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

NICE public health guidance x

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, legislation, regulation, enforcement, surveillance and workforce development.

The guidance is for national and local policy makers, strategic planners, commissioners, managers and practitioners who have a direct or indirect role in preventing unintentional injuries among children and young people aged under 15. This includes those working in the NHS, local authorities, education and the wider public, private, voluntary and community sectors. In particular, it will be of interest to: national government departments and agencies, local government, children's trusts, local safeguarding children boards, primary care trusts, children's services, the police, transport planners and providers of play and leisure facilities. It may also be of interest to children, young people, parents, carers and other members of the public.

This is one of five pieces of NICE guidance on how to prevent unintentional injuries among children and young people aged under 15. It should be read alongside guidance on: the provision of safety equipment and home risk assessments; road design and modification; outdoor play and leisure; and

education and protective equipment to prevent unintentional injuries on the road when they have been published. (For further details, see section 7.)

The Programme Development Group (PDG) has considered the evidence reviews, cost effectiveness and expert testimony.

This document sets out the Group's preliminary recommendations. It does not include all sections that will appear in the final guidance. NICE is now inviting comments from stakeholders (listed on our website at: www.nice.org.uk).

Note that this document does not constitute NICE's formal guidance on strategies to prevent unintentional injuries among children and young people aged under 15. The recommendations made in section 1 are provisional and may change after consultation with stakeholders and fieldwork.

The stages NICE will follow after consultation (including fieldwork) are summarised below.

- The Group will meet again to consider the comments, reports and any additional evidence that has been submitted.
- After that meeting, the Group will produce a second draft of the guidance.
- The draft guidance will be signed off by the NICE Guidance Executive.

For further details, see '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

The key dates are:
Closing date for comments: 15 June 2010.
Next PDG meeting: 13–14 July 2010.

Members of the PDG are listed in appendix A and supporting documents used to prepare this document are listed in appendix E.

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

Contents

1 Recommendations

When writing the recommendations, the Programme Development Group (PDG) (see appendix A) considered the evidence reviews, evidence of cost effectiveness and expert testimony. Note: this document does not constitute NICE's formal guidance on this programme. The recommendations are preliminary and may change after consultation.

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

The evidence reviews, supporting evidence statements and economic analysis are available at http://guidance.nice.org.uk/PHG/Wave17/12

This guidance uses the term 'unintentional injuries' rather than accidents as: 'most injuries and their precipitating events are predictable and preventable'[1]. The term 'accident' implies an unpredictable and therefore unavoidable event.

National policy

This guidance identifies national policy options that are most likely to be successful in reducing unintentional injuries among children and young people.

The policy recommendations are listed at the start of each section (see recommendations 1, 5, 9, 10, 11, 13, 15, 16, 22, 23, 31 and 32). They are based on evidence that suggests policy change is needed to ensure local agencies and individuals take action.

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

[1] Davis R, Pless B (2001) BMJ bans 'accidents'. Accidents are not unpredictable. BMJ 322: 1320–21.

Definitions

Home safety

The process of systematically identifying potential hazards in the home, evaluating the risks and providing information or advice on how to reduce them is described in this guidance as a home safety assessment. 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[2].

Home safety equipment comprises any permanent device used to prevent injury in the home, such as smoke and carbon monoxide alarms, thermostatic mixing valves and window restrictors.

For the purpose of this guidance, the 'home' refers to the home, garden and boundaries.

Water safety

For the purpose of this guidance, 'water safety' applies to areas within and outside the home. It includes, baths, garden ponds, rivers and lakes.

Road safety

The Department for Transport's consultation 'A safer way' sought views on the vision, targets and measures for improving road safety in Great Britain beyond 2010. It included proposals to encourage: 'highway authorities, over time, [to] introduce 20 mph zones or limits into streets which are primarily residential in nature, or other areas where pedestrian and cyclist movements are high (for example, around schools or markets) and which are not part of any major through route'[3].

[2] Home safety assessment tools are available from The Royal Society for the Prevention of Accidents (www.rospa.com); Child Accident Prevention Trust (www.capt.org.uk) and SafeHome (www.safehome.org.uk).
[3] Department for Transport (2009) A safer way. Consultation on making Britain's roads the safest in the world. London: Department for Transport.

General recommendations

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 the prevention of unintentional injuries in government white papers and policy

Who should take action?

- Department for Children, Schools and Families.
- Department of Health.
- Department for Transport.
- The Home Office.

What action could be taken?

Ensure targets to reduce unintentional injuries among children and young people are included in all government white papers and all policy plans of relevance to children's health. The white papers and policy plans could include:

- strategies for cross-government working to support the targets
- consideration of inequalities in terms of which groups of children and young people have higher rates of unintentional injury
- support to collect data on incidence, severity, type and place of injury (for example, see 'recommendations 9–13 on injury surveillance').

Recommendation 2 Incorporating the prevention of unintentional injuries in the local 'Children and young people's plan'

Who should take action?

Children's trust board, in consultation with local safeguarding children boards.

What action should they take?

- Ensure the 'Children and young people's plan' (CYPP) includes a commitment to prevent unintentional injuries and to reduce inequalities in unintentional injuries among children and young people.

