PREVENTING UNINTENTIONAL INJURIES AMONG UNDER-15s IN THE HOME

Report 1:

Systematic reviews of effectiveness and cost-effectiveness of home safety equipment and risk assessment schemes

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About the Peninsula Technology Assessment Group (PenTAG)

The Peninsula Technology Assessment Group is part of the Institute of Health Service Research at the Peninsula Medical School. PenTAG was established in 2000 and carries out independent Health Technology Assessments for the UK HTA Programme, systematic reviews and economic analyses for NICE (Technology Appraisal and Centre for Public Health Excellence) and systematic reviews as part of the Cochrane Collaboration Heart Group, as well as for other local and national decision-makers. The group is multi-disciplinary and draws on individuals' backgrounds in public health, health services research, computing and decision analysis, systematic reviewing, statistics and health economics. The Peninsula Medical School is a school within the Universities of Plymouth and Exeter. The Institute of Health Research is made up of discrete but methodologically related research groups, among which Health Technology Assessment is a strong and recurring theme. Projects to date include:

- Interventions to prevent unintentional injury in children on the road: Systematic reviews of effectiveness and cost-effectiveness of road and street design-based interventions aimed at reducing unintentional injuries in children (2009)
- A systematic review of risk factors for unintentional injuries among children and young people aged under 15 years: Quantitative correlates review of unintentional injury in children (2009)
- Providing public information to prevent skin cancer. Barriers to and facilitators to conveying information to prevent first occurrence of skin cancer: a systematic review of qualitative research (2009)
- Population and community programmes addressing multiple risk factors to prevent cardiovascular disease: a qualitative study into how and why some programmes are more successful than others (2009)
- Barriers to and facilitators for the effectiveness of multiple risk factor programmes aimed at reducing cardiovascular disease within a given population: a systematic review of qualitative research (2009)
- Bevacizumab, sorafenib tosylate, sunitinib and temsirolimus for renal cell carcinoma: A systematic review and economic model (2008)
- The Effectiveness and Cost-Effectiveness of Methods of Storing Donated Kidneys from deceased donors: A Systematic Review and Economic Model (2008)
- The Effectiveness and Cost-Effectiveness of Cochlear Implants for Severe to Profound Deafness in Children and Adults: A Systematic Review and Economic Model (2008)
- Inhaled Corticosteroids and Long-Acting Beta2-Agonists for The Treatment of Chronic Asthma an Children Under the Age of 12 Years: a Systematic Review and Economic Analysis (2007)
- The Effectiveness and Cost-Effectiveness of Cardiac Resynchronisation Therapy for Heart Failure. Systematic Review And Economic Evaluation (2007)

- The effectiveness and cost-effectiveness of Carmustine Implants and Temozolomide for the treatment of newly-diagnosed High Grade Glioma**.** Systematic Review And Economic Evaluation (2007)
- The Effectiveness and Cost-Effectiveness of Cinacalcet for Secondary Hyperparathyroidism in end stage renal disease patients on dialysis. Systematic Review And Economic Evaluation (2007)
- The Cost-Effectiveness of testing for hepatitis C (HCV) in former injecting drug users. Systematic Review And Economic Evaluation. (2006)
- The Effectiveness and Cost-Effectiveness Of Surveillance Of Barrett's Oesophagus: Exploring The Uncertainty (2005)
- The Effectiveness And Cost-effectiveness Of Dual Chamber Pacemakers Compared To Single Chamber Pacemakers For Bradycardia Due To Atrioventricular Block Or Sick Sinus Syndrome - Systematic Review And Economic Evaluation (2005)
- The Effectiveness And Cost-Effectiveness Of Pimecrolimus And Tacrolimus For Atopic Eczema - A Systematic Review And Economic Modelling (2005)
- Do The Findings Of Case Series Studies Vary Significantly According To Methodological Characteristics?(2005)
- The Effectiveness And Cost-Effectiveness Of Microwave And Thermal Balloon Endometrial Ablation For Heavy Menstrual Bleeding - A Systematic Review And Economic Modelling (2004)
- The Effectiveness And Cost-Effectiveness Of Imatinib For First Line Treatment Of Chronic Myeloid Leukaemia In Chronic Phase (2003)
- Systematic Review Of Endoscopic Sinus Surgery For Nasal Polyps (2003)
- Screening For Hepatitis C Among Injecting Drug Users And In Genitourinary Medicine (GUM) Clinics - Systematic Reviews Of Effectiveness, Modelling Study And National Survey Of Current Practice (2002)
- The Effectiveness And Cost-Effectiveness Of Imatinib (STI 571) In Chronic Myeloid Leukaemia - A Systematic Review (2002)

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Declaration of authors' competing interests

No authors have competing interests.

List of abbreviations

A&E	Accident and emergency department
BA	Before and after study
C$	Canadian dollars
CBA	Controlled before and after study
CHEC	A collaborative project led by researchers at the University of Maastricht, which developed a 'criteria list' for assisting with the systematic review of economic evaluations
CI	Confidence interval
Con.	Control group
CPHE	Centre for Public Health Excellence
Ed.	Education (in the form of semi-structured safety counselling)
EV	External validity (of a study)
FU	Follow-up
GP	General Practitioner
HRA	Home risk assessment
HSE	Home safety equipment
In.	Intervention group
IRR	Incidence rate ratio
IV	Internal validity (of a study)
LRFIPP	Lifesavers Residential Fire and Injury Prevention Program, a smoke alarm giveaway scheme with education brochures, which ran in Oklahoma City from 1990 to 1994 (evaluation published in Haddix et al. 2001)
MD	Mean difference
n	Number of participants in a study that were followed-up (for a particular outcome)
N	Number of participants in a study that received the intervention
NA	Not applicable
NB	Please note
NICE	National Institute for Health & Clinical Excellence
NR	Not reported
NS	Not significant
OR	Odds ratio
PenCLAHRC	Peninsula Collaboration for Leadership in Applied Health Research and Care
PenTAG	Peninsula Technology Assessment Group
PUIC	Prevention of unintentional injuries to children (suite of NICE systematic reviews)
RCT	Randomised controlled trial
RoSPA	The Royal Society for the Prevention of Accidents
S&I	Supply & installation (of home safety equipment)
UK	United Kingdom
USA	United States of America

