 1.04 (0.80, 1.36) Total difficulties: Borderline vs. normal OR 1.30 (0.97, 1.74) *High vs. normal OR 1.59 (1.20, 2.11)*
	Lalloo & Sheiham (2003)*, major injuries (requiring medical consultation or visit to hospital): Borderline prosocial behaviour vs. normal behaviour OR 0.62 (0.39, 0.98) High prosocial behaviour vs. normal behaviour OR 1.00 (0.60, 1.65)

Characteristics	**<u>All settings-Undefined injuries:</u> Author (year) (* indicates UK study)** **Associations (95% CI unless otherwise stated)** *(positive associations are italicised; positive associations with relative risk equivalent >2.0 are highlighted)*
	Lalloo & Sheiham (2003)*, major head injuries (requiring medical consultation or visit to hospital): Borderline prosocial behaviour vs. normal behaviour OR 1.43 (0.91, 2.25) High prosocial behaviour vs. normal behaviour OR 1.11 (0.56, 2.20)
	Lalloo & Sheiham (2003)*, major injuries (requiring medical consultation or visit to hospital): *Borderline hyperactivity vs. normal behaviour OR 1.54 (1.13, 2.09)* High hyperactivity vs. normal behaviour OR 1.24 (0.94, 1.64)
	Lalloo & Sheiham (2003)*, major head injuries (requiring medical consultation or visit to hospital): *Borderline hyperactivity vs. normal behaviour OR 1.89 (1.26, 2.86)* *High hyperactivity vs. normal behaviour OR 1.94 (1.38, 2.73)*
	Lalloo & Sheiham (2003)*, major injuries (requiring medical consultation or visit to hospital): Borderline emotional symptoms vs. normal behaviour OR 0.94 (0.65, 1.36) *High emotional symptoms vs. normal behaviour OR 1.48 (1.13, 1.94)*
	Lalloo & Sheiham (2003)*, major head injuries (requiring medical consultation or visit to hospital): Borderline emotional symptoms vs. normal behaviour OR 0.96 (0.58, 1.57) High emotional symptoms behaviour vs. normal behaviour OR 1.20 (0.81, 1.78)
	Lalloo & Sheiham (2003)*, major injuries (requiring medical consultation or visit to hospital): Borderline conduct disorder vs. normal behaviour OR 1.14 (0.85, 1.53) *High conduct disorder vs. normal behaviour OR 1.33 (1.02, 1.74)*
	Lalloo & Sheiham (2003)*, major head injuries (requiring medical consultation or visit to hospital): Borderline conduct disorder vs. normal behaviour OR 1.38 (0.94, 2.03) *High conduct disorder vs. normal behaviour OR 1.60 (1.13, 2.27)*

Characteristics	**<u>All settings-Undefined injuries:</u> Author (year) (* indicates UK study)** **Associations (95% CI unless otherwise stated)** *(positive associations are italicised; positive associations with relative risk equivalent >2.0 are highlighted)*
	Lalloo & Sheiham (2003)*, major injuries (requiring medical consultation or visit to hospital): Borderline peer problems vs. normal behaviour OR 0.99 (0.72, 1.35) High peer problems vs. normal behaviour OR 1.21 (0.92, 1.59)
	Lalloo & Sheiham (2003)*, major head injuries (requiring medical consultation or visit to hospital): Borderline peer problems vs. normal behaviour OR 1.17 (0.79, 1.77) High peer problems vs. normal behaviour OR 1.02 (0.68, 1.53)
	Lalloo & Sheiham (2003)*, minor injuries (pain/discomfort for >24 hours): Borderline prosocial behaviour vs. normal behaviour OR 0.99 (0.67, 1.47) High prosocial behaviour vs. normal behaviour OR 0.69 (0.37, 1.27)
	Lalloo & Sheiham (2003)*, minor head injuries (pain/discomfort for >24 hours): Borderline prosocial behaviour vs. normal behaviour OR 1.75 (0.97, 3.16) High prosocial behaviour vs. normal behaviour OR 1.72 (0.79, 3.75)
	Lalloo & Sheiham (2003)*, minor injuries (pain/discomfort for >24 hours): Borderline hyperactivity vs. normal behaviour OR 0.95 (0.66, 1.38) High hyperactivity vs. normal behaviour OR 1.15 (0.86, 1.53)
	Lalloo & Sheiham (2003)*, minor head injuries (pain/discomfort for >24 hours): *Borderline hyperactivity vs. normal behaviour OR 1.81 (1.03, 3.18)* *High hyperactivity vs. normal behaviour OR 2.03 (1.28, 3.21)*
	Lalloo & Sheiham (2003)*, minor injuries (pain/discomfort for >24 hours): Borderline emotional symptoms vs. normal behaviour OR 0.87 (0.59, 1.28) High emotional symptoms vs. normal behaviour OR 1.30 (0.98, 1.73)

Characteristics	**<u>All settings-Undefined injuries:</u> Author (year) (* indicates UK study)** **Associations (95% CI unless otherwise stated)** *(positive associations are italicised; positive associations with relative risk equivalent >2.0 are highlighted)*
	Lalloo & Sheiham (2003)*, minor head injuries (pain/discomfort for >24 hours): Borderline emotional symptoms vs. normal behaviour OR 1.64 (0.92, 2.91) *High emotional symptoms vs. normal behaviour OR 1.73 (1.05, 2.83)*
	Lalloo & Sheiham (2003)*, minor injuries (pain/discomfort for >24 hours): Borderline conduct disorder vs. normal behaviour OR 1.04 (0.76, 1.41) High conduct disorder vs. normal behaviour OR 0.90 (0.66, 1.22)
	Lalloo & Sheiham (2003)*, minor head injuries (pain/discomfort for >24 hours): Borderline conduct disorder vs. normal behaviour OR 1.49 (0.88, 2.50) *High conduct disorder vs. normal behaviour OR 1.68 (1.05, 2.70)*
	Lalloo & Sheiham (2003)*, minor injuries (pain/discomfort for >24 hours): Borderline peer problems vs. normal behaviour OR 1.16 (0.86, 1.58) High peer problems vs. normal behaviour OR 1.11 (0.83, 1.49)
	Lalloo & Sheiham (2003)*, minor head injuries (pain/discomfort for >24 hours): Borderline peer problems vs. normal behaviour OR 1.14 (0.64, 2.02) High peer problems vs. normal behaviour OR 1.40 (0.85, 2.30)
	Ordonana et al (2008)*, children ever experiencing an unintentional injury: *Externalising scale OR 1.02 (1.01, 1.03)* ADHD subscale OR 1.02 (1.00, 1.03) Internalising scale OR 1.01 (0.99, 1.02)

Characteristics	**<u>All settings-Undefined injuries:</u> Author (year) (* indicates UK study)** **Associations (95% CI unless otherwise stated)** *(positive associations are italicised; positive associations with relative risk equivalent >2.0 are highlighted)*
	Ordonana et al (2008)*, children who had experienced >=2 unintentional injuries: *Externalising scale OR 1.02 (1.01, 1.04)* *ADHD subscale OR 1.02 (1.01, 1.04)* Internalising scale OR 1.02 (0.99, 1.04)
	Schwebel & Brezausek (2008), injuries in children with mild nocturnal awakening pattern: Positive affect χ^2 0.00 (-0.28, 0.28) Negative affect χ^2 5.95 (-0.70, -0.08) Externalising behaviour χ^2 0.01 (-0.02, 0.03)
	Soubhi (2004), injuries in children <2 years old (cross-sectional model): *Difficulty of the child OR 2.31 (1.60, 3.33)*
	Soubhi (2004), injuries in children <2 years old (longitudinal model): *Difficulty of the child OR 1.75 (1.19, 2.55)*
	Soubhi (2004), injuries in children 2-3 years old (cross-sectional model): *Physical aggression/opposition OR 1.07 (1.01, 1.13)*
	Soubhi (2004), injuries in children 2-3 years old (longitudinal model): Physical aggression/opposition OR 1.05 (0.97, 1.14)
	Soubhi et al (2004), injuries in children 2-3 years old: Prosocial behaviour OR 0.97 (0.90, 1.04) Hyperactivity OR 0.97 (0.89, 1.05) Physical aggression/opposition OR 1.06 (0.98, 1.14)

Characteristics	**<u>All settings-Undefined injuries:</u> Author (year) (* indicates UK study)** **Associations (95% CI unless otherwise stated)** *(positive associations are italicised; positive associations with relative risk equivalent >2.0 are highlighted)*
	Soubhi et al (2004), injuries in children 4-11 years old: Prosocial behaviour OR 1.00 (0.98, 1.03) Hyperactivity OR 0.96 (0.87, 1.04) Physical aggression/opposition OR 1.06 (0.96, 1.15)
	Spinks et al (2008), all injuries: *Hyperactive vs. not hyperactive OR 1.98 (1.48, 2.64)*
	Spinks et al (2008), all medically treated injuries: *Hyperactive vs. not hyperactive OR 1.56 (1.01, 2.43)*
	Reading et al (2008)*, all accidents (Rutter score measures behavioural characteristics): *Rutter score 2-3 vs. Rutter score 0-1 Rate ratio 1.15 (1.07, 1.24)* *Rutter score 4-5 vs. Rutter score 0-1 Rate ratio 1.26 (1.17, 1.36)* *Rutter score >=6 vs. Rutter score 0-1 Rate ratio 1.39 (1.27, 1.52)*
	Reading et al (2008)*, medically attended accidents: Child hardly ever avoids risks vs. child never avoids risks Rate ratio 1.00 (0.89, 1.12) Child sometimes avoids risks vs. child never avoids risks Rate ratio 0.94 (0.83, 1.05) Child often avoids risks vs. child never avoids risks Rate ratio 0.82 (0.70, 0.96)

Characteristics	**<u>All settings-Undefined injuries:</u> Author (year) (* indicates UK study)** **Associations (95% CI unless otherwise stated)** *(positive associations are italicised; positive associations with relative risk equivalent >2.0 are highlighted)*
	Reading et al (2008)*, all accidents (Strengths and difficulties score measure emotional strengths and problems): Strengths and difficulties score quartile 2 vs. strengths and difficulties score quartile 1 Rate ratio 1.04 (0.96, 1.13) Strengths and difficulties score quartile 3 vs. strengths and difficulties score quartile 1 Rate ratio 0.98 (0.90, 1.07) *Strengths and difficulties score quartile 4 vs. strengths and difficulties score quartile 1 Rate ratio 1.12 (1.03, 1.22)*
	Reading et al (2008)*, medically attended accidents (Strengths and difficulties score measure emotional strengths and problems): *Strengths and difficulties score quartile 2 vs. strengths and difficulties score quartile 1 Rate ratio 1.18 (1.02, 1.36)* Strengths and difficulties score quartile 3 vs. strengths and difficulties score quartile 1 Rate ratio 1.08 (0.93, 1.24) *Strengths and difficulties score quartile 4 vs. strengths and difficulties score quartile 1 Rate ratio 1.26 (1.09, 1.46)*
	Reading et al (2008)*, all accidents: *Child rarely argues with mother vs. child never argues with mother Rate ratio 1.19 (1.09, 1.30)* *Child sometimes argues with mother vs. child never argues with mother Rate ratio 1.29 (1.19, 1.39)* *Child frequently argues with mother vs. child never argues with mother Rate ratio 1.34 (1.23, 1.46)*

Characteristics	**<u>All settings-Undefined injuries:</u> Author (year) (* indicates UK study)** **Associations (95% CI unless otherwise stated)** *(positive associations are italicised; positive associations with relative risk equivalent >2.0 are highlighted)*
	Reading et al (2008)*, medically attended accidents: Child rarely argues with mother vs. child never argues with mother Rate ratio 0.99 (0.85, 1.15) Child sometimes argues with mother vs. child never argues with mother Rate ratio 1.11 (0.97, 1.27) *Child frequently argues with mother vs. child never argues with mother Rate ratio 1.22 (1.05, 1.41)*
Child's alcohol consumption	Xiang et al (2008), risk of serious injury: *Use alcohol <=1 day/week vs. never use alcohol OR 1.42 (1.27, 1.58)* *Use alcohol 2-4 days/week vs. never use alcohol OR 1.67 (1.35, 2.02)* *Use alcohol >=5-6 days/week vs. never use alcohol OR 2.05 (1.66, 2.44)*
	Xiang et al (2008), risk of serious injury: *Rarely drink beer vs. never drink beer OR 1.28 (1.13, 1.43)* *Drink beer every month vs. never drink beer OR 1.60 (1.36, 1.84)* *Drink beer every week vs. never drink beer OR 1.92 (1.67, 2.17)*
	Xiang et al (2008), risk of serious injury: *Rarely drink wine vs. never drink wine OR 1.20 (1.07, 1.33)* *Drink wine every month vs. never drink wine OR 1.47 (1.23, 1.73)* *Drink wine every week vs. never drink wine OR 1.93 (1.57, 2.29)*
	Xiang et al (2008), risk of serious injury: *Rarely drink spirits vs. never drink spirits OR 1.37 (1.20, 1.53)* *Drink spirits every month vs. never drink spirits OR 1.51 (1.29, 1.75)* *Drink spirits every week vs. never drink spirits OR 2.08 (1.81, 2.35)*

Characteristics	**<u>All settings-Undefined injuries:</u> Author (year) (* indicates UK study)** **Associations (95% CI unless otherwise stated)** *(positive associations are italicised; positive associations with relative risk equivalent >2.0 are highlighted)*
	Xiang et al (2008), risk of serious injury: *Been drunk once in lifetime vs. never been drunk in lifetime OR 1.58 (1.37, 1.79)* *Been drunk 2-3 times in lifetime vs. never been drunk in lifetime OR 1.47 (1.24, 1.71)* *Been drunk >=4 times in lifetime vs. never been drunk in lifetime OR 1.74 (1.51, 1.98)*
Child's mood	Petridou et al (1998), events occurring in the 2 hours prior to an injury that resulted in the child being hospitalised for >24 hours: *Strenuous physical activity OR 24.2 (10.8, 54.4)* *Intellectual exertion OR 9.0 (1.9, 25.8)* Involvement in family quarrel OR 2.6 (0.4, 16.9) *School examination OR 3.8 (1.5, 9.4)* *Pleasing event OR 3.4 (1.5, 8.2)*
Recent sibling injury	Johnston et al (2000), time elapsed since sibling injury: 3 days Relative injury hazard 0.9 (0.5, 1.55) *10 days Relative injury hazard 2.2 (1.65, 2.9)* *30 days Relative injury hazard 1.6 (1.25, 1.9)* *60 days Relative injury hazard 1.45 (1.2, 1.8)* *90 days Relative injury hazard 0.35 (1.05, 1.7)*

Characteristics	**<u>All settings-Undefined injuries:</u> Author (year) (* indicates UK study)** **Associations (95% CI unless otherwise stated)** *(positive associations are italicised; positive associations with relative risk equivalent >2.0 are highlighted)*
Disabilities or medical conditions	Lee et al (2008): Autism vs. controls OR 2.15 (1.00, 4.60) *Attention Deficit (Hyperactivity) Disorder vs. controls OR 2.74 (1.63, 4.59)* Learning disability vs. controls OR 0.78 (0.50, 1.22) *Psychopathology vs. controls OR 2.06 (1.24, 3.42)* Other medical conditions vs. controls OR 1.26 (1.00, 1.58)
	McDermott et al (2008): Autism vs. no disability Relative rate 1.23 (0.86, 1.75)
	Petridou et al (2005): Children with vision problems vs. children without vision problems OR 1.61 (0.85, 3.07)

Characteristics	**<u>All settings-Undefined injuries:</u> Author (year) (* indicates UK study)** **Associations (95% CI unless otherwise stated)** *(positive associations are italicised; positive associations with relative risk equivalent >2.0 are highlighted)*
	Sinclair & Xiang (2008): *All single disabilities vs. no disability Prevalence ratio 1.30 (1.15, 1.48)* Epilepsy/ seizures only vs. no disability Prevalence ratio 1.90 (0.75, 4.81) Hearing problem only vs. no disability Prevalence ratio 1.78 (0.95, 3.33) Other impairment only vs. no disability Prevalence ratio 1.57 (0.97, 2.53) Bone/ joint/ muscle problem only vs. no disability Prevalence ratio 1.52 (0.75, 3.09) *Other emotional/ behavioural problem only vs. no disability Prevalence ratio 1.50 (1.15, 1.97)* Asthma/ breathing problem only vs. no disability Prevalence ratio 1.38 (0.94, 2.03) Vision problem only vs. no disability Prevalence ratio 1.36 (0.59, 3.13) Attention Deficit (Hyperactivity) Disorder only vs. no disability Prevalence ratio 1.36 (0.93, 1.98) Speech problem only vs. no disability Prevalence ratio 1.30 (0.96, 1.77) Other developmental problem only vs. no disability Prevalence ratio 1.15 (0.82, 1.62) Learning disability only vs. no disability Prevalence ratio 1.09 (0.78, 1.53) Birth defect only vs. no disability Prevalence ratio 1.08 (0.47, 2.46) Mental retardation only vs. no disability Prevalence ratio 0.61 (0.19, 1.93) Injury-related disability only vs. no disability Prevalence ratio 0.27 (0.04, 1.94)
Child illness	Bradbury et al (1999), medically treated child injuries: *Signs & symptoms of illness in past 30 days Partial R^2 .01 (p<.01 for the F test)* *Child susceptibility to illness Partial R^2 .01 (p<.05 for the F test)*