- Ensure the CYPP includes a commitment to develop a workforce that has the capacity to prevent unintentional injuries. This includes the provision of suitably trained staff and opportunities for initial and ongoing multi-agency training and development.

- Ensure the CYPP defines how partners working with the children's trust will collaborate to deliver the injury prevention commitments in the plan. For example, regulatory frameworks supported by inspection programmes and robust performance management could be used to ensure effective delivery.

- Ensure the children's trust board reports to the local strategic partnership on progress in meeting the commitments set out in the CYPP.

Recommendation 3 Appointing a local child injury prevention coordinator

Who should take action?

Children's trust board, in consultation with local safeguarding children boards.

What action should they take?

- Ensure the children's trust or local authority area has a permanent child injury prevention coordinator. They could be employed by the local authority, primary care trust, or another local partner such as the fire and rescue service or a housing association. Alternatively, they could be a joint appointment by several local partners.

- Ensure the child injury prevention coordinator:

- monitors progress made on the injury prevention commitments set out in the CYPP and reports back to the children's trust board
- promotes unintentional injury prevention programmes within partner organisations
- raises the profile of unintentional injury prevention with the local safeguarding children board
- networks at regional and national level with other child injury prevention coordinators
- helps develop strategies within partner organisations and coordinates them across partner organisations
- works with local partners to develop a 2 to 3 year injury prevention strategy which is integrated into the CYPP plan
- coordinates partnership working to prevent unintentional injuries among children and young people and to raise local awareness about the need for prevention activities
- sits on the local safeguarding children board
- acts as a local source of information and advice on unintentional injury prevention.

Recommendation 4 Identifying and responding to multiple emergency department attendances

Who should take action?

- Liaison health visitors.

- Emergency department staff, including triage nurses.

What action should they take?

Alert health visitors, school nurses and GPs when a child or young person repeatedly attends an emergency department for treatment for an unintentional injury. The aim is to ensure health visitors, school nurses and GPs are aware of those families which might benefit from injury prevention advice and home safety assessments.

Recommendations for workforce training and capacity building

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 5 Funding injury prevention training

Who should take action?

- Department of Health.
- Department for Children, Schools and Families.

What action could be taken?

Fund educational establishments and organisations (such as the Faculty of Public Health, the Children's Workforce Development Council, universities, royal colleges and not-for-profit organisations) to develop courses, modules and standards relating to the prevention of unintentional injury among children and young people.

Recommendation 6 Developing standards for injury prevention

Who should take action?

- Children's Workforce Development Council (CWDC).
- Faculty of Public Health.
- Royal colleges and professional bodies.
- The voluntary sector.
- Universities.

What action should they take?

Develop standards for unintentional injury competencies. These should take into account the different roles and responsibilities of professionals working within and outside the NHS.

Recommendation 7 Training for child injury prevention coordinators

Who should take action?

- Children's trusts and local safeguarding children boards.
- The voluntary sector.

What action should they take?

- Ensure coordinators understand the importance of preventing unintentional injuries and the range of preventive measures available. Ensure they have the skills to carry out the duties and activities detailed in recommendation 3.
- Provide coordinators with both informal and formal learning opportunities. For example, 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.
- Ensure specialist education and training is monitored and evaluated to see what effect it has on practitioners' performance. Revise approaches that are found to be ineffective.

Recommendation 8 Injury prevention training for the wider childcare workforce

Who should take action?

- Children's trusts.
- Local safeguarding children boards.
- NHS, social care and education practitioners.

- Primary care trusts (PCTs), commissioners and managers.
- The voluntary sector.

What action should they take?

- Provide everyone who works with (or cares for) children and young people – directly or indirectly – with access to unintentional injury prevention education and training.
- The education and training should:
  - support the wider child health remit
  - develop an understanding of the importance of preventing unintentional injuries and their consequences, and the preventive measures available
  - be equally available to everyone in the wider childcare workforce.
- Ensure specialist education and training is monitored and evaluated to see what effect it has on practitioners' performance. Revise approaches that are found to be ineffective.

Recommendations for injury surveillance

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 9 Establishing a national injuries surveillance resource

Who should take action?

- Department of Health, acting as the lead government department.
- Other government departments including: Department for Children, Schools and Families, Department for Transport, Department of Communities and Local Government and the Home Office.

What action could be taken?

- Establish a national injuries surveillance resource covering all populations and injuries to support the monitoring of injury risks and the effects of prevention measures. This could be provided by a network of agencies but it should have a single point of contact or a coordinating agency.

- The resource should include local, regional and national injury datasets and data sources. For example, it should include data gathered from emergency departments, Reporting of Injuries, Diseases and Dangerous Occurrences Regulations (RIDDOR), Hospital Episode Statistics (HES), coroner reports, ambulance call-out reports, fire and rescue services reports, reported road casualty statistics (STATS19) and data from the child death review process as they become available.

- The coordinating agency or agencies should:
    - identify and develop new data sources
    - provide data-sharing protocols for all injury data submissions, developing protocols where needed
    - collate, manage, analyse and interpret injury-related data
    - 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 (for example, for data collected by fire and rescue services and emergency departments)
    - respond to the needs of hospital trusts, local safeguarding children boards, police forces, academics and others by: disseminating information locally and regionally; providing a

publicly available, searchable database; and supporting the European Commission's work on injury surveillance.

