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# **Strategies to prevent unintentional injuries among children and young people aged under 15**

## **NICE public health guidance 29**

### **Strategies to prevent unintentional injuries among children and young people aged under 15**

#### **Ordering information**

You can download the following documents from

[www.nice.org.uk/guidance/PH29](http://www.nice.org.uk/guidance/PH29)

- The NICE guidance (this document) which includes all the recommendations, details of how they were developed and evidence statements.
- A quick reference guide for professionals and the public.
- Supporting documents, including an evidence review and an economic analysis.

For printed copies of the quick reference guide, phone NICE publications on 0845 003 7783 or email [publications@nice.org.uk](mailto:publications@nice.org.uk) and quote N2351.

This guidance represents the views of the Institute and was arrived at after careful consideration of the evidence available. Those working in the NHS, local authorities, the wider public, voluntary and community sectors and the private sector should take it into account when carrying out their professional, managerial or voluntary duties.

Implementation of this guidance is the responsibility of local commissioners and/or providers. Commissioners and providers are reminded that it is their responsibility to implement the guidance, in their local context, in light of their duties to avoid unlawful discrimination and to have regard to promoting equality of opportunity. Nothing in this guidance should be interpreted in a way which would be inconsistent with compliance with those duties.

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## Introduction

The Department of Health (DH) asked the National Institute for Health and Clinical Excellence (NICE) to produce public health guidance on the prevention of unintentional injuries among children and young people aged under 15. This guidance focuses on strategies, regulation, enforcement, surveillance and workforce development in relation to preventing unintentional injuries in the home, on the road and during outdoor play and leisure.

The guidance is for commissioners and providers of health services, local authority children's services, local authorities and their strategic partnerships, local highway authorities, local safeguarding children boards, police, fire and rescue services, policy makers, professional bodies, providers of play and leisure facilities, and schools.

It is also for other public, private, voluntary and community organisations and services which have a direct or indirect role in preventing unintentional injuries among children and young people aged under 15.

The guidance may also be of interest to children, young people, parents, carers and other members of the public.

This is one of three pieces of NICE guidance published in November 2010 on how to prevent unintentional injuries among children and young people aged under 15. It should be read in conjunction with the two other publications. These focus on: the provision of home safety equipment and home risk assessments and road design and modification. (For further details, see section 7.)

The Programme Development Group (PDG) developed these recommendations on the basis of reviews of the evidence, economic modelling, expert testimony, stakeholder comments and fieldwork.

Members of the PDG are listed in appendix A. The methods used to develop the guidance are summarised in appendix B.

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Supporting documents used to prepare this document are listed in appendix E.

Full details of the evidence collated, including fieldwork data and stakeholder comments, are available on the NICE website, along with a list of the stakeholders involved and NICE's supporting process and methods manuals. The website address is: [www.nice.org.uk](http://www.nice.org.uk)

This guidance was developed using the NICE public health programme process.

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NHS Evidence has accredited the process used by the Centre for Public Health Excellence at NICE to produce guidance. Accreditation is valid for 3 years from June 2010 and is applicable to guidance produced using the processes described in NICE's 'Methods for the development of NICE public health guidance' (2009). More information on accreditation can be viewed at [www.evidence.nhs.uk](http://www.evidence.nhs.uk)

## 1 Recommendations

This is NICE's formal guidance on strategies to prevent unintentional injuries among children and young people aged under 15. When writing the recommendations, the Programme Development Group (PDG) (see appendix A) considered the evidence of effectiveness (including cost effectiveness), expert testimony, fieldwork data and comments from stakeholders. Full details are available at [www.nice.org.uk/guidance/PH29](http://www.nice.org.uk/guidance/PH29)

The evidence statements underpinning the recommendations are listed in appendix C.

The evidence reviews, supporting evidence statements and economic analysis are available at [www.nice.org.uk/guidance/PH29](http://www.nice.org.uk/guidance/PH29)

Please note: the absence of recommendations on any particular measures to prevent unintentional injuries is a result of a lack of evidence that met the inclusion criteria for the evidence reviews. It should not be taken as a judgement on whether or not any such measures are effective and cost effective.

### ***Definitions***

The guidance uses the term 'unintentional injuries' rather than 'accidents' as: "most injuries and their precipitating events are predictable and preventable"<sup>1</sup>. The term 'accident' implies an unpredictable and therefore unavoidable event.

The term 'vulnerable' is used to refer to children and young people who are at greater than average risk of an unintentional injury due to one or more factors. As an example, they may be more vulnerable if they:

- are under the age of 5 years (generally, under-5s are more vulnerable to unintentional injuries in the home)

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<sup>1</sup> Davis R, Pless B (2001) BMJ bans 'accidents'. Accidents are not unpredictable. BMJ 322: 1320–21.

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- are over the age of 11 (generally, over-11s are more vulnerable to unintentional injuries on the road)
- have a disability or impairment (physical or learning)
- are from some minority ethnic groups
- live with a family on a low income
- live in accommodation which potentially puts them more at risk (this could include multiple-occupied housing and social and privately rented housing).

### ***Topics***

The recommendations are divided into six categories: general, workforce training and capacity building, injury surveillance, home safety, outdoor play and leisure, and road safety.

### ***National recommendations***

The guidance includes some national recommendations to assist local action (see recommendations 1, 5, 7, 10 and 21).

The decision on whether these recommendations are taken forward – and how they are prioritised – will be determined by government and subject to statutory regulatory and cost impact assessments.

## ***General recommendations***

### **Context**

The prevention of unintentional injuries among children and young people may not be a priority among local organisations. To ensure prevention activities are accorded the importance they deserve, they need to be incorporated into national objectives aiming to improve the population's health. Local injury prevention coordinators could promote a strategic framework for action and encourage local agencies to work together.

### ***Whose health will benefit?***

Children and young people aged under 15, their parents and carers (some of the recommendations may also benefit the wider population).

### **Recommendation 1 Incorporating unintentional injury prevention within local and national plans and strategies for children and young people's health and wellbeing**

#### ***Who should take action?***

- Local authority children's services and their partnerships, in consultation with local safeguarding children boards.
- Government departments with a responsibility for preparing policy and plans relating to children and young people's health and wellbeing.

#### ***What action should they take?***

- Ensure local and national plans and strategies for children and young people's health and wellbeing include a commitment to preventing unintentional injuries among them. In particular, the plans and strategies should aim to prevent unintentional injuries among the most vulnerable groups to reduce inequalities in health. This commitment should be part of a wider objective to keep children and young people safe.
- Ensure plans and strategies include the following to prevent unintentional injuries among children and young people:

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- support for cross-departmental and cross-agency working to achieve national and local commitments
  - support for local partnerships, including those with the voluntary sector, and a requirement that they work together to ensure children and young people can lead healthy, active lives
  - information about how partners will collaborate on injury prevention
  - support for data collection on the incidence, severity, type, cause and place of injury (for example, see recommendations 7–8 on injury surveillance)
  - support for monitoring the outcomes of injury prevention initiatives
  - support for the development of workforce capacity in this area, including the provision of suitably trained staff and opportunities for initial and ongoing multi-agency training and development (see recommendations 4–6).
- Local authorities should report to the local strategic partnership on progress made to meet the commitments set out in the plans and strategies. This should include details on the experiences of children, young people, their parents and carers.

### **Recommendation 2 Coordinating unintentional injury prevention activities**

#### ***Who should take action?***

- Local authority children's services and their partnerships, in consultation with local safeguarding children boards.
- Local highway authorities and their road safety partnerships.
- Other local authority services that may have a remit for preventing unintentional injuries such as education, environmental health and trading standards.

***What action should they take?***

- Ensure there is a child and young person injury prevention coordinator.  
The aim is to help achieve the commitments set out in local plans and strategies for children and young people's health and wellbeing. The coordinator could be someone in the local authority, an NHS organisation or another local partner organisation (such as the fire and rescue service or a housing association). Alternatively, the coordinating role could be jointly funded by several local partners.
- Ensure the coordinator:
  - works with local partnerships that include organisations involved with children, young people, their parents and carers
  - develops a 2 to 3-year injury prevention strategy with these partners which is integrated into all relevant local plans and strategies for children and young people's health and wellbeing
  - networks at regional and national level with other child and young person injury prevention coordinators
  - raises local awareness about the need for prevention activities. This includes sitting on the local safeguarding children board. It also includes acting as a local source of information and advice on prevention
  - monitors progress made on the injury prevention commitments set out in local plans and strategies for children and young people's health and wellbeing. They should report progress to the director of children's services.
- Ensure the coordinator understands the range of preventive measures available and is trained – and has the skills – to carry out the above activities. Provide them with both informal and formal learning opportunities. (The former could include using peer support and 'cascade learning' within placements. The latter could include the acquisition of qualifications at different stages of a formal career pathway.)

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- Ensure specialist learning and training is monitored and evaluated to see what effect it has on the coordinator's performance. Revise approaches that are found to be ineffective.

### **Recommendation 3 Identifying and responding to attendances at emergency departments and minor injuries units**

#### ***Who should take action?***

- Staff in emergency departments and minor injuries units, including triage nurses.
- Local child and young person injury prevention coordinators.
- Local safeguarding children boards.
- Liaison health visitors.
- Staff offering out-of-hours health services for children and young people (for example, in walk-in centres).

#### ***What action should they take?***

Ensure health visitors, school nurses and GPs are aware of families which might benefit from injury prevention advice and a home safety assessment. Do this by using local protocols to alert them when a child or young person repeatedly needs treatment for unintentional injuries at an emergency department or minor injuries unit. Do the same when a single attendance raises concerns.

### ***Recommendations for workforce training and capacity building***

#### **Context**

Professional standards are needed to set out the knowledge and skills (or 'competencies') for a range of injury prevention roles within and outside the NHS. Funding to develop these standards and curricula – and the provision of accessible training – is also required.

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***Whose health will benefit?***

Children and young people aged under 15, their parents and carers (some of the recommendations may also benefit the wider population).

**Recommendation 4 Developing professional standards for injury prevention**

***Who should take action?***

- Faculty of Public Health.
- Children's Workforce Development Council (CWDC).
- Royal colleges and professional bodies (for example, the Nursing and Midwifery Council).
- Health Professions Council.
- Sector skills councils.
- Relevant voluntary sector organisations.
- Universities.

***What action should they take?***

- Develop professional standards for unintentional injury prevention. These should take into account the different roles and responsibilities of professionals working within and outside the NHS. They should also take practitioners' views into account.
- Ensure all relevant organisations incorporate these standards into their professional skills development programmes.

**Recommendation 5 Funding the development of injury prevention standards and curricula**

***Who should take action?***

- Department of Health.

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- Department for Education.

***What action could be taken?***

Encourage funding for educational establishments and organisations to help them develop standards for competencies in – and courses and modules on – the prevention of unintentional injuries among children and young people. The establishments and organisations involved could include: the Faculty of Public Health, the Children’s Workforce Development Council, universities, royal colleges and organisations in the voluntary sector.

**Recommendation 6 Providing the wider childcare workforce with access to injury prevention training**

***Who should take action?***

- Local authority children’s services and their partnerships, including local safeguarding children boards.
- Local injury prevention coordinators.
- Commissioners, managers and practitioners working in health, social care and education services.
- Relevant organisations in the voluntary and private sector.

***What action should they take?***

- Provide access to appropriate education and training in how to prevent unintentional injuries for everyone who works with (or cares for and supports) children, young people and their families. Prioritise those who work directly with children, young people and their families.
- Ensure the education and training:
  - supports the wider child health remit (for example, the promotion of children and young people’s development)
  - helps develop an understanding of the importance of preventing unintentional injuries and their consequences and the preventive measures available.

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- Ensure specialist education and training is monitored and evaluated to see what effect it has on practitioner performance. Revise approaches that are found to be ineffective.

## ***Recommendations for injury surveillance***

### **Context**

Injury 'surveillance'<sup>2</sup> is needed to monitor unintentional injuries among children and young people locally, regionally and nationwide. The data gathered could be used as the basis to plan preventive initiatives. Such initiatives may need to take a particular type of injury into account locally or regionally – even though it may not be a major problem nationwide.

### ***Whose health will benefit?***

Children and young people aged under 15, their parents and carers (some of the recommendations may also benefit the wider population).

### **Recommendation 7 Establishing a national injuries surveillance resource**

#### ***Who should take action?***

- Association of Public Health Observatories.
- College of Emergency Medicine.
- Government departments including Department of Health and its Public Health Service, Department for Education, Department for Transport, Department for Communities and Local Government and the Home Office.
- Office for National Statistics.
- The Information Centre for Health and Social Care.

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<sup>2</sup> Surveillance of any health issue is defined as the: 'systematic, ongoing collection, collation and analysis of health-related information that is communicated in a timely manner to all who need to know which health problems require action in their community'. Last JM (2007) A dictionary of public health. Oxford: Oxford University Press.

