NATIONAL INSTITUTE FOR HEALTH AND CLINICAL EXCELLENCE

PUBLIC HEALTH DRAFT GUIDANCE

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Preventing unintentional injuries in the home among children and young people aged under 15: providing safety equipment and home-risk assessments

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 preventing unintentional injuries among children and young people aged under 15 in the home. This guidance focuses on the supply and installation of home safety equipment and home-risk assessments. It is particularly aimed at reducing unintentional injuries among children and young people living in disadvantaged circumstances.

The guidance is for commissioners, managers and practitioners who have a direct or indirect role in, and responsibility for, preventing unintentional injuries among children and young people aged under 15 in the home. This includes those working in the NHS, local authorities, education and the wider public, private, voluntary and community sectors. In particular, it may be of interest to primary care trusts, the environmental health sector, children's services, the police and fire and rescue services. It will also be of interest to children, young people, parents and carers and other members of the public.

This is one of five pieces of NICE guidance currently in development on how to prevent unintentional injuries among children and young people aged under 15. The others will address: road design and modification; education and protective equipment to prevent road injuries; outdoor play and leisure; and strategies, legislation, regulation, enforcement, surveillance and workforce development. (For further details, see section 7).

The Public Health Interventions Advisory Committee (PHIAC) has considered both the reviews of the evidence and the economic analysis.

This document sets out the Committee'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 preventing unintentional injuries among children and young people aged under 15 in the home. 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 Committee will meet again to consider the comments, reports and any additional evidence that has been submitted.
- After that meeting, the Committee 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: 2 December 2009

Second Committee meeting: 15 January 2010

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

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

Contents

1 Recommendations

When writing the recommendations, the Public Health Interventions Advisory Committee (PHIAC) (see appendix A) considered the evidence of effectiveness and cost effectiveness. Note: this document does not constitute NICE's formal guidance on this intervention. 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: www.nice.org.uk/guidance/index.jsp?action=folder&o=45193

Context

This guidance focuses on the supply and installation of home safety equipment and home risk assessments, either delivered separately or together. These interventions should form part of a broader strategy to reduce unintentional injuries in the home (including education and regulation).

Home safety equipment comprises any device used to prevent injury in the home. This includes smoke and carbon monoxide alarms, hot water temperature restrictors, safety gates (including stair gates) and oven, window and door guards and locks.

A home risk assessment involves systematically identifying potential hazards in the home, evaluating those risks and providing information or advice on how to reduce them. It may be carried out by a trained assessor or by the householder themselves using an appropriate checklist.

The 'home' refers to inside the dwelling. It does not include the garden or outbuildings.

Recommendation 1: identifying and prioritising households at greatest risk

Who is the target population?

Children and young people aged under 15 years at greatest risk of an unintentional injury, their parents and carers.

Who should take action?

Local strategic partnerships (LSPs), children and young people's strategic partnerships (where they are not part of the LSP), local safeguarding children boards (LSCBs) and children's trusts.

What action should they take?

- Use local information to identify and prioritise households where children and young people aged under 15 are at greatest risk of unintentional injury. Factors could include overcrowding, a low income and a lack of appropriately installed safety equipment. The data could come from surveys and needs assessments and existing datasets (such as hospital episode statistics). Or data could be gathered as part of routine practice (for example, during home visits by community practitioners).

- Consider establishing or using an existing database to share information on high-risk households with other statutory agencies. For example, social workers, GPs and health visitors could identify overcrowded dwellings and notify others via a database accessible to all statutory organisations.

Recommendation 2: establishing partnerships

Who is the target population?

Children and young people aged under 15 years at greatest risk of an unintentional injury, their parents and carers.

Who should take action?

- PCT strategic planners and child health leads.
- Fire and rescue services.
- Housing associations.
- Local authorities: leads for children's services, environmental health, accident prevention and home safety and housing.
- Children's trusts.
- Sure Start and Children's Centres.
- Others with a remit to prevent unintentional injury in the home.

What action should they take?

Establish local partnerships with relevant statutory and voluntary organisations (including those involved in lifestyle and other heath initiatives) to:

- Identify and collect data on specific households where children and young people aged under 15 are at greatest risk of an unintentional injury.
- Identify barriers to creating a safe home (for example, cultural norms, issues of trust or lack of control over the home environment).
- Get the community involved (as outlined in NICE public health guidance 9 'Community engagement' www.nice.org.uk/PH9). For example, use local 'community champions' to promote home safety interventions and help practitioners gain the trust of householders.

- Develop and deliver interventions, in line with recommendation 3.

Recommendation 3: delivery

Who is the target population?

Children and young people aged under 15 years at greatest risk of an unintentional injury, their parents and carers.

Who should take action?

Local partnerships with responsibility for delivery (see recommendation 2).

What action should they take?

- Offer home risk assessments to the households identified and prioritised in recommendations 1 and 2. Where appropriate, supply and install suitable, high quality home safety equipment.