Recommendation 10 Establishing a robust national emergency department minimum commissioning dataset

Who should take action?

- Department of Health.
- The NHS Information Centre for Health and Social Care.

What action could be taken?

- Use publications and data-sharing protocols to ensure all hospital trusts are aware of the data collection requirements for the universal, and mandatory emergency department minimum commissioning dataset.
- Develop additional data submission quality indicators (for example, to support the Department of Health's 'world class commissioning' programme[4]).

Recommendation 11 Establishing an enhanced emergency department dataset

Who should take action?

- College of Emergency Medicine.
- Department of Health.

What action could be taken?

- 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 injuries.

[4] www.dh.gov.uk/en/Managingyourorganisation/Commissioning/Worldclasscommissioning/DH_083204

- Promote the development of information technology (IT) systems that can collect enhanced emergency department datasets for submission to the agency or agencies coordinating the national injuries surveillance resource (see recommendation 9).

- Work with agencies involved in national injuries surveillance (see recommendation 9) to develop methods and procedures for collating, analysing and disseminating data and for quality assurance.

Recommendation 12 Gathering high quality data on injuries from emergency departments

Who should take action?

PCTs and hospital trusts.

What action should they take?

- Ensure commissioning contracts for emergency departments (including minor injury units and walk-in centres) stipulate that all required data is collected – and to the required standard. Contracts should also stipulate which data collection and submission methods should be used. In addition, they should include financial penalties for failure to meet the requirements of the emergency department commissioning dataset.

- Ensure all hospital trust injury data are submitted to The NHS Information Centre for Health and Social Care.

Recommendation 13 Sharing data among agencies

Who should take action?

- Government agencies.

- Local authorities.

- Local strategic partnerships.

What action should they take?

- Ensure guidance on data-sharing protocols issued by the DH and Department for Children, Schools and Families[5] is adopted by all agencies that collect local injury data. This includes emergency departments, coroners, ambulance services, fire and rescue services, police forces and child death overview panels. It also includes the Health and Safety Executive.

- Ensure datasets can be integrated to provide accurate statistics on local injuries and their causes.

Recommendations for home safety

See also recommendations from 'Preventing unintentional injuries among under 15s in the home' (NICE public health guidance – publication expected November 2010).

Recommendation 14 Introducing a regulatory framework for fitting and maintaining permanent safety equipment in social and rented housing

Whose health will benefit?

- Children and young people aged under 15 and their parents or carers.

- Single people and families in multiple-occupied dwellings.

Who should take action?

- Department for Children, Schools and Families.

- Department for Communities and Local Government.

- Department of Health.

[5] See 'Information sharing: guidance for practitioners and managers' (Department for Children, Schools and Families 2008) and 'DCSF standards in data collected around children and young people' [online]. Available from www.standards.dfes.gov.uk

What action could be taken?

- Introduce a regulatory framework that incorporates the housing health and safety rating system (HHSRS) and requires the fitting of permanent safety equipment in all social and rented housing. Priority should be given to homes where children aged under 5 are living.

- The framework should include an associated inspection programme and enforcement activities to ensure landlords, social housing providers and local authorities fit and maintain the following equipment:
    - hard-wired smoke alarms
    - thermostatic mixer valves for baths
    - window restrictors
    - carbon monoxide alarms.

Recommendation 15 Delivering information to accompany regulation and guidance on fitting and maintaining permanent safety devices

Whose health will benefit?

- Children and young people aged under 15, their parents or carers.

- Single people and families in multiple-occupied dwellings.

Who should take action?

- Department for Communities and Local Government.

- Department for Children, Schools and Families.

- Department of Health.

What action could be taken?

- Advertise and provide information on new regulations and guidance for fitting and maintaining safety equipment prior to the introduction of these new standards. Target:
    - groups responsible for social and rented housing, 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 enforcing home safety regulations and legislation
  - residents in rented and social housing.

- Evaluate the effectiveness of information provision and advertising on an ongoing basis.

Recommendation 16 Incorporating home safety assessments in the Healthy Child Programme[6]

Whose health will benefit?

Children aged under 5 and their parents or carers.

Who should take action?

Department of Health.

What action could be taken?

Ensure the Healthy Child Programme and any other national initiatives to improve child health have standards for, and guidance on, delivering home safety assessments to all families with a child aged under 5.

Recommendation 17 Incorporating home safety assessments in the 'Children and young people's plan'

Whose health will benefit?

Children aged under 5 and their parents or carers.

Who should take action?

Children's trust boards, in consultation with local safeguarding children boards.

[6] The three Healthy Child Programme core documents are available at www.dh.gov.uk/en/Healthcare/Children/Maternity/index.htm

What action should they take?

Ensure the 'Children and young people's plan' offers home safety assessments to all families with a child aged under 5.

Recommendation 18 Commissioning home safety assessments

Whose health will benefit?

Children aged under 5 and their parents or carers.

Who should take action?

PCT commissioners.

What action should they take?

- Commission home safety assessments for all families with a child aged under 5, in accordance with the Healthy Child Programme and the 'Children and young person's plan'. Assessments should be in line with NICE guidance on 'Preventing unintentional injuries among under 15s in the home' (NICE public health guidance – expected publication date November 2010).