Characteristics	**<u>All settings-Undefined injuries:</u> Author (year) (* indicates UK study)** **Associations (95% CI unless otherwise stated)** *(positive associations are italicised; positive associations with relative risk equivalent >2.0 are highlighted)*
Physicality	Reading et al (2008)*, all accidents: Physical activity score quartile 2 vs. physical activity score quartile 1 Rate ratio 1.06 (0.99, 1.13) *Physical activity score quartile 3 vs. physical activity score quartile 1 Rate ratio 1.10 (1.03, 1.17)* *Physical activity score quartile 4 vs. physical activity score quartile 1 Rate ratio 1.20 (1.12, 1.28)*
	Reading et al (2008)*, medically attended accidents: Physical activity score quartile 2 vs. physical activity score quartile 1 Rate ratio 1.06 (0.94, 1.19) Physical activity score quartile 3 vs. physical activity score quartile 1 Rate ratio 1.05 (0.94, 1.18) *Physical activity score quartile 4 vs. physical activity score quartile 1 Rate ratio 1.22 (1.09, 1.37)*
	Reading et al (2008)*, medically attended accidents: Physical development score quartile 2 vs. physical activity score quartile 1 Rate ratio 1.10 (0.98, 1.22) *Physical development score quartile 3 vs. physical activity score quartile 1 Rate ratio 1.17 (1.04, 1.31)* *Physical development score quartile 4 vs. physical activity score quartile 1 Rate ratio 1.14 (1.01, 1.28)*
Family characteristics	
Socio-economic status	Faelker et al (2000), all childhood (age 0-19 years) injuries: *Income category II vs. income category I (richest) Rate ratio 1.10 (1.02, 1.19)* *Income category III vs. income category I (richest) Rate ratio 1.22 (1.10, 1.35)* *Income category IV vs. income category I (richest) Rate ratio 1.42 (1.27, 1.60)* *Income category V (poorest) vs. income category I (richest) Rate ratio 1.67 (1.48, 1.89)*

Characteristics	**<u>All settings-Undefined injuries:</u> Author (year) (* indicates UK study)** **Associations (95% CI unless otherwise stated)** *(positive associations are italicised; positive associations with relative risk equivalent >2.0 are highlighted)*
	Faelker et al (2000), all childhood (age 0-19 years) injuries in females: Income category II vs. income category I (richest) Rate ratio 1.04 (0.92, 1.17) Income category III vs. income category I (richest) Rate ratio 1.04 (0.90, 1.22) *Income category IV vs. income category I (richest) Rate ratio 1.23 (1.05, 1.44)* *Income category V (poorest) vs. income category I (richest) Rate ratio 1.46 (1.46, 1.73)*
	Faelker et al (2000), all childhood (age 0-19 years) injuries in males: *Income category II vs. income category I (richest) Rate ratio 1.11 (1.01, 1.22)* *Income category III vs. income category I (richest) Rate ratio 1.16 (1.03, 1.30)* *Income category IV vs. income category I (richest) Rate ratio 1.30 (1.16, 1.45)* *Income category V (poorest) vs. income category I (richest) Rate ratio 1.64 (1.46, 1.84)*
	Faelker et al (2000), all injuries in ages 0-4 years: Income category II vs. income category I (richest) Rate ratio 1.11 (0.93, 1.32) Income category III vs. income category I (richest) Rate ratio 1.10 (0.87, 1.40) *Income category IV vs. income category I (richest) Rate ratio 1.30 (1.02, 1.65)* Income category V (poorest) vs. income category I (richest) Rate ratio 1.23 (0.93, 1.63)
	Faelker et al (2000), all injuries in ages 5-9 years: Income category II vs. income category I (richest) Rate ratio 1.07 (0.90, 1.26) Income category III vs. income category I (richest) Rate ratio 1.08 (0.88, 1.34) Income category IV vs. income category I (richest) Rate ratio 1.09 (0.87, 1.36) *Income category V (poorest) vs. income category I (richest) Rate ratio 1.32 (1.05, 1.67)*

Characteristics	**<u>All settings-Undefined injuries:</u> Author (year) (* indicates UK study)** **Associations (95% CI unless otherwise stated)** *(positive associations are italicised; positive associations with relative risk equivalent >2.0 are highlighted)*
	Faelker et al (2000), all injuries in ages 10-14 years: Income category II vs. income category I (richest) Rate ratio 1.11 (0.96, 1.29) Income category III vs. income category I (richest) Rate ratio 1.16 (0.94, 1.42) Income category IV vs. income category I (richest) Rate ratio 1.19 (0.93, 1.52) Income category V (poorest) vs. income category I (richest) Rate ratio 1.30 (0.99, 1.70)
	Faelker et al (2000), minor injuries (requiring advice only or treatment with no follow-up) (ages 0-19): Income category II vs. income category I (richest) Rate ratio 1.06 (0.96, 1.16) Income category III vs. income category I (richest) Rate ratio 1.12 (1.00, 1.26) *Income category IV vs. income category I (richest) Rate ratio 1.18 (1.04, 1.33)* *Income category V (poorest) vs. income category I (richest) Rate ratio 1.50 (1.32, 1.71)*
	Faelker et al (2000), moderate injuries (requiring treatment and follow-up) (ages 0-19): Income category II vs. income category I (richest) Rate ratio 1.05 (0.92, 1.20) Income category III vs. income category I (richest) Rate ratio 1.20 (1.00, 1.42) *Income category IV vs. income category I (richest) Rate ratio 1.51 (1.25, 1.83)* *Income category V (poorest) vs. income category I (richest) Rate ratio 1.73 (1.40, 2.13)*
	Faelker et al (2000), extreme injuries (requiring hospital admission) (ages 0-19): Income category II vs. income category I (richest) Rate ratio 1.09 (0.66, 1.81) Income category III vs. income category I (richest) Rate ratio 0.37 (0.13, 1.02) Income category IV vs. income category I (richest) Rate ratio 1.45 (0.77, 2.71) Income category V (poorest) vs. income category I (richest) Rate ratio 1.53 (0.76, 3.06)

Characteristics	**<u>All settings-Undefined injuries:</u> Author (year) (* indicates UK study)** **Associations (95% CI unless otherwise stated)** *(positive associations are italicised; positive associations with relative risk equivalent >2.0 are highlighted)*
	Hippisley-Cox et al (2002)*, ages 0-4 years: 2nd Townsend deprivation score quintile vs. lowest quintile Rate ratio 1.06 (0.99, 1.13) *3rd Townsend deprivation score quintile vs. lowest quintile Rate ratio 1.27 (1.20, 1.35)* *4th Townsend deprivation score quintile vs. lowest quintile Rate ratio 1.41 (1.33, 1.49)* *Highest Townsend deprivation score quintile vs. lowest quintile Rate ratio 1.88 (1.78, 1.99)*
	Hippisley-Cox et al (2002)*, ages 5-14 years: 2nd Townsend deprivation score quintile vs. lowest quintile Rate ratio 1.03 (0.98, 1.08) *3rd Townsend deprivation score quintile vs. lowest quintile Rate ratio 1.17 (1.12, 1.22)* *4th Townsend deprivation score quintile vs. lowest quintile Rate ratio 1.38 (1.32, 1.43)* *Highest Townsend deprivation score quintile vs. lowest quintile Rate ratio 1.66 (1.59, 1.72)*
	Jones et al (2002), fractures incurred ages 0-18 years: Lowest socio-economic group vs. middle socio-economic group OR 1.4 (1.0, 1.84) Highest socio-economic group vs. middle socio-economic group OR 1.03 (0.81, 1.30)
	Lalloo & Sheiham (2003)*, major injuries (requiring medical consultation or visit to hospital): Social class IIINM vs. I/II OR 1.08 (0.78, 1.50) Social class IIIM vs. I/II OR1.14 (0.90, 1.45) Social class IV/V vs. I/II OR 1.12 (0.86, 1.46)
	Lalloo & Sheiham (2003)*, major head injuries (requiring medical consultation or visit to hospital): Social class IIINM vs. I/II OR 1.25 (0.81, 1.92) Social class IIIM vs. I/II OR1.21 (0.87, 1.68) Social class IV/V vs. I/II OR 1.01 (0.81, 1.92)

Characteristics	**<u>All settings-Undefined injuries:</u> Author (year) (* indicates UK study)** **Associations (95% CI unless otherwise stated)** *(positive associations are italicised; positive associations with relative risk equivalent >2.0 are highlighted)*
	Lalloo & Sheiham (2003)*, minor injuries (pain/discomfort for >24 hours): Social class IIINM vs. I/II OR 1.09 (0.81, 1.48) Social class IIIM vs. I/II OR 0.78 (0.61, 1.00) Social class IV/V vs. I/II OR 0.72 (0.54, 0.94)
	Lalloo & Sheiham (2003)*, minor head injuries (pain/discomfort for >24 hours): Social class IIINM vs. I/II OR 0.78 (0.47, 1.30) Social class IIIM vs. I/II OR 0.81 (0.51, 1.28) Social class IV/V vs. I/II OR 1.19 (0.68, 2.07)
	Ordonana et al (2008)*, children ever experiencing an unintentional injury: *Social disadvantage OR 1.26 (1.04, 1.52)*
	Ordonana et al (2008)*, children who had experienced >=2 unintentional injuries: *Social disadvantage OR 1.96 (1.39, 2.74)*
	Ostberg (1997), mortality from injuries: Upper non-manual vs. intermediate non-manual OR 0.93 Lower non-manual vs. intermediate non-manual OR 0.94 *Skilled manual vs. intermediate non-manual OR 1.53 (95% CI does not include 1.00)* *Unskilled manual vs. intermediate non-manual OR 1.53 (95% CI does not include 1.00)* *Self-employed vs. intermediate non-manual OR 1.52 (95% CI does not include 1.00)* *Farmer vs. intermediate non-manual OR 2.47 (95% CI does not include 1.00)* *Others vs. intermediate non-manual OR 1.80 (95% CI does not include 1.00)*

Characteristics	**<u>All settings-Undefined injuries:</u> Author (year) (* indicates UK study)** **Associations (95% CI unless otherwise stated)** *(positive associations are italicised; positive associations with relative risk equivalent >2.0 are highlighted)*
	Otters et al (2005), injuries in children aged 5-11 years: Middle vs. high OR 1.0 (0.89, 1.1) Low vs. high OR 1.15 (1.0, 1.3)
	Otters et al (2005), injuries in children aged 12-17 years: *Middle vs. high OR 1.13 (1.01, 1.26)* *Low vs. high OR 1.39 (1.22, 1.58)*
Family has no access to a car	Kendrick & Marsh (2001), medically attended injuries: *No access to a car vs. access to a car OR 1.74 (1.18, 2.57)*
Medicaid status	Marcin et al (2003), predictors of survival in paediatric trauma patients: People with Medicaid vs. people with other health insurance OR 0.56 (0.31, 1.03)
Social welfare benefits	Lalloo & Sheiham (2003)*, major injuries (requiring medical consultation or visit to hospital): In receipt of one type of benefit vs. not in receipt of benefits OR 1.10 (0.85, 1.41) In receipt of more than one type of benefit vs. not in receipt of benefits OR 1.12 (0.85, 1.47)
	Lalloo & Sheiham (2003)*, major head injuries (requiring medical consultation or visit to hospital): In receipt of one type of benefit vs. not in receipt of benefits OR 0.77 (0.52, 1.16) *In receipt of more than one type of benefit vs. not in receipt of benefits OR 1.54 (1.10, 2.16)*
	Lalloo & Sheiham (2003)*, minor injuries (pain/discomfort for >24 hours): In receipt of one type of benefit vs. not in receipt of benefits OR 1.03 (0.79, 1.34) In receipt of more than one type of benefit vs. not in receipt of benefits OR 0.92 (0.68, 1.23)

Characteristics	**<u>All settings-Undefined injuries:</u> Author (year) (* indicates UK study)** **Associations (95% CI unless otherwise stated)** *(positive associations are italicised; positive associations with relative risk equivalent >2.0 are highlighted)*
	Lalloo & Sheiham (2003)*, minor head injuries (pain/discomfort for >24 hours): In receipt of one type of benefit vs. not in receipt of benefits OR 0.92 (0.56, 1.52) In receipt of more than one type of benefit vs. not in receipt of benefits OR 0.94 (0.55, 1.60)
	Sellstrom et al (2003), hospital admissions due to injuries in children aged 1-6: *In receipt of social welfare benefits vs. not in receipt of social welfare benefits OR 1.32 (1.18 to 1.47)*
	Sellstrom et al (2003), hospital admissions due to injuries in children aged 7-15: In receipt of social welfare benefits vs. not in receipt of social welfare benefits OR 1.09 (0.98 to 1.21)
Education	Bancej & Arbuckle (2000), injuries in farm children aged 0-4 years (Mother's highest education): High school graduate vs. less than high school OR 1.53 (0.99, 2.35) *Some post-secondary vs. less than high school OR 1.76 (1.03, 3.01)* Post-secondary graduate vs. less than high school OR 1.41 (0.90, 2.21)
	Bancej & Arbuckle (2000), injuries in farm children aged 5-9 years (Father's highest education): High school graduate vs. less than high school OR 1.29 (0.86, 1.94) *Some post-secondary vs. less than high school OR 2.04 (1.18, 3.51)* Post-secondary graduate vs. less than high school OR 0.97 (0.62, 1.52)
	Bancej & Arbuckle (2000), injuries in farm children aged 10-15 years (Mother's highest education): High school graduate vs. less than high school OR 0.57 (0.30, 1.09) *Some post-secondary vs. less than high school OR 2.10 (1.01, 4.36)* Post-secondary graduate vs. less than high school OR 0.98 (0.53, 1.82)
	Bishai et al (2008), injuries in children aged 30-33 months, mother's level of education: College graduate OR 0.652 (0.358, 1.187)

Characteristics	**<u>All settings-Undefined injuries:</u> Author (year) (* indicates UK study)** **Associations (95% CI unless otherwise stated)** *(positive associations are italicised; positive associations with relative risk equivalent >2.0 are highlighted)*
	Blakely et al (2003), unintentional injury death (ages 0-14 years): Trade vs. tertiary education Rate ratio 1.1 (0.7, 1.7) School vs. tertiary education Rate ratio 1.1 (0.7, 1.7) Nil vs. tertiary education Rate ratio 1.4 (0.9, 2.3)
	Brenner et al (1999), injury mortalities: *<=11 years vs. >16 years OR 2.31 (2.01, 2.66)* *12 years vs. > 16 years OR 1.59 (1.40, 1.81)* *13-15 years vs. > 16 years OR 1.36 (1.19, 1.56)*
	Hussey (1997), injury mortalities: *<12 years vs. >=16 years Risk ratio 1.65 (1.07, 2.52)* 12 years vs. >=16 years Risk ratio 1.14 (0.77, 1.70) 13-15 years vs. >=16 years Risk ratio 1.41 (0.90, 2.18)
	Li et al (2008), non-fatal injuries (ages 0-14 years) (parental level of education): *Practical high school (11 years) vs. theoretical high school and/or college (>=12 years) OR 1.10 (1.05, 1.15)* *Compulsory school (9 years) vs. theoretical high school and/or college (>=12 years) OR 1.11 (1.06, 1.17)*
	Ni et al (2002), model 1 (adjusting for age and sex): *12-15 years vs. <12 years OR 1.6 (1.03, 2.3)* >=16 years vs. <12 years OR 1.5 (0.98, 2.4)
	Ni et al (2002), model 3 (adjusting for age and sex whilst including income, status, education and ethnicity): 12-15 years vs. <12 years OR 1.4 (0.9, 2.1) >=16 years vs. <12 years OR 1.3 (0.9, 2.1)