- Ensure the assessment, supply and installation of equipment are 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)
    - cultural and religious beliefs
    - whether or not English is the first language
    - levels of literacy
    - the control people have over their home environment (for example, tenants of social and private landlords, women in traditional, patriarchal families and those living with extended families may not have the authority to agree to an installation)
    - the household's perception of, and degree of trust in, authority.

- Ensure follow-up advice and information is given in person, by phone or letter. This should emphasise the need to be vigilant about home safety, outline why safety equipment has been installed – and the danger of disabling it.

- Keep records of households that have been given safety advice or equipment to prevent duplication. (It may be possible to use an existing local database.) Ensure they are accessible to all those with a direct or indirect responsibility for preventing unintentional injuries in the home.

- Use these records to identify when maintenance and follow-up is required, to feed into strategic planning and to prioritise future interventions (see recommendation 1).

- Ensure homes where safety equipment has been installed are re-visited to see if it is still appropriate and functional. Homes should also be checked to determine whether there are any new requirements (for example, this may be due to changes in the building itself or the family). Home safety messages should be reinforced.

- Encourage all practitioners who visit families and carers with children and young people aged under 15 to provide home safety advice and, where necessary, conduct a home risk assessment. If possible, they should supply and install home safety equipment. If they do not have the appropriate skills or equipment, they should refer the household to services that can carry out these tasks.

2 Public health need and practice

The World Health Organization (WHO) estimates that by 2020, unintentional injury will account for the largest single loss of human life (Towner et al. 2001). Currently, it is a leading cause of death among children and young people aged 1–14 in England and Wales (Audit Commission and Healthcare Commission 2007).

In 2006, unintentional injuries led to 246 deaths among those aged 0–14 in England and Wales (Office for National Statistics 2008). While death rates are falling (Edwards et al. 2006), unintentional injury still results in more than two million visits to accident and emergency (A&E) departments by children in the UK every year. Half of these injuries occur at home and many are preventable (Audit Commission and Healthcare Commission 2007).

In England alone in 2006/07, unintentional injury led to over 100,000 children and young people aged under 15 being admitted to hospital (The NHS Information Centre 2007). According to hospital episode statistics (HES), there was a 0.2% increase in hospital admissions due to unintentional injuries during 2005/06 (Audit Commission and Healthcare Commission).

Children and young people who survive a serious unintentional injury can experience severe pain and may need lengthy treatment (including numerous stays in hospital). They could be permanently disabled or disfigured (Child Accident Prevention Trust 2008) and their injuries may have an impact on both their social and psychological wellbeing.

Types of injury

Children and young children are vulnerable to a range of unintentional injuries in the home including falls, burns and scalds, drowning, suffocation and poisoning (Child Accident Prevention Trust 2008). In the UK between 2000 and 2002, falls were the major cause of unintentional injury in the home among those aged under 15, according to home accidents surveillance system (HASS) data (Department of Trade and Industry 2002). 'Drowning and submersion' and 'other accidental threats to breathing' led to the most deaths

in the home among this group between 2002 and 2005 (Office of National Statistics 2008).

Costs

Treating unintentional injuries among children and young people costs UK A&E departments approximately £146 million a year. Further treatment costs are significant, for example, it can cost £250,000 to treat one severe bath water scald (Child Accident Prevention Trust 2008). The indirect costs include enforced absence from school and the need for children and young people to be supervised (which could involve family and carers taking time off from work).

Risk factors

Epidemiological data indicate that the risk of an unintentional injury is greatest among households living in the most deprived circumstances. Children and young people from lower socioeconomic groups whose parents have never worked (or who are long-term unemployed) are 13.1 times more likely to die from such an injury than those whose parents are managers and professionals (Edwards et al. 2006). The evidence also suggests that a range of interrelated factors can lead to a higher risk of injury. Apart from a low income and overcrowded housing conditions, they include a lack of safety equipment. Other factors include gender, age, culture, ethnicity and the household's level of control over their home environment. Although not necessarily the direct cause of injury, these factors can increase children and young people's risk of exposure to a potential hazard.

Current policy and practice

Local strategic partnerships (LSPs) and local safeguarding children boards (LSCBs) have a duty to promote children and young people's health and wellbeing and general welfare. In addition, local area agreements (LAAs) provide an opportunity for local authorities, in partnership with the NHS and other organisations, to focus on unintentional injuries in the home. Practice is variable, but some areas are taking innovative approaches to home safety.

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3 Considerations

PHIAC took account of a number of factors and issues when developing the recommendations.

3.1 Both generic and targeted interventions are used to prevent injuries in the home. The former could include legislation – for example, to improve the way homes are constructed. The latter could include the provision of safety equipment. Both generic and targeted interventions aim to do three things, either independently or in combination: change attitudes and behaviour, alter the environment, and provide information or training (Lund and Aarø 2004).

3.2 The technical efficacy of safety equipment has been proven and, in most cases, has improved since the research studies included in the evidence reviews were undertaken.

3.3 The evidence did not cover the range of safety equipment available. For example, there were no evaluations of interventions involving the installation of carbon monoxide detectors.