Glossary of terms

Base case (analysis)	The main deterministic analysis which uses the best (most plausible/justified) parameters and assumptions.
Confidence interval	A way of expressing certainty about the findings from a study or group of studies, using statistical techniques. A confidence interval describes a range of possible effects (of a treatment or intervention) that are consistent with the results of a study or group of studies. A wide confidence interval indicates a lack of certainty or precision about the true size of the effect of the intervention and is seen in studies with too few participants. Where confidence intervals are narrow they indicate more precise estimates of effects and a larger sample of people studied. It is usual to interpret a '95%' confidence interval as the range of effects within which we are 95% confident that the true effect lies.
Cost-effectiveness analysis	A type of economic evaluation in which the incremental costs are compared with the incremental benefits (expressed in natural units), typically to produce an Incremental Cost-Effectiveness Ratio (e.g. £X,000 per additional unit of effectiveness)
Cost-utility analysis	A type of cost-effectiveness analysis in which consequences or benefits of the intervention are expressed in preference-based units that reflect both added/lost survival and increased/decreased health-related quality of life, to produce an Incremental Cost-Effectiveness Ratio (e.g. £X,000 per QALY)
Cost of illness study	A type of economic study which estimates the overall burden to society, in cost terms, of a disease or condition. Critically, it does not involve estimating either the costs or effectiveness of specific interventions or programmes to prevent or treat those diseases or conditions.
Decals	Adhesive items that can be applied to fittings (e.g. a bath) in order to provide a non-stick surface
Deterministic analysis	Analysis which uses single values (point estimates) for each numerical assumption (in contrast to probabilistic analysis, which is based on sampling from a defined distribution of possible parameter values)
Discount rate	An annual rate for deflating the value of costs or health outcomes which occur in the future
External validity	The degree to which the results of a study hold true in non-study situations, for example in routine NHS practice. May also be referred to as the *generalisability* of study results to non-study populations.
First Year Rate of Return (FYRR)	The monetary value of the additional benefits of an intervention, divided by the additional costs (measured or estimated for the first year after a project or scheme's implementation, and discounted to a base year); usually expressed as a percentage (i.e. if benefits exceed costs then the ratio is >100%, and if costs exceed benefits the ratio is <1).
Full economic evaluation	An evaluation which estimates or measures and compares both the costs and the effectiveness (or benefits) of two or more comparators. Cost-effectiveness analyses, cost-utility analyses and cost-benefit analyses are the main three recognised types.
Home risk assessment	A systematic assessment of a home to identify potential hazards, evaluate the risk, and provide information or advice on appropriate actions to reduce those risks. The assessment may either be by a trained assessor visiting the home, or by a householder assessing their own home
Home safety education	Semi-structured discussion with parents (or carers) of at least 10 minutes duration about how to reduce unintentional injuries to children in the home (this does not include the use of safety information leaflets, unless these are used to augment the in-person discussion)
Incidence density ratio	The incidence density ratio compares the number of cases occurring per person-months at risk in each group before and after the intervention (Mallonee et al 1996)
Incidence rate ratio	See *rate ratio*.
Interaction term	Interaction term: the degree to which a variable impacts upon the outcome of an intervention may depend upon the value of another variable; this relationship (and its statistical significance) can be quantified in a regression analysis, with the interaction term being the relationship between the variables of interest.
Internal validity	Refers to the integrity of the study design.

Jarman score	A method of deriving a score (from census data) that indicates the extent of socio-economic deprivation within a geographical area (Jarman 1983).
Mean difference	The difference between the mean (average) of the intervention group and the mean (average) of the control group; used in this report where data has been reported on a continuous scale.
Net Present Value	The value of estimates of future streams of benefits less future streams of costs, when both are discounted to their value in the base year (i.e. the year of the analysis)
Odds ratio	Odds are a way of representing probability, especially familiar for betting. In recent years odds ratios have become widely used in reports of clinical studies. They provide an estimate (usually with a *confidence interval*) for the effect of a treatment. Odds are used to convey the idea of 'risk' and an odds ratio of 1 between two treatment groups would imply that the risks of an adverse outcome were the same in each group. For rare events the odds ratio and the *relative risk* (which uses actual risks and not odds) will be very similar.
One-way sensitivity analysis	With a model-based analysis, varying one input variable at a time to see how such changes alter the results of the analysis.
Probabilistic sensitivity analysis	An analysis conducted to quantify the decision uncertainty which arises from the uncertainty of all the parameter estimates used as model inputs. Involves defining a distribution of possible values for each uncertain input parameter and then sampling from those values for a large number of simulated individuals.
Randomised controlled trial	A study to test a specific drug or other treatment in which people are randomly assigned to two (or more) groups: one (the experimental group) receiving the treatment that is being tested, and the other (the comparison or control group) receiving an alternative treatment, a placebo (dummy treatment) or no treatment. The two groups are followed up to compare differences in outcomes to see how effective the experimental treatment was. (Through randomisation, the groups should be similar in all aspects apart from the treatment they receive during the study.)
Rate ratio	Like the relative risk is a ratio but instead based on the rate of a given event or outcome (e.g. 2 deaths per 100 person years of exposure to a risk factor) in one group of subjects compared to another group (e.g. 1 death per 100 person years of exposure, i.e. rate ratio = 2.0).
Relative risk	A summary measure which represents the ratio of the risk of a given event or outcome (for example an adverse reaction to the drug being tested) in one group of subjects compared to another group. When the 'risk' of the event is the same in the two groups the relative risk is 1. In a study comparing two treatments, a relative risk of 2 would indicate that patients receiving one of the treatments had twice the risk of an undesirable outcome than those receiving the other treatment.
Report	A publication based on the data collected in a study. There may be more than one report relating to the same dataset, for example where different analyses of the data are produced or where research participants are followed-up at later points in time.
Sensitivity analysis	Varying either a model's input variables or other model assumptions to see how such changes alter the results of the analysis (i.e. to see how sensitive the model results are to the changes)
Study	A piece of research that is published in one or more reports.
Supply and/or installation (of home safety equipment)	Refers to equipment (supplied in the course of an intervention) that physically requires installation in the home if it is to be used correctly (e.g. smoke alarms, stair gates, cupboard locks).
Time horizon	The length of time over which an economic evaluation (or other study) estimates or measures both the costs and effects relating to the included comparators.