Characteristics	**<u>All settings-Undefined injuries:</u> Author (year) (* indicates UK study)** **Associations (95% CI unless otherwise stated)** *(positive associations are italicised; positive associations with relative risk equivalent >2.0 are highlighted)*
	Ni et al (2002), model 4 (excluding children without health insurance): 12-15 years vs. <12 years OR 1.1 (0.8, 1.7) >=16 years vs. <12 years OR 1.1 (0.7, 1.7)
	Overpeck et al (1997), maternal education: <12 years vs. >12 years Rate ratio 0.75 (0.65, 0.87) 12 years vs. > 12 years Rate ratio 0.87 (0.78, 0.97)
	Petridou et al (2005), paternal education: *6 year decrements OR 1.37 (1.03, 1.81)*
	Reading et al (2008)*, all accidents: Mother has vocational qualification vs. mother has no qualifications Rate ratio 1.02 (0.92, 1.14) *Mother has O level qualification vs. mother has no qualifications Rate ratio 1.13 (1.04, 1.22)* *Mother has A level qualification vs. mother has no qualifications Rate ratio 1.26 (1.15, 1.37)* *Mother has degree qualification vs. mother has no qualifications Rate ratio 1.43 (1.30, 1.57)*
	Schluter et al (2006): Secondary vs. no formal qualifications RR 1.15 (0.85, 1.54) Post-Secondary vs. no formal qualifications RR 1.21 (0.89, 1.66)
	Sellstrom et al (2003), hospital admissions due to injuries in children aged 1-6: Maternal education of 12-13 years vs. maternal education of >13 years OR 1.00 (0.91 to 1.10) *Maternal education of 0-11 years vs. maternal education of >13 years OR 1.45 (1.29 to 1.63)*

Characteristics	**<u>All settings-Undefined injuries:</u> Author (year) (* indicates UK study)** **Associations (95% CI unless otherwise stated)** *(positive associations are italicised; positive associations with relative risk equivalent >2.0 are highlighted)*
	Sellstrom et al (2003), hospital admissions due to injuries in children aged 7-15: Maternal education of 12-13 years vs. maternal education of >13 years OR 1.04 (0.96 to 1.12) Maternal education of 0-11 years vs. maternal education of >13 years OR 1.05 (0.95 to 1.16)
	Simpson et al (2005), hospitalisation due to injury where parents less than high school education: Socioeconomic status II vs socioeconomic status I (highest) OR 1.31 (0.83, 2.06) Socioeconomic status III vs socioeconomic status I (highest) OR 1.19 (0.75, 1.90) *Socioeconomic status IV vs socioeconomic status I (highest) OR 2.11 (1.36, 3.28)*
Income	Blakely et al (2003), unintentional injury death (ages 0-14 years): $30000-$49999 vs. >=$50000 Rate ratio 1.6 (0.8, 3.5) $20000-$29999 vs. >=$50000 Rate ratio 1.9 (0.9, 4.0) *$10000-$19999 vs. >=$50000 Rate ratio 2.3 (1.1, 4.8)* *<$10000 vs. >=$50000 Rate ratio 3.3 (1.5, 7.4)*
	D'Souza et al (2008): Median to <150% median income vs. >=150% median income OR 1.34 (0.81, 2.22) 80% to <median income vs. >=150% median income OR 1.49 (0.86, 2.59) 60% to <80% median income vs. >=150% median income OR 1.43 (0.82, 2.52) 50% to <60% median income vs. >=150% median income OR 1.37 (0.74, 2.55) 40% to <50% median income vs. >=150% median income OR 1.40 (0.73, 2.68) <40% median income vs. >=150% median income OR 1.75 (0.96, 3.21)

Characteristics	**<u>All settings-Undefined injuries:</u> Author (year) (* indicates UK study)** **Associations (95% CI unless otherwise stated)** *(positive associations are italicised; positive associations with relative risk equivalent >2.0 are highlighted)*
	Li et al (2008), non-fatal injuries (ages 0-14 years): Middle-high income vs. high income OR 0.95 (0.88, 1.02) Middle-low income vs. high income OR 0.91 (0.85, 0.97) Low income vs. high income OR 0.90 (0.84, 0.97)
	Marcin et al (2003), predictors of survival in paediatric trauma patients: Median household income (associated with $1000 decrement) OR 1.01 (0.98, 1.03) Below poverty line (associated with 1% increase in households below poverty line) OR 1.00 (0.99, 1.01)
	Ni et al (2002), model 1 (adjusting for age and sex): *Near poor vs. poor OR 1.6 (1.1, 2.4)* *Not poor vs. poor OR 2.1 (1.5, 3.1)* Unknown vs. poor OR 1.3 (0.9, 2.1)
	Ni et al (2002), model 3 (adjusting for age and sex whilst including income, status, education and ethnicity): *Near poor vs. poor OR 1.5 (1.01, 2.2)* *Not poor vs. poor OR 1.8 (1.2, 2.7)* Unknown vs. poor OR 1.1 (0.8, 1.9)
	Ni et al (2002), model 4 (excluding children without health insurance): Near poor vs. poor OR 1.5 (0.96, 2.2) *Not poor vs. poor OR 1.6 (1.1, 2.4)* Unknown vs. poor OR 1.1 (0.7, 1.8)

Characteristics	**<u>All settings-Undefined injuries:</u> Author (year) (* indicates UK study)** **Associations (95% CI unless otherwise stated)** *(positive associations are italicised; positive associations with relative risk equivalent >2.0 are highlighted)*
	Ordonana et al (2008)*, children ever experiencing an unintentional injury: Total family income £26000-£40999/year vs. >£41000/year OR 1.00 (0.72, 1.39) Total family income £12000-£25999/year vs. >£41000/year OR 1.15 (0.84, 1.57) Total family income <£11999/year vs. >£41000/year OR 1.27 (0.90, 1.79)
	Ordonana et al (2008)*, children who had experienced >=2 unintentional injuries: Total family income £26000-£40999/year vs. >£41000/year OR 1.85 (0.95, 3.59) *Total family income £12000-£25999/year vs. >£41000/year OR 2.27 (1.20, 4.32)* *Total family income <£11999/year vs. >£41000/year OR 2.34 (1.18, 4.64)*
	Overpeck et al (1997): In poverty vs. not in poverty Rate ratio 1.04 (0.92, 1.16)
	Reading et al (2008)*, all accidents: *Financial difficulties score quartile 2 vs. financial difficulties score quartile 1 Rate ratio 1.11 (1.04, 1.17)* *Financial difficulties score quartile 3 vs. financial difficulties score quartile 1 Rate ratio 1.09 (1.02, 1.16)* *Financial difficulties score quartile 4 vs. financial difficulties score quartile 1 Rate ratio 1.12 (1.04, 1.20)*
	Schluter et al (2006): *NZ$20001-$40000 vs. <NZ$20000 RR 1.59 (1.15, 2.19)* >NZ$40000 vs. <NZ$20000 RR 1.40 (0.90, 2.16) *Unknown vs. <NZ$20000 RR 1.82 (1.02, 3.23)*
	Spinks et al (2008), all injuries: <AUS$41600 vs. >AUS$72800 OR 1.40 (0.47, 1.08) AUS$41600-$72799 vs. >AUS$72800 OR 0.96 (0.70, 1.32)

Characteristics	**<u>All settings-Undefined injuries:</u> Author (year) (* indicates UK study)** **Associations (95% CI unless otherwise stated)** *(positive associations are italicised; positive associations with relative risk equivalent >2.0 are highlighted)*
	Spinks et al (2008), all medically treated injuries: <AUS$41600 vs. >AUS$72800 OR 1.07 (0.67, 1.71) AUS$41600-$72799 vs. >AUS$72800 OR 0.91 (0.57, 1.46)
Lone parent	Braun et al (2005), association with injuries: *Single parent p<0.0001*
	Haynes et al (1999), log accident rates regressed onto percentage of lone parent households: *In enumeration districts R^2 9.8* *In wards R^2 43.1* *In social areas R^2 59.3*
	Ordonana et al (2008)*, children ever experiencing an unintentional injury: Mother not living with father OR 1.12 (0.89, 1.40)
	Ordonana et al (2008)*, children who had experienced >=2 unintentional injuries: *Mother not living with father OR 1.55 (1.10, 2.18)*
	Ostberg (1997), mortality from injuries: *Single-parent families vs. two-parent families OR 1.48 (95% CI does not include 1.00)*
	Overpeck et al (1997): *Single-parent vs. two-parent family Rate ratio 1.40 (1.24, 1.58)* >=3 adults in household vs. two-parent family Rate ration 1.03 (0.89, 1.20)
	Reading et al (1999)*, all injuries: Lone parent OR 1.08 (0.97, 1.21)

Characteristics	**<u>All settings-Undefined injuries:</u> Author (year) (* indicates UK study)** **Associations (95% CI unless otherwise stated)** *(positive associations are italicised; positive associations with relative risk equivalent >2.0 are highlighted)*
	Reading et al (1999)*, moderate and severe injuries: *Lone parent OR 1.23 (1.02, 1.49)*
	Simpson et al (2005), hospitalisation due to injury in children with lone parents: Socioeconomic status II vs socioeconomic status I (highest) OR 1.48 (0.94, 2.34) *Socioeconomic status III vs socioeconomic status I (highest) OR 1.64 (1.04, 2.61)* *Socioeconomic status IV vs socioeconomic status I (highest) OR 1.64 (1.05, 2.56)*
Family type	Bishai et al (2008), injuries in children aged 30-33 months: *Mother stayed with partner OR 2.093 (1.147, 3.818)* Mother stayed with partner but never married OR 1.567 (0.665, 3.693) Moved in the previous year OR 0.584 (0.389, 0.878) Father does not co-reside OR 1.516 (0.707, 3.250)
	Blakely et al (2003), unintentional injury death (ages 0-14 years): *1 parent vs. 2 parents Rate ratio 1.8 (1.2, 2.5)*
	Brenner et al (1999), injury mortalities: *Unmarried parents vs. married parents OR 1.55 (1.42, 1.68)*
	Hussey (1997), injury mortalities: Female head of household vs. married head of household Risk ratio 0.96 (0.67, 1.38) Other head of household vs. married head of household Risk ratio 1.28 (0.75, 2.20)
	Lalloo & Sheiham (2003)*, major injuries (requiring medical consultation or visit to hospital): Stepparent vs. both biological parents OR 1.00 (0.69, 1.44) Single parent vs. both biological parents OR 1.23 (0.97, 1.57)

Characteristics	**<u>All settings-Undefined injuries:</u> Author (year) (* indicates UK study)** **Associations (95% CI unless otherwise stated)** *(positive associations are italicised; positive associations with relative risk equivalent >2.0 are highlighted)*
	Lalloo & Sheiham (2003)*, major head injuries (requiring medical consultation or visit to hospital): Stepparent vs. both biological parents OR 1.12 (0.69, 0.81) Single parent vs. both biological parents OR 1.16 (0.82, 1.63)
	Lalloo & Sheiham (2003)*, minor injuries (pain/discomfort for >24 hours): Stepparent vs. both biological parents OR 1.11 (0.78, 1.59) Single parent vs. both biological parents OR 1.11 (0.86, 1.43)
	Lalloo & Sheiham (2003)*, minor head injuries (pain/discomfort for >24 hours): Stepparent vs. both biological parents OR 0.96 (0.50, 1.87) Single parent vs. both biological parents OR 0.76 (0.46, 1.28)
Family members	Petridou et al (2005): >=6 vs. <6 OR 0.55 (0.35, 0.85)
No. of children in family	Overpeck et al (1997): >=3 children vs. 1-2 children Rate ratio 1.08 (0.98, 1.20)
No. of siblings	Flower et al (2006), injury mortality among children who lived on farms: *>2 children in family vs. <=2 children in family OR 2.79 (1.47, 5.30)*
	Otters et al (2005), injuries in children aged 0-4 years: *1 vs. 0 OR 1.19 (1.02, 1.39)* *2 vs. 0 OR 1.25 (1.02, 1.53)* *>=3 vs. 0 OR 1.57 (1.19, 2.08)*

Characteristics	**<u>All settings-Undefined injuries:</u> Author (year) (* indicates UK study)** **Associations (95% CI unless otherwise stated)** *(positive associations are italicised; positive associations with relative risk equivalent >2.0 are highlighted)*
	Otters et al (2005), injuries in children aged 5-11 years: 1 vs. 0 OR 1.06 (0.89, 1.25) 2 vs. 0 OR 1.10 (0.91, 1.32) >=3 vs. 0 OR 1.22 (0.98, 1.52)
	Reading et al (2008)*, all accidents: Child has twin or triplet vs. child does not have twin or triplet Rate ratio 0.64 (0.53, 0.78)
Older siblings	Ordonana et al (2008)*, children ever experiencing an unintentional injury: Older siblings OR 0.90 (0.74, 1.09)
	Ordonana et al (2008)*, children who had experienced >=2 unintentional injuries: Older siblings OR 0.87 (0.63, 1.20)
Birth of twins	Schluter et al (2006): Twin vs. single baby RR 0.51 (0.21, 1.21)
No. of people in household	Schluter et al (2006): 5-7 people vs. 2-4 people RR 1.16 (0.85, 1.58) >=8 people vs. 2-4 people RR 1.16 (0.79, 1.71)
	Bradbury et al (1999), medically treated child injuries: *No. of children in home at recruitment Partial R^2 .01 (p<.05 for the F test)*
Child supervision	Bishai et al (2008), injuries in children aged 30-33 months, caregivers whilst mother works: Nobody else watches child OR 0.936 (0.507, 1.726) Grandparent watches child OR 0.642 (0.395, 1.043) Primary caregiver is father OR 2.324 (0.993, 5.442)

Characteristics	**<u>All settings-Undefined injuries:</u> Author (year) (* indicates UK study)** **Associations (95% CI unless otherwise stated)** *(positive associations are italicised; positive associations with relative risk equivalent >2.0 are highlighted)*
Parental unemployment	Blakely et al (2003), unintentional injury death (ages 0-14 years): >=1 unemployed vs. >1 employed Rate ratio 1.3 (0.8, 2.3) All non-active vs. >1 employed Rate ratio 1.1 (0.7, 1.9)
	Ordonana et al (2008)*, children ever experiencing an unintentional injury: Unemployed parents OR 1.03 (0.73, 1.45)
	Ordonana et al (2008)*, children who had experienced >=2 unintentional injuries: Unemployed parents OR 1.46 (0.91, 2.32)
	Petridou et al (2005): Employed vs. unemployed OR 1.77 (0.93, 3.36)
Parents' well-being (e.g. social support, depression)	Braun et al (2005), association with injuries: *Caregiver mental illness p=0.06*
	Damashek et al (2005), predictors of child injury rates: *Maternal locus of control ß .24 (p<.01)* Maternal psychopathology ß .06 Maternal stress ß -.19 (p<.08)

Characteristics	**<u>All settings-Undefined injuries:</u> Author (year) (* indicates UK study)** **Associations (95% CI unless otherwise stated)** *(positive associations are italicised; positive associations with relative risk equivalent >2.0 are highlighted)*
	Haynes et al (2008)*, social support score intra-class correlation for all injuries (ICC – provides a measure of the strength of any 'neighbourhood effect'): Social support score ICC% in largest areas (average population 7976): *Super-communities (joining adjacent communities with similar deprivation) 1.94 (p<0.01)* *Townsend zones (maximise homogeneity of deprivation scores) 1.84 (p<0.01)* *Tenure zones (maximise homogeneity of house tenure types) 2.39 (p<0.01)* *House-type zones (maximise homogeneity of housing type) 1.50 (p<0.01)* Social support score ICC% in medium areas (average population 3968): *Communities (local identity and similar social characteristics) 2.28 (p<0.01)* *Townsend zones (maximise homogeneity of deprivation scores) 2.36 (p<0.01)* *Tenure zones (maximise homogeneity of house tenure types) 2.60 (p<0.01)* *House-type zones (maximise homogeneity of housing type) 1.88 (p<0.01)* Social support score ICC% in smaller areas (average population 2598): *Sub-communities (subdivision of communities based on deprivation) 2.65 (p<0.01)* *Townsend zones (maximise homogeneity of deprivation scores) 2.32 (p<0.01)* *Tenure zones (maximise homogeneity of house tenure types) 2.38 (p<0.01)* *House-type zones (maximise homogeneity of housing type) 2.01 (p<0.01)* Social support score ICC% in smallest areas (average population 483): *Enumeration districts (census collection convenience with minimum population) 2.88 (p<0.01)*