3.4 There was limited evidence on residential care homes. While some elements of the recommendations may apply, residential care homes are already subject to a range of legislation. This includes The Care Homes Regulations 2001 (HM Government 2001) and 'Children's homes: national minimum standards, children's homes regulations' (DH 2002).

3.5 PHIAC considered it very unfortunate that many injury prevention schemes do not include an integrated and robust evaluation process. This limits the evidence available on their impact.

3.6 Children and young people learn by taking risks and challenging themselves when playing and in other activities. Many areas of the

home – and activities that take place there – pose an inherent risk. Safety equipment and education help to keep children safe.

3.7 PHIAC acknowledged that interventions need to take into account a household's everyday circumstances and routine practices – and how receptive families are to safety messages. PHIAC believes that it is important to raise awareness of safety issues.

3.8 Safety equipment has to be used and maintained to be effective.

3.9 Forthcoming NICE guidance will cover strategic approaches to reducing unintentional injuries among the under 15s. This will include the use of legislation and regulation. (For more details see section 7.)

4 Implementation

NICE guidance can help:

- NHS organisations, social care and children's services meet:
  - the requirements of Every Child Matters
  - their local area agreement targets, for example, in relation to national indicator 70 (to reduce children and young people's hospital admissions caused by unintentional or deliberate injuries)
  - 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).

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

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 guidance 37 (2006). Available from www.nice.org.uk/CG37

Under development

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

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

Preventing unintentional injuries among under 15s in the home: consultation

Strategies to prevent unintentional injuries among under 15s. NICE public health guidance (publication expected October 2010).

Preventing unintentional road injuries among under 15s: education and protective equipment. NICE public health guidance (publication date to be confirmed).

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).

8 References

Audit Commission and Healthcare Commission (2007) Better safe than sorry: preventing unintentional injury to children. London: Audit Commission

British Medical Association (2001) Injury prevention. London: British Medical Association Board of Science and Education

Child Accident Prevention Trust (2008) Child Accident Prevention Trust factsheet: preventing bath water scalds using thermostatic mixing valves [online]. Available from www.capt.org.uk

Department of Health (2002) Children's homes: national minimum standards, children's homes regulations. London: Department of Health

Department of Trade and Industry (2002) Home accidents surveillance system (HASS) [online]. Available from www.hassandlass.org.uk

Edwards P, Roberts I, Green J et al. (2006) Deaths from injury in children and employment status in family: analysis of trends in class specific death rates. BMJ 333: 119–21

HM Government (2001) The Care Homes Regulations 2001. London: HM Government

Lund J, Aarø LE (2004) Accident prevention. Presentation of a model placing emphasis on human, structural and cultural factors. Safety Science 42: 271–324

Office for National Statistics (2008) Mortality statistics: deaths registered in 2006. Review of the Registrar General on deaths in England and Wales [online]. Available from www.statistics.gov.uk

Office of the Deputy Prime Minister (2006) The economic cost of fire: estimates for 2004 [online]. Available from www.communities.gov.uk

The NHS Information Centre (2007) Hospital episode statistics (HES) [online]. Available from www.hesonline.nhs.uk

Towner E, Dowswell T, Mackereth C et al. (2001) What works in preventing unintentional injuries in children and young adolescents? An updated systematic review. London: Health Development Agency

Towner E, Dowswell T, Errington G et al. (2006) Injuries in children aged 0–15 years and inequalities: A report prepared for the Health Development Agency. London: Health Development Agency

Appendix A Membership of the Public Health Interventions Advisory Committee (PHIAC), the NICE project team and external contractors

Public Health Interventions Advisory Committee

NICE has set up a standing committee, the Public Health Interventions Advisory Committee (PHIAC), which reviews the evidence and develops recommendations on public health interventions. Membership of PHIAC is multidisciplinary, comprising public health practitioners, clinicians, local authority officers, teachers, social care professionals, representatives of the public, academics and technical experts as follows.

Professor Sue Atkinson CBE Independent Consultant and Visiting Professor, Department of Epidemiology and Public Health, University College London

Mr John F Barker Associate Foundation Stage Regional Adviser for the Parents as Partners in Early Learning Project, DfES National Strategies

Professor Michael Bury Emeritus Professor of Sociology, University of London. Honorary Professor of Sociology, University of Kent

Professor K K Cheng Professor of Epidemiology, University of Birmingham

Ms Joanne Cooke Programme Manager, Collaboration and Leadership in Applied Health Research and Care for South Yorkshire

Dr Richard Cookson Senior Lecturer, Department of Social Policy and Social Work, University of York

Mr Philip Cutler Forums Support Manager, Bradford Alliance on Community Care

Ms Lesley Michele de Meza Personal, Social, Health and Economic (PSHE) Education Consultant, Trainer and Writer

Professor Ruth Hall Regional Director, Health Protection Agency, South West

Ms Amanda Hoey Director, Consumer Health Consulting Limited

Mr Alasdair J Hogarth Educational Consultant and recently retired Head Teacher

Mr Andrew Hopkin Assistant Director, Local Environment, Derby City Council

Dr Ann Hoskins Director, Children, Young People and Maternity, NHS North West

Ms Muriel James Secretary, Northampton Healthy Communities Collaborative and the King Edward Road Surgery Patient Participation Group