Note: Validity, odds ratio and trial definitions sourced from NICE Public Health Guidance Development: Glossary of technical terms.

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1. Summary

1.1. Introduction

This report presents the findings of a systematic review about the effectiveness and cost-effectiveness of interventions (involving the supply and/or installation of home safety equipment, and/or the provision of home risk assessments) aimed at reducing unintentional injuries to children in the home.

1.2. Aim

The aim of this systematic review was to identify, critically appraise, and synthesise evidence relating to interventions involving the supply and/or installation of home safety equipment, and/or the provision of home risk assessments. Four research questions informed the review:

- Which interventions involving the supply and/or installation of home safety equipment (free of charge or at a reduced cost) are effective and cost-effective in preventing unintentional injuries among children and young people aged under 15 in the home?

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

- What are the factors which either enhance or reduce the effectiveness of interventions involving the supply and/or installation of home safety equipment and/or home risk assessments, or which help or hinder their implementation? (effectiveness review)

- What are the main causal relationships which seem to explain how the different combinations of resources (and levels of costs) of these interventions are related to intended outcomes (cost-effectiveness review)

1.3. Methods

A single search strategy of bibliographic databases was used to identify both effectiveness and cost-effectiveness studies. In addition, a targeted search of named programmes was conducted. Screening of abstracts was conducted by one reviewer using the inclusion and exclusion criteria stated in the review protocol. Included studies were quality appraised using the NICE CPHE Methods Manual (2009) quantitative studies checklist (effectiveness review) or the Evers et al (2005) checklist (cost-effectiveness review). Data extraction was conducted by one reviewer into NICE CPHE evidence tables (effectiveness review) or an adapted version (cost-effectiveness review). Findings were narratively synthesised.

1.4. Findings

Twenty-six reports, presenting the findings of 22 studies, were included in the effectiveness review. Ten of these studies were RCTs, three were cluster RCTs, four were controlled before & after studies, and five were uncontrolled before & after studies. Thirteen of the 22 included studies were conducted in the USA, five were conducted in the UK, two in Canada, one in France, and one in Australia. Seven studies (five RCTs and two cluster RCTs) were appraised as methodologically strong (rated ++), nine studies (three RCTs, one cluster RCT, four CBAs, and one BA) were appraised as methodologically weaker (rated +), and five studies (two RCTs and four BAs) were appraised as methodologically weak (rated -).

Evidence statement 1: Free or discounted supply of home safety equipment
There is evidence from 1 RCT (Woolf et al 1992 [+], USA) about interventions with free or discounted supply of home safety equipment. This evidence is only partially applicable as it was not conducted in the UK.
Injuries
a. There is no evidence presented on injury outcomes in the report evaluating the free or discounted supply of home safety equipment (Woolf et al 1992).
Installation of home safety equipment
b. There is weak evidence from 1 RCT (Woolf et al 1992 [+]) to suggest that mailing

cupboard locks free-of-charge (to families where a child had recently experienced a poisoning incident) had a statistically significant effect on the installation of such locks (*p*=.001).
Home safety knowledge and behaviour
c. There is weak evidence from 1 RCT (Woolf et al 1992 [+]) 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 2: Free or discounted supply and installation of smoke alarms
There is evidence from two cluster RCTs (DiGuiseppi et al 2002 [++], UK; Harvey et al 2004 [+], USA) and two CBAs (Douglas et al 1998 [+]; Mallonee et al 1996 [+], both USA) about interventions with free or discounted supply and installation of smoke alarms. This evidence is only partially applicable to the UK as only one study was conducted in the UK.
Injuries
a. There is inconsistent evidence about impact on injury from one cluster RCT (DiGuiseppi et al 2002 [++]) and one CBA (Mallonee et al 1996 [+]). There is evidence from the better quality cluster RCT (DiGuiseppi et al 2002) 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 % CI 0.5, 2.0)). However, the CBA study (Mallonee et al 1996) 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).
Installation of home safety equipment
b. There is inconsistent evidence about impact on rates of installation of home safety equipment from two cluster RCTs (DiGuiseppi et al 2002 [++]; Harvey et al 2004 [+]) and one CBA (Mallonee et al 1996 [+]). There is evidence from the better quality cluster RCT (DiGuiseppi et al 2002) 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 another cluster RCT that the

free supply and installation of smoke alarms had a significant effect on the installation and functioning of smoke alarms: OR 4.82 (95% CI 3.97, 5.85) (Harvey et al 2004). Mallonee et al (1996) 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.
Home safety knowledge and behaviour
c. There is no evidence presented on home safety knowledge and behaviour outcomes in the reports evaluating the free or discounted supply and installation of smoke alarms (DiGuiseppi et al 2002; Douglas et al 1998; Harvey et al 2004; Mallonee et al 1996).