- Those who carry out home safety assessments and provide home safety equipment should:
    - where appropriate, supply and install suitable, high quality home safety equipment that adheres to the British 'Kite mark' or the equivalent European standard[7].

- Ensure the assessment, supply and installation of equipment is tailored to meet the household's specific needs and circumstances. Factors to take into account include:
    - the developmental age of the children (in relation to any equipment installed)
    - whether or not a child or family member has a disability
    - cultural and religious beliefs

[7] This is an extract from a recommendation that appears in 'Preventing unintentional injuries among under 15s in the home'. NICE public health guidance XX.

  - whether or not English is the first language
  - levels of literacy
  - the level of control people have over their home environment. (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)
  - the household's perception of, and degree of trust in, authority[8].

- Ensure education, advice and information is given 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, useful links and contacts should be provided in case of a home safety problem[9].

Recommendations for water safety inside and outside the home

See also recommendation from 'Preventing unintentional injuries among under 15s: outdoor play and leisure'. (NICE public health guidance – publication expected November 2010).

Whose health will benefit?

Children and young people aged under 15, their parents and carers.

Recommendation 19 Providing water safety information and education

Who should take action?

- Injury prevention practitioners.

[8] This is an extract from a recommendation that appears in 'Preventing unintentional injuries among under 15s in the home'. NICE public health guidance XX.

- Lifeguards.
- Schools.
- Swimming instructors.

What action should they take?

- Provide children and young people, their parents and carers with information[9] and education on water safety in play and leisure environments. This should be appropriate to the age, development and experience of the child or young person and should meet the household's particular needs and circumstances.
- Ensure the information and education:
  - helps parents, carers, older children and young people to identify and address the potential risks from water in the home, garden and wider environment. This includes baths, garden ponds, rivers and lakes
  - stresses the importance of proper supervision, particularly for younger children, and describes in detail what this means.
- Provide timely information and advice during the holiday seasons and for dealing with conditions such as heat waves and extreme cold (ice might form on ponds, rivers and lakes during extreme cold spells).

Recommendation 20 Developing water safety skills

Who should take action?

- Injury prevention practitioners.
- Lifeguards.
- Schools.

[9] For example, the RoSPA water safety code for children (www.rospa.com) and the Child Accident Prevention Trust (CAPT) factsheets (www.capt.org.uk).

- Swimming instructors.

What action should they take?

- Know which groups of children and young people are most vulnerable and at high risk of drowning – and of when that risk is increased. For example, children with certain medical conditions may be more at risk, boys are more likely to be at risk than girls. Older children are more likely to drown outside the home.

- Encourage children and young people, their parents or carers to become competent swimmers.

- Ensure swimming lessons include general water safety information. They should also raise children and young people's awareness of how difficult it is to assess and manage the risks posed by water in a range of different environments.

- When encouraging children and young people, their parents or carers to swim, make them aware of local health initiatives to encourage physical activity and reduce obesity, as these may make it easier for them to access swimming pools.

Recommendation 21 Water safety – advice for leisure providers

Who should take action?

Leisure facility providers such as hoteliers, holiday companies and tour operators.

What action should they take?

- Identify and minimise the risk of drowning.

- Ensure timely water safety information is provided for the holiday season and during conditions such as heat waves and extreme cold (ice might form on ponds, rivers and lakes during extreme cold spells). This could include clearly displayed information at appropriate locations.

Recommendations for outdoor play and leisure

See also recommendation from 'Preventing unintentional injuries among under 15s: outdoor play and leisure'. (NICE public health guidance – publication expected November 2010).

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 22 Promoting cycle helmet use – government

Who should take action?

- Department for Children, Schools and Families.
- Department of Health.

What action could be taken?

- Promote the use of correctly fitted and fastened cycle helmets for children and young people who cycle off the road. Use information campaigns and ongoing education to encourage this. These activities could highlight the importance of adults wearing helmets to act as role models.
- Evaluate the campaigns and education initiatives by collecting data from a range of settings both before and afterwards. This should provide detail on:
  - incidence of helmet use and cycling (that is, exposure to risk)
  - nature and severity of cycle injuries, including traumatic brain injury
  - variations (and hence, inequalities) in helmet use among different social groups
  - the factors that encourage or prevent the use of helmets.

Recommendation 23 Promoting fireworks safety – government

Who should take action?

- Department for Business, Innovation and Skills.

- Department for Children, Schools and Families.
- Department of Communities and Local Government.
- Department of Health.

What action could be taken?

- Continue the national firework safety campaign for Bonfire Night and run similar campaigns at all celebrations and festivals where firework use is prevalent, such as New Year and Diwali.
- Maintain emergency department surveillance of firework-related injuries. Collect data on the severity, time and place of injuries.
- Ensure local and regional data are used to inform national firework safety campaigns.

Recommendation 24 Developing play policies – for public play and leisure facilities

Who should take action?

All outdoor play and leisure providers in the public, private and voluntary sectors. This includes the leisure industry, parish and town councils and early years providers.

What action should they take?