Dr Matt Kearney General Practitioner, Castlefields, Runcorn. GP Public Health Practitioner, Knowsley PCT

CHAIR Professor Catherine Law Professor of Public Health and Epidemiology, UCL Institute of Child Health

Mr David McDaid Research Fellow, Department of Health and Social Care, London School of Economics and Political Science

Mr Bren McInerney Community Member

Professor Susan Michie Professor of Health Psychology, BPS Centre for Outcomes Research and Effectiveness, University College London

Dr Stephen Morris Professor of Health Economics, Department of Epidemiology and Public Health, University College London

Dr Adam Oliver RCUK Senior Academic Fellow**,** Health Economics and Policy, London School of Economics

Dr Mike Owen General Practitioner, William Budd Health Centre, Bristol

Dr Toby Prevost Reader in Medical Statistics, Department of Public Health Sciences, King's College London

Ms Jane Putsey Lay Member, Registered Tutor, Breastfeeding Network

Dr Mike Rayner Director, British Heart Foundation Health Promotion Research Group, Department of Public Health, University of Oxford

Mr Dale Robinson Chief Environmental Health Officer, South Cambridgeshire District Council

Ms Joyce Rothschild Children's Services Improvement Adviser, Solihull Metropolitan Borough Council

Dr Tracey Sach Senior Lecturer in Health Economics, University of East Anglia

Professor Mark Sculpher Professor of Health Economics, Centre for Health Economics, University of York

Dr David Sloan Retired Director of Public Health

Dr Stephanie Taylor Reader in Applied Research, Centre for Health Sciences, Barts and The London School of Medicine and Dentistry

Dr Stephen Walters Reader in Medical Statistics, University of Sheffield

Dr Dagmar Zeuner Joint Director of Public Health, Hammersmith and Fulham PCT

Expert co-optees to PHIAC:

Carolyn Cripps Member, London Home and Water Safety Council; Consultant and Trainer, burns prevention and home safety; Member, Institute of Home Safety

Lisa Irving Public Health Nurse (accident prevention), Northumberland Care NHS Trust

Rob Taylor Station Manager, Community Fire Safety, Merseyside Fire and Rescue Service

Heather Ward Chair, NICE Programme Development Group for 'Strategies to prevent unintentional injuries among under 15s.'; Honorary Senior Research Fellow, Centre for Transport Studies, University College, London

NICE project team

Mike Kelly
CPHE Director

Simon Ellis
Associate Director

James Jagroo
Lead Analyst

Hilary Chatterton
Analyst

Lesley Owen
Technical Adviser (Health Economics)

External contractors

Reviewers: evidence reviews

Review 1: 'Preventing unintentional injuries among under-15s in the home. Systematic reviews of effectiveness and cost-effectiveness of home safety equipment and risk assessment schemes' was carried out by Peninsula Technology Assessment Group (PenTAG). The principal authors were: Mark Pearson, Ruth Garside, Tiffany Moxham and Rob Anderson.

Review 2: 'Barriers to, and facilitators of the prevention of unintentional injury in children in the home: a systematic review of qualitative research' was carried out by PenTAG. The principal authors were: Janet Smithson and Tiffany Moxham.

Reviewers: cost-effectiveness modelling

'Preventing unintentional injuries among under-15s in the home. Report 3: cost-effectiveness modelling of home-based interventions aimed at reducing unintentional injuries in children' was carried out by PenTAG. The principal authors were: Martin Pitt, Rob Anderson and Tiffany Moxham.

Appendix B Summary of the methods used to develop this guidance

Introduction

The reviews and cost effectiveness 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 PHIAC meetings provide further detail about the Committee's interpretation of the evidence and development of the recommendations.

All supporting documents are listed in appendix E and are available at www.nice.org.uk/guidance/PHG/Wave18/1

Guidance development

The stages involved in developing public health intervention 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 review(s) and economic analysis undertaken

6. Evidence and economic analysis released for consultation

7. Comments and additional material submitted by stakeholders

8. Review of additional material submitted by stakeholders (screened against inclusion criteria used in review/s)

9. Evidence and economic analysis submitted to PHIAC

10. PHIAC produces draft recommendations

11. Draft guidance released for consultation and for field testing

12. PHIAC 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 PHIAC to help develop the recommendations. The overarching questions were:

Question 1: Which interventions involving the supply and/or installation of home safety equipment are effective and cost effective in preventing unintentional injuries among children and young people aged under 15 in the home?

Question 2: Are home risk assessments effective and cost effective in preventing unintentional injuries among children and young people aged under 15?

Question 3: What are the barriers to, and facilitators of, interventions involving the supply and/or installation of home safety equipment and/or home risk assessments?

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

Reviewing the evidence

Two evidence reviews were carried out: one on effectiveness and cost effectiveness and one on the barriers to, and facilitators of, the prevention of unintentional injury in children in the home.