Characteristics	**<u>All settings-Undefined injuries:</u> Author (year) (* indicates UK study)** **Associations (95% CI unless otherwise stated)** *(positive associations are italicised; positive associations with relative risk equivalent >2.0 are highlighted)*
	Haynes et al (2008)*, post-natal depression score intra-class correlation for all injuries (ICC – provides a measure of the strength of any 'neighbourhood effect'): Post-natal depression score ICC% in largest areas (average population 7976): *Super-communities (joining adjacent communities with similar deprivation) 0.36 (p<0.01)* *Townsend zones (maximise homogeneity of deprivation scores) 0.45 (p<0.01)* *Tenure zones (maximise homogeneity of house tenure types) 0.42 (p<0.01)* *House-type zones (maximise homogeneity of housing type) 0.25 (p<0.01)* Post-natal depression score ICC% in medium areas (average population 3968): *Communities (local identity and similar social characteristics) 0.50 (p<0.01)* *Townsend zones (maximise homogeneity of deprivation scores) 0.43 (p<0.01)* *Tenure zones (maximise homogeneity of house tenure types) 0.48 (p<0.01)* *House-type zones (maximise homogeneity of housing type) 0.39 (p<0.01)* Post-natal depression score ICC% in smaller areas (average population 2598): *Sub-communities (subdivision of communities based on deprivation) 0.52 (p<0.01)* *Townsend zones (maximise homogeneity of deprivation scores) 0.50 (p<0.01)* *Tenure zones (maximise homogeneity of house tenure types) 0.54 (p<0.01)* *House-type zones (maximise homogeneity of housing type) 0.29 (p<0.01)* Post-natal depression score ICC% in smallest areas (average population 483): *Enumeration districts (census collection convenience with minimum population) 0.68 (p<0.01)*

Characteristics	**<u>All settings-Undefined injuries:</u> Author (year) (* indicates UK study)** **Associations (95% CI unless otherwise stated)** *(positive associations are italicised; positive associations with relative risk equivalent >2.0 are highlighted)*
	Reading et al (2008)*, all accidents: *Parent(s)' life events score quartile 2 vs. parent(s)' life events score quartile 1 Rate ratio 1.14 (1.07, 1.21)* *Parent(s)' life events score quartile 3 vs. parent(s)' life events score quartile 1 Rate ratio 1.24 (1.16, 1.32)* *Parent(s)' life events score quartile 4 vs. parent(s)' life events score quartile 1 Rate ratio 1.39 (1.30, 1.49)*
	Reading et al (2008)*, medically attended accidents: Parent(s)' life events score quartile 2 vs. parent(s)' life events score quartile 1 Rate ratio 1.11 (1.00, 1.24) Parent(s)' life events score quartile 3 vs. parent(s)' life events score quartile 1 Rate ratio 1.10 (0.98, 1.24) *Parent(s)' life events score quartile 4 vs. parent(s)' life events score quartile 1 Rate ratio 1.21 (1.08, 1.36)*
	Reading et al (2008)*, all accidents: Parent(s)' social support score quartile 2 vs. parent(s)' social support score quartile 1 Rate ratio 0.93 (0.87, 0.99) Parent(s)' social support score quartile 3 vs. parent(s)' social support score quartile 1 Rate ratio 0.91 (0.85, 0.97) Parent(s)' social support score quartile 4 vs. parent(s)' social support score quartile 1 Rate ratio 0.86 (0.80, 0.93)
	Schwebel & Brezausek (2008): *Chronic severe maternal depression vs. not depressed t=4.31, p<.01 (0.58, 1.54)* Chronic moderate maternal depression vs. not depressed t=0.36 (-0.33, 0.47)

Characteristics	**<u>All settings-Undefined injuries:</u> Author (year) (* indicates UK study)** **Associations (95% CI unless otherwise stated)** *(positive associations are italicised; positive associations with relative risk equivalent >2.0 are highlighted)*
	Schwebel & Brezausek (2004), all injuries in children aged 6-36 months, model with father individual differences added: Maternal neuroticism β .10 Maternal extraversion β .01 Maternal agreeableness β .01 Maternal strains from employment β .04 Maternal gains from employment β -.02 Maternal positive involvement β -.00 Maternal time spent with child β -.02 Paternal neuroticism β .01 Paternal extraversion β .02 Paternal agreeableness β .04 Paternal strains from employment β .07 *Paternal gains from employment β .18 (p<.05)*

Characteristics	**<u>All settings-Undefined injuries:</u> Author (year) (* indicates UK study)** **Associations (95% CI unless otherwise stated)** *(positive associations are italicised; positive associations with relative risk equivalent >2.0 are highlighted)*
	Schwebel & Brezausek (2004), all injuries in children aged 6-36 months, model with father parenting added: Maternal neuroticism β .08 Maternal extraversion β -.01 Maternal agreeableness β -.01 Maternal strains from employment β .07 Maternal gains from employment β -.01 Maternal positive involvement β -.01 Maternal time spent with child β -.03 Paternal neuroticism β .00 Paternal extraversion β .01 Paternal agreeableness β .09 Paternal strains from employment β .07 *Paternal gains from employment β .17 (p<.05)* Paternal total involvement with child β -.17 (p<.10) Paternal internal household chores β .12 Paternal external household chores β .13
Parent's psychological characteristics	Schwebel & Brezausek (2008), injuries in children with mild nocturnal awakening pattern: Maternal stress χ^2 1.79 (-0.01, 0.05) Positive depression χ^2 1.43 (-0.01, 0.04)
	Soubhi (2004), injuries in children 2-3 years old (cross-sectional model): *Positive parenting OR 1.07 (1.01, 1.13)*

Characteristics	**<u>All settings-Undefined injuries:</u> Author (year) (* indicates UK study)** **Associations (95% CI unless otherwise stated)** *(positive associations are italicised; positive associations with relative risk equivalent >2.0 are highlighted)*
	Soubhi et al (2004), injuries in children 2-3 years old: Family functioning OR 1.00 (0.96, 1.04) Positive parenting OR 0.88 (0.81, 0.95) Consistent parenting OR 0.94 (0.87, 1.00)
	Soubhi et al (2004), injuries in children 4-11 years old: Family functioning OR 0.99 (0.97, 1.01) Positive parenting OR 0.97 (0.95, 1.00) *Below average consistency parenting OR 1.43 (1.22, 1.68)*
Parental substance misuse	Braun et al (2005), association with injuries: *Maternal substance abuse p=0.0003*
Teenage mother	Kendrick & Marsh (2001), injuries resulting in hospital admission: *Teenage mother vs. non-teenage mother OR 2.78 (1.08, 7.15)*
Mother's age at birth	Braun et al (2005), association with injuries: *Mother aged <18 years at time of birth p=0.04*
	Ekeus et al (2004), hospital admissions for injuries: *12-17 years vs. 33-55 years RR 1.4 (1.2, 1.6)* *18-19 years vs. 33-55 years RR 1.4 (1.3, 1.5)* *20-24 years vs. 33-55 years RR 1.2 (1.2, 1.2)* *25-28 years vs. 33-55 years RR 1.1 (1.1, 1.1)* 29-32 years vs. 33-55 years RR 1.0 (1.0, 1.1)

Characteristics	**<u>All settings-Undefined injuries:</u> Author (year) (* indicates UK study)** **Associations (95% CI unless otherwise stated)** *(positive associations are italicised; positive associations with relative risk equivalent >2.0 are highlighted)*
	Flower et al (2006), injury mortality among children who lived on farms: *<25 years vs. >=32 years OR 2.17 (1.05, 4.49)* >=25-<28 years vs. >=32 years OR 1.34 (0.59, 3.02) >=28-<32 years vs. >=32 years OR 0.96 (0.41, 2.21)

Characteristics	**<u>All settings-Undefined injuries:</u> Author (year) (* indicates UK study)** **Associations (95% CI unless otherwise stated)** *(positive associations are italicised; positive associations with relative risk equivalent >2.0 are highlighted)*
	Haynes et al (2008)*, mother's age at birth intra-class correlation for all injuries (ICC – provides a measure of the strength of any 'neighbourhood effect'): Mother's age at birth ICC% in largest areas (average population 7976): *Super-communities (joining adjacent communities with similar deprivation) 9.58 (p<0.01)* *Townsend zones (maximise homogeneity of deprivation scores) 10.95 (p<0.01)* *Tenure zones (maximise homogeneity of house tenure types) 10.46 (p<0.01)* *House-type zones (maximise homogeneity of housing type) 8.85 (p<0.01)* Mother's age at birth ICC% in medium areas (average population 3968): *Communities (local identity and similar social characteristics) 12.34 (p<0.01)* *Townsend zones (maximise homogeneity of deprivation scores) 12.83 (p<0.01)* *Tenure zones (maximise homogeneity of house tenure types) 12.20 (p<0.01)* *House-type zones (maximise homogeneity of housing type) 11.80 (p<0.01)* Mother's age at birth ICC% in smaller areas (average population 2598): *Sub-communities (subdivision of communities based on deprivation) 12.61 (p<0.01)* *Townsend zones (maximise homogeneity of deprivation scores) 12.00 (p<0.01)* *Tenure zones (maximise homogeneity of house tenure types) 11.82 (p<0.01)* *House-type zones (maximise homogeneity of housing type) 12.20 (p<0.01)* Mother's age at birth ICC% in smallest areas (average population 483): *Enumeration districts (census collection convenience with minimum population) 15.71 (p<0.01)*

Characteristics	**<u>All settings-Undefined injuries:</u> Author (year) (* indicates UK study)** **Associations (95% CI unless otherwise stated)** *(positive associations are italicised; positive associations with relative risk equivalent >2.0 are highlighted)*
	Ordonana et al (2008)*, children ever experiencing an unintentional injury: Mother's age OR 0.98 (0.96, 0.99)
	Ordonana et al (2008)*, children who had experienced >=2 unintentional injuries: Mother's age OR 0.97 (0.94, 0.99)
Mother's age at time of injury	Reading et al (1999)*, all injuries: OR 0.97 (0.96, 0.97)
	Reading et al (1999)*, moderate and severe injuries: OR 0.97 (0.95, 0.98)
	Reading et al (2008)*, all accidents: *14-19 years vs. 25-34 years Rate ratio 1.35 (1.15, 1.58)* *20-24 years vs. 25-34 years Rate ratio 1.19 (1.11, 1.28)* >=35 years vs. 25-34 years Rate ratio 0.90 (0.83, 0.98)
	Reading et al (2008)*, medically attended accidents: *14-19 years vs. 25-34 years Rate ratio 1.32 (1.01, 1.74)* *20-24 years vs. 25-34 years Rate ratio 1.17 (1.04, 1.32)* >=35 years vs. 25-34 years Rate ratio 0.92 (0.81, 1.06)

Characteristics	**<u>All settings-Undefined injuries:</u> Author (year) (* indicates UK study)** **Associations (95% CI unless otherwise stated)** *(positive associations are italicised; positive associations with relative risk equivalent >2.0 are highlighted)*
	Schluter et al (2006): 20-24 years vs. <20 years RR 0.90 (0.53, 1.52) 25-29 years vs. <20 years RR 0.85 (0.49, 1.47) 30-34 years vs. <20 years RR 0.86 (0.48, 1.52) 35-39 years vs. <20 years RR 0.77 (0.43, 1.38) >=40 years vs. <20 years RR 0.63 (0.25, 1.63)
Age of parent(s)	Bishai et al (2008), injuries in children aged 30-33 months: Mother aged >=40 years OR 0.397 (0.178, 0.886)
	Haynes et al (2003)*, all injuries: *15-24 years age gap between injured child and parent OR 1.15 (1.07, 1.25)* 35-44 years age gap between injured child and parent OR 0.91 (0.79, 1.05) Other age gap between injured child and parent OR 1.01 (0.86, 1.18)
	Haynes et al (2003)*, serious injuries: 15-24 years age gap between injured child and parent OR 1.06 (0.93, 1.21) 35-44 years age gap between injured child and parent OR 0.80 (0.62, 1.02) Other age gap between injured child and parent OR 0.94 (0.72, 1.24)
	Petridou et al (2005): *Father's age, 5 year decrements OR 1.33 (1.09, 1.64)*

Characteristics	**<u>All settings-Undefined injuries:</u> Author (year) (* indicates UK study)** **Associations (95% CI unless otherwise stated)** *(positive associations are italicised; positive associations with relative risk equivalent >2.0 are highlighted)*
Overcrowded housing	Blakely et al (2003), unintentional injury death (ages 0-14 years): >1 - <=1.5 people vs. <=1 person per bedroom Rate ratio 0.9 (0.6, 1.3) >1.5 - <=2 people vs. <=1 person per bedroom Rate ratio 0.5 (0.3, 0.9) >2 people vs. <=1 person per bedroom Rate ratio 1.1 (0.6, 2.0)
Migrant status	Li et al (2008), non-fatal injuries (ages 0-14 years): Born in Sweden with one or both parents born aboard vs. born in Sweden OR 0.87 (0.78, 0.97) Born outside Sweden vs. born in Sweden OR 0.89 (0.84, 0.95)
	Ostberg (1997), mortality from injuries: *Parents born abroad vs. parents born in Sweden OR 1.55 (95% CI does not include 1.00)*
	Petridou et al (2003), injuries in disabled children: *Migrant vs. Greek OR 1.74 (1.16, 2.62)*

Characteristics	**<u>All settings-Undefined injuries:</u> Author (year) (* indicates UK study)** **Associations (95% CI unless otherwise stated)** *(positive associations are italicised; positive associations with relative risk equivalent >2.0 are highlighted)*
	Schwebel et al (2005): *Risk of injury to children of US-born vs. immigrant mothers, adjusted for variables related to immigration status OR 2.34 (1.82, 3.02)* *Risk of injury to children of US-born vs. immigrant mothers, adjusted for variables related to injury risk OR 2.45 (1.90, 3.16)* *Risk of injury to children of US-born vs. immigrant mothers, adjusted for assistance with parenting OR 2.47 (1.93, 3.16)* *Risk of injury to children of US-born vs. immigrant mothers, adjusted for parenting strategies OR 2.65 (1.98, 3.55)* *Risk of injury to children of US-born vs. immigrant mothers, adjusted for health care accessibility OR 2.44 (1.91, 3.13)* *Risk of injury to children of US-born vs. immigrant mothers, adjusted for all above variables OR 2.40 (1.76, 3.27)*
	Sellstrom et al (2003), hospital admissions due to injuries in children aged 1-6: Mother's country of birth (not Sweden) vs. Mother's country of birth (Sweden) OR 0.99 (0.90 to 1.09)
	Sellstrom et al (2003), hospital admissions due to injuries in children aged 7-15: Mother's country of birth (not Sweden) vs. Mother's country of birth (Sweden) OR 0.97 (0.89 to 1.05)
History of family accidents	Petridou et al (2005): *>=2 accidents in family vs. <2 accidents in family OR 2.25 (1.21, 4.19)*
Neighbourhood characteristics	

Characteristics	**<u>All settings-Undefined injuries:</u> Author (year) (* indicates UK study)** **Associations (95% CI unless otherwise stated)** *(positive associations are italicised; positive associations with relative risk equivalent >2.0 are highlighted)*
Socio-economic status	Blakely et al (2003), unintentional injury death (ages 0-14 years): Quintile 2 vs. quintile 1 (least deprived) Rate ratio 1.5 (0.8, 2.7) Quintile 3 vs. quintile 1 (least deprived) Rate ratio 1.3 (0.7, 2.4) *Quintile 4 vs. quintile 1 (least deprived) Rate ratio 2.8 (1.6, 4.8)* Quintile 5 (most deprived) vs. quintile 1 (least deprived) Rate ratio 1.8 (1.0, 3.3)
	Haynes et al (2003)*, all injuries: *Area deprivation OR 1.04 (1.02, 1.06)*
	Haynes et al (2003)*, serious injuries: *Area deprivation OR 1.04 (1.02, 1.07)*
	Haynes et al (1999), accident rates: *Townsend score in enumeration districts R^2 10.5* *Townsend score in wards R^2 52.7* *Townsend score in social areas R^2 63.3*
	Kendrick & Marsh (2001), medically attended injuries: *Deprived area (Townsend score >=4) vs. non-deprived area OR 1.78 (1.24, 2.54)*
	Kendrick & Marsh (2001), injuries resulting in hospital admission: *Deprived area (Townsend score >=4) vs. non-deprived area OR 3.97 (1.50, 10.48)*
	Li et al (2008), non-fatal injuries (ages 0-14 years): Quartile 2 vs. Quartile 1 (most affluent) OR 1.04 (0.98, 1.11) Quartile 3 vs. Quartile 1 (most affluent) OR 1.06 (0.99, 1.13) *Quartile 4 (most deprived) vs. Quartile 1 (most affluent) OR 1.13 (1.06, 1.21)*