- Ensure a policy is in place that allows children and young people to participate in a variety of play and leisure activities. The policy should:
  - take a balanced approach to assessing risks and benefits when addressing safety issues
  - promote the need for children and young people to develop skills to assess and manage risks according to their age and ability
  - take into account their preferences.

- Comply with British and European standards for equipment and environments. This includes those covering playgrounds, fairgrounds, toy safety and swimming pools.

- Where equipment or an environment is not covered by standards, play providers should identify and address unnecessary hazards.

Recommendation 25 Developing play policies for private play and leisure facilities used by the public

Who should take action?

Private providers of play facilities that are open to the public, such as pubs and hotels.

What action should they take?

- Take a balanced approach when assessing the risks and benefits of play facilities.

- Comply with British and European standards for equipment and environments. This includes those covering playgrounds, fairgrounds, toy safety and swimming pools.

- Where equipment or an environment is not covered by standards, identify and address hazards.

Recommendation 26 Promoting cycle helmet use – retailers

Whose health will benefit?

Children and young people aged under 15.

Who should take action?

Retail outlets and cycle hire centres.

What action should they take?

- Provide point-of-sale advice on the correct fitting of cycle helmets (this includes online sales).

- Consider setting up a certified retailer scheme like that run by the British Equestrian Trade Association[10].

Recommendation 27 Promoting cycle helmet use – local agencies

Who should take action?

- Schools.

What action should they take?

Ensure travel plans cover off-road routes and encourage children and young people to demonstrate their cycling proficiency and to wear helmets.

Recommendation 28 Promoting cycle helmet use – event organisers

Who should take action?

- Organisers of off-road cycling events, competitions and training.
- Cycle hire centres.

What action should they take?

- Ensure the wearing of correctly fitted cycle helmets is obligatory for participation in all off-road bike events, cycle training and competitions even when they are not covered by the British Cycling competition regulations[11].
- Ensure cycle hire centres provide and require the wearing of correctly fitted and fastened cycle helmets.

Recommendation 29 Fireworks safety – local agencies

Who should take action?

- Trading standards officers.

[10] Visit www.beta-uk.org/
[11] Visit http://new.britishcycling.org.uk/zuvvi/media/bc_files/corporate/2009_handbook_06_rules_general_road_track.pdf

- Police and fire service.

What action should they take?

Ensure the firework safety code is given to adults at the point-of-sale when they buy fireworks. The code should be available in a range of languages and should be provided as a condition of a vendor's trading licence.

Recommendation 30 Conducting local safety campaigns on the use of fireworks

Who should take action?

- Fire service.
- Injury prevention coordinators.
- PCTs.
- Police.

What action should they take?

- Use emergency department surveillance data to inform local firework injury prevention campaigns.
- Conduct local firework injury prevention campaigns for all celebrations and festivals where firework use is prevalent, such as Bonfire Night, New Year and Diwali.
- Evaluate the effectiveness of campaigns.

Recommendations for road safety

See also recommendations from ‘Preventing unintentional road injuries among under 15s: road design’. (NICE public health guidance – publication expected November 2010).

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 31 Child road safety reviews and consultation – government

Who should take action?

- Department for Transport.
- Government Offices for the Regions.

What action could be taken?

- Specify mandatory criteria for child road safety reviews to ensure consistency among regions. Reviews should:
  - include all road injury data collected by partners
  - include data which can identify whether some social groups experience more injuries on the road than others (inequalities data)
  - include risks to local children and young people
  - cover all journeys, not just those to and from school.
- Ensure local highway authorities, working with their road safety partners (see recommendation 33):
  - conduct child road safety reviews at least every 2 years
  - consult children and young people – particularly those from disadvantaged communities – about their road use and perceptions of risk

  - collate, publish and disseminate the review and consultation findings.

- Ensure local authorities use the reviews to aid decision-making and evaluate the impact on local policies, practice and injuries, including health inequalities policy.

Recommendation 32 Increasing police involvement in child road safety

Who could take action?

- Her Majesty's Inspectorate of Constabulary.

What action should they take?

- Include road safety and enforcement in police report cards
- Review police involvement with local strategic partnerships on road safety issues for children and young people under 15, specifically on speed limit enforcement.

Recommendation 33 Establishing and managing road safety partnerships

Who should take action?

Local highway authorities.

What action should they take?

- Establish a road safety partnership to help plan, coordinate and manage road safety activities. It could include injury prevention co-coordinators, local safeguarding children boards, the police and primary care trusts (PCTs).

- Nominate a member of staff who is responsible for road safety partnership work.

- Work with the partners listed above and also with children and young people's services, relevant voluntary sector organisations and others, to

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

- The road safety partnership should develop policies, strategies and programmes which:
    - focus on children and young people from disadvantaged areas and communities to understand how they use (and wish to use their environment) and how their safety can be improved
    - involve other professional partnerships, children's councils and neighbourhood forums to gain local knowledge
    - draw 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.

- Programmes should take into account how injury risk differs according to age and road type. They should be evaluated using a range of outcome measures, including injury figures. A variety of evaluation methods should be used, such as controlled trials, 'stepped-wedge' trials (sequential rollout to all participants) and process evaluations.

Recommendation 34 Local child road safety reviews and consultation

Who should take action?

Local highway authorities and their road safety partnerships (see recommendation 33).