Identifying the evidence

The following databases were searched from 1990 up to March 2009, using a single strategy to identify relevant primary and qualitative research (no study design filters were applied):

- Applied Social Science Index and Abstracts (ASSIA)
- Bibliomap
- Centre for Review and Dissemination databases
- CINAHL (Cumulative Index of Nursing and Allied Health Literature)
- Cochrane Library database of systematic reviews
- Database of Abstracts of Reviews of Effects (DARE)
- Database of Promoting Health Effectiveness Reviews (DoPHER)
- EconLit

- Evidence for Policy and Practice Information and Co-ordinating (EPPI) Centre databases
- Health Management Information Consortium (HMIC)
- ISI Web of Knowledge Social Science Citation Index (SSCI)
- Science Citation Index Expanded (SCI-EXPANDED)
- MEDLINE
- National Health Service Economic Evaluations Database (NHSEED)
- NHS Economic Evaluation Database (HTA)
- PsycINFO
- SafetyLit
- Trials Register of Promoting Health Interventions (TRoPHI)

A follow-up targeted search of named programmes was conducted in MEDLINE and using the search engine Google.

The following websites were also searched:

- Child Accident Prevention Trust (www.capt.org.uk)
- Children in Wales (www.childreninwales.org.uk/areasofwork/childsafety)
- Eurosafe (www.eurosafe.eu.com)
- Injury Observatory for Britain & Ireland (www.injuryobservatory.net)
- Integris (EU Injuries programme for coordinating injury data) (www.rp7integris.eu/en/pages/home-1.aspx)
- International Society for Child and Adolescent Injury Prevention (www.iscaip.net)
- Public Health Observatory website for the South West (lead on injuries) www.swpho.nhs.uk)
- The Royal Society for the Prevention of Accidents (www.rospa.org)

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

Selection criteria

Studies were included in the effectiveness and cost effectiveness review if they:

- were published from 1990 to March 2009 in English
- were conducted in member countries of the Organisation for Economic Cooperation and Development (OECD)
- reported injury related outcomes (for example, a reduction in injuries from smoke inhalation, an increase in the number of smoke alarms installed and improved knowledge of how to prevent other injuries in the home).

Studies were excluded if they did not:

- compare the injury-related outcome prior to or without the intervention report injury-related outcomes for children or young people aged under 15[1] (for examples, see above)
- for the cost-effectiveness review only, assess the cost and related benefits or effectiveness of the intervention (or class of intervention).

Quality appraisal

Included papers were assessed for methodological rigour and quality using the relevant 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 methodology checklist criteria have been fulfilled. Where they have not been fulfilled, the conclusions are thought very unlikely to alter.

+ Some of the methodology checklist criteria have been fulfilled. Those criteria that have not been fulfilled or not adequately described are thought unlikely to alter the conclusions.

– Few or no methodology checklist criteria have been fulfilled. The conclusions of the study are thought likely or very likely to alter.

[1] However, studies that reported injury-related outcomes among, for example, those aged 5–18 years would be included if most of the data related to children aged 15 years or under.

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 evidence statements relating to each key question. The evidence statements were prepared by the public health collaborating centre (see appendix A). The statements reflect their judgement of the strength (quantity, type and quality) of evidence and its applicability to the populations and settings in the scope.

Economic analysis

The economic analysis consisted of a review of economic evaluations (the cost effectiveness part of review 1) and a cost-effectiveness model (report 3).

Cost effectiveness review (part of review 1)

As indicated above, a single search strategy was used to identify relevant economic evaluations from a wide range of databases (listed earlier).

Cost-effectiveness modelling

Two economic models were constructed to incorporate data from the evidence reviews.

First, the intervention model was used to analyse the effectiveness of an intervention to increase the number of people using a particular safety feature (such as a smoke alarm or stair gate) in the home.

The second stage outcomes model used the levels of installed safety equipment in the population (derived from the first model) to predict the number of resulting injuries and fatalities over the lifetime of the population cohort. It involved a cost–utility analysis undertaken from the NHS and personal social services perspective.

A number of assumptions were made which could underestimate or overestimate the cost effectiveness of the interventions (see review modelling report for further details).

The results are reported in: 'Preventing unintentional injuries among under-15s in the home. Report 3: cost-effectiveness modelling of home-based interventions aimed at reducing unintentional injuries in children'. It is available at www.nice.org.uk/guidance/PHG/Wave18/1

Fieldwork

This section will be completed in the final document.

How PHIAC formulated the recommendations

At its meeting in September 2009 PHIAC considered the evidence of effectiveness and cost effectiveness to determine:

- whether there was sufficient evidence (in terms of quantity, quality and applicability) to form a judgement
- whether, on balance, the evidence demonstrates that the intervention is effective, ineffective or equivocal
- where there is an effect, the typical size of effect.

PHIAC developed draft recommendations through informal consensus, based on the following criteria.