Evidence statement 3: Free or discounted supply of home safety equipment with safety education
There is evidence from four RCTs (Clamp & Kendrick 1998 [++], UK; Posner et al 2004 [++], USA; Sangvai et al 2007 [-], USA; Sznajder et al 2003 [+], France) about interventions with free or discounted supply of home safety equipment in conjunction with safety education. This evidence is only partially applicable to the UK as only one study was conducted in the UK.
Injuries
a. There is no evidence presented on injury outcomes in the reports evaluating the free or discounted supply of home safety equipment in conjunction with safety education (Clamp & Kendrick 1998; Posner et al 2004; Sangvai et al 2007; Sznajder et al 2003).
Installation of home safety equipment
b. There is moderate evidence from three RCTs (Clamp & Kendrick 1998 [++]; Sangvai et al 2007 [-]; Sznajder et al 2003 [+]) that the free or discounted supply of **smoke alarms** in conjunction with safety education **increases the rate of installation** of these devices (OR 1.14 (95% CI 1.04, 1.25) (Clamp & Kendrick 1998); 16.0 (95% CI 1.50, 171.21) (Sangvai et al 2007); 2.57 (95% CI 1.77, 3.75) (Sznajder et al 2003)). c. There is weak evidence from two RCTs (Clamp & Kendrick 1998 [++]; Sznajder et al 2003 [+]) 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 (Clamp & Kendrick 1998), with only fire guards reported as being more likely to be present post-intervention (based on self-report).

d. There is weak evidence from 1 RCT (Posner et al 2004 [++]) 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** (MD 21.1 (95% CI 13.90, 28.30) (Posner et al 2004)) (based on self-report).

Home safety knowledge and behaviour

e. There is strong evidence from four RCTs (Clamp & Kendrick 1998 [++]; Posner et al 2004 [++]; Sangvai et al 2007 [-]; Sznajder et al 2003 [+]) that the free or discounted supply of a range of safety equipment in conjunction with safety education **increases knowledge** about the prevention of **poisoning** (Clamp & Kendrick 1998; Posner et al 2004; Sangvai et al 2007); Sznajder et al 2003) and **scalds** (Clamp & Kendrick 1998; Posner et al 2004).

f. There is inconsistent evidence from three RCTs (Clamp & Kendrick 1998 [++]; Posner et al 2004 [++]; Sznajder et al 2003 [+]) about the effect of free or discounted supply of a range of safety equipment in conjunction with safety education upon **knowledge about:** the prevention of **fires** (Clamp & Kendrick 1998 (increased); Posner et al 2004 (no effect); Sznajder et al 2003 (increased)), **falls** (Clamp & Kendrick 1998 (no effect); Posner et al 2004 (no effect); Sznajder et al 2003 (increased)), and **wounds** (Clamp & Kendrick 1998 (increased); Posner et al 2004 (increased); Sznajder et al 2003 (no effect)).

g. There is weak evidence from one RCT (Posner et al 2004 [++]) that the free or discounted supply of a range of safety equipment in conjunction with safety education **does not increase knowledge** about the prevention of **drowning** (Posner et al 2004).

h. There is weak evidence from one RCT (Sznajder et al 2003 [+]) that the free or discounted supply of a range of safety equipment in conjunction with safety education **increases knowledge** about the prevention of **suffocation** (Sznajder et al 2003).

Evidence statement 4: Free or discounted supply and installation of home safety equipment with safety education
There is evidence from one RCT (resulting in two study reports: Kendrick et al, 2009 [++]; Watson et al 2005 [++], UK) about an intervention with free or discounted supply and installation of home safety equipment (in conjunction with safety education). This evidence is judged as highly applicable as it is recent and from the UK.
Injuries
a. There is moderate evidence from one RCT that free home safety equipment (or its delivery) and installation with safety education has **no statistically significant impact** on **serious injury rates** in children as measured by secondary care attendance (IRR 1.02 95% CI 0.90, 1.13), hospital admission (IRR 1.02 95% CI 0.70, 1.48), the abbreviated injury scale (OR 1.14 95% CI 0.76, 1.71) or the minor injury severity score (OR 0.98 95% CI 0.75, 1.27) (Watson et al 2005). Primary care attendance appeared to increase (IRR 1.37 95% CI 1.11, 1.70) (Watson et al 2005).
Installation of home safety equipment
b. 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) (Watson et al 2005). The intervention **did not have a statistically significant impact on reducing socio-economic inequalities** in the uptake and continued use (12 months post-intervention) of **smoke alarms** (Kendrick et al 2009). c. There is weak evidence from one RCT about free home safety equipment (or its delivery) and installation with safety education. Outcomes showed mixed evidence of effect: **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 (Watson et al 2005). The intervention **had a statistically significant impact on reducing socio-economic inequalities** in the uptake and continued use (12 months post-intervention) of **stair gates** (Kendrick et al 2009).
Home safety knowledge and behaviour
d. 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 that these effects are **no longer seen after 24 months** for safe storage of sharp objects (Watson et al 2005).

Evidence statement 5: Home risk assessment only
There is evidence from one RCT (Paul et al 1994 [-], Australia) about an intervention with home risk assessment only. This evidence is of low applicability to the UK as the intervention is not recent and took place in a rural Australian setting.
Injuries
a. The study about home risk assessments only did not report injury outcomes.
Installation of home safety equipment
b. There is weak evidence from one RCT suggesting that an intervention with home risk assessment only may **increase the use of smooth table top corners** at 5-9 months after the intervention. However, the study does not report the other measured results which do not favour the intervention.
Home safety knowledge and behaviour
c. There is weak evidence from one RCT suggesting that an intervention with home risk assessment only **does not affect knowledge and behaviour around nine out of the 13** measured safety items at 5-9 months.