What action should they take?

- Ensure local child road safety reviews are carried out at least every 2 years. Ensure they incorporate the mandatory core elements from guidance issued by the Department for Transport and Government Offices for the Regions to ensure consistency within regions. They should:
    - include all road injury data collected by the road safety partners

  - include data which can identify whether some social groups experience more injuries than others (inequalities data)
  - include risks to local children and young people
  - cover all journeys, not just those to and from school.

- Ensure local children and young people are consulted about their road use and perceptions of risk.

- Use the reviews and consultation findings to inform local initiatives to reduce road injuries among children and young people.

Recommendation 35 Aligning local child road safety policies

Who should take action?

Children's trusts' board, in consultation with the local safeguarding children board.

What action should they take?

Ensure child safety policies, the 'Children and young people's plan' (CYPP), the road safety strategy and the community safety plan share common targets and strategies for reducing the number and severity of local road injuries.

Recommendation 36 Promoting and enforcing road safety initiatives

Who should take action?

- Local highway authorities and their road safety partnerships.
- Local authorities.

What action should they take?

- Use signage, road design and engineering measures to ensure risks in the road environment (such as the presence of a nearby playground or school) are clearly indicated. The need to comply with any resulting safety measures, such as a lower speed limit, should also be clearly indicated

- Use national and local education and media campaigns to promote the benefits of safety initiatives in areas where children are present. Initiatives could include 20 mph zones and limits and the use of appropriate and safe parking. Where compliance with these initiatives is poor, work with the police to enforce them.

2 Public health need and practice

Background

Unintentional injury is a leading cause of death among children and young people living in Europe (Sethi et al. 2006). In 2008 in England and Wales, 208 children and young people aged 0–14 died from unintentional injuries (Office for National Statistics 2009).

Road traffic collisions cause the largest number of unintentional childhood injuries and deaths (Child Accident Prevention Trust 2008a). In 2008 in Britain, 2807 children and young people aged under 16 were seriously injured or died as a result of such collisions (124 died on the roads) according to police reports (Department for Transport 2009).

While the largest number of childhood deaths from unintentional injury occur on the road, a substantial number of children also die from unintentional injuries at home or in leisure environments. In 2008, for example, 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, they led to around 97,000 children and young people aged under 15 being admitted to hospital in 2008/09 (The Information Centre for Health and Social Care 2009).

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

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

Minor unintentional injuries are part of growing up and help children and young people to learn their boundaries and manage risks for themselves. However, it is important to maintain a balance between encouraging them to explore and develop, and managing the risks to prevent serious injury (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 13 times 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 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

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. 2006).

Costs

There are six million visits to A&E departments 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 2008b).

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 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

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

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

In addition, the new performance framework for local authorities includes national indicators on preventing injuries among children and young people[12] (Department for Communities and Local Government 2007).

Other government initiatives include:

- the Housing Health and Safety Rating System (Office of the Deputy Prime Minister 2006)
- the road safety strategy (Department for Transport 2007)
- responsibility for safety in workforce settings (Health and Safety Executive 2009)
- 'Every child matters' (Department for Children, Schools and Families 2003)

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

Locally, local area and public service agreements provide 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.

[12] NI70: Hospital admissions caused by unintentional and deliberate injuries to children and young people. 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 five pieces of NICE guidance on how to prevent unintentional injuries among children and young people aged under 15. Several members of the PDG involved with this guidance (including the chair) were co-opted as members of NICE's Public Health Interventions Advisory Committee (PHIAC). As members of PHIAC they advised on three complementary NICE publications which were developed using NICE's public health intervention process. These covered unintentional injuries on the road, in the home and outdoors respectively (for details see section 7). A fifth piece of guidance on preventing unintentional injuries is due to be published in December 2011.

3.2 Children and young people learn, develop and mature when playing and taking part in activities that challenge them and that sometimes involve taking risks.

3.3 Many areas of the home, road and play and leisure environments have hazards which increase the risk of injury. Safety equipment and education is 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.

3.7 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 of injuries caused in any given situation.

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 There is a need to understand the determinants of injury (risk, exposure and context) before introducing legislation.

3.11 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.

3.12 Legislation could inadvertently increase exposure to risk. For example, legislation making installation of thermostatic mixing valves compulsory should help reduce the risk of scalding from hot water. As

a result, however, parents may not automatically check the temperature of water before bathing a child. 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.

3.13 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

3.14 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 on unintentional injuries in the home and in leisure settings.

3.15 The 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, so the actual number of road injuries is thought to be more than three times that in ‘Reported road casualties in Great Britain 2008’ (Department for Transport 2009).

- 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.

- 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).

3.16 The PDG acknowledged that it is important to supplement injury data with information about exposure to risk (such as the duration of risk and number of people undertaking the activity).

3.17 Sharing injury data between organisations (for example, ambulance service and the police) is necessary to overcome gaps in knowledge and inconsistencies in recording such injuries.

3.18 The PDG is aware that organisations can find it difficult to share data. Barriers can be institutional or relate to the confidentiality and security of personal information.

3.19 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.

3.20 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 emergency department staff.