- Strength (quality and quantity) of evidence of effectiveness and its applicability to the populations/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.
- Cost effectiveness (for the NHS and other public sector organisations).
- Balance of risks 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 evidence statements from two evidence reviews provided by public health collaborating centres (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 review (see appendix E for details). It also sets out a brief summary of findings from the economic analysis.

Evidence statement number E4d indicates that the linked statement is numbered 4d in review 1 'Preventing unintentional injuries among under-15s in the home. Systematic reviews of effectiveness and cost-effectiveness of home safety equipment and risk assessment schemes'.

Evidence statement number B1 indicates that the linked statement is numbered 1 in review 2 'Barriers to, and facilitators of the prevention of unintentional injury in children in the home: a systematic review of qualitative research.'

The reviews are available at:
www.nice.org.uk/guidance/index.jsp?action=folder&o=45193

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) below.

Recommendation 1: economic modelling; IDE

Recommendation 2: evidence statements B1, B4, B5, B6, B7, B8, B9, B10, B11, B12, B13, B14, B15; IDE

Recommendation 3: evidence statements E1c, E2a, E2b, E3b, E3c, E3d, E4b, E4c, E4d, E6b, E7b, E9b, B4, B5, B6, B7, B8, B9, B10, B11, B12, B13, B14, B15; IDE

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 E1c

There is weak evidence from one randomised controlled trial (RCT) (+) to suggest that the mailing of a safety information leaflet with free cupboard locks (to families where a child had recently experienced a poisoning incident) had no statistically significant effect on the home safety behaviour of parents.

Evidence statement E2a

There is inconsistent evidence about impact on injury from one cluster RCT (++) and one controlled before-and-after study (CBA) (+). There is evidence from the better quality cluster RCT that the free supply and installation of smoke alarms had no significant effect on the incidence of fire-related hospitalisations and deaths (rate ratio 1.0 [95% confidence interval {CI} 0.5, 2.0]). However, the CBA study suggests that the free supply and installation of smoke alarms decreased the incidence of fire-related injuries (within-group pre-post intervention comparison: 0.2 [95% CI 0.1, 0.4] for the intervention group and 1.1 [95% CI 0.7, 1.7] for the remainder of the city).

Evidence statement E2b

There is inconsistent evidence about impact on rates of installation of home safety equipment from two cluster RCTs (one [++], one [+]) and one CBA (+). There is evidence from the better quality cluster RCT that the free supply and installation of smoke alarms had no significant effect on the installation or functioning of smoke alarms within households (Rate ratio 1.0 [95% CI 0.4, 2.4]). However, there is evidence from the other cluster RCT that the free supply and installation of smoke alarms had a significant effect on the installation and functioning of smoke alarms: odds ratio (OR) 4.82 (95% CI 3.97, 5.85). The CBA study reported that 51% of intervention households (identified as being without a smoke alarm prior to the intervention) had a correctly installed and functioning smoke alarm at 12 months follow-up.

Evidence statement E3c

There is weak evidence from two RCTs (one [++] and one [+]) about interventions with free or discounted supply of home safety equipment in conjunction with safety education. Outcomes about three types of home safety equipment (buffers, electrical outlet covers and cupboard locks/latches) are reported, showing mixed evidence of effect. Outcomes about other types of home safety equipment (non-slip bathroom items, window locks, fire guards and stair gates) are presented in one report, with only fire guards reported as being more likely to be present post-intervention (based on self-report).

Evidence statement E3d

There is weak evidence from one RCT (++) that the free or discounted supply of a range of safety equipment, in conjunction with safety education, increases the rate of installation of safety equipment as a whole (mean difference [MD] 21.1 [95% CI 13.90, 28.30]) (based on self-report).

Evidence statement E4b

There is weak evidence from one RCT (++) that free home safety equipment (or its delivery) and installation with safety education increases the use of smoke alarms at 12 months (OR 1.83 [95% CI 1.33, 2.53]) and 24 months (OR 1.67 [95% CI 1.21, 2.32]). The intervention did not have a statistically significant impact on reducing socioeconomic inequalities in the uptake and continued use (12 months post-intervention) of smoke alarms.

Evidence statement E4c

There is weak evidence from one RCT (++) that showed mixed evidence of effect of the supply of free home safety equipment (or its delivery) and installation with safety education. Outcomes showed no impact on fire guards being fitted and always used after 12 or 24 months, and increased use of stair gates and window locks at 12 months, but not 24 months. The intervention had a statistically significant impact on reducing socioeconomic inequalities in the uptake and continued use (12 months post-intervention) of stair gates.

Evidence statement E4d

There is weak evidence from one RCT (++) that free home safety equipment (or its delivery) and installation with safety education may increase the safe storage at 12 months of cleaning products and sharp objects, but these effects are no longer seen after 24 months for safe storage of sharp objects.

Evidence statement E6b

There is inconsistent evidence from two RCTs (one [+] and one [++]) and one CBA (+) about interventions with a home risk assessment and free or discounted supply of home safety equipment that included a smoke alarm. Outcomes about the rates of installation of smoke alarms (all self-reported) show mixed evidence of effect (no effect, increased, increased).