Evidence statement 6: Home risk assessment and free or discounted supply of home safety equipment
There is evidence from two RCTs (Babul et al 2007 [+], Canada; King et al 2001; 2005 [++], Canada), one cluster RCT (Kendrick et al 1999 [++], UK), two CBAs (Hendrickson 2005 [+], USA; Johnston et al 2000 [+], USA), and two BAs (Bablouzian et al 1997 [-], USA; Metchikian et al 1999 [-], USA) about interventions with a home risk assessment and free or discounted supply of home safety equipment. This evidence is partially applicable to the UK as only one of the studies was conducted in the UK.

Injuries
a. There is inconsistent evidence from one RCT (King et al 2001; 2005 [++]) and one cluster RCT (Kendrick et al 1999 [++]) about the effect of a home risk assessment and free or discounted supply of home safety equipment on the **occurrence of medically attended injuries**. There is evidence that injury rates decreased at **12 months** following the intervention (OR 0.75 (95% CI 0.58, 0.96) (King et al 2001)) (outcomes self-reported), but not at **25 months** following the intervention (OR 0.97 (95% CI 0.72, 1.30) (Kendrick et al 1999)). There is evidence that injury rates were decreased (at borderline statistical significance) at **36 months** (OR 0.80 (95% CI 0.64, 1.00) (King et al 2005)) (outcomes self-reported).
Installation of home safety equipment
b. There is inconsistent evidence from two RCTs (Babul et al 2007 [+]; King et al 2001 [++]) and one CBA (Johnston et al 2000 [+]) 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** (Babul et al 2007 (no effect); King et al 2001 (increased); Johnston et al 2000 (increased)). c. There is inconsistent evidence from two RCTs (Babul et al 2007 [+]; King et al 2001 [++]) and two BAs (Bablouzian et al 1997 [-]; Metchikian et al 1999 [-]) about interventions with a home risk assessment and free or discounted supply of home safety equipment. Outcomes about three types of **home safety equipment** (electrical outlet covers, cupboard locks/ latches, and stair gates) are reported, showing **mixed evidence of effect**.
Home safety knowledge and behaviour
d. There is moderate evidence from two RCTs (Babul et al 2007 [+]; King et al 2001 [++]) and one BA (Bablouzian et al 1997 [-]) that a home risk assessment and free or discounted supply of home safety equipment **does not improve home safety knowledge** and behaviour about preventing **fires** or **falls** (Bablouzian et al 1997; Babul et al 2007; King et al 2001 (fires only)). e. There is inconsistent evidence from two RCTs (Babul et al 2007 [+]; King et al 2001 [++]), one CBA (Johnston et al 2000 [+]) and one BA (Bablouzian et al 1997 [-]) about the effect of a home risk assessment and free or discounted supply of home safety equipment on home

safety knowledge. Knowledge about preventing **scalds was improved** (Babul et al 2007; King et al 2001), however there was mixed evidence of effect upon knowledge about the prevention of **poisoning** (Babul et al 2007 (no effect); Johnston et al 2000 (improved); King et al 2001 (no effect)).

f. There is weak evidence from one RCT (Babul et al 2007 [+]) that a home risk assessment and free or discounted supply of home safety equipment **does not improve home safety knowledge** and behaviour about preventing **drowning** (Babul et al 2007).

g. There is inconsistent evidence from one RCT (King et al 2001 [++]) and one CBA (Hendrickson 2005 [+]) about the effect of a home risk assessment and free or discounted supply of home safety equipment on parents' perceived **self-efficacy**. There is evidence from one CBA that there was a significant difference between intervention and control groups in self-efficacy at **6 weeks** follow-up (Hendrickson 2005). However, there is evidence from one RCT that self-efficacy did not improve at **12 months** follow-up (King et al 2001).

h. There is evidence from one BA (Metchikian et al 1999 [-]) that a home risk assessment and free or discounted supply of home safety equipment improves home safety knowledge and behaviour (as a whole) at **4-6 months** follow-up (descriptive data only).

Evidence statement 7: Home risk assessment and free or discounted supply and installation of home safety equipment
There is evidence from one CBA (Schwarz et al 1993 [+], USA) and three BAs (Cagle et al 2006 [-], USA; Carman et al 2006 [-], UK; Klitzman et al 2005 [+], USA) about an intervention with a home risk assessment and free or discounted supply and installation of home safety equipment. This evidence is partially applicable as only one of the studies was conducted in the UK.
Injuries
a. Two studies report injury outcomes after home risk assessment and free or discounted supply and installation of home safety equipment (Cagle et al 2006; Carman et al 2006). Carman only presents descriptive statistics, making impact unclear. Cagle suggests that scald injuries are significantly reduced post-intervention, however this conclusion may be

unsound due to lack of control group and contamination issues.
Installation of home safety equipment
b. Three studies 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 (Cagle et al 2006; Klitzman et al 2005; Schwarz et al 1993). 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 6-9 months (Cagle et al 2006). One study found significant improvements in the numbers of households with working window guards and fire extinguishers post-intervention (Klitzman et al, 2005). Finally, two studies showed significantly more smoke alarms installed and working post intervention (Klitzman et al 2005 $p<0.0001$; Schwarz et al 1993 OR 0.30 95% CI 0.24, 0.38: showing less alarm absence in the intervention group).
Home safety knowledge and behaviour
c. There is mixed evidence from 2 studies about the impact of home risk assessment and free or discounted supply and installation of home safety equipment on safety knowledge and behaviour. Of the four safety knowledge and behaviour outcomes (reduced hot water temperature, number of scald risks, fire escape plan and medications with child proof caps) reported by these 2 studies, one was positively affected by the intervention (fire escape plan), one negatively affected (hot water temperature increased in intervention group), and the others were not significantly affected..