Home safety

3.21 The recommendations on home-safety assessments and the supply and installation of home safety equipment are aimed at preventing injuries among all children and young people aged under 15. However, they prioritise households where children and young people are at greatest risk of an unintentional injury. As a result, the focus is on families with young children, those living in social or rented or overcrowded conditions, and those living on a low income.

3.22 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.

3.23 Given the extent of unintentional injuries among children under 5 in the home – and the increased risk of injuries in disadvantaged families, especially those living in social and rented housing, the PDG has made specific recommendations for these groups.

3.24 Although targeting specific groups may reduce health inequalities, it will have a limited impact on the overall injury rate. Both targeted and universal approaches are required to reduce both the overall injury rate and health inequalities.

3.25 The physical environment may have an influence on the rate and type of injuries that occur. For example, high-rise flats often have 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.

3.26 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).

3.27 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.

3.28 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.

3.29 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.

3.30 As more smoke alarms are installed than any other type of safety equipment, there is less potential to use them to reduce health inequalities.

3.31 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

3.32 The PDG recognises the need for physical activity and outdoor play and leisure and that exposure to some risk may be beneficial during these activities. However, a distinction should be made between 'good' and 'bad' risks:

- Good risks are manageable and help a child's development. For example, swimming skills learnt in a pool could, if successfully applied, help the child enjoy the benefit of swimming in the sea or another natural environment.

- Bad risks are difficult or impossible to assess and will not lead to any obvious benefits, or will 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.

3.33 The PDG recognises the difficulties of regulating 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.

3.34 The PDG agrees with the Royal Society for the Prevention of Accidents' (RoSPA's) view that children should be "as safe as necessary, not as safe as possible".

3.35 When interpreting the evidence it should be noted that the classification of an 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 they are playing in water or swimming, playing with a ball or participating in sport.

3.36 Media campaigns to promote injury prevention activities may increase health inequalities, as uptake is likely to vary among different groups. For example, girls are more likely to wear cycle helmets than boys, yet boys may be exposed to greater risks while cycling, as they tend to undertake riskier activities. So the potential health gain for a boy who wears a helmet would be greater than that for a girl.

3.37 With respect to helmet use, the PDG could only make recommendations in relation to 'off road' activities. The scope for this guidance covered modifications to the road environment. It did not include the use of protective equipment on the road, such as cycle helmets. However, as it also covered outdoors play and leisure, the use of helmets in these environments was reviewed. Forthcoming NICE guidance will make recommendations on preventing unintentional road injuries using education and protective equipment (more details can be found at http://guidance.nice.org.uk/PHG/Wave18/56).

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

- the need to purchase a helmet when buying a bike
- the need to include helmets as part of rent-a-bike schemes

- how they could be introduced into the informal secondhand bike market (which includes passing them down and between families)
- design and fitting
- the fact that adults are poor role models when it comes to helmet wearing
- the need to wear them for other activities such as skateboarding and water sports
- inappropriate use and the potential for injury if they are worn in settings not designed for their use, such as playgrounds.

3.39 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.

3.40 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 for short periods of time. For example, they are sold in advance of Bonfire Night and other festivals when retailers and display organisers are granted temporary licences.

3.41 When interpreting self-reported data on children and young people's exposure to risk, there is a need to consider their reluctance 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 to risk difficult to estimate.

Road safety

3.42 The PDG noted several demographic differences in child pedestrian injuries. For example, more boys than girls are injured. In addition, children aged 10 and under are more likely to be injured on urban minor 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 ethnic backgrounds) are more likely to make unaccompanied journeys. (Children from other ethnic groups are more likely to be supervised by an older sibling).

3.43 Most studies on speed are conducted on the main road network with fewer on minor residential roads.

3.44 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. Reducing traffic speed should help to encourage physically active modes of travel. However, at the same time, an increase in physically active travel increases children and young people's exposure to the risks inherent in this type of transport.

3.45 There is an imbalance in the evaluation of 'permissive' and 'punitive' legislation in favour of the latter. This means that equally effective permissive measures may not be recommended for lack of evidence. Most legislation sets rules for the conduct of individuals or groups and imposes sanctions for transgressions. For example, exceeding the speed limit leads to sanctions. Allowing bicycles in bus lanes is an example of permissive legislation.

3.46 Transport studies tend to be designed as 'before-and-after' studies, estimating 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.

3.47 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.

Limitations of the evidence

3.48 The recommendations in this guidance reflect the evidence identified and the PDG's discussions. Absence of recommendations about any particular measure to prevent unintentional injuries among children and young people is a result of a lack of evidence. It should not be taken as a judgement on whether or not other measures are effective or cost effective.

3.49 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, any conclusion about an intervention's effectiveness may be erroneous.

3.50 Many injury prevention programmes do not lend themselves to 'blinding' participants to the research study group they have been allocated to. However, it is often possible to have evaluators who are 'blind' to group allocation.

3.51 Although interventions including both adults and children and young people are often evaluated, the outcomes for children and young people are not reported separately.

3.52 Studies of the effectiveness of strategic approaches to injury prevention (such as legislation and enforcement) did not provide a strong evidence base on which to conduct an economic modelling exercise. 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.

This section will be completed in the final document.