Characteristics	**<u>All settings-Undefined injuries:</u> Author (year) (* indicates UK study)** **Associations (95% CI unless otherwise stated)** *(positive associations are italicised; positive associations with relative risk equivalent >2.0 are highlighted)*
	Reading et al (1999)*, all injuries: Townsend index (enumeration district) OR 1.01 (1.0, 1.03) *Townsend index (social area) OR 1.03 (1.01, 1.05)*
	Reading et al (1999)*, moderate and severe injuries: Townsend index (enumeration district) OR 1.02 (1.0, 1.05) *Townsend index (social area) OR 1.04 (1.01, 1.08)*
	Soubhi (2004), injuries in children 2-3 years old (cross-sectional model): Neighbourhood disadvantage OR 0.70 (0.54, 0.91)
	Soubhi (2004), injuries in children 2-3 years old (longitudinal model): Neighbourhood disadvantage OR 0.60 (0.36, 1.00)
Urban/rural	Li et al (2008), non-fatal injuries (ages 0-14 years): Middle-sized towns vs. large cities OR 1.01 (0.95, 1.07) *Small towns/ rural areas vs. large cities OR 1.07 (1.01, 1.14)*
	Petridou et al (2003), injuries in disabled children: Rural vs. urban OR 0.51 (0.36, 0.74)
	Otters et al (2005), injuries in children aged 0-4 years: *Semirural vs. urban OR 1.44 (1.25, 1.66)* *Rural vs. urban OR 1.76 (1.57, 1.98)*
	Otters et al (2005), injuries in children aged 5-11 years: *Semirural vs. urban OR 1.28 (1.10, 1.49)* *Rural vs. urban OR 1.58 (1.39, 1.79)*

Characteristics	**<u>All settings-Undefined injuries:</u> Author (year) (* indicates UK study)** **Associations (95% CI unless otherwise stated)** *(positive associations are italicised; positive associations with relative risk equivalent >2.0 are highlighted)*
	Otters et al (2005), injuries in children aged 12-17 years: *Semirural vs. urban OR 1.27 (1.09, 1.47)* *Rural vs. urban OR 1.56 (1.37, 1.76)*
	Simon et al (2004), injury-related visits to emergency departments: Urban vs. non-urban OR 0.92 (0.71, 1.19)
Neighbourhood characteristics	Soubhi (2004), injuries in children <2 years old (cross-sectional model): Neighbourhood cohesion OR 1.06 (0.93, 1.21) *Neighbourhood problems OR 1.17 (1.05, 1.30)*
	Soubhi (2004), injuries in children <2 years old (longitudinal model): Neighbourhood cohesion OR 1.02 (0.92, 1.14) *Neighbourhood problems OR 1.09 (1.01, 1.19)*
	Soubhi (2004), injuries in children 2-3 years old (longitudinal model): Neighbourhood disadvantage OR 0.88 (0.81, 0.95)
	Soubhi et al (2004), injuries in children aged 2-3 years: Neighbour's cohesion OR 1.00 (0.95, 1.06) Neighbourhood problems OR 1.08 (1.00, 1.18) Neighbourhood disadvantage OR 0.93 (0.65, 1.32) % single females OR 0.96 (0.92, 0.99) % families with income <$20000 OR 1.02 (0.99, 1.05)

Characteristics	**<u>All settings-Undefined injuries:</u> Author (year) (* indicates UK study)** **Associations (95% CI unless otherwise stated)** *(positive associations are italicised; positive associations with relative risk equivalent >2.0 are highlighted)*
	Soubhi et al (2004), injuries in children aged 4-11 years: Neighbour's cohesion OR 1.03 (0.99, 1.06) Neighbourhood problems OR 1.05 (1.00, 1.10) Neighbourhood disadvantage OR 1.01 (0.88, 1.17) % single females OR 0.98 (0.97, 1.00) % families with income <$20000 OR 1.02 (1.00, 1.03)

Characteristics	**<u>All settings-Undefined injuries:</u> Author (year) (* indicates UK study)** **Associations (95% CI unless otherwise stated)** *(positive associations are italicised; positive associations with relative risk equivalent >2.0 are highlighted)*
Neighbourhood size	Haynes et al (2008)*, number of accidents intra-class correlation for all injuries (ICC – provides a measure of the strength of any 'neighbourhood effect'): Number of accidents ICC% in largest areas (average population 7976): *Super-communities (joining adjacent communities with similar deprivation) 0.56 (p<0.01)* *Townsend zones (maximise homogeneity of deprivation scores) 0.62 (p<0.01)* *Tenure zones (maximise homogeneity of house tenure types) 0.83 (p<0.01)* *House-type zones (maximise homogeneity of housing type) 0.42 (p<0.01)* Number of accidents ICC% in medium areas (average population 3968): *Communities (local identity and similar social characteristics) 0.85 (p<0.01)* *Townsend zones (maximise homogeneity of deprivation scores) 0.88 (p<0.01)* *Tenure zones (maximise homogeneity of house tenure types) 0.98 (p<0.01)* *House-type zones (maximise homogeneity of housing type) 0.59 (p<0.01)* Number of accidents ICC% in smaller areas (average population 2598): *Sub-communities (subdivision of communities based on deprivation) 0.88 (p<0.01)* *Townsend zones (maximise homogeneity of deprivation scores) 0.98 (p<0.01)* *Tenure zones (maximise homogeneity of house tenure types) 0.87 (p<0.01)* *House-type zones (maximise homogeneity of housing type) 0.60 (p<0.01)* Number of accidents ICC% in smallest areas (average population 483): *Enumeration districts (census collection convenience with minimum population) 0.87 (p<0.05)*

Characteristics	**<u>All settings-Undefined injuries:</u> Author (year) (* indicates UK study)** **Associations (95% CI unless otherwise stated)** *(positive associations are italicised; positive associations with relative risk equivalent >2.0 are highlighted)*
Population density	Ostberg (1997), mortality from injuries: II vs. I (high) OR 1.05 *III vs. I (high) OR 1.32 (95% CI does not include 1.00)* *IV (low) vs. I (high) OR 1.53 (95% CI does not include 1.00)*
Institutional characteristics	
Care settings	Schwebel et al (2006): Average hours in child care centre vs. not in child care centre RR 0.99 (0.99, 0.99) Average quality of child care vs. not in child care centre RR 0.98 (0.85, 1.12) Average hours in family day care centre vs. not in family day care centre RR 0.99 (0.99, 0.99) Average quality of child care vs. not in family day care centre RR 1.19 (0.92, 1.53)
Safety measures at municipality level (e.g. injury registration and monitoring, inter-sectoral injury prevention working groups)	Sellstrom et al (2003), differences in injury outcome in children aged 1-6 years : *Average numbers of safety measures vs. many safety measures OR 1.20 (1.05 to 1.36)* *Few safety measures vs. many safety measures OR 1.33 (1.15 to 1.49)*
	Sellstrom et al (2003), differences in injury outcome in children aged 7-15 years : Average numbers of safety measures vs. many safety measures OR 1.08 (0.95 to 1.23) Few safety measures vs. many safety measures OR 1.07 (0.94 to 1.22)

5. Discussion and conclusions

This review examines the evidence for risk factors of unintentional injury in children and young people aged under 15. We specifically examined three risk factor categories – child characteristics, family characteristics and neighborhood characteristics, and examined three settings of unintentional injury – the home, the road and other environments. It is hoped that the results of this review will promote discussion and help to identify the priorities and main opportunities for the prevention of unintentional injuries in children.

5.1. Findings of this review

The evidence presented in this review is from 90 studies. In order to minimize the potential risks of confounding, we limited inclusion to those studies that were multivariable (i.e. considered one or more risk factor) and multivariate (i.e. measure of association adjusted for other predictors and/or confounders).

The findings can be summarized according to the two research questions posed at the outset of this review:

Question 1 - What factors are associated with unintentional injury incidence and outcomes in childhood?

The range and pattern of risk factors associated with unintentional injury in children less than 15 is dependant on the type and setting of injury. Nevertheless, increasing age, male gender and low socioeconomic status were consistency associated with increased risk of unintentional injuries across injury types.

Question 2 - What is the nature (e.g. strength, covariation and interactions) of the association/relationship between these different factors and unintentional injury outcomes?

By including only multivariable and multivariate studies we were able to take account examine of potential interaction of risk factors. For those significant risk factors, generally a low to moderate strength of association (i.e. relative risk equivalent < 2.0) with unintentional injury outcomes was seen.

5.2. Comparison with previous systematic reviews

Our searches failed to identify a previous systematic review that has addressed the scope of this present review. However, we did find one systematic review that examined a specific area of childhood injury.

Khambalia et al (2006) undertook to a review to identify unintentional injuries in children aged 0-6 years. Their literature searches were conducted between 1996 and 2005. Therefore there is some commonality in the 14 studies identified and the present review although most of the analyses reported by Khambalia et al were univariate. A range of fall injuries were considered such as bunk bed, stairway, playground or infant walker. A number of major risk factors were identified by the review authors: increasing age of the child, male gender, day care setting (versus home care setting) and lower socioeconomic status.

At the PDG meeting an in press systematic review was drawn to our attention. This study by Mytton et al (2009) examined the prevalence of unintentional injuries in children aged 5-18 years and the factors associated with such injuries. In order to limit potential bias (especially recall bias) the authors limited their inclusion to prospective cohort studies. Based on bibliographic searches up to January/February 2006 a total of 14 studies were included. Male sex, being taller and heavier, behaviour and risk-taking behaviour problems, having a large number of siblings, and a young mother were all found to be associated with occurrence of injury across more than one cohort study and setting. Somewhat in contrast to the present report, indicators of socioeconomic status were not found to be consistently associated with injury risk. The authors identified a number of limitations in the current evidence base for unintentional injuries in children i.e. limited reporting by studies, lack of use of repeated measures analysis (to assess temporal changes in injury risk and associated factors), few studies reporting risk factors at the level of the child's environment and lack of studies in low/middle-income countries.

5.3. Methodological strengths and limitations of the review

This review has a number of methodological strengths:

1. It is based on a comprehensive search of electronic bibliographic databases.

2. It is limited to studies that reported multivariate analysis that adjusting for potential confounders.
3. The included studies were largely based on large representative populations of children linked to injury outcomes identified by hospitalisation and claims databases.

Inclusion all forms of comparative observational study design (i.e. cross-sectional, cohort and case control studies) increased the comprehensiveness of the review. However, we also acknowledge that prospective cohort studies may offer higher level evidence.

However, there are number of methodological weaknesses that introduce potentially important caveats in the interpretation of the findings of this review:

1. Because of constraints of time, we were not able to review of reference lists of included studies or contact experts in the field as planned.
2. Reviews of observational studies are particularly prone to publication bias (i.e. more likely to identify studies demonstrating a significant association between a risk factor and unintentional injury in children and conversely less likely to identify statistically non-significant risk factors. Easterbrook et al, 1991). However, all data are reported in this review whether negative or positive.
3. The lack of detailed reporting in a number of studies made accurate categorisation of the location of injury occurrence (e.g. home versus other environment) problematic.
4. Few studies employed standardised measures of injury severity.
5. There is a lack of standardisation in the selection of confounders, making direct comparison amongst studies difficult.
6. The lack of longitudinal data means that causal inferences about the relationship between risk factors and injury are not strong.
7. As risk factors for a given injury type and setting were usually assessed by one or two studies, it is not possible comment on consistency of associations.
8. Formal assessment of study quality was not performed. This was because could not identify any previously developed quality assessment criteria for assessing of studies examining risk factors or correlates.
9. Our strength of evidence classification (base on a relative risk equivalent of ≥ 2) is arbitrary. Associations should also be interpreted in the context of the severity of outcome (e.g. mortality vs. morbidity) and their precision (e.g. width of 95% confidence intervals).

10. That only a small proportion of evidence was collected in the UK puts into question to external generalisability of the findings of this review (e.g. applicability of statements about particular ethnic groups such as native American populations). The inclusion of pre-1997 studies may have generated a wider body of UK evidence.
11. Finally, whilst we recognise that the conclusions of this review may differ if the evidence was reviewed from different perspectives (e.g. inclusion only of UK studies or inclusion of only cohort studies or separation of mortality and morbidity outcomes) time and resources prevented us from undertaking such sub-analyses.

5.4. Implications for prevention

Knowledge of risk factors for unintentional injuries can assist injury practitioners, program developers and policy makers in determining appropriate interventions. Approaches may vary depending on whether risk factors are modifiable or fixed. Modifiable risk factors (e.g., overcrowded housing, road safety measures, playgrounds) describe targets for specific intervention, whereas fixed risk factors (e.g., child gender, child age and family or area socioeconomic status) aid in identifying populations in which to intervene. From a population health perspective, the results from this review suggest targeting interventions to families with a low socioeconomic status taking into account the gender and age of children. Whilst we recognise that it may have been valuable to have presented our findings according to different perspectives (e.g. type of study design, UK only studies), because of limitations of time and resources, this was not possible.

Gaps in the evidence identified

We identified several gaps in the currently available evidence of association between risk factors and unintentional injury in children. First, we were able to identify very few multivariate studies looking at drowning-related injury. Second, the majority of studies focused on child and family characteristics while only a few examined the impact of neighborhood characteristics. Moreover, few of these studies employed appropriate multilevel statistical analysis methods. Finally, few studies were conducted in the UK.

Future studies of the association of risk factors and unintentional injury in children need more emphasis on longitudinal designs. Such studies will allow clearer identification of true ‘determinants’ and separate them out from factors that are simply statistically associated ‘correlates’.

6. References cited in introduction

Easterbrook PJ, Berlin JA, Gopalan R, Matthews DR. Publication bias in clinical research. *Lancet.* 1991;337:867-72.

Khambalia, A., Joshi, P., Brussoni, M., Raina, P., Morrongiello, B., Macarthur, C. Risk factors for unintentional injuries due to falls in children aged 0-6 years: a systematic review, *Injury Prevention* 2006;12:378-U38.

Krug E.G., Sharma G.K., Lozano, R. 2000 The global burden of injuries. *Am J Public* Health 90:523-6.

Mytton, J., Towner, E., Brussoni, M., Gray, S. Unintentional injuries in school-aged children and adolescents: lessons from a systematic review of cohort studies. *Injury Prevention* 2009: 15; 111-124.

Roberts, L., DiGuiseppi, C., Ward, H. Childhood injuries: extent of problem, epidemiological trends, and costs. *Injury Preven* 1998:4 (Suppl):S10-S16

Sibert, J.R., Maddocks, G.B., Brown, B.M. Childhood accidents – an endemic of epidemic proportions. A*rch Disease Childhood* 1981;56:225-7

Towner, T., Dowsell, T., Errington, G., Burkes, M., Towner, J. 2005 *Injuries in children aged 0-14 years and inequalities: a report prepared for the Health Development Agency.* London: Health Development Agency.

7. Appendices

Appendix 1. Search strategy

7.1. Bibliographic Databases

The following bibliographic databases were searches order to identify relevant primary research:

- ASSIA (Applied Social Science Index and Abstracts)
- CINAHL (Cumulative Index of Nursing and Allied Health Literature)
- Database of Abstracts of Reviews of Effectiveness (DARE; 'other reviews' in Cochrane Library)
- EMBASE
- HMIC (or Kings Fund catalogue and DH data)
- MEDLINE
- PsycINFO
- Social Science Citation Index

7.2. Search Strategy

The Medline search strategy example follows and will be "translated" according to the appropriate thesaurus terms for each individual database named above. Where a database did have a thesaurus or a search facility to incorporate thesaurus searching, text words only were used. All searches where possible were limited to English language and from 1997-current. All search strategies were conducted on February 3, 2009.

Ovid MEDLINE(R) 1950-current (online version)

1. determinant*.tw.

2. associated with.tw.

3. correlate*.tw.

4. correlation coefficient.tw.

5. regression coefficient*.tw.

6. (relationship* adj3 statist*).tw.

7. risk/

8. (relative adj3 risk).tw.

9. Regression Analysis/

10. 1 or 2 or 3 or 4 or 5 or 6 or 7 or 8 or 9

11. (accident* or crash* or collision* or fatal* or (uninten* adj injur*)).tw.

12. (drowning* or burn* or scald* or fall* or poisoning* or asphyxiation*).tw.

13. Drowning/

14. Burns/

15. Accidental Falls/

16. Poisoning/

17. Asphyxia/

18. Accidents/

19. Accident Prevention/

20. Accidents, Traffic/

21. Accidents, Home/

22. Athletic Injuries/

23. or/11-22

24. 10 and 23

25. (child* or juvenil* or adolescent* or school* or infant* or pediat* or paediat* or (young adj people)).tw.