Evidence statement 8: Home risk assessment and discounted supply of home safety equipment with education
There is evidence from one RCT about an intervention with a home risk assessment and discounted supply of home safety equipment (in conjunction with education) (Gielen et al 2002 [++], USA). This evidence is of low applicability to the UK as it is from the USA.
Injuries
a. The study about home risk assessments and discounted supply of home safety equipment with education did not report injury outcomes.

Installation of home safety equipment
b. There is weak evidence from one RCT suggesting that home risk assessments and discounted supply of home safety equipment with education **do not increase** the presence and use of smoke alarms, stair gates, or cupboard locks of latches or the use of a specially built children's safety centre (Gielen et al 2002).
Home safety knowledge and behaviour
c. The RCT does not report on differences in behaviour between the control and intervention groups in terms of safety knowledge and behaviour. It does suggest that those who had visited a safety centre took more action to prevent injury, but no more people from the intervention arm visited the centre than from the control arm.

Summary evidence statement 9: Overall impact of home based interventions on rates of injury and installation of safety equipment
Injuries Of the 22 included studies, seven report on the impact of interventions on injury rates.
a. There is inconsistent evidence about impact on injury rate from seven studies: four found no significant reduction in injury with any intervention (three RCTs - DiGuiseppi et al 1999, 2000, [++] UK; Kendrick et al, 1990 [+] UK; Watson et al, 2005, [++] UK; and one uncontrolled before and after study – Carmen et al, 2006 [-] UK). The three that *did* suggest injury rates were reduced have limitations due to difficulty in attributing the change to the intervention (Cagle et al, 2006 USA [-], BA) the use of self-reported outcomes and high attrition rates (King et al, 2001, 2005 Canada [++], RCT) and the use of unadjusted analyses, and an atypical high risk setting (Mallonee et al, 1996 USA [+], RCT). The applicability of these findings is partial, with all the studies finding no impact being set in the UK, and those suggesting positive results in North America.
Installation of smoke alarms Of the 22 included studies, 14 provide information about the installation of smoke detectors post intervention, however, only six used robust designs which both

reported observed outcomes and had a control group.
b. 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 (Harvey et al, 2004 RCT [+] USA; Mallonee et al, 1996 CBA [+] USA; Sangvai et al 2007 RCT [-] USA; Schwarz et al, 1993 CBA [+] USA) and two suggest that no significant impact was seen on smoke alarms (DiGuiseppi et al, 1999; 2002 RCT [++] UK; Gielen et al, 2002 RCT [++] USA).
Installation of other home safety equipment   Of the 22 included studies, 19 provide information about the installation of home safety equipment post intervention, however, only one used a robust designs which both reported observed outcomes and had a control group.
c. There is evidence from one RCT that home risk assessments with free or discounted supply of home safety equipment with safety education does not increase the functional presence of safety equipment (Gielen et al, 2002, RCT [++]USA).

Evidence statement 10: Cost-effectiveness of smoke alarm giveaway schemes
There is inconsistent evidence from 2 cost-effectiveness analyses of smoke alarm giveaway schemes with education materials, that such schemes when targeted at high risk areas and households may be cost-effective from a societal perspective (Ginnelly et al. 2005 [+];Haddix et al. 2001 [+]). The UK-based alarm giveaway programme (Ginnelly et al. 2005) was found to be both less effective and more costly than no giveaway programme, whereas the USA-based programme (Haddix et al. 2001) was found to be both highly effective and cost-saving, compared with no programme. In addition to the fact that one study was in inner-city London (UK) and the other was in a large US city, there were a number of other differences in the characteristics of the intervention, the targeted intervention areas and analysis methods which may explain the directly opposite effectiveness and cost-effectiveness results. In particular, the UK study was based on effectiveness data from an RCT whereas the US study was based on an uncontrolled before and after study; also, the US study

included the value of productivity losses associated with fire-related injuries (and for each fatal injury these were over $0.75 million).

The evidence from the UK-based cost-effectiveness study is judged as directly applicable to UK urban settings (Ginnelly et al. 2005). However, the evidence from the older USA-based study (Haddix et al. 2001) is judged as only partially applicable to UK urban settings. There was no evidence from non-urban settings, or of schemes which did not target high risk and low socio-economic status areas.

Evidence statement 11: Cost-effectiveness of home risk assessments

There is weak evidence from one cost-effectiveness study based on a randomised controlled trial in Canadian cities, that a single home visit involving an information package, discount vouchers, and home-specific risk-reduction advice (based on a previous risk assessment) is cost-effective from a heath system perspective (King et al. 2001 [-]). This cost-effectiveness conclusion either relies on the assumption that avoiding such injuries to children is worth over C$372 to society, and/or that the value of other benefits to families and carers (e.g. gained leisure or earnings not lost caring for the injured child) exceeds C$372. Assessment of the quality of this study was highly compromised by the very small amount of space devoted to describing it within the effectiveness paper.

The evidence is from a Canadian study which uses 15-year old data and is therefore judged as only partially applicable to UK family homes; the generalisability of the study's findings beyond Canada is also hindered by the absence of sensitivity analyses.

2. Background

2.1. Epidemiology

Globally, unintentional injury contributes to the top fifteen causes of death across all age groups of children aged 0-19 years, with road traffic accidents, drowning, fire related burns and falls most common (Peden et al. 2008) A separate review has been undertaken by PenTAG to evaluate engineering measures aimed at the prevention of injury to children on the road, and was previously presented to the PHIAC. The current review considers the prevention of unintentional injury to children in the home. In children under the age of five, the majority of injuries occur in the home. It is known that higher levels of injury morbidity and mortality are found among those from more deprived backgrounds, whatever measure (parental occupation, deprivation index of local area, etc.) is used, although to date there has been little robust research about the impact of interventions on different socio-economic groups (Dowswell & Towner 2002). In addition, unintentional injury is more common, and more serious in boys than girls, and this gap increases with a child's age (Healthcare Commission and Audit Commission 2007). Given variation in injury rates both between and within countries, it is clear that many such injuries are preventable.