***What action could be taken?***

- Establish a national injuries surveillance resource covering all populations and injuries to help monitor injury risks and the effects of preventive measures. It could be provided by a network of agencies but there should be a single point of contact or a coordinating agency. The resource could be part of the proposed 'Information revolution'<sup>3</sup>.
- Ensure the resource includes local, regional and national injury datasets and data sources. For example, it should include data gathered from: emergency departments, walk-in centres, minor injury units, Reporting of Injuries, Diseases and Dangerous Occurrences Regulations (RIDDOR), Hospital Episode Statistics (HES), coroner reports, ambulance call-out reports, fire and rescue service reports, reported road casualty statistics (STATS19) and the child death review process (as data become available).
- The coordinating agency or network of agencies should:
  - ensure datasets can be integrated to provide accurate, anonymised and aggregated statistics on local injuries and their causes
  - collate, manage, analyse and interpret injury-related data (using experienced injury researchers to advise on analysis and interpretation)
  - provide a secure and reliable information system for recording and interrogating data (compliant with the Data Protection Act 1998)
  - monitor the quality of data submissions and datasets
  - report relevant findings to support the monitoring of emergency department service contracts
  - provide government departments with advice on developing standardised injury data collection and coding across datasets

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<sup>3</sup> See Department of Health (2010) An information revolution: a consultation on proposals. London: Department of Health. Available from [www.dh.gov.uk/en/Consultations/Liveconsultations/DH\\_120080](http://www.dh.gov.uk/en/Consultations/Liveconsultations/DH_120080)

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(for example, for data collected by fire and rescue services and emergency departments)

- identify and develop new data sources for example, data collected by non-governmental agencies and the voluntary sector
  - disseminate information locally and regionally and provide a readily available, searchable database for authorised users
  - support the European Commission’s work on injury surveillance.
- Ensure national guidance on data-sharing protocols<sup>4</sup> is adopted by all agencies that collect local injury data. This includes: ambulance services, child death overview panels, coroners, emergency departments, fire and rescue services, the Health and Safety Executive and police forces.
  - Promote the development of an enhanced national emergency department dataset based on submissions from a representative sample of hospitals. Ensure it includes additional data on events and activities leading to an injury<sup>5</sup>.

### **Recommendation 8 Gathering high quality injury data from emergency departments**

#### ***Who should take action?***

Commissioners of health services.

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<sup>4</sup> See the NHS Information Governance Toolkit website at [www.igt.connectingforhealth.nhs.uk](http://www.igt.connectingforhealth.nhs.uk) and Department of Health (2007) NHS information governance guidance on legal and professional obligations. London: Department of Health. Available from [www.dh.gov.uk/en/Publicationsandstatistics](http://www.dh.gov.uk/en/Publicationsandstatistics)

Also see HM Government (2008) Information sharing: guidance for practitioners and managers. London: Department for Children, Schools and Families and Communities and Local Government. Available from <http://publications.education.gov.uk>

<sup>5</sup> Such a dataset is being piloted by the Department of Health and the College of Emergency Medicine. It contains similar detail to that previously collected for the Home and Leisure Accident Surveillance Systems [HASS/LASS] and the results are presented as anonymised, aggregated data.

***What action should they take?***

- Ensure all hospital trusts are made aware of the data collection requirements for the universal and mandatory A&E (minimum) commissioning dataset.
- Ensure commissioning contracts for emergency departments (including minor injury units and walk-in centres) stipulate that all required data are collected – and to the required A&E (minimum) commissioning dataset standard. Contracts should also stipulate which data collection and submission methods should be used.
- Ensure contracts include financial penalties for failure to meet the requirements of the A&E (minimum) commissioning dataset.
- Ensure all hospital trust injury data are submitted to the NHS Information Centre for Health and Social Care.

***Recommendations for home safety***

**Definitions and context**

For the purposes of this guidance, ‘home’ refers to the home, garden and boundaries of a property. A home safety assessment is the process of systematically identifying potential hazards in these areas, evaluating the risks and providing information or advice on how to reduce them. Other terms commonly used to describe the same process include ‘home risk assessment’ and ‘home safety check’. It may be carried out by a trained assessor or by parents, carers and other householders using an appropriate checklist<sup>6</sup>.

Permanent home safety equipment is defined here as any device that needs to be fitted and cannot easily be modified or removed by the householder. Examples include smoke and carbon monoxide alarms, thermostatic mixing valves and window restrictors.

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<sup>6</sup> Home safety assessment tools are available from: The Royal Society for the Prevention of Accidents ([www.rospa.com](http://www.rospa.com)) and SafeHome ([www.safehome.org.uk](http://www.safehome.org.uk)).

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Ensuring permanent safety equipment is fitted in homes and the provision of home safety assessments should help prevent unintentional injuries among all under-15s. However, groups facing a higher than average risk of an unintentional injury need to be prioritised. Particularly vulnerable groups in relation to home safety are children aged under 5 and those living in temporary, rented and social housing with families on a low income (for other vulnerable groups see definitions on page 6).

(See also recommendations made in NICE public health guidance 30 'Preventing unintentional injuries among under-15s in the home'.)

***Whose health will benefit?***

Children and young people aged under 15 and their families (some of the recommendations may also benefit the wider population).

**Recommendation 9 Installation and maintenance of permanent safety equipment in social and rented dwellings**

***Who should take action?***

Local authorities.

***What action should they take?***

- Consider developing local agreements with housing associations and landlords to ensure permanent home safety equipment is installed and maintained in all social and rented dwellings. Priority should be given to accommodation where children aged under 5 are living. Use the Housing Health and Safety Rating System (HHSRS)<sup>7</sup>. Permanent safety equipment includes:
  - hard-wired or 10-year, battery-operated smoke alarms
  - thermostatic mixer valves for baths
  - window restrictors
  - carbon monoxide alarms.

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<sup>7</sup> The HHSRS is a method for assessing potential risks to the health and safety of occupants in residential properties. It is used by local authorities to assess social and rented dwellings, and to require landlords to carry out remedial action to address any serious hazards (for more details, see <http://communities.gov.uk/documents/housing/pdf/142631.pdf>).

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- Publicise any local agreements to install and maintain permanent safety equipment. Provide information about these agreements to the following groups and evaluate their awareness:
  - those responsible for social and rented dwellings, such as landlords and social housing providers
  - practitioners with an injury prevention remit or who have an opportunity to help prevent injuries among children and young people
  - practitioners with a role in assessing health and safety in residential properties
  - residents in rented and social dwellings.

**Recommendation 10 Incorporating guidance on home safety assessments within relevant national initiatives**

***Who should take action?***

- Department of Health.
- Department for Education.

***What action could be taken?***

Ensure national initiatives to improve child health include guidance on delivering home safety assessments and providing safety education to families with a child under 5 or with other children who may be particularly vulnerable to unintentional injuries. (Relevant national initiatives include the Healthy Child Programme<sup>8</sup>.)

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<sup>8</sup> The three Healthy Child Programme core documents are available at [www.dh.gov.uk/en/Healthcare/Children/Maternity/index.htm](http://www.dh.gov.uk/en/Healthcare/Children/Maternity/index.htm)

**Recommendation 11 Incorporating home safety assessments and equipment provision within local plans and strategies for children and young people's health and wellbeing**

***Who should take action?***

Local authority children's services and their partnerships, in consultation with local safeguarding children boards.

***What action should they take?***

- Ensure home safety assessments and education are incorporated in local plans and strategies for children and young people's health and wellbeing. They should be aimed at families with a child under 5 or with other children who may be particularly vulnerable to unintentional injuries.
- Commission local agencies to offer home safety assessments and, where appropriate, supply and install suitable, high quality home safety equipment (whenever possible, adhering to British or equivalent European standards.)<sup>9</sup>
- Ensure commissions specify that the assessment and the supply and installation of equipment needs to be tailored to meet the household's specific needs and circumstances. Factors to take into account include the developmental age of the children and whether or not a child or family member has a disability. Cultural and religious beliefs, whether or not English is the first language and levels of literacy within the household also need to be noted. In addition, the level of control people have over their home environment<sup>10</sup> and the household's perception of, and degree of trust in, authority should be taken into account<sup>9</sup>.

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<sup>9</sup> This is an edited extract from a recommendation that appears in NICE public health guidance 30 (2010) 'Preventing unintentional injuries among under-15s in the home'. In that guidance, home safety equipment includes door guards and cupboard locks, safety gates and barriers, smoke and carbon monoxide alarms, thermostatic mixing valves and window restrictors.

<sup>10</sup> Many people may not have the authority to agree to an installation, for example, tenants of social and private landlords and those who are unable to make household or financial decisions.

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- Ensure commissions specify that the assessment needs to help parents, carers, older children and young people identify and address the potential risks from water in the home (this includes baths and garden ponds<sup>11</sup>).
- Ensure commissions specify that education, advice and information is needed both during a home safety assessment and during the supply and installation of home safety equipment. This should emphasise the need to be vigilant about home safety and explain how to maintain and check home safety equipment. It should also explain why safety equipment has been installed – and the danger of disabling it. In addition, commissions should specify that useful links and contacts need to be given to householders as part of this provision, in case of a home safety problem<sup>12</sup>.

### ***Recommendations for outdoor play and leisure***

#### **Context**

Children and young people learn, develop and mature when playing and taking part in activities that challenge them. Their participation in regular physical activity and outdoor play and leisure is important for their growth, development and general health and wellbeing – in both the short and long term. (For example, it can help reduce the risk of obesity and cardiovascular disease.)

The type of hazards encountered during outdoor activities will vary for different age groups and according to where they take place. Likewise, the factors to be considered when addressing and balancing risks and benefits will also differ. For example, where children and young people go off-road cycling will vary, depending on their age and experience: younger children are most likely to cycle in gardens and parks, while older children and young people may get involved in activities such as BMX racing or mountain biking.

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<sup>11</sup> For example, advice from the National Water Safety Forum and leaflets and booklets from the Child Accident Prevention Trust (CAPT) ([www.capt.org.uk](http://www.capt.org.uk)).

<sup>12</sup> This is an edited extract from a recommendation that appears in NICE public health guidance 30 (2010) 'Preventing unintentional injuries among under-15s in the home'. In that guidance, home safety equipment includes door guards and cupboard locks, safety gates and barriers, smoke and carbon monoxide alarms, thermostatic mixing valves and window restrictors.

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These recommendations cover preventive activities at the strategic level (for example, the need to monitor compliance with safety standards). This does not imply that they are the only actions that could be taken to prevent unintentional injuries outdoors and during play and leisure.

***Whose health will benefit?***

Children and young people aged under 15, their parents and carers (some of the recommendations may also benefit the wider population).

**Recommendation 12 Developing policies for public outdoor play and leisure**

***Who should take action?***

- Head teachers and school governors.
- Local strategic partnerships.
- Play and leisure providers in the public, private, voluntary and community sector. This includes representatives of the leisure industry, parish and town councils and early years services. It also includes private providers of outdoor play facilities that are open to the public, such as pubs and hotels.
- Public, private, voluntary and community sector managers and decision makers responsible for play and leisure policies.

***What action should they take?***

- Ensure a policy is in place which:
  - takes a balanced approach to assessing the risks and benefits of play and leisure environments and activities (see NICE public health guidance 17 'Promoting physical activity for children and young people')
  - counters excessive risk aversion
  - promotes the need for children and young people to develop skills to assess and manage risks, according to their age and ability

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- takes into account children and young people’s preferences about the types of outdoor play and leisure activities they want to participate in
  - is inclusive, taking into account the needs of all children and young people, including those from lower socioeconomic groups, those from minority ethnic groups with specific cultural requirements and those who have a disability.
- Use local information and data on environments, equipment and behaviour that pose a risk of serious unintentional injury to help plan prevention initiatives. Include information and data provided by practitioners, play and leisure providers, children, young people, their parents and carers.
- Focus prevention initiatives on groups most at risk of an unintentional injury. Initiatives could include modification of equipment and the environment, and the provision of information, education and safety equipment.
- Take into account the principles of British and European standards covering equipment and the environment (where they exist) as part of a risk-benefit assessment of outdoor play and leisure environments. This includes standards covering playgrounds, fairgrounds, toy safety and swimming pools, as well as those for inspection and maintenance.
- Where equipment and the environment cannot be modified, provide information, advice and education about risk management and the use of any appropriate safety equipment.

### **Recommendation 13 Providing education and advice on water safety**

#### ***Who should take action?***

- Injury prevention coordinators and health practitioners (for example, health visitors and school nurses).
- Lifeguards.

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- Outdoor activity and holiday centre managers.
- Schools.
- Swimming instructors.
- Swimming pool managers.

### ***What action should they take?***

- Know which groups of children and young people are at high risk of drowning – and when that risk is increased. For example, children with certain medical conditions may be more at risk and boys are more likely to be at risk than girls. In addition, older children are more likely to drown outside the home.
- Provide children, young people, their parents and carers with information<sup>13</sup> and education on water safety in play and leisure environments. This should be appropriate to the age, developmental stage and experience of the child or young person and meet the household's particular needs and circumstances. It should be readily available in a suitable format. It should also be factually correct and consistent.
- Ensure the information and education:
  - helps parents, carers, older children and young people identify and address the potential risks from water in the wider environment (this includes lakes, canals, rivers and on the coast)
  - stresses the importance of proper supervision, particularly for younger children, and describes in detail what this means.
- Provide timely information and advice, for example, during the holiday season and for dealing with conditions such as heatwaves and extreme cold. (Ice might form on ponds, rivers and lakes during extreme cold

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<sup>13</sup> For example, advice from the National Water Safety Forum, the RoSPA water safety code for children ([www.rospa.com](http://www.rospa.com)) and the Child Accident Prevention Trust leaflets and booklets ([www.capt.org.uk](http://www.capt.org.uk)).

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spells.) This could include clearly displayed information at appropriate locations.

- Encourage children, young people, their parents and carers to become competent swimmers and to learn other water safety skills (for example, so that they know how to effect a rescue).
- Ensure swimming lessons include general and specific water safety information. Specific information could include detail on the meaning of different coastal warning flags. It should also raise children and young people's awareness of how difficult it is to assess and manage the hazards posed by water in a range of different outdoor environments.

### **Recommendation 14 Water safety advice for leisure providers**

#### ***Who should take action?***

Leisure facility providers such as leisure centre and pool operators, boat hire companies, hoteliers, holiday companies and tour operators.