26. 25 and 24

27. limit 24 to ("all infant (birth to 23 months)" or "all child (0 to 18 years)" or "newborn infant (birth to 1 month)" or "infant (1 to 23 months)" or "preschool child (2 to 5 years)" or "child (6 to 12 years)" or "adolescent (13 to 18 years)")

28. 24 and 27

29. 28 or 26

30. limit 29 to (english language and yr="1997 - 2009")

7.3. Web-based Databases

Due to time and resource constraints and amount of material the following databases were searched only for review of reviews. These searches were conducted between the 6-12 February, 2009.

- SafetyLit
- EPPI Centre databases
- The Campbell Library of Systematic Reviews:
    - BIBLIOMAP
    - DoPHER

- Transport Research Information Service (TRIS) [1]
- International Transport Research Documentation (ITRD)[1]

7.4. Organisation web-sites and in-house databases

The following organisations' websites were searched for reports and review of reviews:

- Injury Prevention Journal (online at BMJ)
- The Royal Society for the Prevention of Accidents (www.rospa.org)
- Child Accident Prevention Trust (http://www.capt.org.uk/)
- UK Department for Transport (DfT)
- Transport Research Laboratory (TRL

7.5. Additional Resources

As part of a parallel review on the subject of unintentional injuries in children, studies of potential relevance were provided for the correlates review, de-duplicated against the previously found papers and screened for inclusion.

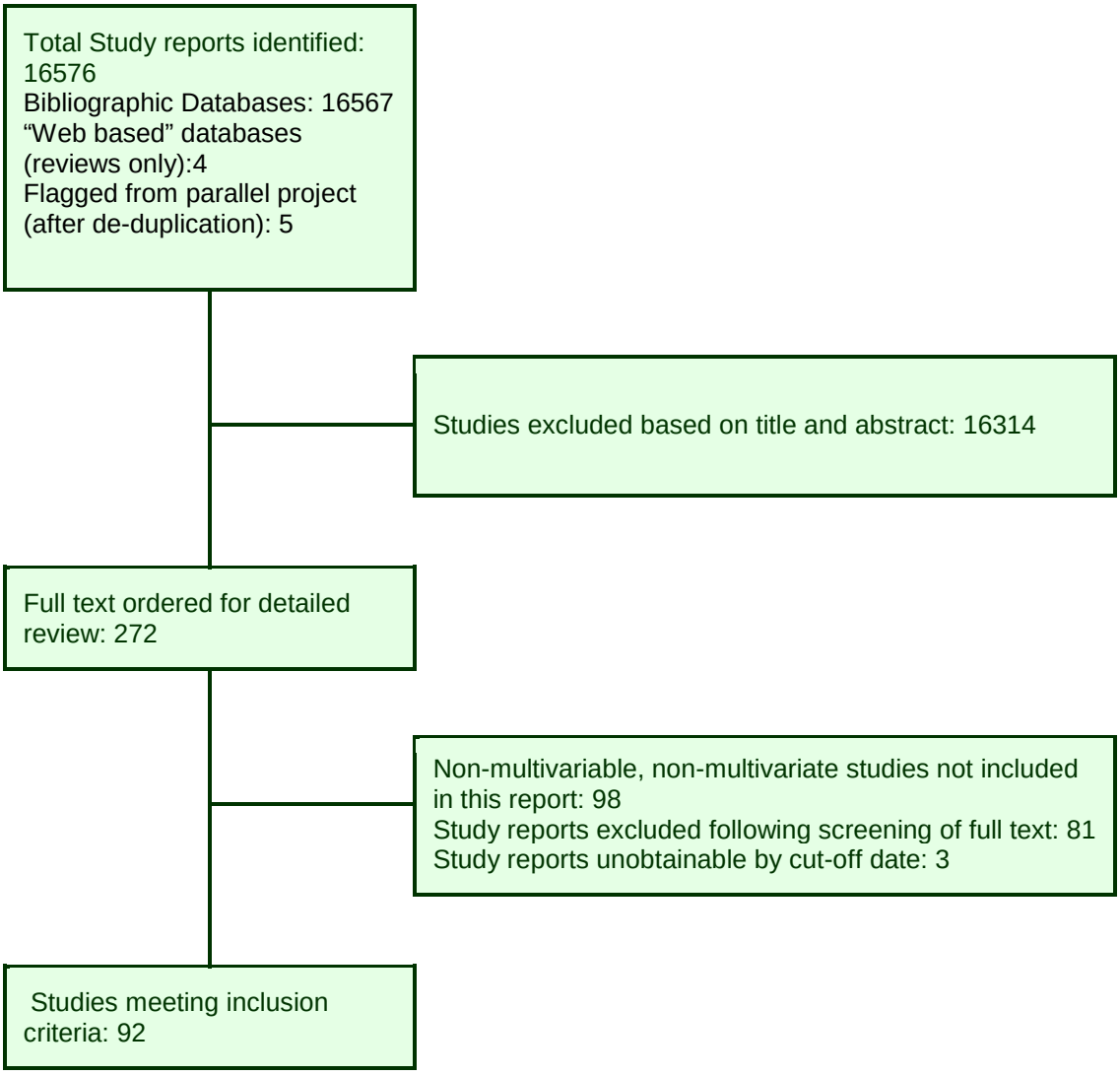
[1] TRIS and ITRD are the two databases that form TRANSPORT.

Appendix 2. QUORUM

Study reports identified

Figure 1 shows the number of study reports identified by the search strategies and how the included studies were identified.

Figure 1: Flow chart illustrating included and excluded studies



Appendix 3. Studies excluded at full text stage & reasons for exclusion

Data does not relate to children aged under 15:

Carlson, K. F., Langner, D., Alexander, B. H., Gurney, J. G., Gerberich, S. G., Ryan, A. D., Renier, C. M., & Mongin, S. J. 2006, "The association between parents' past agricultural injuries and their children's risk of injury - Analyses from the Regional Rural Injury Study - II", Archives of Pediatrics & Adolescent Medicine, vol. 160, no. 11, pp. 1137-1142.

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Chau, N., Predine, R., Aptel, E., d'Houtaud, A., & Choquet, M. 2007, "School injury and gender differentials: a prospective cohort study", European Journal of Epidemiology, vol. 22, no. 5, pp. 327-334.

Frisch, L. & Plessinger, A. 2007, "Fatal passenger vehicle crashes with at least 1 driver younger than 15 years: a Fatality Analysis Reporting System study", Journal of Rural Health, vol. 23, no. 2, pp. 158-163.

LaScala, E. A., Gerber, D., & Gruenewald, P. J. 2000, "Demographic and environmental correlates of pedestrian injury collisions: a spatial analysis", Accident Analysis & Prevention, vol. 32, no. 5, pp. 651-658.

Lawlor, D. A., Sterne, J. A. C., Tynelius, P., Smith, G. D., & Rasmussen, F. 2006, "Association of childhood socioeconomic position with cause-specific mortality in a prospective record linkage study of 1,839,384 individuals", American Journal of Epidemiology, vol. 164, no. 9, pp. 907-915.

Lehtola, M. M., Rautiainen, R. H., Day, L. M., Schonstein, E., Suutarinen, J., Salminen, S., & Verbeek, J. H. 2008, "Effectiveness of interventions in preventing injuries in agriculture - A systematic review and meta-analysis", Scandinavian Journal of Work, Environment and Health, vol. 34, no. 5, pp. 327-336.

Mattila, V., Parkkari, J., Kannus, P., & Rimpela, A. 2004, "Occurrence and risk factors of unintentional injuries among 12-to 18-year-old Finns - A survey of 8219 adolescents", European Journal of Epidemiology, vol. 19, no. 5, pp. 437-444.

Newcombe, R. G., Lyons, R. A., Jones, S. J., & Patterson, J. 2005, "Home injuries and built form--methodological issues and developments in database linkage", BMC Health Services Research, vol. 5, no. 1, p. 12.

Pickett, W., Molcho, M., Simpson, K., Janssen, I., Kuntsche, E., Mazur, J., Harel, Y., & Boyce, W. F. 2005, "Cross national study of injury and social determinants in adolescents", Injury Prevention, vol. 11, no. 4, pp. 213-218.

Shai, D. 2006, "Income, housing, and fire injuries: A census tract analysis", Public Health Reports, vol. 121, no. 2, pp. 149-154.

Shepherd, J., Farrington, D., & Potts, J. 2002 “Relations between offending, injury and illness”, Journal of the Royal Society of Medicine, vol. 95, pp. 539-544.

Shepherd, J., Farrington, D., & Potts, J. 2004 “Impact of antisocial lifestyle on health”, Journal of Public Health, vol. 26, no.4, pp.347-352.

Winqvist, S., Lehtilahti, M., Jokelainen, J., Luukinen, H., & Hillbom, M. 2007, "Traumatic brain injuries in children and young adults: a birth cohort study from northern Finland", Neuroepidemiology, vol. 29, no. 1-2, pp. 136-142.

Wong, J. T. & Chung, Y. S. 2008, "Analyzing heterogeneous accident data from the perspective of accident occurrence", Accident Analysis & Prevention, vol. 40, no. 1, pp. 357-367.

No report of numerical association between explanatory variables and unintentional injuries:

Collins, D. C. & Kearns, R. A. 2005, "Geographies of inequality: child pedestrian injury and walking school buses in Auckland, New Zealand", Social Science & Medicine, vol. 60, no. 1, pp. 61-69.

Cumberland, P., Rahi, J.S. & Peckham, C.S. 2004 “Impact of congenital colour vision deficiency on education and unintentional injuries: findings from the 1958 British birth cohort”, British Medical Journal, vol.329, pp.1074-1075.

Johansson, B. & Drott, P. 2001, "Informal parental traffic education and children's bicycling behaviour", Upsala Journal of Medical Sciences, vol. 106, no. 2, pp. 133-144.

Jones, I.E., Williams, S.M. & Goulding, A. 2004 “Associations of birth weight and length, childhood size, and smoking with bone fractures during growth: evidence from a birth cohort study”, American Journal of Epidemiology, vol.159, no.4, pp.343-350.

Macarthur, C., Hu, X., Wesson, D. E., & Parkin, P. C. 2000, "Risk factors for severe injuries associated with falls from playground equipment", Accident Analysis & Prevention, vol. 32, no. 3, pp. 377-382.

Petridou, E., Polychronopoulou, A., Kouri, N., Karpathios, T., Koussouri, M., Messaritakis, Y., Mathioudakis, Y., Siafas, K., Tsitsika, H., & Zografos, E. 1997, "Unintentional childhood poisoning in athens: a mirror of consumerism?", Journal of Toxicology - Clinical Toxicology, vol. 35, no. 6, pp. 669-675.

Rahi, J.S., Cumberland, P.M., & Peckham, C.S. 2006, “Does ambylopia affect educational, health, and social outcomes? Findings from 1958 British cohort”, British Medical Journal, vol.332, pp.820-824.

Thompson, R., Choonara, I., Hewitt, S., Holt, M., & rbyshire Road, S. P. 2003, "Age and sex of drivers associated with child pedestrian injuries", Journal of Child Health Care, vol. 7, no. 3, pp. 184-190.

No report of numerical association between unintentional injury and explanatory variables:

Coggan, C., Patterson, P., Brewin, M., Hooper, R. et al 2000 “Evaluation of the Waitakere Community Injury Prevention Project”, Injury Prevention, vol.6, pp.130-134.

Day, L., Ozanne-Smith, J., Cassell, E., McGrath, A. 1997 “Latrobe Valley Better Health Project. Evaluation of injury prevention program 1992-1996 Report no.114”, Melbourne: Monash University Accident Research Centre/ Victorian Health Promotion Foundation.

Ekman, R., Schelp, L., Welander, G., Svanstom, L. 1997 “Can a combination of local, regional and national information substantially increase bicycle-helmet wearing and reduce injuries? Experiences from Sweden”, Acc Anal Prev, vol.29, pp.321-328.

Ytterstad, B., Smith, G., Coggan, C. 1998 “Harstad injury prevention study: prevention of burns in young children by community-based intervention”, Injury Prevention, vol. 4, pp.176-180.

Outside of review scope:

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Appendix 6. Characteristics of included studies

Author (year) **Country**	**Population** **N**	**Type of injury**	***Correlates (and adjusting variables) assessed***
Abdel-Aty (2007) USA Cross-sectional study	Children and young people (n=451) aged 4 – 18 injured as pedestrians or cyclists in road crashes during 1999-2003 in Orange County, Florida	Injury reported to Florida Department of Highway Safety and Motor Vehicles' Traffic Crash Statistics	*Predictor: road (lane number), age* *gender* *Adjusted for: driver contribution, traffic control, vehicle type, site location, alcohol use, vehicle movement, speed relative to limit*
Badger (2008) USA Cross-sectional study	Children and young people aged 5 to 18 years admitted during a 10 year period to Shriners Burns Hospital, Cincinnati, Ohio with a diagnosis of ADD or ADHD. n = 103 compared with non-ADD/ADHD controls	Acute burn admissions	*Predictor: age, gender, ADHD/ADD diagnosis, behaviours and disorders; family characteristics* *Adjusted for: other predictors*
Bancej (2000) Canada	Children aged 0-18 living on a farm (all children from Ontario based survey) n=1,765	Injury requiring emergency room visit (based on questionnaire to mother)	*Predictor: child gender, mother worked off-site & education, father education, size & type of farm*

Cross sectional			*Adjusted for: calendar year*
Bishai (2008) US Cohort study	"Healthy Steps" data set of n=5565 infants in 15 US studies enrolled between 1996-1997 followed for up to 33 months.	Medical claim (hospital or practice visits) as a result of injury	*Predictor: mother characteristics (education, ethnicity, age, relationship), family structure, caregivers while mother works, birthweight, gender, maternal age, primary caregiver* *Adjusted for: other predictors*
Blakely (2003) New Zealand Cross-sectional study	Children (aged 0 -14) in New Zealand. Of 693 deaths, n=156 unintentional deaths were linked to census records	Mortality data, ICD-9 codes 800-949 denoting unintentional injury, 810-825 road injury	*Family characteristics (highest qualification, class, income, car access, employment status, area deprivation)* *Family characteristic (one or two parent)* *All analyses adjusted for age and ethnicity*
Bradbury (1999) USA Longitudinal study	Study based on health care utilisation data from the Columbia Medical Plan (central Maryland) n=295 children aged 5 to 11 on 1/1/1989 recorded.	Mother-reported medically treated child injuries	*Predictors: age, number of children in household, mother's marital status, various composite scales, child health, child mental health (behaviour problems, social competency, positive well-being, gifted),* *maternal variables (anxiety, satisfaction with social support)* *Adjusted for: other predictors*
Braun (2005)	Children aged 15 mo to 3 yrs	Injury resulting in hospitalisation (retrospective review of	*Predictor: well care child visit, other non-injury primary care/specialist/emergency*

USA Retrospective cohort	N=817 (all children who were hospitalised and random 4:1 control cohort of non hospitalised children)	administrative claims & medical records) confirmed by ICD-9 included falls, poisoning, burns, motor traffic injury `	*dept/hospitalisations, total non injury contacts, total duration of healthcare* *Adjusted for: other predictors*
Brehaut et al (2003) Canada Case control study	Children aged 0-19 with a behavioural disorder (n=16806)	Road injuries (both car (ICD-9 E810-819, E822-825) and pedal cycle (ICD-9 E850-869), falls (ICD-9 E880-888) and drownings (ICD-9 E830, E832, E910)	*Predictor: Behavioural disorders* *Adjusted for: Age, sex, socio-economic status, region*
Brenner (1999) USA Cross sectional	Children age <1 (all US children from national birth register) n=10,370 injury deaths	Injury deaths (US national database of deaths) based on ICD-9 (includes suffocation, motor vehicle, fires, drowning)	*Predictor: maternal age, ethnicity, number of previous births, marital status, education& prenatal care; child birth weight and gender* *Adjusted for: all other predictors*
Chen (2006) USA Cross sectional	Children aged 0-15 who were passengers in car crashes n=10,028 (random sample from national database based on insurance claims)	Motor vehicle injury (insurance claims, follow up telephone interview & on-site crash investigation)	*Predictor: time of day & driver age* *Adjusted for: child age, seating row, restraint status, collision type*
Chen (2005) USA	Children aged 4-8 who were passengers in car crashes n=19,111 (from insurance	Motor vehicle injury (insurance claims, follow up telephone interview & on-site crash investigation)	*Predictor: driver age* *Adjusted for: child age, seating row, restraint status, crash severity*