2.1.1. Morbidity

Until 2002, the Department of Trade and Industry compiled annual accident statistics for England and Wales using the Home and Leisure Accident Surveillance Systems (HASS/LASS), to assess the number of unintentional injuries resulting in harm serious enough to result in a visit to hospital. The Department of Health has recently commissioned the South West Public Health Observatory to undertake research assessing the feasibility replacing the system of HASS/LASS and this will report in early 2010 (http://www.rospa.com/hassandlass/update.htm).

Data from the most recent of the HASS/LASS reports is available from the Royal Society for the Prevention of Accidents (RoSPA) website. This shows that in 2002 there were 477,486 accidents in the home among those aged 0-4 years and 405,019 among those aged 5-14 years which resulted in injuries requiring hospital attendance (www.hassandlass.org.uk). On average, in 2000-02, nearly three-quarters of a million children aged 0-15 years presented at hospital annually having been injured inside the home (Table 1).

Falls (location not specified) are the most frequent cause of child injury, leading to presentation at hospital, followed by striking contact and crushing/piercing injury. According to the Children's Fire and Burn Trust, latest figures from the National Burn Injury Database show that an average of 1500 children under the age of 5 are admitted to hospital for burns annually, 60% for scalds due to hot water, hot drinks or cooking accidents (http://www.childrensfireandburntrust.org.uk/).

2.1.2. Mortality

Absolute numbers of deaths recorded as "accidental" by the ONS for 2008 are shown in Table 2, together with the rate per million population for 2007 (Office for National Statistics 2009). In 2008, there were 208 deaths recorded as accidental by the ONS (Table 2) Unfortunately, while this provides age specific data for the cause of death, this is not linked to information about the location. From other sources, however, we know that for about half of those with unintentional injuries in the 0-14 age group presenting at accident and emergency departments, these are likely to have been sustained at home (Healthcare Commission and Audit Commission 2007).

A 1996 study suggested that for every one child death in the UK due to home and leisure activities, there are 151 hospital admissions and 1947 attendances at accident and emergency departments (Walsh et al. 1996).

Table 1: Accidents inside the home resulting in presentation at hospital[a] aged 0-14 2000-2002

Year	Age	Poisoning	Acute over exertion	Bite/sting	Chemical effect	Crushing/ piercing	Electrical/ radiation	Falls	Foreign body	Striking contact	Suffocation	Thermal effect	Other	All Accident victims aged 0-14
2000	**0-4**	24,091	10,538	7,309	2,963	38,744	373	222,868	38,691	70,676	2,963	31,382	21,873	798,708
	5-14	2,643	8,036	9,704	869	48,324	461	120,898	17,474	87,103	2,093	12,063	19,195	
2001	**0-4**	22,634	10,050	5,248	3,356	33,594	268	207,078	36,057	68,044	2,570	27,739	15,030	734,545
	5-14	2,035	6,533	8,782	1,071	44,928	321	112,919	16,190	84,216	1,749	11,549	13,994	
2002	**0-4**	23,903	10,107	5,433	3,875	31,919	287	192,167	32,431	72,734	3,178	25,789	15,170	708,972
	5-14	3,854	5,925	8,754	1,476	40,385	369	102,767	17,774	85,834	1,804	9,984	14,125	
Mean 2000-02 Ages 0-14		26,387	17,063	15,077	4,537	79,298	693	319,566	52,872	156,202	4,786	39,502	33,129	747,408

Source: RoSPA (HASSandLASS.org.uk)

[a] Accidents taking place at home but outside are not included

Table 2: Number and rate of childhood deaths in England and Wales recorded as accidental

ICD code category	Sex	Number by age group				Rate per million by age group		
Cause of death		Under 1	1-4	5-14	Total 0-14	Under 1	1-4	5-14
Accidents* (V01-X59)	M	16	36	77	129	48	34	29
	F	11	28	40	79	27	15	13
Falls (W00-W19)	M	-	1	5	6	-	2	1
	F	-	1	1	2	3	-	-
Accidental drowning and submersion (W65-W74)	M	1	9	5	15	6	8	2
	F	-	2	-	2	-	1	1
Exposure to smoke, fire and flames (X00-X09)	M	-	3	2	5	3	5	0
	F	-	3	2	5	3	1	1
Accidental poisoning by and exposure to noxious substances	M	-	-	5	5	-	-	1
(X40-X49)	F	-	2	1	3	-	-	1
Accidental poisoning by and exposure to antiepileptic, sedative-hypnotic,	M	-	-	1	1	-	-	-
antiparkinsonism and psychotic drugs not elsewhere Classified (X41)	F	-	-	-	0	-	-	-
Accidental poisoning by and exposure to narcotics and psychodysleptics	M	-	-	2	2	-	-	0
[hallucinogens], not elsewhere classified (X42)	F	-	1	-	1	-	-	0
Accidental poisoning by and exposure to other and unspecified drugs, medicaments	M	-	-	-	0	-	-	-
and biological substances (X44)	F	-	-	-	0	-	-	-
Accidental exposure to unspecified factor (X59)						3	-	1
						6	1	1

Source: ONS.gov.uk. *Mortality Statistics*. Deaths registered in 2007 – rates. Death registered in 2008 – numbers. *Traffic deaths included.

3. Aims

3.1. Introduction

NICE is developing a range of public health guidance to prevent unintentional injuries among children and young people aged under 15. This review (Report 1) focuses on the effectiveness and cost-effectiveness evidence related to interventions involving the supply and/or installation of home safety equipment, and/or the provision of home risk assessments, aimed at reducing unintentional injuries to children in the home. Two related reports have also been produced to inform this guidance. Report 2 contains a review of qualitative research regarding barriers to, and facilitators of, the prevention of unintentional injuries to children in the home. Report 3 contains a report of economic modelling which assesses a smoke alarm give-away scheme and a home risk assessment and advice programme including free safety equipment.