Evidence statement E7b

Three studies (one CBA [+] and two before-and-after [BA] [{-}, {+}]) report on the continued presence and use of installed equipment after home risk assessment and free or discounted supply and installation of home safety equipment. There is mixed evidence about the impact on continued working equipment. One study found that 60% of installed hot water tempering valves remained in situ after 6 to 9 months. One study found significant improvements in the numbers of households with working window guards and fire extinguishers post-intervention. Finally, two studies (one CBA [+] and one BA [+]) showed significantly more smoke alarms installed and working post-intervention ($p<0.0001$; OR 0.30 [95% CI 0.24, 0.38: showing less alarm absence in the intervention group]).

Evidence statement E9b

There is inconsistent evidence from six robust studies (which use both observed outcome measures and a controlled study design) about the presence of functional smoke alarms. Four suggest that the intervention increased functioning presence (one RCT [+], one CBA [+], one RCT [-] and one CBA [+]) and two suggest that no significant impact was seen on smoke alarms (both RCT [++]).

Evidence statement B1

Five studies (three [-] and two [+]) explicitly cited perceived legal or policy barriers to unintentional injury prevention programmes. Particular weaknesses identified in carrying out fire safety interventions included work being too short term and fragmented due to lack of coordination of home safety in one central organisation. Weak legislation for landlords of rented accommodation meant that recommendations were not necessarily implemented effectively. Weak regulation on containers of toxic products was a barrier to reducing unintentional injury in the home, as consumer choice allowed toxic products not always to be sold in child- resistant containers.

Facilitators for prevention programmes aimed at reducing unintentional injuries to children in the home included strong policy drivers or legislation – for example, an obligation under the Fire Services Act to councils or landlords to implement services, and the provision of funding to enable this.

Evidence statement B4

Nine studies (four [-], four [+] and one [++]) found that a major barrier to implementing safety equipment and childproofing a home was living in a home one was not free to modify.

The studies found that mothers particularly found a lack of control over their home environment due to living in rented accommodation, and/or with extended family. In rented accommodation, landlords were reported as unresponsive to requests for installation or maintenance of safety equipment. In extended family homes, often in overcrowded situations, young parents often did not have a say in how the home was arranged. Two studies noted

that high turnover of tenants in cheap rented accommodation limited the effectiveness of projects to organise effective installation and maintenance. In two studies, having landlords with the ability and eagerness to make repairs led to more effective interventions.

Evidence statement B5

Four studies (two [-] and two [+]) found that faulty or poor quality equipment was a barrier to interventions to reduce unintentional injuries to children in the home. For example, mothers resorted to taping over electric sockets when safety plugs were not provided or did not work.

The four studies made recommendations for different or better equipment. Studies recommended the provision of tamper-proof smoke alarms with 10-year batteries, alternatives of sprinkler systems for some populations, smoke alarms with longer lasting batteries, help for fitting alarms, or simpler systems for older residents, and more systematic provision of child-resistant containers.

Suspicion by those in vulnerable communities of strangers coming into their homes to assess or install property, and suspicion of ‘free’ offers, needs to be mitigated in successful interventions.

Evidence statement B6

The two studies on smoke alarm installation (one [+], one [-]) both found that people balance immediate and longer term risks to health and wellbeing when they disable alarms. They were aware that it was less than ideal to disable smoke alarms, but weighed this against other factors, especially the inconvenience and stress of malfunctioning alarms.

Evidence statement B7

Three studies (one [+] and two [-]) based on evaluation of specific interventions all found that training in installation and equipment use/replacement was a facilitator to reducing the incidence of unintentional injuries to children in the home.

Evidence statement B8

Cost emerged as a theme in five of the studies, always as a barrier to reducing accidents to children in the home, or to obtaining help if a child had been injured (two [-], two [+] and one [++]). Three studies found that the perceived cost of installing safety devices or making repairs was a major barrier in the correct use of smoke alarms and in general for safety equipment. However, in one study the provision of free safety equipment, in this case a smoke alarm, led to the equipment being rejected due to suspicions precisely because it was free, which suggests that making equipment or installations totally free may not always be appropriate.

Evidence statement B9

Four studies (one [-], two [+] and one [++]) found that young or poorly educated mothers found it hard to anticipate the child's rate of development in terms of ability to climb, open containers or locks, or light fires. One study, in contrast, found that mothers were good at anticipating developmental milestones and adjusting the home environment in advance of changes, thereby reducing the rate of unintentional injuries in the home (+).

Evidence statement B10

One study (++) found that exposure to a child poisoning incident, either in real life or in the media, increased awareness of that particular danger and was a motivator for implementing safety measures. This suggests that providing information on unintentional poisoning via media outlets might be an effective facilitator in raising awareness of risk.

Evidence statement B11

One study (-) found that adolescent mothers found it hard to deal with issues of blame, oscillating between ideas of the accident-prone child who would have accidents whatever you did, and the negligent adult who was responsible for their child's accidents. The study recommends that care providers approach the topic of injury in a forthright manner when working with adolescent mothers, challenging the idea that injuries are unavoidable while not assigning blame to the mother for injury to the child. It also suggests that

‘helping mothers identify risks to their specific child in their specific environment may be the most effective intervention’.