Cross sectional	claims that were available for interview)		
D'Souza (2007) New Zealand Retrospective cohort study	3 year retrospective cohort study of n=246 fatally injured children aged 0-17 (0-14 at enrolment in 1991) of children enrolled in New Zealand Census-Mortality Study	Injury mortality assigned ICD9 codes E800 to E949	*Predictor: age, gender. Ethnicity, deprivation, parental education, parental employment, household income Adjusted for: standardised for age and other variables*
Damashek (2005) USA Prospective cohort	Children aged 15-18 & 33-36 months n=149 (no details of selection give)	Injury (reported by mother interviews)	*Predictor: maternal age, socioeconomic status behaviour (number of measures), child age & gender* *Adjusted for other predictors*
Department of Transport (1988) UK Cross-sectional study	Children 7-15 N=1027 drawn form patient list of London health clinic	Injury due to road traffic accident identified by hospital records	*Predictor: child problem behaviour (various)* *Adjusted for: age, sex and other predictors*
Duncanson (2000) New Zealand Cross-sectional study	Jan 1991 to Dec 1996. Children and young people aged 0-14 (n=37) reported killed in fire in New Zealand Health Information Service	Fire fatalities assigned to ICD codes E890 to 899	*Predictor: ethnicity* *Adjusted for: stratified by age*

Ekeus (2004) Sweden Cohort study	Study based on Swedish national registers (National Board of Health and Welfare and Statistics Sweden) of 800,192 children born in Sweden 1987-1993 followed up from age 0 to age 7. N=47,126 children were admitted to hospital for unintentional injury, 183 deaths assigned to violence or accident.	Injuries requiring hospital admission, sub-classified according to ICD-9 code recorded at hospital discharge	*Predictor: maternal age at birth* *Adjusted for: combinations of sex and year of child birth, type of community, housing, education, income, welfare payments of grandmother, ethnicity, lone parent household, alcohol/substance misuse, psychiatric illness in parents*
Engstrom et al (2002) Sweden Cross-sectional study	Children and young people (n=c.2.6 million) aged 0-19 injured during 1990-1994 in Sweden	Injuries occurring in traffic and through falling	*Predictor: Family characteristics (type of employment)* *Adjusted for: Country of parents' birth, single parent household, receipt of welfare benefits*
Faelker (2000) Canada Cross-sectional study	Based on Kingston site of Canadian Hospitals Injury Reporting and Prevention Programme (CHIRPP). Children and young people aged 0-19 during 1996, with n=5,894 injuries.	Injury requiring attendance at ED, classified according to ICD-9 codes.	*Predictor: type of Injury, severity, income* *Adjusted for: age, sex and other socio-economic variables*
Flower (2006)	All children in US Agricultural Health Study	Deaths due to injury based on state death registry	*Predictor: child age*

USA Case control study	n=21,360		*Adjusted for: gender, calendar year*
Graham (2008) UK Cross sectional	Children ≤ 16 (all UK children based on census data) N=not stated	Child pedestrian injuries(police records as part of UK Dept of Transport database)	*Predictor: deprivation (income, employment, housing & services, health, education, crime, environment at ward level)* *Adjusted for: other predictors*
Hansen (2005) Norway Cross-sectional	Children aged 4-15 random sample from registry of inhabitants of Bergen n=1200	Bicycle-related injury reported by parental questionnaire	*Predictor: time cycling per week, age at debut of cycling, gender* *Adjusted for: other predictors*
Harrop (2007) Canada Cross-sectional study	Native (n=319) and non-native (n=1848) children and young people (aged 0-19 years) fatally injured in Alberta, Canada between January 1st 1985 and December 31st 1994	Death from injury (intentional and unintentional) as assigned by ICD-9 codes E800 to E999.9 (except E870 to E879 surgical and medical misadventure and E930 to E949 pharmaceutical adverse effect)	*Predictor : native versus non-native, injury type* *Adjusted for: other predictors*
Hasselberg (2001) Sweden Cross sectional	Children aged 0-15 N=1,549,181 (all Swedish children on national census register)	Road traffic injuries (pedestrian, bicyclists, drivers of mopeds, motorcycles and care) requiring hospitalisation as defined by ICD-9	*Predictor: Socioeconomic status defined by occupation* *Adjusted for: child gender*

Hasselberg (2004) Sweden Longitudinal study	Children aged 10-14 entered into Swedish Population and Housing Census of 1990 followed up 1991-1999. N-16,094 injuries to pedestrians, cyclists and car-passengers.	Traffic injuries (according to ICD-9 and ICD-10 codes) requiring at least one night hospitalisation	*Predictor: household characteristics (social class, education, disposable income)* *Adjusted for: other predictors*
Haynes (2003) UK Prospective cohort	Children aged 5-14 N=3526 injured children (all injured children over 13 month period) & N=3526 matched (age and postcode) with non-injury child	Presented with injury to A&E dept.	*Predictor: child age & sex, single parent, migrants, distance from hospital & playground, number of children, living in deprived area* *Adjusted for: other predictors*
Haynes (1999) UK Cross-sectional study	Children aged 0-4 living in the study area who had attended A&E for n=2,868 accidents in Norwich, England between August 1993 and July 1995	Accident requiring visit to Accident and Emergency Unit	*Predictor: deprivation score of ward (Townsend), proportion of lone parent households in ward* *Adjusted for: other predictors*
Haynes *et al*. (2008) UK Cohort study	Cohort study of 9391 pre-school children aged 0-4 recorded in Avon Longitudinal Study of Parents and Children having 19,150 reported	Carer reported number of accidents (cohort study)	*Predictor: type of neighbourhood (various classification schemes), child age, child activity score, development score, conduct difficulties score, mother post-natal depression, life events score, social*

	accidents		*support score, smoker, age at delivery* *Adjusted for: other predictors*
Hippesley-Cox (2002) UK Cross-sectional	Children age 0-14 N=56,629 injury admissions (all injuries in Trent region 1992-1997)	Hospital admission for injury (road, fire, poisoning, falls) as defined by ICD-9 &10	*Predictor: socioeconomic status (Townsend score at ward level)* *Adjusted for: rurality, % males, % asian/back, distance from nearer hospital (at ward level)*
Hjern (2001) Sweden Cross-sectional	Children aged 0-3 N=546,336 (all children born in Sweden 1987-1991)	Hospitalised for home-based injury (burns, poisoning, falls, foreign object) as defined by ICD-9	*Predictor: child gender, number of siblings, maternal age at child birth, education & country of birth, lone-parent, receiving benefit, rural residency, home ownership* *Adjusted for: child age*
Hussey (1997) USA Cross sectional	Children age 0-17 N= 167,104 deaths (cluster based sample of US households population survey)	Injury mortality based on ICD-9 (from US national mortality register)	*Predictor: Socioeconomic status (household head education & family income)* *Adjusted for: race, single parent, family size, child age & sex, rural/urban*
Janssen (2007) Canada Cross-sectional study	5559 Canadian youth (grades 6 to 10) in 2001/2002 “Health Behavior in School Aged Children” Survey	Self reported injury (based on WHO “Health Behaviour in School-Aged Children” template)	*Predictor: age, at school/outside of school, physical activity level* *Other: predictors*

Jiang (2008) Canada Cross sectional	Children aged 11-15 N=7,031 (national HBSC survey based on cluster sampling of school classed)	Injury requiring hospitalisation (from survey questionnaire)	*Predictor: alcohol consumption* *Adjusted for: age, sex, ethnicity, socioeconomic status (family affluence) & geographical area (urban/rural)*
Johnston (2000) USA Cross-sectional study	Children aged 0 to 15 attending ED in King County Washington 1/10/1992 to 30/9/1993. Data recorded for n=4921 injuries requiring medical attention (82 requiring hospital admissions) who were siblings, injured within 90 days of ED visit of 41,242 other children	Medically attended injury (as coded by ICD-9) requiring ED treatment or admission.	*Predictor: age, gender, ethnicity, family size, non-injury ED use* *Adjusted for: other predictors*
Jones et al (2002) New Zealand Cohort	Children and young people aged 0-18 (n=601) (Dunedin Multidisciplinary Child Development Study)	Parental report of fractures incurred in past 2 years (past 5 years for initial interview at age 5, past 3 years for final interview at age 18)	*Predictor: socioeconomic status* *Adjusted for: age, sex*
Juurlink (2003) Canada Case control	Children ≤3 hospital admission for poisoning (all admissions in Ontario) n=49; control (randomly selected age and gender matched control 50:1) n=2000	Hospital admission for iron poisoning (national admission database) as defined by ICD-9	*Predictor: birth of a sibling* *Adjusted for: maternal age and household income*

Kendrick (2001) UK Longitudinal study	Children (n=771) aged 3-12 months followed for 25 months (250 injuries recorded) in Nottingham, England.	Medically attended injury (according to READ codes) determined from paper and computerised primary care records as well as Nottingham Accident and Emergency Dept.	*Predictor: gender, children in family, previous injury, socio-demographic characteristics (benefits, no access to car, owner occupier, deprived area, overcrowding, unemployed parent), family characteristic (children in family, single parent, teenage mother, ethnicity)* *Adjusted for: other predictors*
Klimentopolou (2008) Greece Cross-sectional study	Children aged 0-14, n=2711 with bicycle related injury recorded in Accident and Emergency Department Injury Cross-sectional System 1996-1998. Four collaborating hospitals	ICD -9 codes E8260-8269 used to identify on-road injury, off-road injury based on European Home and Leisure Accidents Cross-sectional System entries 45720-45899. Nordic Medico-Statistical Committee (NOMESCO) code 4400-4499 and 5000 also used.	*Predictors: nationality, place of residence, number of injuries (multiple/single), outcome (hospital/non-hospital)* *Adjusted for: age, gender, time of day and season*
Kmet (2006) Canada Cross-sectional study	Children aged 0-17 between 1997-2002 killed or injured (n=4,660 casualties) in motor vehicle crash in Alberta, Canada	Police reported incidents of motor vehicle crashes resulting in hospitalisation or death	*Predictors: age, gender, urban/rural* *Adjusted for: other predictors*
Koroukian (2007) USA Cross sectional	Children aged 0-14 N=not stated (based on State mortality registers)	Road traffic, drowning, fire, poisioning & falls death as defined by ICD-9-CM (Medicaid and death certificates files linked)	*Predictor: Medicaid vs non-Medicaid* *Adjusted for: race, sex*

Lalloo (2003) UK Cross sectional	Children aged 4-15 N= 5,913 (all children in England based on probability sample [HSE])	Accidental injury (minor – resulting in pain or discomfort >24 hrs; major - requiring doctor contact or hospitalisation) - self report	*Predictor: Children behavioural characteristics (various)* *Adjusted for: child age & gender, social class, receiving benefits & family type*
Lalloo (2003) UK Cross sectional	Children aged 2-15 n=12,877 (all children in England based on probability sample [HSE])	Accidental injury (minor – resulting in pain or discomfort >24 hrs; major - requiring doctor contact or hospitalisation)	*Predictor: Children behavioural characteristics (various)* *Adjusted for: child age & gender, family: socioeconomic status (receiving benefits, occupational class, single parent)*
LaScala (2004) USA Cross-sectional study	Children aged 0-15 injured as pedestrians or cyclists (n=717 collisions) during April 1992-March 1996 in California	California State-Wide Integrated Traffic Reporting System	*Predictors: community demographics (youth population, percent divorced, income, unemployment, ethnicity, traffic low, school populations)* *Adjusted for: other predictors*
Laursen (2008) Denmark Cross-sectional study	Children aged below 15 years living in 32 municipalities in Denmark between 1998 and 2003. N=50,561 injuries to 173,504 children	Home injuries coded using EU Coding manual V2000	*Predictors: mother's age at childbirth, number of children, family type, highest education, highest Income, crowded dwelling, dwelling type* *Adjusted for: age, sex and distance from hospital*

Lee (2008) USA Cross-sectional study	Children with autism (n=83), ADD/ADHD (n=191), learning disability (n=307), psychopathology (n=210) or other medical conditions (n=1802) aged 3-5 who had participated in National Survey of Children's Health Jan 03 to July 04	Self reported injury; during previous 12 months child had gone to hospital emergency room as a result of accident, injury or poisoning, or had been injured or poisoned and required medical attention (not limited to emergency rooms or attention that requires a doctor)	*Predictor: developmental disability* *Adjusted for: gender, age, number of children, ethnicity, poverty level)*
Li (2008) Sweden Cross sectional	Children aged 0.14 N=1.58 million (national database with all people in Sweden)	First hospitalisation for non-fatal injury defined by ICD-10 includes transport, falls, other external cause of accidental injury	*Predictor: Neighbourhood affluence, child sex, family income, parental education, immigrant status, urban/rural, alcohol/substance abuse* *Adjusted for: all other predictors*
McDermott (2008) USA Cross sectional	Children aged ≤18 n=138,111 (all insured by Medicaid in South Carolina in 2003)	Injury requiring hospitalisation or emergency dept visit as defined by ICD-9-CM including falls, motor vehicle, poisoning, bicycle, fire/heat injuries	*Predictor: Austism or Pervasive Development Disorder vs no disability* *Adjusted for: child age and gender*
Macpherson (2004) Canada Cross sectional	Children aged 5-19 N=9,650 hospitalised for injury (all children from national	Hospitalised for bicycle-related injury defined by ICD-9	*Predictor: urban/rural location* *Adjusted for: age, sex, socioeconomic status, helmet legislation, involved in bicycle-motor injury*

	database of Canadian hospital admissions)		
Malhotra (2008) UK Cross-sectional study	Children (aged 0-13) injured in road collisions in London 2001-2006	Police collected road injury data (STATs19)	*Predictor: age, site of injury, ethnicity, casualty type* *Adjusted for: other predictors*
Marcin (2003) USA Cross-sectional study	All children <18 n=5507 admitted to hospital emergency unit	Admission for injury as listed on hospital trauma registry defined by ICD-9	*Predictor: household income, poverty, insurance* *Adjusted for: other predictors*
Nakahara (2004) Japan Cross-sectional study	Counts of children aged 0-14 killed in road crashes in n=47 Japanese prefectures. Analysis carried out using vehicle fatalities used as a proxy for pedestrian fatalities.	Mortality data for Japan extracted using ICD-8 E-codes 810-823 (1970-1978), ICD-9 codes (E810-E825)	*Predictors: age, area features (public parks, pavements on local/main roads, pedestrian crossings, infringement notices, traffic volume, education, ambulance, densely inhabited district population* *Adjusted for: other pre*
Ni (2002 USA Cross sectional	Children aged 6-17 N=38,458 (all children in national [NHIS] survey)	Non-fatal recreational injury that required medical attention defined by ICD-9 (from interview by adult in household)	*Predictors: family income, adult family education & child ethnicity* *Adjusted for: child age, gender & race region of residence, urban/rural, health insurance stated*
Ordonana (2008)	Children aged 0-5	Unintentional injury requiring medical or surgical attention as	*Predictors: social disadvantage, family income, age of mother, age of mother at*

Spain (UK data) Cross sectional	N=1,0527 (twin pairs) (from UK twin pair cohort)	defined by ICD-10 (from mother interview)	*birth of twins, older sibling, living with father, child behaviour (3 categories)* *Adjusted for: gender*
Ostberg (1997) Sweden Cross-sectional	All children aged 0-12 listed on national population census excluding those not living with parent n=not stated	Deaths due of accidents according to national mortality registry	*Predictors: social class, gender, single parent, immigrant status, population density* *Adjusted for: other predictors*
Otters (2004) Holland Cross-sectional study	Children aged 0-17 having n=9,484 injury episodes as surveyed via general practices in Holland 2001	Second Dutch National Survey of General Practice, coded using International Classification of Primary Care	*Predictors: gender, age, residence (urban, semi-rural, rural), social class, number of siblings, ethnicity, age difference to mother* *Adjusted for: other predictors*
Overpeck (1997) USA Cross sectional	Children <18 N=17,110 (from national survey [NHIS] based on probability sampling of households)	Injury that resulted in medical attention (from respondent, usually mother, interview) as defined by ICD	*Predictors: ethnicity & socioeconomic status (health insurance, number of adults, number of children, urban, maternal education, poverty level)* *Adjusted for: ethnicity, child age & gender and other predictors*
Petridou (2002) Greece Case control	Children who experienced playground injury n=777 (All children in Athens area registered on injury system) n=336 controls (attended hospital or minor	Injury presenting in hospital (local area register and interview with child guardian) as define by ICD-10	*Predictors: time, day, season, mechanism of accident, day of accident, number of injuries, inured part of body, injury severity, medical outcome* *Adjusted for: child age, gender &*

	ailments but not injury)		*nationality*
Petridou (2003) Greece Case control	Disabled children aged 0-14 N=251 (all injured children in 4 Greek towns) N=not stated (non-disabled control)	Injuries presenting to emergency departments as defined by ICD-9 (carer and child questionnaire)	*Predictors: disabled vs non-disabled, child age, gender & nationality, urban/rural, weekday/weekend, month of injury, mechanism of injury, number of injuries & hospitalisations* *Adjusted for: other predictors*
Petridou (2005) Greece Prospective cohort	Children aged 0-14 N=748 (all children in Greek town of Velestino)	All injuries (notified by healthcare or educational establishments or police) defined by ICD-9	*Predictors: child age, vision problem, BMI & height, parental age, education, & employment, history of family accidents, number of family members* *Adjusted for: other predictors*
Petridou (1998) Greece Case control study	Case control study matching n=-239 children attending ED (Centre for Research and Prevention of Injuries among the Young – CEREPRI) in Athens, Greece between November 1995 and October 1996 with burns.	Burns requiring ED attendance, recorded in Emergency Department Injury Cross-sectional System Database (EDISS)	*Predictors: gender, age, ethnicity, maternal age, maternal socio-economic status, number of siblings, birth order, household (number of residents, number of bedrooms), where child spends most of the day, burn avoidance index, child activity score* *Adjusted for: other predictors*
Petridou (1998) Greece	Children aged 8-14 hospitalised for more than 24 hours as a result of an injury in Athens from Nov	Injuries resulting in 24 hours hospitalisation	*Predictors: strenuous physical activity, intellectual exertion, family quarrel, school exam, pleasing event*