#### ***What action should they take?***

- Use risk analysis and management procedures to identify where there may be a risk of drowning. Minimise that risk, wherever possible, without discouraging swimming.
- Provide water safety information in a range of languages and formats. This could include clearly displayed information at appropriate locations. Ensure provision is timely. For example, ensure it is provided during the holiday season and in extreme weather conditions such as heatwaves and extreme cold. (Ice might form on ponds, rivers and lakes during extreme cold spells.)

### **Recommendation 15 Advising on off-road cycle safety**

#### ***Who should take action?***

- NHS and other health organisations.

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- Local authorities.
- Schools and school travel advisers.
- Injury prevention coordinators.
- Police.
- Retail outlets and cycle hire centres.

### ***What action should they take?***

- NHS, other health organisations and local authorities should use local information campaigns and ongoing education to encourage cycle training and promote the use of correctly fitted and fastened cycle helmets while cycling off the road. Campaigns could focus on younger children learning to cycle, for example in gardens and parks, and on older children and young people who go BMX racing or mountain biking. The campaigns could suggest that adults set an example by wearing helmets whenever they cycle.
- Schools, school travel advisers, injury prevention coordinators, local authorities and the police should ensure travel plans cover off-road routes. They should also encourage children and young people to undertake cycle training and to wear cycle helmets.
- Retailers should provide point-of-sale advice on the correct fitting of cycle helmets (this includes online sales). They should also consider setting up a certified retailer scheme like that run by the British Equestrian Trade Association<sup>14</sup>.
- Cycle hire centres should advise about the advantages of children and young people wearing correctly fitted and fastened cycle helmets. They should provide them if requested.

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<sup>14</sup> Visit [www.beta-uk.org/](http://www.beta-uk.org/)

## **Recommendation 16 Conducting local firework safety campaigns**

### ***Who should take action?***

- Environmental health officers.
- Fire service.
- Primary care and hospital trusts.
- Injury prevention coordinators.
- Local authority children's services and their partnerships.
- Police.
- Schools.
- Trading standards officers.

### ***What action should they take?***

- Use emergency department surveillance data to inform local firework injury prevention campaigns.
- Conduct local firework injury prevention campaigns<sup>15</sup> during the lead up to all celebrations and festivals where fireworks are used. This includes Bonfire Night, New Year and Diwali. Use the principles of behaviour change<sup>16</sup> to inform campaign planning, delivery and evaluation. Evaluate the effectiveness of campaigns.
- Trading standards officers should ensure adults are given the firework safety code when they buy fireworks, as a condition of the licence to store and sell fireworks. The code should be available in a range of languages and formats.

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<sup>15</sup> See Department for Business Innovation and Skills (2010) Firework safety: be media wise! [online] Available from <http://bis.ecgroup.net/Publications/ConsumerIssues/ProductSafetyFireworks.aspx>

<sup>16</sup> See NICE public health guidance 6 Behaviour change (2007). Available from [www.nice.org.uk/guidance/PH6](http://www.nice.org.uk/guidance/PH6)

## ***Recommendations for road safety***

### **Context**

These recommendations propose that those responsible for road safety should focus on the needs of local children and young people. This includes helping drivers to reduce their speed in areas where children and young people are present. They should be read in conjunction with recommendations made in NICE public health guidance 31 'Preventing unintentional road injuries among under-15s: road design'.

### ***Whose health will benefit?***

Children and young people aged under 15, their parents and carers (some of the recommendations may also benefit the wider population).

## **Recommendation 17 Maintaining and managing road safety partnerships**

### ***Who should take action?***

Local highway authorities.

### ***What action should they take?***

- Maintain the existing road safety partnership (or establish one where none exists) to help plan, coordinate and manage road safety activities. It should include the road safety team, fire and rescue services, the injury prevention coordinator, the NHS, police, local education authorities and local safeguarding children boards.
- Ensure the health sector plays an active role in the partnership (see NICE public health guidance 31 'Preventing unintentional injuries among under-15s: road design').
- Nominate a member of staff who is responsible for road safety partnership work.
- Work with the partners listed in the first action point above, children and young people's services, relevant voluntary sector organisations and others

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to identify and manage road environments that pose a high risk to children and young people.

- Secure funding streams for local road safety initiatives and support these partnerships by promoting good practice.
- Ensure the road safety partnership develops policies, strategies and programmes which are based on an understanding of how children and young people use (and wish to use) their environment. This involves consulting parents and carers about their children's road use and safety. It also involves gaining local information from other professional partnerships, children's councils and neighbourhood forums.
- Ensure the road safety partnership draws on all available information (such as demographics and risk-exposure data) to plan road injury reduction programmes, as part of the local community safety strategy. The programmes should take into account how injury risk differs according to age and road type. They should also reflect the increased risks facing children and young people from disadvantaged areas and communities.
- Evaluate programmes using a range of outcome measures, including road injury data. A variety of evaluation methods should be used, such as controlled trials, 'stepped-wedge' trials (sequential rollout to all participants) and process evaluations.

### **Recommendation 18 Carrying out local child road safety reviews and consultations**

#### ***Who should take action?***

Local highway authorities and their road safety partnerships (see recommendation 17).

#### ***What action should they take?***

- Ensure local child road safety reviews are carried out at least every 3 years. To ensure consistency within regions, ensure they include the following:

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- all road injury data collected by road safety partners
  - data which can identify whether some social groups experience more injuries than others (inequalities data)
  - risks to local children and young people
  - information about all types of journey, not just those to and from school.
- Ensure local children and young people, particularly those from disadvantaged communities, are consulted about their road use and their opinions about the risks involved. In addition, consult parents and carers about their children's road use and safety.
  - Use the reviews and consultation findings to inform local initiatives to reduce road injuries among children and young people.
  - Evaluate the impact of initiatives on local policies (including health inequalities policy), practice and injuries.

### **Recommendation 19 Aligning local child road safety policies**

#### ***Who should take action?***

- Local authority children's services and their partnerships, in consultation with local safeguarding children boards.
- Local highway authorities and their road safety partnerships.

#### ***What action should they take?***

- Review local partners' priorities and strategies to ensure they are coordinated.
- Involve the local injury prevention coordinator in the development of the child road safety review and liaise with them about consultations with the local community.
- Ensure consistency between the road injury prevention priorities and strategies within child safety policies, local plans and strategies for children

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and young people's health and wellbeing, the road safety strategy and local authority community safety plans. (This includes ensuring consistency at all levels within non-unitary organisations.)

### **Recommendation 20 Promoting and enforcing speed reduction**

#### ***Who should take action?***

- Local highway authorities and their road safety partnerships.

#### ***What action should they take?***

- Use signage, road design and engineering measures to reduce vehicle speeds on roads where children and young people are likely to be, such as those passing playgrounds or schools (see NICE public health guidance 31 'Preventing unintentional injuries among under-15s: road design').
- Use signage to warn drivers of the likely presence of children and young people in areas that they frequent (such as schools and playgrounds) and the need to comply with safety measures.
- Use national and local education and media campaigns to promote the benefits of safety initiatives – including 20 mph speed limits and zones – in areas frequented by children and young people.
- Evaluate compliance with speed limits.
- Where evaluation shows that compliance is poor, work with the police to improve it through education and, where necessary, enforcement activities.

### **Recommendation 21 Involving the police in driver education initiatives and activities to reduce traffic speed**

#### ***Who should take action?***

- Her Majesty's Inspectorate of Constabulary.
- The Home Office.

***What action could be taken?***

- Include road safety and enforcement in Her Majesty's Inspectorate of Constabulary (HMIC) evaluation tools (report cards) to ensure both are considered when police priorities are set.
- Encourage the police to work with other local partners (see recommendations 17–20) on road safety issues in relation to children and young people aged under 15. In particular, encourage the police to contribute to driver education initiatives on the need for compliance with speed limits.
- Encourage the police to work with the existing road safety partnership (or with relevant agencies if there is no such partnership) to determine areas where vehicle speeds need to be reduced. Draw upon the knowledge of safer neighbourhood teams and the demographic and consultation data within community safety plans to understand local children and young people's use of the road environment.

## **2 Public health need and practice**

### ***Background***

Unintentional injury is a leading cause of death among children and young people aged 1–14 (Audit Commission and Healthcare Commission 2007). In England and Wales in 2008, 208 children and young people aged 0–14 died from such injuries. Around 44% of those deaths were transport-related (Office for National Statistics 2009).

In 2009, 65 under-15s were killed and 18,307 were injured on the roads in Great Britain, 2267 of them seriously. Of those killed or seriously injured, 1507 (65%) were pedestrians. Cyclists (381) and car passengers (380) made up the bulk of the remainder (that is, cyclists and car passengers each accounted for around 16% of the total) (Department for Transport 2010).

A substantial number of children also die from unintentional injuries at home or in leisure environments. For example, in England and Wales in 2008, 55 children died from choking, suffocation or strangling, 17 from drowning and 10 from smoke, fire and flames (Office for National Statistics 2009).

Death rates from unintentional injuries are falling (Edwards et al. 2006). However, in England alone, around 100,000 children and young people aged under 15 were admitted to hospital in 2009/10 as a result of such injuries (The Information Centre for Health and Social Care 2010).

In 2002, nearly 900,000 children and young people in the UK aged under 15 attended hospital following an unintentional injury in the home (Department of Trade and Industry 2002). Over a million children and young people aged under 15 were taken to hospital following an unintentional injury outside their home; 360,000 were injured while at school, 180,000 while playing sport and 33,000 while in a public playground (Department of Trade and Industry 2002).

Unintentional injury can affect a child or young person's social and emotional wellbeing. For example, those who survive a serious unintentional injury can experience severe pain and may need lengthy treatment (including numerous

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stays in hospital). They could also be permanently disabled or disfigured (Eurosafte 2006).

Minor unintentional injuries are part of growing up and help children and young people to learn their boundaries and manage risks for themselves. The need to balance encouraging them to explore and develop, and managing the risks to prevent serious injury, was recognised in a government review published in 2009 (Department for Children, Schools and Families 2009a).

### ***Risk factors***

Children and young people from lower socioeconomic groups are more likely to be affected by unintentional injuries (Towner et al. 2005). Children whose parents have never worked (or are long-term unemployed) are more likely to die from an unintentional injury compared to children whose parents are in higher managerial or professional occupations. The social gradient is particularly steep in relation to deaths caused by household fires, cycling and walking (Edwards et al. 2006).

A range of other factors also influence the likelihood of an unintentional injury. These include: personal attributes (such as age, physical ability and medical conditions), behaviour (such as risk-taking), the environment (for example, living in a house that opens onto a road or living in poor quality housing) (Audit Commission and Healthcare Commission 2007; Towner et al. 2005; Millward et al. 2003).

While combinations of these factors create the conditions in which unintentional injuries occur, many are preventable (Audit Commission and Healthcare Commission 2007).

### ***Preventing unintentional injuries***

Approaches to preventing unintentional injuries range from education (providing information and training) to product or environmental modifications and enforcement (regulations and legislation). The World Health Organization argues that legislation is a powerful tool that has helped reduce unintentional

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injuries on the road, in the home and in leisure environments (Peden et al. 2008).

It has been suggested that the most effective strategies use a combination of approaches (British Medical Association 2001). Experience from European countries with the best safety records show that positive leadership, together with concerted efforts to provide safer physical and social environments, can reduce unintentional injuries (Sethi et al. 2008).

### **Costs**

There are six million visits to A&E departments in the UK each year as a result of unintentional injuries. Around two million involve children and young people – at a cost to the NHS of approximately £146 million a year (Audit Commission and Healthcare Commission 2007). Further treatment costs are significant. For example, £250,000 may be needed to treat one severe bath water scald (Child Accident Prevention Trust 2008).

The cost of unintentional injury is also borne by other public sector services such as transport, the police, fire and rescue services and the criminal justice system (Mallender et al. 2002). The long-term health needs and indirect 'human costs' for the family (Mallender et al. 2002) could include the repercussions of enforced absence from school, including the need for children and young people to be supervised. This, in turn, could involve family and carers having to take time off from work (Audit Commission and Healthcare Commission 2007).

### ***Current policy and practice***

The 'Children's plan' carried forward the 'Every child matters' objective to keep children and young people safe (Department for Children, Schools and Families 2003; 2007; 2008a; 2009b.) The 'Staying safe: action plan' set out a cross-government strategy (Department for Children, Schools and Families 2008b).

Strategic partnerships and local safeguarding children boards have a duty to promote children and young people's safety as part of the action plan.

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In addition, the national indicator set for local authorities and local authority partnerships addressed the prevention of injuries among children and young people<sup>17</sup> (Department for Communities and Local Government 2007).

Other relevant government initiatives have included:

- the housing health and safety rating system (Office of the Deputy Prime Minister 2006)
- the child road safety strategy (Department for Transport 2007)
- responsibility for safety in workforce settings (Health and Safety Executive 2009).

The Treasury has also set out guidance on the value of preventing unintended fatalities and injuries (HM Treasury 2003).

Local area agreements have provided an opportunity for local authorities, in partnership with the NHS and other organisations, to focus on preventing unintentional injuries. Practice is variable, however some areas are adopting an innovative approach.

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<sup>17</sup> National indicators NI70: Hospital admissions caused by unintentional and deliberate injuries to children and young people and NI48: Children killed or seriously injured in road traffic accidents.

### **3 Considerations**

The Programme Development Group (PDG) took account of a number of factors and issues when developing the recommendations.