4 Implementation

NICE guidance can help:

- NHS organisations, social care and children's services meet the requirements of the DH's 'Operating framework for 2008/09' and 'Operational plans 2008/09–2010/11'.
- NHS organisations, social care and children's services meet the requirements of the Department of Communities and Local Government's 'The new performance framework for local authorities and local authority partnerships'.
- National and local organisations within the public sector meet government indicators and targets to improve health and reduce health inequalities.
- Local authorities fulfil their remit to promote the economic, social and environmental 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, such as local strategic partnerships.

NICE will develop tools to help organisations put this guidance into practice. Details will be available on our website after the guidance has been issued (www.nice.org.uk/PHxx).

5 Recommendations for research

This section will be completed in the final document.

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

6 Updating the recommendations

This section will be completed in the final document.

7 Related NICE guidance

Published

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

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

Routine postnatal care of women and their babies. NICE clinical guideline 37 (2006). Available from www.nice.org.uk/CG37

Under development

Preventing unintentional injuries among under 15s in the home. NICE public health guidance (publication expected November 2010).

Preventing unintentional road injuries among under 15s: road design. NICE public health guidance (publication expected November 2010).

Preventing unintentional injuries among under 15s: outdoor play and leisure. NICE public health guidance (publication expected November 2010).

Preventing unintentional road injuries among under 15s: education and protective equipment. NICE public health guidance (publication expected December 2011).

Preventing unintentional road injuries among young people aged 15–24. NICE public health guidance (publication date to be confirmed).

Transport policies that prioritise walking and cycling. NICE public health guidance (publication date to be confirmed).

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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.

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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.

NICE project team

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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.

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 TMVs in social housing for families’ was carried out by PenTAG. The principal authors were: Rob Anderson and Tiffany Moxham.

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 http://guidance.nice.org.uk/PHG/Wave17/12

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)1
- PsycINFO
- SPORTDiscus
- Transport Research Information Service (via the TRIS)

- Transport Research Laboratory

Website searches included:

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

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 http://guidance.nice.org.uk/PHG/Wave17/12

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.
- 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.

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: http://guidance.nice.org.uk/PHG/Wave17/12

Fieldwork

This section will be completed in the final document.

How the PDG formulated the recommendations

At its meetings between February 2009 and February 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.
- 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).

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’.

- 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. **ET.1** indicates that expert testimony number 1 is linked to the recommendation.

The reviews, expert testimony and economic analysis are available at http://guidance.nice.org.uk/PHG/Wave17/12

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, 2.14c, 2.14f, 2.14i

Recommendation 2: evidence statements 2.2, 2.3, 2.4, 2.5, 2.7, 2.8, 2.9, 2.10, 2.11, 2.12, 2.14c, 2.14f, 2.14i

Recommendation 3: IDE

Recommendation 4: IDE

Recommendation 5: IDE

Recommendation 6: IDE

Recommendation 7: IDE

Recommendation 8: IDE

Recommendation 9: evidence statement 1.1; ET.6

Recommendation 10: evidence statement 1.1; ET.6

Recommendation 11: evidence statement 1.1; ET.6

Recommendation 12: evidence statement 1.1; ET.6

Recommendation 13: evidence statement 1.1; ET.6

Recommendation 14: evidence statements 4.1, 4.2, 4.3, 4.4, ET.3

Recommendation 15: IDE

Recommendation 16: evidence statements 2.8, 2.14a, 4.1, 4.2, 4.3, 4.4

Recommendation 17: evidence statements 2.8, 2.14a, 4.1, 4.2, 4.3, 4.4

Recommendation 18: evidence statements 2.8, 2.14a, 4.1, 4.2, 4.3, 4.4

Recommendation 19: IDE

Recommendation 20: IDE

Recommendation 21: IDE

Recommendation 22: evidence statement 5.3

Recommendation 23: evidence statement 5.5

Recommendation 24: evidence statement 5.4

Recommendation 25: evidence statement 5.4

Recommendation 26: IDE

Recommendation 27: IDE

Recommendation 28: IDE

Recommendation 29: evidence statement 5.5

Recommendation 30: evidence statement 5.5

Recommendation 31: evidence statement 2.14f; ET.1

Recommendation 32: IDE

Recommendation 33: evidence statements 1.3, 2.14f; ET.1

Recommendation 34: evidence statement 2.14f; ET.1

Recommendation 35: IDE

Recommendation 36: evidence statements 1.2, 3.1, 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 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 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 2.14c

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

There is moderate evidence from three recent systematic reviews (one [++] and two [+]) that road speed enforcement devices (cameras, lasers or radar) will often 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, none of the systematic reviews were able to identify factors which were consistently associated with higher injury or crash reductions (such as automated versus non-automated detection, mobile versus fixed, covert versus overt, urban versus motorway, or on roads with different speed limits). Nor did included studies 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. However, in one review (++), it seems that most evaluations of the effectiveness of speed enforcement devices have been conducted either in rural or semi-rural areas, or on roads with speed limits of 60 km per hour or over. Therefore the relevance of this evidence for reducing road injuries in environments where children are likely to be pedestrians is probably limited.

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 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 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 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 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.

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.

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 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.

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.

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, 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.

Appendix E: supporting documents

Supporting documents are available at http://guidance.nice.org.uk/PHG/Wave17/12 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 residential areas, and 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’.

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
- ‘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