Cross-sectional study	1994 to Apr 1997 (n=156)		*Adjusted for: time of day*
Petrou (2006) UK Cross sectional	Children 0-10 N=117,212 (link birth cohort & HES data)	Mortality and morbidity and injury and poisoning (from hospital activity/episode data)	*Predictors: Social class* *Adjusted for: child sex & age, order of birth, adoption, multiplicity, maternal smoking, type of delivery, maternal age, operations & weight, parity*
Ramsay (2003) UK Case control	Children 0-4 N=79 (presenting to A&E over 1 mo period) & N=128 age & sex matched controls with no injury	Unintentional home injury presenting to single hospital A&E that includes poisoning, burns and fingertip injuries	*Predictors: housing, child has own bedroom, number of cars owned, number of children, carer age, marital status, occupational status, education, receiving benefits, child handiness, medical condition, accident history & sibling accident history, place child plays most, safety devices used* *Adjusted for: age & gender*
Reading (1998) UK Cross-sectional study	Children aged 0-4 attending Norwich and Norfolk A&E department August 1993-July 1995, n=3944 attendances out of a population (within 20km) of 22,552	Injury requiring medical assistance; severity coded using Alwash and MacCarthy (1988), data on child obtained from health registers deemed more appropriate for young children.	*Predictor: gender, lone parent, mother age, previous live births, number of elder siblings, distance from ED, deprivation (Townsend index)* *Adjusted for: other predictors*
Reading (2008) UK	Longitudinal study of n=14,062 children in the ALSPAC cohort study. 19,150 accidents of which	Carer reported number of accidents (cohort study)	*Predictors: age, gender, siblings (twin or triple), ethnicity, psychometric scores (Activity inside/outside, development score, gross motor score, child avoids*

Cohort study	4,831 were medically attended		*risks, Rutter score, strengths and difficulties Score, frequently argues with mother), maternal age, education, ethnicity, partner, employment, social status, smoking/alcohol/cannabis use, postnatal depression, social network score, employment, ethnicity, alcohol use, social class, number and age of other children, number of carers, household income, financial difficulties, owner occupier, access to car, council rented, flat, more than one person per room, no garden, pool or pond, safety features score, poor quality, fear of crime, environmental problems, neighbourhood contacts, road density, busy traffic, rural, moved neighbourhood* *Adjusted for: other predictors*
Reimers (2008) Sweden Cross sectional	Children & young people aged 10-19 who were admitted to hospital for at least 1 night following an injury n=not stated (based upon Stockholm County Council's inpatient register for 1993-5 & 2003-5)	Fall, vulnerable road-user, and motor-vehicle rider-related injuries as defined in ICD-9 and ICD-10	*Predictors: age, gender, socio-economic status (neighbourhood)* *Adjusted for: other predictors*

Rowe (2004) UK Cross sectional	Children aged 5-15 N=10,438 (from UK Child Benefit Register)	Unintentional injury (from parental interview) that included burns, falls, poisoning, head injury, fractures	*Predictors: child psychiatric disorder, & intellectual functioning, family ethnicity, income, social class, size, functioning & single parent, parent education, teenage parenthood, neighbourhood strife,* *Adjusted for: age & sex*
Schluter (2006) New Zealand Cohort study	Cohort study "Pacific Islands Families: First Two Years of Life study" (PIF) running from 2000 to 2002; n=342 injuries of which 113 were treated in hospital in New Zealand	Mother reported injury, including information on type of medical attention sought.	*Predictors: age, sex, maternal characteristics (age, ethnicity, smoking, income, education, English fluency, birth place, number of children), household characteristics (number of residents)* *Adjusted for: other predictors*
Schmertmann (2008) Australia Cross sectional	Children aged 0-4 (all living in New South Wales)	Hospitalisations due to unintentional poisoning according to ICD-10-CM (NSW Inpatient Statistics Collection)	*Predictor: child age & sex, remoteness of residence, socioeconomic status* *Adjusted for: other predictors*
Schroder-Hansen (2005) Norway Cross sectional	Children aged 4-15 N=865 (random age stratified sample from Bergen city and who completed questionnaire)	Bicycle-related injury (from parental questionnaire)	*Predictor: debut age of cycling, time cycling per week, gender* *Adjusted for: other predictors*
Scholer (1998)	All children age ≤5	Fire-related deaths (identified fro	*Predictor: maternal education, race, age,*

USA Retrospective cohort	n=1,428,694 (Tennessee census data)	death certificates) as defined by ICD-9	*marital age, timing of 1st prenatal visit, number of children. Rural, neighbourhood income* *Adjusted for: other predictors*
Schwebel (2005) USA Cross sectional	Children aged about 5 from impoverished family n=5,090 (all families from Head Start trial)	Injury (undefined and source not described)	*Predictor: Immigrant vs US born* *Adjusted for: family size & poverty, maternal education & age, child age, gender & hyperactivity, father present, number of adults in home parenting strategies, health insurance*
Schwebel (2008) USA Prospective cohort	Children ≤3 years N=799 (from national longitudinal study NICHD)	Injury (undefined) (reported by mother at interview)	*Predictor: nocturnal waking, child gender, positive & negative affect & externalising behaviour, family socio-economic status, patenting, maternal stress* *Adjusted for: other predictors*
Schwebel *et al.* (2006) USA Cross-sectional study	29 children referred to outpatient clinic (assumed to be in Birmingham, Alabama) for behavioural disorders.	Mother completed "Unintentional Injury Questionnaire" (Plumert, 1995)	*Diagnosis of ADHD/ODD* *Symptoms of ADHD/ODD* *Parenting styles (Nurturance, Responsiveness, Non-restrictive attitude, consistency)* *Hazard room behaviour*
Schwebel *et al.* (2006)]	Longitudinal study based on National Institute of	Mother reported injury requiring	*Gender*

USA Longitudinal study	Child Health and Human Development (NICHD) Study of Early Child Care, children from across the USA. Data from 1,225 families reported here.	professional medical attention	*Child variables (activity level, mood)* *Family variables (income:needs, positive parenting)* *Childcare variables (average hours in childcare centre/family daycare centre, quality of these)*
Schwebel (2004) USA Cohort study	NICHD Study of Early Child Care (longitudinal study), n=1364	Injuries (reported by mothers) requiring professional medical attention	*Predictors: child characteristics (gender, temperament), mother characteristics (7 scales including neuroticism and time with child), father characteristics (8 scales)* *Adjusted for: demographics, child variables, parenting or all three.*
Sellstrom et al (2003) Sweden Cohort study	Children aged 1-15 resident in Stockholm county (excluding Stockholm city) during 1994-1998 (n=1 056 064 person years – number injured not specified)	All injuries (ICD-9 E830-929 or ICD-10 W01-X59)	*Predictor: Age, receipt of social welfare benefits, population density* *Adjusted for: Neighbourhood safety measures, "individual level covariates" (p726), urbanisation*
Senserrick (2007) USA Cross sectional	Children aged 0-15 who were passengers in car crashes N=16,233	Motor vehicle injuries (from insurance claim records & telephone survey)	*Predictor: Age of and sibling driver* *Adjusted for: child age, seating row, restraint status, driver gender, vehicle type*

	(based on insurance claims & telephone survey)		
Senturia et al (1997) USA Case control study	Children and young people aged 7-18 who were seen in an emergency department (Chicago area, June-July 1995) as a result of trauma	Injuries occurring whilst riding a bicycle	*Predictor: Speed, location, distance from home, bike type, riding companions, purpose of ride, stunt riding* *Adjusted for: Not stated*
Shenassa (2004): USA Cross sectional	Children 0-6 (all 11,735 injuries in Illinois state)	Fall and burn non-fatal injuries requiring hospitalisation as defined by ICD-9	*Predictor: child age and gender, poverty and ethnicity (by area)* *Adjusted for: owner occupancy & percent of housing before 1950*
Silversides (2005) UK Cross-sectional study	Children aged 0-12 attending one of four ED in North and West Belfast (n=479 injuries) between 2nd January and 31st December 2001	Dedicated Injury Cross-sectional Module (ISM) computer package used to record injury data.	*Predictors: injury type, deprivation of home census enumeration district* *Adjusted for: other predictors*
Simon (2006) USA Cross sectional	Children aged ≤19 N=56,277 million (injury-related visits) (5-year period from	Emergency room visits includes sports, falls, motor vehicle injury (from national survey ambulatory care services in hospitals)	*Predictor: Insurance type* *Adjusted for: age, sex, region, urban location, year*

	national database)		
Simon (2004) USA Cross-sectional study	Children and young people aged 0-18 attending ED in the USA in 1998 and selected by stratified random sample of EDs in National Hospital Ambulatory Medical Care Survey (NHAMCS). N=2,656 injury records	Survey respondent indicated that ED visit was in relation to an Injury as well as injury related visit supplementary criteria (added 5 cases). External cause codes (ICD-9) as well as free text examined to determine injury type.	*Predictor: gender, age, ethnicity, urban, region of US, health insurance* *Adjusted for: other predictors*
Simpson (2005) Canada Cross-sectional study	Children and young people in grades 6 – 10 in Canada surveyed during 2001/2002 using WHO Health Behaviour in School Aged Children instrument. 7,235 students surveyed from 170 schools across Canada, n=3,905 medically attended injuries	Medically treated injury, injury hospitalisation, sports injury, injury from fight.	*Predictors family affluence (How often child goes to bed/school hungry, child feels safe where they live, child feels area is a good place to live, child reports family well off), area level variables (lone parent families, unemployment, education levels, average income)* *Adjusted for: other predictors*
Sinclair (2008) USA Cross-sectional study	242.796 children aged 0 to 17 reported in the National Health Interview Survey 1997-2005 with (13,252) and without (229,544) disability. N=5,955 injury episodes, of which 496 involved children with a	Injury defined as a traumatic event in which the person was injured one of more times from an external cause	*Predictors: disability, gender, age, parental education, poverty status, family size* *Adjusted for: other predictors*

	single disability.		
Sosnowska (2003) Poland Prospective cohort	Children 5-17 N=3274 accidents (schools in Wloclawek region)	School accidents (based school on accident report form)	*Predictor: school environment. School size, equipment with gymnasium, equipment in playground, length of school day, student staff ratio* *Adjusted; child age & gender*
Soubhi (2004) Canada Cross-sectional study	Children aged 0 to 11 n=12661 in cross-sectional sample, n=9796 in longitudinal sample (injury count not known) National longitudinal survey of children and youth 1994/5 and 1996/7	Positive response to question "was your child injured in the last 12 months", paper implies that this question dealt with injuries that required contact with health care services.	*Gender* *Consistent parenting* *(adjusted for family socio-economic status, number of persons in household, primary main carer restrictions on activity, depression, neighbourhood cohesion, percent of single female households, positive parenting)*
Soubhi et al (2004) Canada Cross-sectional study	Children aged 2-13 (n=9796) (National Longitudinal Survey of Children & Youth, 1996-7)	Positive response to question "was your child injured in the last 12 months"	*Predictors: Gender, neighbourhood characteristics, parenting characteristics, child behavioural characteristics* *Adjusted for: socioeconomic status, number of persons in household, parental characteristics, previous injuries to child*
Spinks (2008) Australia	Children aged 5-12 N=871 (from prospective cohort study CHIPS & mail	All injuries requiring first aid treatment and requiring medical treatment (via questionnaire to	*Predictor: child hyperactivity, child gender, child age, household income* *Adjusted for: other predictors*

Prospective cohort	shot random sample of families)	participating families)	
Tarantino et al (1999) USA Observational study	Infants aged <=10 months who were treated at an emergency department (January 1990-December 1992) for injuries resulting from falls (n=167, of which n=153 where abuse was not suspected)	Injuries resulting from falls	*Predictor: Age, gender, ethnicity, Medicaid status* *Adjusted for: Not stated*
Tobin (2002) UK Cross sectional	Children aged <15 (all children in Leicester city) n=117,200	Attended, admitted to a fracture clinic or hospitalised for fracture as defined by ICD-10	*Predictor: ethnicity* *Adjusted for: socio-economic status (Townsend score)*
Voas (2002) USA Cross-sectional	Children aged <16 killed by road traffic accident n=12,266 from national mortality registers	Road traffic deaths from national mortality registers	*Predictors: child ethnicity, child age, parental education, driver gender, driver blood alcohol, household poverty, household income* *Adjusted for: other predictors*
von Kries (1998) Germany Case control study	Case control study based on 174 child (age 6 to 14) pedestrian injuries in Dusseldorf, Germany between January 1993 and March 1995	Police reported road injury	*Predictors: environmental factors examined: speed limits, pelican crossings, number of playgrounds* *Adjusted for: matched for age, gender.*

Winston (2006) USA Cross-sectional study	Children under 16 years of age (n=5146) involved in 3818 vehicle crashes occurring between Dec 1 2000 and Dec 30 2004 in 15 states and District of Columbia randomly selected from claims presented to the State Farm Insurance Corporation (Bloomington, Illinois)	Injury type not given (injured in car crash)	*Predictors: driver characteristics (gender, age, ethnicity, education, income), child age, quality of restraint use* *Adjusted for: other predictots*
Xiang (2006) USA Cross sectional	Children aged 5-17 N=687 (random sample from national database)	Pedestrian & cycling injuries (from telephone survey)	*Predictors: disability, age, gender, race, family income, history of traffic problems* *Adjusted for: other predictors*

Appendix 7. Additional systematic reviews screened for references

The following studies were excluded on the basis of details provided in Mytton et al (2009) (see Mytton et al (2009) for full citations):

Published pre-1997.

Anderson et al (1994); Alexander et al (1992); Cobb et al (1995); Horwood et al (1989); Fergusson et al (1995); Padilla et al (1976); Langley et al (1981); Langley & Silva (1985); Langley et al (1987a); Langley et al (1987b); Chalmers et al (1989); Lodge et al (1990); Begg et al (1990); Begg et al (1991); Begg et al (1992); Davidson et al (1987); Davidson et al (1988); Bijur et al (1988a); Bijur et al (1988b); Bijur et al (1990); West & Farrington (1977); Peckham (1973); Peckham & Pearson (1976); Pless et al (1989); Bijur et al (1991); Miller et al (1974)

Study not conducted in an OECD country.

Chen et al (2005a); Chen et al (2005b); Peng et al (2003); Yang et al (1998); Kozik et al (1999)

Unintentional injury outside of the review scope.

Hammig et al (2001); McKinley et al (2002)

The following studies identified in Towner et al (2005) were excluded following examination of their full-text (full citations listed in Appendix 3):

Coggan et al (2000); Day et al (1997); Ekman et al (1997); Ytterstad et al (1998)

The following studies identified in Mytton et al (2009) were excluded following examination of their full-text (full citations listed in Appendices 3 and 4):

Cumberland et al (2004); Jones et al (2004); Rahi et al (2006); Shepherd et al (2002); Shepherd et al (2004); West & Sweeting (2004)

The following studies identified in Mytton et al (2009) were included following examination of their full-text (full citations listed in Appendix 5):

Jones et al (2002); Soubhi et al (2004)