#### ***General***

- 3.1 This is one of three pieces of NICE guidance on how to prevent unintentional injuries among children and young people aged under 15. Several PDG members (including the chair) were co-opted as members of NICE's Public Health Interventions Advisory Committee (PHIAC) to advise on two pieces of guidance developed using NICE's public health intervention process. These covered unintentional injuries on the road and in the home and were published at the same time as this guidance. (For details see section 7.)
- 3.2 The extent of participation in any activity (that is, someone's exposure to risk of injury) correlates with injury rates. However, multiple risk factors may also correlate with the number and type of injuries in any given situation. Therefore, the determinants of injury (such as exposure and context) need to be understood. Details such as the nature and duration of the activity – and number of people undertaking it – could be used to supplement injury data and develop this understanding. Care is required when interpreting children and young people's self-reported data, as they may be reluctant to report where they have been and what they have done. In addition, younger children do not have a well-developed sense of time, making their exposure difficult to estimate.
- 3.3 Many areas of the home, road and play and leisure environments have hazards which increase the risk of injury. Supervision, safety equipment and education are important to help keep children and young people safe. Equipment has to be maintained to be effective.
- 3.4 Some families may not be receptive to advice on how to prevent unintentional injury because of 'fatigue' from repeated contact about

other health problems, such as cardiovascular disease (CVD) and cancer.

- 3.5 Injury prevention interventions can be passive or active. Passive interventions do not require an active change in behaviour (as an example, they could include the presence of fire resistant materials or air bags in cars).
- 3.6 Children are not just small adults. Their physical, psychological and behavioural characteristics make them more vulnerable to injuries than adults. For example, the small stature of young children increases their risk on the road, where they may be masked by parked cars. Similarly, a given amount of a poisonous substance is likely to be more toxic for a child who has a much smaller body mass than an adult (Peden et al. 2008).
- 3.7 Targeting specific groups may help reduce health inequalities. However, it will have a limited impact on overall injury rates. Targeted and universal approaches are required to reduce both the overall injury rate and health inequalities.
- 3.8 Preventing serious injury is important. For every death, there are many more serious injuries which result in hospitalisation and most of these are avoidable.

### ***Legislation, regulation and enforcement***

- 3.9 Caution should be exercised when considering evidence from other countries as different contexts often apply. For example, the drafting and introduction of UK legislation is often preceded by extensive consultation, which is not the case in all countries.
- 3.10 Legislation can cover everyone, not just children and young people. For example, home safety regulation that requires gas inspections generally benefits everyone in the home.
- 3.11 Numerous mechanisms are available to encourage compliance with

safety procedures (for example, enforcement, insurance, health and safety legislation and the use of penalty points for drivers). However, enforcement activities may be more acceptable in public spaces such as on roads than in private spaces such as the home.

3.12 Levels of compliance with legislation and regulation are dependent upon having a structured and comprehensive inspection process. For example, Australian studies on swimming pools have found that compliance with safety regulations is more likely if: there is a register of households with swimming pools, there is an annual inspection programme, and penalties are enforced for any breach of the regulations.

### ***Injury surveillance***

3.13 In 2002, the Home Accident Surveillance System (HASS) and the Leisure Accident Surveillance System (LASS) both came to an end. Since then, there has been a lack of standardised data collection of unintentional injuries in the home and in leisure settings. 'An information revolution' (DH 2010) proposes that health data should be collected from multiple sources and disseminated by a single agency. It highlights the central role that high quality information can play in improving outcomes and narrowing inequalities.

3.14 The Programme Development Group (PDG) acknowledged a number of factors that may confound injury data. This includes the following:

- Road traffic collisions not reported to the police are unlikely to be included in the STATS19 statistics. The actual number of road injuries is thought to be more than three times that in 'Reported road casualties in Great Britain 2009' (Department for Transport 2010).
- The number of injuries and fatalities may fall because an initiative intended to reduce injuries could also lead to a reduction in the number of people taking part in a given activity.

Likewise, an initiative to promote physical activity might lead to an increase in the number of injuries due to an increase in the number of participants.

- A dataset may not include all injuries which occur in localities that lack emergency departments (for example, rural areas where the distance from hospital is a barrier to attendance).

3.15 Sharing injury data between organisations (for example, the ambulance service, hospitals and the police) is necessary to overcome gaps in knowledge and inconsistencies in recording such injuries. However, the PDG was aware that organisations can find it difficult to share data. Barriers can be institutional or relate to the confidentiality and security of personal information.

3.16 Injury rates may vary according to the time of year. For example, children and young people's activity patterns may be different during the school term compared with the school holidays.

3.17 Shortcomings in injury data collection may result from a lack of awareness of the benefits of monitoring and surveillance. For example, emergency department staff may consider data collection an unnecessary burden. Greater awareness of the use and benefits of this information may lead to a greater commitment to data collection among these staff.

### ***Home safety***

3.18 The recommendations on home safety assessments and the supply and installation of home safety equipment are aimed at preventing unintentional injuries among all children and young people aged under 15. However, they prioritise households where children and young people are at greater than average risk of unintentional injuries due to one or more factors. For example, those aged under 5 and those living in social, rented or temporary accommodation with families on a low income are particularly vulnerable.

- 3.19 Extensive evidence suggests that socioeconomic disadvantage increases the risk of childhood injury. Forty-four per cent of lone parents with dependent children are social tenants (Communities and Local Government 2009). Social tenants and often, tenants of private landlords have less income than owner-occupiers.
- 3.20 Given the extent of unintentional injuries among children under 5 in the home – and the increased risk of injuries among disadvantaged families, the PDG has made specific recommendations for these groups.
- 3.21 The physical environment may have an influence on the rate and type of injuries that occur. For example, high-rise flats often have potential hazards such as balconies, communal stairs and unsecured windows (Child Accident Prevention Trust 2010). In such situations, tenants may not have permission or the resources to make alterations.
- 3.22 The evidence available focused on items that need to be fitted to use at home, such as smoke alarms, window restrictors and thermostatic mixing valves (although there was no evidence about some equipment, including carbon monoxide alarms). It does not cover safety devices that do not need installing (for example, those already fitted onto lighters).
- 3.23 When interpreting the evidence it should be noted that:
- housing type and density differs between non-UK and UK studies, so research findings from other countries should be applied with caution
  - an economic downturn can lead to a decline in the rate of construction of new buildings, so the potential to reduce unintentional injuries through recommendations for new-build homes is also lessened
  - in studies reporting the effectiveness of thermostatic mixing

valves:

- some may have included scalds from other hot liquids such as drinks (that is, not just scalds caused by bath or shower water)
- surveillance of their use may itself have contributed to their reported effectiveness, as the people being observed may have been inclined to take more care
- some suggested that the occupant could reset the device, but it was not reported how often this occurred; the ability to override them could mean the degree of effectiveness demonstrated in studies could change
- installation of thermostatic mixing valves may change other safety practices, such as reducing the number of times parents check the water temperature before bathing a child. However, this will not increase the risk of scalds if the device is functional and set to an appropriate temperature.

3.24 It became compulsory to fit thermostatic mixing valves to bath taps in all new homes in England and Wales from 6 April 2010. Thermostatic mixing valves are usually fitted near to the tap, so that most stored hot water remains at a high enough temperature to kill the bacterium that causes Legionnaires' disease.

3.25 With the exception of window restrictors, all age groups would benefit from home safety equipment (smoke and carbon monoxide alarms and thermostatic mixing valves). Window restrictors should benefit children aged over 2 as they are capable of climbing and falling from an unguarded window. The age at which window restrictors become ineffective is not clear. However, it is likely that most children can overcome child-resistant mechanisms by the time they reach the age of 5. Key-operated locks (where the key is inaccessible to a child) tend to be effective for longer. It is important to note the need to open windows in a fire emergency.

- 3.26 As more smoke alarms are installed than any other type of safety equipment, there is less potential to use them to reduce health inequalities.
- 3.27 Gaining access to people's homes needs sensitive consideration. The PDG acknowledge that the home is a private space and access will involve discussion and negotiation with residents.

### ***Outdoor play and leisure***

- 3.28 The PDG agreed with the Royal Society for the Prevention of Accidents (RoSPA) that children should be "as safe as necessary, not as safe as possible". Children and young people learn, develop and mature when playing and taking part in activities that challenge them and that sometimes involves taking risks. Play and leisure activities help children and young people to learn about the complex relationship between themselves and the world in which they live. Exposure to a degree of challenge may be beneficial during these activities. However, a distinction should be made between manageable and unmanageable situations:
- Some challenging situations are manageable and help a child to develop physically and emotionally. For example, undertaking a familiar activity without adult supervision is likely to be manageable.
  - In other situations, the risks may be too difficult for a child to assess and manage, or are unlikely to lead to any obvious benefits. They may even expose the child to danger. Examples would be swimming in a disused quarry, or playing on poorly designed and maintained equipment in a play area.
- 3.29 Parents' and carers' and their child's perception of safety can influence the amount of time children and young people spend on outdoor play and leisure activities. These perceptions can be influenced by the media. In addition, fear of litigation can influence

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the nature and extent of activities provided by educational and play organisations.

- 3.30 It is difficult to regulate activities such as canyoning and wild swimming and the settings in which they take place. It is also difficult to regulate inland waterways not currently used for supervised recreation.
- 3.31 The classification of a leisure activity is not always clear. For example, when a child is cycling it's not always clear whether cycling is a leisure activity or is being used as a form of transport. Similarly, it's not always clear whether a child or young person is playing in water or swimming, playing with a ball or participating in sport.
- 3.32 Media campaigns to promote injury prevention activities may increase health inequalities, as uptake is likely to vary among different groups. For example, disadvantaged families are less likely to respond to health information than families who are more advantaged.
- 3.33 The PDG acknowledged that dividing on- and off-road cycling into two separate activities was an artificial division, particularly in relation to older children. The scope of the guidance did not include equipment used to prevent against unintentional injuries on the road. However, it did cover outdoor play and leisure, so the use of helmets in parks, on bridleways and in other environments was reviewed. (Children often fall off their bikes, especially when they are learning to ride a bicycle and when they are learning BMX and mountain bike skills, so there is a need to protect them from unnecessary injury.)
- 3.34 Recommendations have been made about promoting cycle helmets but not about making them compulsory. The PDG was aware of the debate on cycle helmets.

3.35 The PDG considered a number of issues in relation to the use of helmets including the:

- need to purchase one when buying a bike
- need to include helmets as part of rent-a-bike schemes
- need to introduce them into the informal secondhand bike market (which includes passing bikes down and between families)
- design and fitting
- fact that some adults are poor role models when it comes to helmet wearing
- need to wear them for other activities such as skateboarding and some high-risk water sports
- potential for injury if they are worn when using equipment not designed for their use (such as playground equipment) or are used in other inappropriate ways.

3.36 Current playground standards aiming to reduce the incidence of traumatic brain injury are important, as it is a potentially serious injury. Protection against broken arms and legs is also needed, as these are common and can result in disability and deformity.

3.37 Interventions that have been shown to reduce firework injuries in other countries may not, necessarily, have the same effect in England. For example, in countries with drier weather conditions, the danger from unexploded fireworks is greater and so measures to clear them up are likely to have a greater impact. Enforcing firework regulations in England is also different because they are only on sale here for short periods of time. For example, retailers and display organisers are granted temporary licences to sell them in advance of Bonfire Night and other festivals.

### ***Road safety***

3.38 The PDG noted several demographic differences in child pedestrian injuries. For example, more boys than girls are injured. In addition,

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children aged 10 and under are more likely to be injured on minor urban roads, while those aged 11 and over are more likely to be harmed on main roads. It also noted that children living in deprived areas (and those from some minority ethnic groups) are more likely than the general population to make journeys alone or only supervised by an older sibling.

- 3.39 Most studies on traffic speed are conducted on the main road network. Fewer are conducted on minor residential roads where children and young people are more likely to be present.
- 3.40 The PDG acknowledged that injury prevention activities should take into account the importance of public transport and sustainable travel modes, such as walking and cycling, which have known health benefits. Reducing traffic speed should help to encourage physically active modes of travel.
- 3.41 Most studies focus on the evaluation of legislation which is enforced by imposing sanctions on those who break the rules. This is because data on the effect of such interventions are more readily available than for less punitive measures. Although the latter may be equally effective, they have not been recommended due to a lack of evidence.
- 3.42 Transport studies tend to use a 'before-and-after' design. They estimate the relationship between two or more factors using data collected at a number of specified intervals over a period of time. They require an adequate control to demonstrate causality.
- 3.43 Children and young people cannot influence the speed or general manner in which vehicles are driven or whether seatbelts are available. In addition, they often have little or no choice about their mode of travel.
- 3.44 The evidence review on the effectiveness of safety cameras which informed evidence statement 3.1 only included systematic reviews.

One of these has since been updated (Wilson et al. 2010) and evidence statement 3.1 has been amended in appendix C of this guidance to include its findings. The systematic reviews in the original report to NICE did not capture evidence from relevant primary sources that report differential effectiveness. However, the PDG noted that the National Safety Camera Programme (Gains et al. 2005) reports differential effects on children, for urban and rural environments and for fixed and mobile cameras. The cost effectiveness review which informed evidence statement 6.5 used primary sources, including the National Safety Camera Programme.

### ***Limitations of the evidence***

- 3.45 The recommendations reflect the evidence identified and the PDG's discussions. The absence of recommendations on any particular measures to prevent unintentional injuries is a result of a lack of evidence that met the inclusion criteria for the evidence reviews. It should not be taken as a judgement on whether or not any such measures are effective and cost effective.
- 3.46 Repeated testing of outcome measures can affect the validity of an evaluation. For example, a variable that is extreme when first measured will tend to be closer to the mean when measured later. If this statistical effect is not taken into account, caution will need to be exercised when interpreting any conclusions about an intervention's effectiveness.
- 3.47 Many injury prevention programmes do not lend themselves to the use of 'blinding' (whereby participants are not aware which research study group they have been allocated to). However, it is often possible to have evaluators who are 'blind' to group allocation.
- 3.48 Although interventions often include adults, children and young people, the outcomes for children and young people are not reported separately.