Evidence statement B12

Five studies (two [-], two [+] and one [++]) noted the large and constant amount of effort which mothers put into preventing unintentional injuries in the home as a major facilitator of reducing unintentional injuries in the home. Authors picked up on several main components of this maternal safeguarding work – commonsense safeguarding, constant vigilance and teaching children about safety.

While these maternal safeguarding activities do act as a short-term facilitator to accident reduction, it is important to note that they are time and energy-intensive and that, for this reason, need supplementing with other forms of unintentional injury prevention.

Evidence statement B13

Three studies (two [+] and one [++]) noted cultural practices which, while they may have been adequate safety measures in the parents’ culture of origin, were risky in a new cultural context. There were two aspects to this theme; lack of experience of the particular risks of a host context, and lack of understanding by health officials about different child safety norms and expectations in immigrants’ cultures.

Mexican mothers in one US study mostly came from rural and semi-rural backgrounds, so had less experience with urban hazards such as multi-storey buildings and hot water taps which could cause falls or scalds. Mexican mothers were also more likely to use Mexican products, which were more likely to come without safety warnings/packaging. Two US studies found significant cultural differences in experience and expectations which led to health visitors classing behaviour as risky because of a lack of understanding of immigrants’ perception of safety and risk.

Evidence Statement B14

Five studies (two [-], two [+] and one [++]) found that a major barrier to child safety in the home was mothers' worry that asking about child injury in any context, including unintentional injury prevention, or taking an unintentionally hurt child to hospital, would result in the child being removed/seen as at risk, and they would be accused of abuse or neglect. All of these studies were in the US or Canada and focused on low-income mothers, and additionally, most were adolescent mothers or immigrant mothers.

Evidence Statement B15

Two studies (one [+], one [++]) found that a major barrier to child safety in the home was mothers' lack of autonomy to make household or financial decisions. Policies/interventions might need to reconsider the often automatic targeting of mothers about safety equipment or behaviour, especially in populations where the fathers (or parents-in-law) traditionally make decisions about household purchases.

Cost-effectiveness evidence

To supplement the cost-effectiveness review, two cost–utility analyses were carried out using the same model of the lifetime costs and effectiveness of relevant home safety interventions.

The first analysis compared the supply and installation of free smoke alarms versus no intervention. It found that a free smoke alarm scheme would probably be cost effective (incremental cost-effectiveness ratio [ICER] £23,046). However, there were many uncertainties in this model and it should be noted that the empirical evidence is inconsistent.

The second analysis compared general home safety consultation and equipment provision versus no intervention. (This includes home safety consultation visits, provision of educational materials and advice, as well as the free supply and installation of a range of equipment.)

The sensitivity analyses demonstrate that, from a public sector perspective, cost–utility is likely to be highly dependent on:

- the proportion of households that participate, the prevalence of existing safety devices in use and the proportion of households that correctly install or use any devices provided
- how long the device is effective (‘functional decay’) and whether or not other changes take place in the household which affect its use
- fixed or overhead costs of programmes relative to the number of households targeted
- number of people in a household and their age
- relative reduction in risk due to the device being properly fitted and used (or due to people adopting safer behaviour in the home).

Appendix D Gaps in the evidence

PHIAC identified a number of gaps in the evidence relating to the interventions under examination, based on an assessment of the evidence. These gaps are set out below.

1. There is a lack of epidemiological data on unintentional injuries in the home among under 15s – the types, causes and severity of injuries (in particular, in relation to falls).

2. There is limited, high quality evidence from the UK on the effectiveness of:
    - a range of home safety equipment, for example, carbon monoxide detectors and equipment incorporating new technologies (the latter include 10-year batteries and hard-wired smoke alarms)
    - different approaches to installing and maintaining home safety equipment and on the comparative effectiveness of combining different approaches (for example, education combined with the installation of safety equipment)
    - targeted approaches and the effects of interventions on different population groups, including deprived and high-risk households
    - making people aware of home safety issues to increase the use of safety equipment.

3. There is a lack of cost-effectiveness studies and related data, such as the standard cost of home safety equipment and installation.

4. There is limited evidence on the reasons why deprived and other high-risk households may be unreceptive to home safety interventions and on what encourages them to take them up

Appendix E Supporting documents

Supporting documents are available at www.nice.org.uk/guidance/PHG/Wave18/1

These include the following:

- Evidence reviews:
  - Review 1: 'Preventing unintentional injuries among under-15s in the home. Systematic reviews of effectiveness and cost-effectiveness of home safety equipment and risk assessment schemes'
  - Review 2: 'Barriers to, and facilitators of the prevention of unintentional injury in children in the home: a systematic review of qualitative research'.

- Cost-effectiveness modelling:
  - 'Preventing unintentional injuries among under-15s in the home. Report 3: cost-effectiveness modelling of home-based interventions aimed at reducing unintentional injuries in children'.

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