3.49 Studies of the effectiveness of strategic approaches to injury prevention (such as legislation and enforcement) did not provide a strong evidence base for economic modelling. As a result, most of the assumptions or variables used in the modelling are based on very limited or estimated data and the conclusions should be treated with caution.

## 4 Implementation

NICE guidance can help:

- NHS organisations, social care and children's services meet the requirements of the DH's revised 'Operating framework for 2010/11'.
- National and local organisations improve quality and health outcomes and reduce health inequalities.
- Local authorities fulfill their remit to promote the wellbeing of communities.
- Local NHS organisations, local authorities and other local public sector partners benefit from any identified cost savings, disinvestment opportunities or opportunities for re-directing resources.
- Provide a focus for multi-sector partnerships for health and wellbeing, such as local strategic partnerships.

NICE has developed tools to help organisations put this guidance into practice. For details, see our website at [www.nice.org.uk/guidance/PH29](http://www.nice.org.uk/guidance/PH29)

## 5 Recommendations for research

The Programme Development Group (PDG) recommends that the following research questions should be addressed to fill the most important gaps in the evidence in relation to this and the other two pieces of NICE guidance that were published in November 2010. These form part of a 'suite' of NICE advice on preventing unintentional injuries:

- Preventing unintentional injuries among under-15s in the home. NICE public health guidance 30.
- Preventing unintentional injuries among under-15s: road design. NICE public health guidance 31.

The PDG notes that 'effectiveness' in these contexts relates not only to the size of the effect, but also to cost effectiveness and duration of effect. It also takes into account any harmful or negative side effects.

Studies of effectiveness and cost effectiveness should investigate and report on the differential effectiveness for children and young people who are more at risk of unintentional injury. They should collect data on the factors listed in research recommendation 1 and also on the:

- short and long-term effects (physical, psychological and financial) on children, young people, their parents and carers (for example, time away from school for children and work for parents and extent of residual disability)
- long-term quality-of-life and public sector cost impacts of non-fatal injuries.

### ***Epidemiology and behaviour***

1. What are the recent epidemiological and aetiological trends in types, causes and impact of unintentional injuries among under-15s? Use data collected by the recommended surveillance systems (see recommendations 7–8) to identify findings for specific groups and activities in the home, on the road and during outdoor play and leisure. Factors to consider are:

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- cause, nature, location and factors involved in the incident and type, site and severity of injury
  - numbers of children and young people involved, time spent undertaking the activity and the extent of supervision
  - demographic details with data presented for subgroups of children and young people (for example, grouped according to age, gender, ethnicity, socioeconomic status, disability and place of residence).
2. How do parents, carers, children and young people perceive risk in the home, on the road and during outdoor play and leisure – and how do they perceive the risks and benefits inherent in specific activities? How do these perceptions vary between populations and subgroups based on gender, age, race/ethnicity, socioeconomic status, disability, or other characteristics of the participants or their environment? How strongly associated is children and young people’s exposure to risk with their behaviour, the causes, incidence and severity of unintentional injury?
  3. Does exposure to risk and the opportunity to experience risk-taking have a beneficial effect on children and young people? Does the effect vary according to age and other socio-demographic factors or according to the quality and nature of the risk?
  4. To what extent – and how – does children and young people’s behaviour alter when their environment is made safer? How does children and young people’s (and their parents’ and carers’) perception of risk impact on the amount and type of physical activity undertaken by children and young people?

### ***Effectiveness studies***

5. What is the differential effectiveness and cost effectiveness of legislation, regulation, policies and standards to prevent unintentional injuries in the UK? Studies should consider the process and cost of development, promotion, implementation and enforcement. They should

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collect baseline data prior to any change and for a meaningful length of time afterwards on:

- home safety assessments, thermostatic mixing valves (TMVs), smoke alarms (hard-wired and 10-year battery-operated), carbon monoxide alarms and window restrictors
  - water safety initiatives, sports rules and regulations, cycling skills training for children and young people and cycle helmet use
  - road safety knowledge and skills, road user behaviour, different types of road signage, differential effectiveness of speed enforcement (networked, targeted or mixed approaches) in rural and residential areas.
6. How effective and cost effective are social marketing and mass-media campaigns in support of legislation, regulation, policy and standards to reduce unintentional injuries among children and young people in the home, on the road and during outdoor play and leisure?
  7. What is the impact of injury prevention training and development initiatives on those involved in preventing injuries in terms of their level of knowledge and degree of competency? What impact do such initiatives have on the scope and quality of preventive activities? Examples of training and developmental initiatives include: training people to undertake home risk assessments and educating representatives of community partnerships and private landlords about the Housing Health and Safety Rating System (HHSRS).
  8. What prevents and what encourages children and young people to comply with legislation, regulation and standards to prevent unintentional injuries in the home, on the road and during outdoor play and leisure?
  9. What prevents and what encourages delivery and implementation of policies/strategies to prevent unintentional injuries among children and young people in the home, on the road and during outdoor play and

leisure? (These are outlined, for example, in white and green papers and policy briefings.)

### ***Interventions: all settings***

10. How do the following factors influence the effectiveness and cost effectiveness of interventions to prevent unintentional injury in the home, on the road and during outdoor play and leisure:
- method of delivery (for example, session format, learning materials)
  - content
  - frequency and duration of follow-ups
  - deliverer
  - parental/carer involvement
  - demographic characteristics of the participants (for example, gender, age, race/ethnicity, socioeconomic status and disability)?
11. What are the most effective and cost-effective ways of providing under-15s, their parents and carers with information, advice and education about safety and hazards in the home, on the road and in outdoor play and leisure environments?
12. To what extent do interventions to prevent unintentional injuries among under-15s in the home, on the road and during outdoor play and leisure impact on the household's safety knowledge and behaviour? What role do family members and carers (fathers, mothers, grandparents and extended family units) play in preventing unintentional injuries?

### ***Interventions: road safety***

13. To what extent do interventions to reduce speed and prevent unintentional injuries on the road among under-15s influence people's attitude, knowledge and behaviour towards road safety (both drivers and the general public)? How can interventions be designed to maximise this effect?

14. How can systematic methods, combining health and engineering research, be developed to:
- assess the effectiveness and cost effectiveness of injury prevention interventions outside the health sector (for example, within education and employment)
  - identify wider public health outcomes as a standard part of research into engineering measures to reduce speed and unintentional injuries (including co-benefits and unintended consequences, such as the impact on physical activity and air quality)?

### ***Interventions: home safety***

15. How effective and cost effective are home safety interventions (including combined interventions) in preventing unintentional injuries among different population groups? For example, how effective are they in relation to participants' gender, age, race/ethnicity, socioeconomic status, disability, or other characteristics? To what extent does effectiveness and cost effectiveness vary according to the type of injury being prevented?
16. To what extent does the provision of safety information, advice and education during a home safety intervention contribute to its effectiveness and cost effectiveness? (For example, does it reduce the number – and severity – of unintentional injuries in the home among under-15s?)
17. How effective and cost effective are the different methods used to deliver safety information, advice and education? To what extent do effectiveness and cost effectiveness vary with different types of injury prevention activity?

### ***Interventions: play and leisure***

18. To what extent does exposure to risk during outdoor play and leisure affect children and young people's risk-management skills in the setting

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where the hazard was encountered, other designated play areas, non-designated play areas and non-play settings?

More detail on the gaps in the evidence identified during development of this guidance is provided in appendix D.

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## **6 Updating the recommendations**

This guidance will be reviewed 3 years after publication to determine whether all or part of it should be updated. Information on the progress of any update will be posted at [www.nice.org.uk/guidance/PH29](http://www.nice.org.uk/guidance/PH29)

## **7 Related NICE guidance**

Preventing unintentional injuries among under-15s: road design. NICE public health guidance 31 (2010). Available from [www.nice.org.uk/guidance/PH31](http://www.nice.org.uk/guidance/PH31)

Preventing unintentional injuries among under-15s in the home. NICE public health guidance 30 (2010). Available from [www.nice.org.uk/guidance/PH30](http://www.nice.org.uk/guidance/PH30)

When to suspect child maltreatment. NICE clinical guideline 89 (2009). Available from [www.nice.org.uk/guidance/CG89](http://www.nice.org.uk/guidance/CG89)

Community engagement. NICE public health guidance 9 (2008). Available from [www.nice.org.uk/guidance/PH9](http://www.nice.org.uk/guidance/PH9)

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## **Appendix A Membership of the Programme Development Group (PDG), co-optees, expert witnesses, the NICE project team and external contractors**

### ***Programme Development Group***

PDG membership is multidisciplinary, comprising policy advisers, commissioners, managers, public health practitioners, clinicians, the police, fire and rescue, representatives of the public, academics, and technical experts as follows.

**Amy Aeron-Thomas** Community Member

**Caroline Bradbury-Jones** Post Doctoral Research Fellow, School of Nursing and Midwifery, University of Dundee

**Andy Chick** formerly Avoidable Injury Manager, Nottingham Fire and Rescue

**Carolyn Cripps** Community Member

**Davina Hartley** Children's Accident Prevention Coordinator, Bradford Safeguarding Children Board

**Mike Hayes** Head of Research and Development, Child Accident Prevention Trust

**Nicola Houghton** Children and Young People's Commissioning Manager, NHS Cornwall and Isles of Scilly

**Lisa Irving** Public Health Nurse for Accident Prevention, Northumberland Care Trust

**Shelley Mason** Community Member

**Jennifer McWhirter** Risk Education Adviser, Royal Society for the Prevention of Accidents (RoSPA)

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**Jeremy Moore** Chief Superintendent, Police Liaison Office, Department for Transport Road Safety Division

**Julie Mytton** Consultant in Child Public Health, NHS Bristol and Senior Research Fellow, University of the West of England, Bristol

**Ceri Phillips** Professor of Health Economics, Swansea University

**Amanda Roberts** Road Safety Team Leader, Telford and Wrekin Council

**Ralph Saunders** Public Health Business Manager, Bradford and Airedale Primary Care Trust

**Tanja Stocks** Team Leader, Team Leader, Hitchin 0–19 Team – School Nursing & Health Visiting. Hertfordshire Community Health Services

**Robert Taylor** Station Manager, Community Fire Safety, Merseyside Fire and Rescue

**Elizabeth Towner** Professor of Child Health, Centre for Child and Adolescent Health, University of the West of England, Bristol

**Julia Verne** Deputy Regional Director of Public Health and Director of the South West Public Health Observatory

**Heather Ward (Chair)** Honorary Senior Research Fellow at the Centre for Transport Studies, University College London

**Expert co-optees to the PDG:**

**Denise Kendrick** Joint Head of Division and Professor of Primary Care Research, University of Nottingham

**Expert testimony to PDG:**

The authors of the expert papers listed at the end of this appendix provided expert testimony to the PDG.

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***NICE project team***

**Michael Kelly** CPHE Director

**Simon Ellis** Associate Director

**Louise Millward** Joint Lead Analyst

**Hilary Chatterton** Joint Lead Analyst

**Hugo Crombie** Analyst

**James Jagroo** Analyst

**Peter Shearn** Analyst

**Lesley Owen** Technical Adviser (Health Economics)

**Sue Jelley** Senior Editor

**Alison Lake** Editor

***External contractors***

**Evidence reviews**

Review 1: 'Current practice and innovative approaches to prevent childhood unintentional injuries: An overview and synthesis of international comparative analyses and surveys of injury prevention policies, legislation and other activities'. This review was carried out by the Personal Social Services Research Unit (PSSRU), London School of Economics & Political Science, with Peninsula Technology Assessment Group (PenTAG), Peninsula Medical School, Exeter. The principal authors were: A-La Park, David McDaid, Zulian Liu, Tiffany Moxham and Rob Anderson.

Review 2: 'A systematic review of risk factors for unintentional injuries among children and young people aged under 15 years' was carried out by PenTAG. The principal authors were: Mark Pearson, Paul Hewson, Tiffany Moxham and Rod Taylor.

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Review 3: 'An overview and synthesis of evidence relating to strategies and frameworks for planning, implementing, enforcing or promoting activities to prevent unintentional injury to children and young people on the road: legislation, regulation, standards and related strategies focusing on the design and modification of highways, roads or streets'. This review was carried out by PenTAG. The principal authors were: Rob Anderson and Tiffany Moxham.

Review 4: 'Strategic and regulatory frameworks for guiding, enforcing or promoting activities to prevent unintentional injury in children and young people in the home environment' was carried out by PenTAG. The principal authors were: Ruth Garside and Tiffany Moxham.

Review 5: 'Strategies, policies and regulatory or legal frameworks and/or mass media campaigns to prevent unintentional injury to children during play and leisure in the external environment'. This review was carried out by West Midlands Health Technology Assessment Collaboration, University of Birmingham. The principal authors were: Khalid Ashfaq, Ismail Yahaya, Olalekan Uthman, Sue Bayliss, Anne Fry-Smith and Rob Anderson.

Review 6: 'Systematic review to provide an overview of published economic evaluations of relevant legislation, regulations, standards, and/or their enforcement and promotion by mass media' was carried out by PenTAG. The principal authors were: Rob Anderson and Tiffany Moxham.

### **Cost effectiveness**

'Economic modelling of legislation/regulations and related national strategies to promote the wider use of: 20mph zones in residential areas, and thermostatic mixing valves (TMVs) in social housing for families' was carried out by PenTAG. The principal authors were: Rob Anderson and Tiffany Moxham.

### **Fieldwork**

The fieldwork 'Strategies to prevent unintentional injury among under-15s' was carried out by Word of Mouth.

### ***Expert testimony***

Expert testimony 1: 'Child road safety' (including 'Child casualties in road accidents: 2007. Road accidents factsheet number 5 [2009]. [Department for Transport]) was presented by Andrew Colski, Head of Vulnerable Road Users Branch, Road User Safety Division, Department for Transport.

Expert testimony 2: 'Preventing unintentional injuries among under-15s' was presented by Anthony Smythe, Policy Adviser, Child Safety Unit, Department for Children, Schools and Families.

Expert testimony 3: 'Inequities in child injuries' was presented by Denise Kendrick, Professor of Primary Care Research, Division of Primary Care, University of Nottingham.

Expert testimony 4: 'Legislating for health' was presented by Ray Pawson, Professor of Social Policy, School of Sociology and Social Policy, Leeds University.

Expert testimony 5: 'Cycle helmets – epidemiology and effectiveness' was presented by Mike Hayes, PDG Member and Heather Ward, PDG Chair.

Expert testimony 6: 'Monitoring and surveillance issues – A&E pilot' was presented by Wendi Slater, Senior Analyst, Public Health Information Team, South West Regional Public Health Observatory.

## **Appendix B Summary of the methods used to develop this guidance**

### ***Introduction***

The reviews, primary research, commissioned reports and economic modelling report include full details of the methods used to select the evidence (including search strategies), assess its quality and summarise it.

The minutes of the Programme Development Group (PDG) meetings provide further detail about the Group's interpretation of the evidence and development of the recommendations.

All supporting documents are listed in appendix E and are available at [www.nice.org.uk/guidance/PH29](http://www.nice.org.uk/guidance/PH29)

### ***Guidance development***

The stages involved in developing public health programme guidance are outlined in the box below.

1. Draft scope released for consultation
2. Stakeholder meeting about the draft scope
3. Stakeholder comments used to revise the scope
4. Final scope and responses to comments published on website
5. Evidence reviews and economic analysis undertaken
6. Evidence released for consultation
7. Comments and any additional material submitted by stakeholders
8. Review of any additional material submitted by stakeholders (screened against inclusion criteria used in reviews)
9. Evidence and economic analysis submitted to PDG
10. PDG produces draft recommendations
11. Draft guidance released for consultation and for field testing
12. PDG amends recommendations
13. Final guidance published on website
14. Responses to comments published on website

## ***Key questions***

The key questions were established as part of the scope. They formed the starting point for the reviews of evidence and were used by the PDG to help develop the recommendations. The overarching questions were:

1. Which approaches are effective and cost effective in preventing or reducing unintentional injuries among children and young people aged under 15?
2. Which approaches are effective and cost effective in preventing or reducing unintentional injuries among children and young people aged under 15 from disadvantaged families?
3. Which types of approach effectively (and cost effectively) support and help develop the skills of professionals and others involved in childhood injury prevention?
4. What type of monitoring systems are effective and cost effective in recording and detecting changes in the type, incidence and prevalence of unintentional injuries among children and young people aged under 15?
5. What are the barriers and facilitators to implementing initiatives to prevent unintentional injuries among children and young people aged under 15?

These questions were made more specific for each review (see reviews for further details).

## ***Reviewing the evidence***

### **Effectiveness reviews**

Five reviews of effectiveness were conducted. One compared international practice (review 1), one covered quantitative correlates (review 2) and three were reviews of effectiveness (reviews 3–5).

### **Identifying the evidence**

The following databases were searched for the effectiveness reviews (from 1990 to January 2009 [review 1], 1990 to February 2009 [review 2], 1990 to April 2009 [review 3], 1990 to June 2009 [review 4] and 1990 to July 2009 [review 5]):

- Cochrane Database of Systematic Reviews
- Database of Abstracts of Reviews of Effectiveness (DARE)
- EPPI Centre databases (Bibliomap, DoPHER, TRoPHI)
- Health Management Information Consortium (HMIC)
- Kings Fund catalogue and Department of Health data
- Health Technology Assessment (HTA)
- MEDLINE
- NHS Economic Evaluation Database (NHS EED)
- SafetyLit
- Social Science Citation Index
- The Campbell Collaboration

In addition, the following databases were searched, as appropriate, for individual reviews (from 1990 to January 2009 [review 1], 1990 to February 2009 [review 2], 1990 to April 2009 [review 3], 1990 to June 2009 [review 4] and 1990 to July 2009 [review 5]):

- Assia
- Cinahl
- Cochrane Injuries Group Register
- EconLit
- Embase
- ISI Web of Science
- International Transport Research Documentation (ITRD)<sup>1</sup>
- PsycINFO
- SPORTDiscus
- Transport Research Information Service (via the TRIS)
- Transport Research Laboratory

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Website searches included:

- Child accident prevention trust (CAPT) ([www.capt.org.uk](http://www.capt.org.uk))
- Eurosafe ([www.eurosaef.eu.com](http://www.eurosaef.eu.com))
- Injury Observatory for Britain and Ireland (IOBI) ([www.injuryobservatory.net.uk](http://www.injuryobservatory.net.uk) )
- Institute of Highway Incorporated Engineers ([www.ihie.org.uk](http://www.ihie.org.uk))
- Institute of Home Safety ([www.instituteofhomesafety.co.uk](http://www.instituteofhomesafety.co.uk) )
- Royal Society for the Prevention of Accidents (RoSPA) ([www.rosipa.org.uk](http://www.rosipa.org.uk))
- Royal Town Planning Institute ([www.rtpi.org.uk](http://www.rtpi.org.uk))
- Safe routes to school (<http://saferoutesinfo.org>)
- South West Public Health Observatory ([www.swpho.nhs.uk](http://www.swpho.nhs.uk))
- UK Department for Transport (DfT) ([www.dft.gov.uk](http://www.dft.gov.uk))

For review 1, searches were primarily conducted by snowball sampling of key organisations and individual contacts, supplemented by Internet searches, including the web pages of international and national organisations. For reviews 2–5, electronic searches of relevant bibliographic databases and selected websites were supplemented by communication with experts and organisations involved in the relevant research or policy areas.

Further details of the databases, search terms and strategies are included in the review reports.

### **Selection criteria**

Studies were included in reviews 1 and 2 if they were published between 1997 and 2009 in English. In addition:

- Review 1 included studies which reported separately for children in at least two countries (or 'country-sized' regions).
- Review 2 focused on observational research and intervention studies which quantified the association or relationship between unintentional injuries among children and two or more variables such as exposure to a particular environment or socioeconomic status.

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Studies were included in reviews 3–5 if they:

- were published between January 1990 and February 2009 in English
- used comparative studies to compare groups of people, places or activities

More detailed inclusion and exclusion criteria for individual reviews can be found at [www.nice.org.uk/guidance/PH29](http://www.nice.org.uk/guidance/PH29)

### **Quality appraisal**

For reviews 1 and 3 to 5, the included papers were assessed for methodological rigour and quality using the NICE methodology checklist, as set out in the NICE technical manual 'Methods for the development of NICE public health guidance' (see appendix E). Each study was graded (++, +, –) to reflect the risk of potential bias arising from its design and execution.

### ***Study quality***

- ++ All or most of the checklist criteria have been fulfilled, where they have not been fulfilled the conclusions are very unlikely to alter.
- + Some of the checklist criteria have been fulfilled. Those criteria that have not been fulfilled or not adequately described are unlikely to alter the conclusions.
- Few or no checklist criteria have been fulfilled. The conclusions of the study are likely or very likely to alter.

The main reasons for studies being assessed as (–) were:

- lack of control or comparison group
- lack of baseline equivalence/data
- inadequately described interventions
- inadequate analysis and reporting of data.

For reviews 2 to 5, the studies were also assessed for their applicability to the area under investigation and the evidence statements were graded as follows:

- Directly applicable.

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- Partially applicable.
- Not applicable.

### **Summarising the evidence and making evidence statements**

The review data was summarised in evidence tables (see full reviews).

The findings from the reviews were synthesised and used as the basis for a number of evidence statements relating to each key question. The evidence statements were prepared by the public health collaborating centres (see appendix A). The statements reflect their judgement of the strength (quality, quantity and consistency) of evidence and its applicability to the populations and settings in the scope.

### ***Cost effectiveness***

There was a review of economic evaluations and an economic modelling exercise.

#### **Review of economic evaluations**

This sought to identify and review economic evaluations published since 1990 of relevant legislation, regulation or other strategic approaches of interest. The search was undertaken in two stages.

- First the RefMan database was searched for 'hits' from the five reviews and two related pieces of NICE public health guidance (preventing unintentional injuries to children on the road and in the home).
- Second, a new search was carried out in EconLit and NHSEED (NHS Economic Evaluation Database) using text words and thesaurus terms covering all types of injuries among children.

#### **Economic modelling**

An economic model was constructed to explore the cost-effectiveness of jurisdiction-wide strategic approaches to prevent unintentional injuries among children aged under 15 years. The exploratory analyses were conducted from a UK public sector perspective.

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Two different strategic policies were explored: to reduce unintentional injuries among children and adults on the road and at home. The former focused on legislation or regulations, supported by other activities, introducing mandatory 20mph zones in high casualty residential areas. The latter focused on legislation or regulations, supported by other activities, to promote installation of thermostatic mixer valves in family social housing where children are aged less than 5 years.

Due to a paucity of data, the model explored which factors might be important in determining cost effectiveness.

The results are reported in: 'Economic modelling of legislation/regulations and related national strategies to promote the wider use of: 20 mph zones in residential areas, and TMVs in social housing for families'. It is available at: [www.nice.org.uk/guidance/PH29](http://www.nice.org.uk/guidance/PH29)

### ***Fieldwork***

Fieldwork was carried out to evaluate how relevant and useful NICE's recommendations would be for practitioners and how feasible it would be to put them into practice.

It was conducted with practitioners and commissioners who are involved in preventing unintentional injuries among children and young people. This included those working in primary care trusts (PCTs), local safeguarding children boards and accident prevention and road safety teams. It also included health visitors, nurses and policy leads, within the NHS, those working in the fire and police services, leisure and play services, and environmental health and housing.

The fieldwork comprised:

- Seven discussion groups conducted in Lancashire, South East London and Sussex by Word of Mouth research consultancy.
- Forty-nine face-to-face and telephone interviews conducted by Word of Mouth with staff from Lancashire, South East London and Sussex. In

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In addition to the groups listed above, participants also included: an assistant school head, a cycle events organiser and a cycle retailer, further education college curriculum managers, healthy schools managers, paediatricians, staff from children's centres, a safer communities manager, a school governor, social workers and voluntary sector children's services managers.

The main issues arising are set out in appendix C under 'Fieldwork findings'. The full fieldwork report 'Strategies to prevent unintentional injury among under-15s' is available at [www.nice.org.uk/guidance/PH29](http://www.nice.org.uk/guidance/PH29)

### ***How the PDG formulated the recommendations***

At its meetings between February 2009 and July 2010, the Programme Development Group (PDG) considered the evidence, expert testimony and cost effectiveness to determine:

- whether there was sufficient evidence (in terms of strength and applicability) to form a judgement
- where relevant, whether (on balance) the evidence demonstrates that the intervention or programme can be effective or is inconclusive
- where relevant, the typical size of effect (where there is one)
- whether the evidence is applicable to the target groups and context covered by the guidance.

The PDG developed draft recommendations through informal consensus, based on the following criteria:

- Strength (type, quality, quantity and consistency) of the evidence.
- The applicability of the evidence to the populations and settings referred to in the scope.
- Effect size and potential impact on the target population's health.
- Impact on inequalities in health between different groups of the population.
- Equality and diversity legislation.

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- Ethical issues and social value judgements.
- Cost effectiveness (for the NHS and other public sector organisations).
- Balance of harms and benefits.
- Ease of implementation and any anticipated changes in practice.

Where possible, recommendations were linked to an evidence statement(s) (see appendix C for details). Where a recommendation was inferred from the evidence, this was indicated by the reference 'IDE' (inference derived from the evidence).

The draft guidance, including the recommendations, was released for consultation in May 2010. At its meeting in July 2010, the PDG amended the guidance in light of comments from stakeholders and experts and the fieldwork. The guidance was signed off by the NICE Guidance Executive in October 2010.

## **Appendix C The evidence**

This appendix lists the evidence statements from six reviews provided by the public health collaborating centre (see appendix A) and links them to the relevant recommendations. (See appendix B for the key to quality assessments.) The evidence statements are presented here without references – these can be found in the full reviews (see appendix E for details).

The appendix also lists six expert testimonies and their links to the recommendations and sets out a brief summary of findings from the economic analysis.

The six evidence reviews are:

- Review 1: 'Current practice and innovative approaches to prevent childhood unintentional injuries: An overview and synthesis of international comparative analyses and surveys of injury prevention policies, legislation and other activities'.
- Review 2: 'A systematic review of risk factors for unintentional injuries among children and young people aged under 15 years'.
- Review 3: 'An overview and synthesis of evidence relating to strategies and frameworks for planning, implementing, enforcing or promoting activities to prevent unintentional injury to children and young people on the road: legislation, regulation, standards and related strategies focusing on the design and modification of highways, roads or streets'.
- Review 4: 'Strategic and regulatory frameworks for guiding, enforcing or promoting activities to prevent unintentional injury in children and young people in the home environment'.
- Review 5: 'Strategies, policies and regulatory or legal frameworks and/or mass media campaigns to prevent unintentional injury to children during play and leisure in the external environment'.

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- Review 6: 'Preventing unintentional injuries in children. Systematic review to provide an overview of published economic evaluations of relevant legislation, regulations, standards, and/or their enforcement and promotion by mass media'.

**Evidence statement number 1.1** indicates that the linked statement is numbered 1 in review 1. **Evidence statement number 2.1** indicates that the linked statement is numbered 1 in review 2. **Evidence statement number 3.1** indicates that the linked statement is numbered 1 in review 3. **ET1** indicates that expert testimony number 1 is linked to the recommendation.

The reviews, expert testimony and economic analysis are available at [www.nice.org.uk/guidance/PH29](http://www.nice.org.uk/guidance/PH29)

Where a recommendation is not directly taken from the evidence statements, but is inferred from the evidence, this is indicated by **IDE** (inference derived from the evidence).

**Recommendation 1:** evidence statements 2.2, 2.3, 2.4, 2.5, 2.7, 2.8, 2.9, 2.10, 2.11, 2.12, 2.14a, 2.14b, 2.14c, 2.14f, 2.14i; ET3

**Recommendation 2:** IDE

**Recommendation 3:** IDE

**Recommendation 4:** IDE

**Recommendation 5:** IDE

**Recommendation 6:** IDE

**Recommendation 7:** evidence statement 1.1; ET6

**Recommendation 8:** evidence statement 1.1; ET6

**Recommendation 9:** evidence statements 4.1, 4.2, 4.3, 4.4; ET3

**Recommendation 10:** evidence statements 2.2, 2.3, 2.4, 2.5, 2.7, 2.8, 2.9, 2.10, 2.11, 2.12, 2.14a, 2.14b, 2.14c, 2.14f, 2.14i, 4.1, 4.2, 4.3; ET3

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**Recommendation 11:** evidence statements 2.2, 2.3, 2.4, 2.5, 2.7, 2.8, 2.9, 2.10, 2.11, 2.12, 2.14a, 2.14b, 2.14c, 2.14f, 2.14i, 4.1, 4.2, 4.3; ET3

**Recommendation 12:** evidence statement 5.4

**Recommendation 13:** IDE

**Recommendation 14:** IDE

**Recommendation 15:** evidence statement 5.3; IDE

**Recommendation 16:** evidence statement 5.5

**Recommendation 17:** IDE

**Recommendation 18:** evidence statements 1.3, 2.14f; ET1

**Recommendation 19:** evidence statement 2.14f; ET1

**Recommendation 20:** IDE

**Recommendation 21:** evidence statements 1.2, 3.1, 3.2, 6.5

### ***Evidence statements***

Please note that the wording of some evidence statements has been altered slightly from those in the review team's report to make them more consistent with each other and NICE's standard house style.

#### **Evidence statement 1.1**

Three (+) international comparison studies show a lack of comparable in-depth information on exposure to risk to help in analysis of the relative impact of different legislative, regulatory, enforcement and compliance interventions.

#### **Evidence Statement 1.2**

Two ecological studies (one [+] and one [-]) in high income countries were unable to associate variations in child morbidity and/or mortality rates across countries to differences in legislation, regulation, enforcement and compliance for road environment modification, road design, home and leisure environment

interventions. However for road safety, evidence from two ecological studies (one [+] and one [++]), suggest a weak trend towards better performing countries (in terms of child fatality rates) having more road environment modification and road design measures in place.

### **Evidence Statement 1.3**

Evidence from one (++) ecological study indicates that differences in the distribution of exposure in the road environment for child pedestrians (in particular relating to time spent near busy main roads) can explain some of the difference in severe child injury and fatality rates between Great Britain and two other northern European countries, France and the Netherlands.

### **Evidence statement 2.2**

There is evidence from 10 studies (one UK). There is evidence of a strong association (that is, relative risk equivalent of greater than 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 (that is, relative risk equivalent of greater than 1.0 to less than 2.0) of injuries with lower parental income, employment status, educational status, socioeconomic 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 2.3**

There is evidence from 18 studies (five UK). There is evidence of a strong association between the lowest socioeconomic 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 second socioeconomic quintile, social deprivation, non-professional parental occupation, rural and mixed-urban environments, being male, or behavioural disorders. There was no

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statistical evidence of injuries being associated with social fragmentation or ethnicity (for cyclists).

#### **Evidence statement 2.4**

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

#### **Evidence statement 2.5**

There is evidence from six studies (one UK) on burns and fire in the home of a strong association between child's age (less than 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 2.7**

There is evidence from three studies (none UK) on falls in the home of a strong association between greater child's age (older than 1 year) and injuries. There is evidence of weak to moderate association of injuries with: being male, 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 living in cities were not statistically associated with falls.

**Evidence statement 2.8**

There is evidence from seven studies (one UK) on poisoning in the home of a strong association between child's age (from 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, living in the country, 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 2.9**

There is evidence from two studies (one UK) on undefined causes of injury in the home 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 2.10**

There is evidence from four studies (none 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 (greater than or equal to 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 2.11**

There is evidence from six studies (one UK) on burns and fire in all environments of a strong association between the most socioeconomically deprived families, living in a house with one to three or more bedrooms, attention deficit hyperactivity disorder (ADHD), and being of Native American

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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 2.12**

There is evidence from three studies (none UK). There is evidence of weak to moderate association of injuries with entitlement to Medicaid (in children aged 5 to 14 years) and with non-entitlement to Medicaid (in infants aged 0 to 4 years). There was no statistical evidence of injuries being associated with being of Native-American descent or the presence of behavioural disorders.

**Evidence statement 2.14a**

There is evidence from 12 studies (four UK) on all injury types in all environments 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 or older versus younger than 4 years), children aged 15–54 months (versus younger than 6 months), and increasing age among children with a disability. There was no statistical evidence of injuries being associated with increasing age in the case of head injuries.

**Evidence statement 2.14b**

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

**Evidence statement 2.14c**

There is mixed evidence from eight studies (one UK) on ethnicity in all injury types in all environments 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 2.14f**

There is evidence from 27 studies (six UK) on family's socioeconomic status in all injury types in all environments of weak to moderate association of injuries with socioeconomic deprivation. There is no statistical evidence of injuries (reported in some studies) being associated with socioeconomic deprivation within certain age categories. There is mixed evidence regarding the association of parental educational attainment and household income with injuries.

**Evidence statement 2.14i**

There is evidence from eight studies (four UK). There is evidence of weak to moderate association of injuries with socioeconomic deprivation, but no evidence of association between other indicators of neighbourhood disadvantage and the occurrence of unintentional injuries.

**Evidence Statement 3.1<sup>18</sup>**

There is moderate evidence from three recent systematic reviews (one [++] and two [+]) that road speed enforcement devices (cameras, lasers or radar) reduce road injuries, and serious/fatal injury crashes/collisions in the vicinity of the devices. One systematic review (+) also concluded that similar size of speed reduction effects were observed over wider geographical areas around the enforcement device sites. The size of the observed reductions in different studies, and in different localities within studies, varies considerably. Similarly, one systematic review (++) found that in those studies where enforcement devices were temporarily placed at certain locations, the duration of speed reductions after removal of the devices (the 'time halo') varied from 1 day to 8 weeks. However, only one of the systematic reviews (++) was able to identify any factor which was consistently associated with higher injury or crash reductions – this was that the effect on urban roads was greater than that on rural roads. There was insufficient consistency between studies to enable the

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<sup>18</sup> This evidence statement differs from the one in the report submitted to NICE. It has been amended to include findings from one (++) systematic review that was included in the original report and has since been updated. The updated review is: Wilson C, Willis C, Hendrikz JK et al. (2010). Speed cameras for the prevention of road traffic injuries and deaths (review). Cochrane Library: 10.

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detection of the effects of other factors (such as different roads user groups, automated versus non-automated detection, mobile versus fixed, covert versus overt, or other roads versus motorway.). The greater effect on urban roads where children are more likely to be pedestrians is relevant. Included studies did not consistently state what the penalties or fines would be for detected speeding, although one systematic review (++) implied there was a relationship between size of pre- and post-reduction in speeding vehicles and the speed threshold set.

This evidence is judged as directly applicable to the UK as the results from the UK studies were generally consistent with the studies from other developed countries.

### **Evidence Statement 3.2**

There is weak evidence from three controlled before-and-after studies (in Australia, Israel and California) that increased or rationalised police enforcement of traffic speeds reduces injury crashes (two [+] and one [-]). There is also weak evidence from three multivariate analyses of longitudinal road accident/injury data (in New Zealand, California and Greece) that increased levels of police enforcement of traffic speeds reduces injury crashes and all injuries (two [+] and one [-]). There is also moderate evidence from one (+) controlled before-and-after study, on motorways in the Netherlands, that increasing the intensity of enforcement – from apprehending 1 in 100 speeding offenders, to 1 in 25, to 1 in 6 – produces statistically significant ( $p$  less than 0.05) reductions in mean speed (1 km per hour for 1:25 versus 1:100; and 3.5 km per hour for 1:6 versus 1:25).

This evidence is judged as partially applicable to road safety policy in the UK. This is because in the included studies there are a number of differences in the way police forces are organised and contribute to speed enforcement. Also, in the role of the police in enforcing speed limits through speed traps and mobile cameras/radar needs to be considered in the context of the widespread use of fixed site automated cameras around the UK road network.

#### **Evidence statement 4.1**

There is evidence from one controlled before-and-after study (+) in the USA that law requiring the installation of smoke detectors, increases the number of houses which have at least one functioning smoke detector and that this may reduce fatalities related to fires in targeted properties.

Knowledge of the law and the penalty for non-compliance may be associated with greater smoke detector installation than knowledge of the law only.

The law assessed required smoke detectors in all bedroom areas of one-, two- and multi-family dwellings, applied retrospectively to homes built prior to the law, and can be enforced by a fine or jail time. In addition, sale of a property is contingent on appropriate smoke detectors being present.

Given the differences in legal systems, responsibilities and enforcement between the USA and the UK, and the high socioeconomic status of the studies communities, the applicability of this finding has been assessed as poor. However, the observations that systems of enforcement which involve regular inspection, with a system of warnings prior to prosecution are effective; that laws which reflect societal laws are effective and that media campaigns to support the introduction of new laws may be important, may be applicable across other settings.

#### **Evidence statement 4.2**

There is evidence from one comparative study in the USA (+) that window guard legislation in New York City reduces child injury related to falls from buildings by about half, despite greater numbers at risk as residents of multiple-family dwellings (1.5 per 100,000 children aged 0–18 years compared with an average of 2.81 per 100,000 in 27 other US states without legislation, and 3 per 100,000 in Massachusetts which introduced interventions without legislation). The law required owners of multiple-family dwellings to provide window guards in apartments where children aged 10 or under lived (half the injuries recorded in NYC were in those aged 11–18). Compliance was subject to annual enforcement. The introduction of the law was accompanied by a coordinated education and advertising programme ('Children can't fly') which

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involved outreach, dissemination of literature, a media campaign and the distribution of free window guards.

Given the differences in legal systems, responsibilities and enforcement between the USA and the UK, and the differences in housing stock and management, the applicability of this finding has been assessed as poor. However, the observation that effective enforcement is a key element of legislative success may be applicable across a range of settings.

#### **Evidence statement 4.3**

There is mixed evidence from four uncontrolled before-and-after studies (all [+], two from the US and two from Australia) about hot water tap temperature legislation. Two studies (one US and one Australia) reported that the annual incidence of burn injuries in children aged 4–13 years increased after the introduction of legislation, and a US study found that injury rates were raised compared to the period immediately prior to legislation being introduced but fell in relation to an earlier comparator time-period. Only one Australian study (+) reported p-values, but this was a significant increase ( $p = 0.01$ ).

One study (Australia) suggested there may be a decrease in the number of scald injuries in children aged 0–4 years, however, the reported differences were non-significant ( $p = 0.57$ ).

Given the differences in legal systems, responsibilities and enforcement between the USA and Australia and the UK, and the differences in housing stock and management, the applicability of these findings have been assessed as poor. However, the observation that legislation aimed at safety in the home may be limited in its effectiveness where it is implemented only in that housing stock where access and enforcement is easier (such as in rented or newly built accommodation only), may be applicable across a range of settings.

#### **Evidence statement 4.4**

There is mixed evidence from four studies (two case control, and two comparative) about swimming pool fencing legislation (two [+], one from USA

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and one from Australia and two [-] one from New Zealand and one from Australia).

Two studies (both [+], one USA and one Australia) suggest that legislation is ineffective where it only requires three-sided fencing. The US study suggests no impact of such legislation on drowning in children aged younger than 10 years compared to no legislation (odds ratio [OR] 1.27, 95% confidence interval [CI] 0.72 to 2.25). The Australian study found the incident rate ratio of drowning in children aged younger than 5 years living in houses with three-sided rather than four-sided pool fencing was 1.78 (95% CI 1.14 to 1.79).

Three studies, two (-) and one (+) (two Australia, one New Zealand) report on outcomes related to legislative management and compliance.

The New South Wales study (-) found that a more structured and comprehensive approach to inspection (including a register of owners, annual inspections, and enforcement of the act including fines) resulted in twice the level of compliance as those with less structured or detailed approaches. Key informant interviews also suggest that lack of clarity in the Fencing Act, and failure to detail how councils should ensure compliance, including how it should be funded, hampered effective implementation.

The Western Australia study (+) suggests that compliance is highest immediately after legislation is introduced, and falls off thereafter, although regular inspection enhances compliance. The New Zealand study (-) found no association with compliance rates and: local authorities having written policies about locating and inspecting pools; a re-inspection programme; or advertising of pool owners' obligations under the relevant act.

Given the differences in legal systems, responsibilities and enforcement between the USA, Australia, New Zealand and the UK, and the low level of private swimming pool ownership in the UK, the applicability of these findings have been assessed as poor. However, some key lessons from these studies may be applicable across a range of settings, such as: the importance of adequate legal requirements in order to glean maximum benefit (as illustrated

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by three- versus four-sided fencing here); the need for regular inspection regimes which are consistently enforced, and the related need for clear lines of responsibility and sufficient funding for these; the need for concurrent education to help owners comply with the spirit as well as the letter of the law (for example, the need for maintenance of equipment, and the valuing of safety over convenience) and finally the need for legislation which does not contradict or confuse other existing rulings.

### **Evidence statement 5.3**

There is moderate-to-weak evidence from two controlled before-and-after studies (one [+] and one [-]) to show that mass-media campaigns, employed as part of a broader non-legislative strategy (that involved educational programmes and purchase subsidies) were effective in increasing compliance with bicycle helmet use. There was also moderate evidence from uncontrolled before-and-after data from one of the studies (-) that the programmes helped to reduce the rates of bicycle-related head injuries in the intervention area.

In the US study (+), the sales of one brand of a youth helmet in the Seattle area (intervention area) rose from 1,500 to 22,000 over a 3-year period (no figures stated for the control area) while observed helmet usage rate among school-age children increased from 5% to 16% compared with a rise of only 1% to 3% in a control community, Portland, Oregon, over the same period.

In the UK study (-) self-reported helmet use among young people aged 11–15 years living in the campaign area increased from 11% at the start of the campaign to 31% after 5 years ( $p < 0.001$ ), with no significant change in the control group. Hospital casualty figures in the campaign area (Reading) for cycle-related head injuries in the under 16 years age group, fell from 112.5 per 100,000 to 60.8 per 100,000 (from 21.6% of all cycle injuries to 11.7%;  $p < 0.005$ ). No injury data were provided for Basingstoke, the control. Applicability: The evidence is judged to be directly applicable to the UK – one of the studies was carried out in the UK and although the other was carried out in the US, it was embarked upon and completed before the introduction of a bicycle helmet legislation, so in a sense the settings reflected what is currently obtainable in

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the UK, a country without mandatory helmet wearing legislation. Furthermore, both countries are similar in terms of living standards and economic development.

#### **Evidence statement 5.4**

There is mixed evidence from two controlled before-and-after studies (both [-], one from Canada and one from the UK) that removal and replacement of unsafe equipment to comply with regulatory standards is an effective strategy for preventing playground injuries. The Canadian study demonstrated statistically non-significant reduction in equipment-related injury rate in the intervention schools after replacement of equipment using the new Canadian Standards Association standards (relative risk [RR] = 0.82 to 0.66 to 1.03). This translated into 177 equipment-related injuries avoided during the study period. The comparable equipment-related injury rate in the non-intervention schools increased by about 15% after the study period, although not statistically significant (RR = 1.15; 95% CI 0.96 to 1.37). The overall injury rate reduced in the intervention schools (RR = 0.70; 95% CI 0.62 to 0.78) and increased in the non-intervention schools (RR = 1.40; 95% CI 1.07 to 2.53) after the study period. However, in the UK study, injury rate per observed child was significantly reduced in the five playgrounds where changes (use of greater depth of bark and replacement of overhead horizontal ladders with rope climbing frame) had been made compared to the control playgrounds without changes.

Applicability: The non-UK study is only partially applicable to the current UK context due to similarities in level of economic development, nature of the playgrounds, as well as targeted populations. The UK study findings are directly applicable.

#### **Evidence statement 5.5**

There is weak evidence from two before-and-after studies (one [-] and one [+], from UK and Italy) and one retrospective time series (one [+] from UK) on the effect of fireworks legislation and enforcement activities on firework-related injuries.

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One study in Italy (+) reported that a comprehensive, multifaceted programme, comprising the combination of enforcement of fireworks law, media campaign and education, reduced the rate of fireworks-related injury from 10 per 100,000 before the intervention programme to 6.1 per 100,000 after it was implemented, and a time-series based study found that amendments to restrictive fireworks legislation led to a reduction of firework-related injury in children.

The study from Northern Ireland (-) did not find a significant increase in fireworks-related injuries requiring hospital admission following liberalisation of the law on fireworks sale (incidence of admissions before: 0.38 per 100,000; after: 0.43 per 100,000). However, the annual number of injuries in this study was already very small relative to annual variations.

Applicability: The Italian study is partially applicable to current UK context while the UK findings are directly applicable. However, the Northern Ireland study may not be directly applicable to the rest of UK because of the civil unrest reported in that part of the kingdom.

### **Evidence statement 6.5**

There were two cost-benefit analyses which assessed the impact of speed enforcement programmes. The photo radar programme in British Columbia was estimated to produce net benefits to society of about C\$114 million (in 2001), and still produced substantial net savings of C\$38 million if only considered from the provincial insurance corporation's perspective.

Similarly, the 420 automated speed camera sites in the UK in 1995/6 were estimated to have a positive net present value of over £26 million, even after 1 year, rising to £241 million after 10 years. This is because annualised fixed costs of £5.3 million plus annual recurrent costs of £3.6 million, would be offset not just by the £6.7 million in fine income, but also the over £30 million in the estimated annual value to society of accidents avoided. In all ten police force areas there was a positive net present value (that is, benefits exceeded costs) within a year of the programme starting.

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These older findings should be seen as having been superseded by the more recent study for the Department for Transport, which evaluated the national safety camera programme. (This study was added to the review after the original report was submitted to NICE.) In this study, it was estimated that there would be 4230 fewer personal injury collisions (any road collision which results in at least one casualty, whether fatal, serious or slight) annually as a result of the safety cameras across all 38 safety camera partnerships. At an estimated value of £61,120 per collision avoided (using Department for Transport standard estimates for 2004) this means an annual estimated economic benefit of £258 million. This compares with the total annual cost of the programme of £96 million. Comparing only the revenue costs per collision prevented (£61,120) with the corresponding economic benefit per collision due to injuries prevented (£22,653), over the four years, gives a cost–benefit ratio of approximately 2.7:1. They also use data from both speed and red light camera sites, although at speed camera sites the reductions in personal injury collisions were associated with reductions in speeds.

### ***Additional evidence***

#### **Expert testimony**

Expert testimony 1: 'Child road safety' (including 'Child casualties in road accidents: 2007. Road accidents factsheet number 5 [2009]' [Department for Transport])

Expert testimony 3: 'Inequities in child injuries'

Expert testimony 6: 'Monitoring and surveillance issues – A&E pilot'.

### ***Cost-effectiveness evidence***

The modelling (see appendix B) explored the potential cost effectiveness of a selection of strategic approaches to encouraging the uptake of interventions to prevent unintentional injuries among children.

The cost and effectiveness of implementation was the most important factor in relation to legislation or regulations promoting 20 mph zones. The cost of

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introducing that legislation or regulation – or of enforcing and monitoring compliance – was much less significant.

Several factors determined the cost effectiveness of legislation, regulations and other strategies to promote the earlier and wider installation of thermostatic mixing valves in social housing used by families with young children. These were:

- expected level of uptake and installation following the introduction of regulations
- number of years before all social housing has one fitted, given the expected uptake after regulations are introduced
- cost of enforcing and monitoring compliance
- number of social housing households that would be eligible for a thermostatic mixing valve under the regulations.

### ***Fieldwork findings***

Fieldwork aimed to test the relevance, usefulness and feasibility of putting the recommendations into practice. The PDG considered the findings when developing the final recommendations. For details, go to the fieldwork section in appendix B and 'Strategies to prevent unintentional injury among under-15s'.

The fieldwork took place between the formation of a new government in May 2010 and the budget of June 2010. In this context, the issue of financial uncertainty was raised by many participants. They also found it difficult to comment on the 'who should take action' part of the recommendations as the new government departmental structures were unclear.

The general recommendations were seen as a positive way to increase the profile of unintentional injury prevention, although the issue of funding and concerns about the technological infrastructure needed were raised. The injury surveillance recommendations were positively received, as participants pointed to the lack of authoritative evidence as a key problem. There were,

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however, concerns about the resource implications of carrying out additional data collection and data coordination activities.

The introduction of a regulatory framework for home safety equipment was strongly welcomed. However, participants did point to the potential impact on the private sector market – as well as the difficulty of getting private sector landlords to comply. Home safety assessments are offered by a range of different services and some participants welcomed the prospect of a standard, common approach. It was noted that some of these recommendations referred to ‘all families with children under 5’ and that more clarity was required.

Although welcomed in principle, there were concerns about the feasibility of putting the water safety recommendations into practice. For example, lifeguards do not have enough time, hospitality and leisure businesses do not have the skills, and those offering swimming lessons struggle to attract those most in need – even when lessons are free of charge. There was, however, support for a social marketing campaign on water safety.

The recommendations on cycle helmet usage were met with some scepticism and there was no consensus on the safety benefits.

The recommendations on play were welcomed. In particular, all participants liked the acknowledgement that any risks involved should be balanced with the benefits. However, they felt that it would not be easy to communicate these recommendations to the diverse range of organisations involved.

Participants liked the prospect of a national fireworks campaign and the emphasis on evaluation. However, some doubted whether the recommendations would prevent further injuries.

The road safety recommendations were generally welcomed as reflecting best practice. Some participants felt that a number of them could be combined. Some welcomed the fact that they could help to get the NHS involved with road safety partnerships.

## **Appendix D Gaps in the evidence**

The Programme Development Group (PDG) identified a number of gaps in the evidence related to the programmes under examination based on an assessment of the evidence. These gaps are set out below.

1. There is a lack of UK studies evaluating the effectiveness and cost-effectiveness of legislation, regulation and standards and their enforcement on related outcomes such as compliance, safety, risk taking behaviours and injury. Cost-effectiveness data rarely considers the cost of developing and promoting legislation.
2. Most studies rely on self-reporting to record morbidity outcomes, protective factors and unintended consequences before and after legislation. In addition, baseline data is rarely collected prior to legislative or regulatory change.
3. There is a lack of studies that report specific outcomes for children.
4. There is a lack of UK studies which record and take into account confounding factors that could impact on the effectiveness of legislation, regulation and standards. This includes children and young people's exposure to risk, environmental characteristics and changes in design standards.
5. There is a lack of studies comparing the effectiveness of legislation, regulation and standards across high-, middle- and low-income countries.
6. There is a lack of studies evaluating the impact of mass-media campaigns to support legislation, regulation and standards.
7. There is a lack of good quality qualitative research on the barriers preventing – and facilitators aiding – compliance with legislation, regulation and standards.

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8. There is a lack of qualitative and quantitative research on injury prevention in the home.
9. There is a lack of information on the effectiveness of legislation relating to home safety assessments, thermal mixing valves, smoke alarms and window restrictors. Evaluations do not tend to incorporate process and outcome factors.
10. There is a lack of information on how well rules and regulations for different sports are enforced.
11. There is a lack of studies addressing the quantitative correlates of drowning.
12. There is a lack of evaluation of the effectiveness of different types of road signage.
13. There is a lack of studies on the differential effectiveness of network-wide, targeted or mixed approaches to speed enforcement on the road. There is also a lack of studies identifying the factors consistently associated with a reduction in injuries from road crashes.

The Group made 18 recommendations for research. These are listed in section 5.

## Appendix E Supporting documents

Supporting documents are available at [www.nice.org.uk/guidance/PH29](http://www.nice.org.uk/guidance/PH29)

These include the following:

- Evidence reviews:
  - Review 1: ‘Current practice and innovative approaches to prevent childhood unintentional injuries: An overview and synthesis of international comparative analyses and surveys of injury prevention policies, legislation and other activities’
  - Review 2: ‘A systematic review of risk factors for unintentional injuries among children and young people aged under 15 years’
  - Review 3: ‘An overview and synthesis of evidence relating to strategies and frameworks for planning, implementing, enforcing or promoting activities to prevent unintentional injury to children and young people on the road: legislation, regulation, standards and related strategies focusing on the design and modification of highways, roads or streets’
  - Review 4: ‘Strategic and regulatory frameworks for guiding, enforcing or promoting activities to prevent unintentional injury in children and young people in the home environment’
  - Review 5: ‘Strategies, policies and regulatory or legal frameworks and/or mass media campaigns to prevent unintentional injury to children during play and leisure in the external environment’.
  - Review 6: ‘Systematic review to provide an overview of published economic evaluations of relevant legislation, regulations, standards, and/or their enforcement and promotion by mass media’.
  
- Economic analysis: ‘Economic modelling of legislation/regulations and related national strategies to promote the wider use of: 20mph zones in

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residential areas, and thermostatic mixing valves (TMVs) in social housing for families’.

- Expert testimony:
  - Expert testimony 1: ‘Child road safety’ (including ‘Child casualties in road accidents: 2007. Road accidents factsheet number 5 [2009]’[Department for Transport])
  - Expert testimony 2: ‘Preventing unintentional injuries among under-15s’
  - Expert testimony 3: ‘Inequities in child injuries’
  - Expert testimony 4: ‘Legislating for Health’
  - Expert testimony 5: ‘Cycle helmets – epidemiology and effectiveness’
  - Expert testimony 6: ‘Monitoring and surveillance issues – A&E pilot’.
  
- Fieldwork report: ‘Strategies to prevent unintentional injury among under-15s’.
  
- A quick reference guide for professionals whose remit includes public health and for interested members of the public. This is also available from NICE publications (0845 003 7783 or email [publications@nice.org.uk](mailto:publications@nice.org.uk) – quote reference number N2351).

For information on how NICE public health guidance is developed see:

- ‘Methods for development of NICE public health guidance (second edition, 2009)’ available from [www.nice.org.uk/phmethods](http://www.nice.org.uk/phmethods)
  
- ‘The NICE public health guidance development process: An overview for stakeholders including public health practitioners, policy makers and the public (second edition, 2009)’ available from [www.nice.org.uk/phprocess](http://www.nice.org.uk/phprocess)