In parallel with this work, NICE is or will be developing public health intervention guidance during 2009 and 2010 on a number of child injury prevention areas:

- 'Preventing unintentional injuries among under 15s: road design' (schemes involving design- or engineering-based interventions to the road or street environment);
- 'Preventing unintentional injuries among under 15s: outdoor play and leisure';
- 'Preventing unintentional road injuries among under 15s: education and protective equipment'.

There will also be public health guidance ('Strategies to prevent unintentional injuries among under 15s', developed through the programme guidance development process) focusing on the broader legislative/regulatory and related strategic policy frameworks which aim to prevent unintentional injuries in children. NICE will also be preparing guidance that focuses on preventing unintentional road injuries among young people aged 15-24.

3.2. Aim

This report presents two systematic reviews which aim to identify, critically appraise, summarise and synthesise evidence relating to the effectiveness (review 1) and cost-effectiveness (review 2) of interventions (involving the supply and/or installation of home safety equipment, and/or the provision of home risk assessments) aimed at reducing unintentional injuries to children in the home.

3.3. Review questions

The three reviews sought to answer the following review questions, as specified in the agreed Review Protocol (see Appendix 1):

- Which interventions involving the supply and/or installation of home safety equipment (free of charge or at a reduced cost) are effective and cost-effective in preventing unintentional injuries among children and young people aged under 15 in the home?

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

- What are the factors which either enhance or reduce the effectiveness of interventions involving the supply and/or installation of home safety equipment and/or home risk assessments, or which help or hinder their implementation? (effectiveness review)

- What are the main causal relationships which seem to explain how the different combinations of resources (and levels of costs) of these interventions are related to intended outcomes (cost-effectiveness review)

Outcomes of interest:

- Changes in injuries and deaths in children and young people aged under 15.

- Changes in knowledge, attitude, skills and behaviour in relation to preventing unintentional injuries among children and young people aged under 15 in the home.

- The rates of supply, correct installation and proper maintenance of safety equipment resulting in a reduction in unintentional injuries among children and young people aged under 15 in the home.

4. Methods

A summary of the methods used in this systematic review is provided below. The original review protocol is reproduced in Appendix 1 (p.169)

4.1. Identification of evidence

4.1.1. Search strategy

See Appendix 2 (p.184) for full search methods and database search strategies.

A single strategy was used to identify relevant primary research for the effectiveness, cost-effectiveness (reported here, Report 1), and qualitative research reviews (see Report 2). A search of electronic bibliographic databases was undertaken: Medline, PsycINFO, ISI Web of Knowledge Social Science Citation Index (SSCI) and Science Citation Index Expanded (SCI-EXPANDED), Health Management Information Consortium (HMIC), CINAHL, Applied Social Science Index and Abstracts (ASSIA), The Cochrane Library database of systematic reviews, EconLit, SafetyLit, the EPPI-Centre databases; TRoPHI, DoPHER, and Bibliomap, and the databases of the Centre for Review and Dissemination; Database of Abstracts of Reviews of Effects (DARE), National Health Service Economic Evaulations Database (NHSEED), and NHS Economic Evaluation Database (HTA). All bibliographic searches used filters to limit publication years from 1990-date of search, English language, and non-animal research where possible. A follow up targeted search of named programmes (identified from the bibliographic searches and from scoping work conducted by NICE CPHE) was conducted in Medline and using the search engine *Google*.

Search terms including the use of specific named devices were determined as part of the protocol process between CPHE and the research group and incorporated stakeholder considerations and the ability of devices to be “installed” in line with the focus of this review.

Potentially includable papers from a parallel review for the CPHE programme on preventing unintentional injuries in children, “A systematic review of risk factors for unintentional injuries among children and young people aged under 15 years:

Quantitative correlates review of unintentional injury in children", were also tagged during title/abstract screening for this review.

Websites and searches of reference lists of reports and reviews were also used to locate reports.

4.1.2. Inclusion of relevant evidence

4.1.2.1. Inclusion and exclusion criteria

Inclusion criteria for both effectiveness and cost-effectiveness reviews:

- Reports published from 1990
- Reports published in English language
- Studies conducted in OECD countries (see Appendix 3, p.189)

Inclusion criteria specific to the effectiveness review:

- Evaluations (prospective or retrospective) of interventions involving the supply and/or installation[2] of home safety equipment and/or home risk assessments[3] using comparative designs (randomised controlled trials, non-randomised controlled trials, before and after studies, or natural experiments)

Exclusion criteria specific to the effectiveness review:

- Empirical studies which only document interventions and related outcomes without evidence regarding injury outcome prior to or without the intervention.

[2] The 'supply and/or installation' of home safety equipment was defined as being for free or at a discount; some interventions required research participants to physically collect the equipment themselves, whilst others organised delivery to participants' homes.

[3] Defined as: A systematic assessment of a home to identify potential hazards, evaluate the risk, and provide information or advice on appropriate actions to reduce those risks. The assessment may either be by a trained assessor visiting the home, or by a householder assessing their own home

- Empirical studies which do not separately report injury-related outcomes for children or young people aged under 15[4].

Inclusion criteria specific to the cost-effectiveness review:

- Full economic evaluations of relevant types of intervention, and high quality costing studies conducted in the UK or countries of a similar level of economic development.

Exclusion criteria specific to the cost-effectiveness review:

- Cost-of-illness studies, or other studies which do not involve assessing the cost and related benefits/effectiveness of particular interventions (or class of intervention).

4.1.2.2. Screening

Reports identified through the searches were uploaded into a *Reference Manager* database. All titles and abstracts (where available) were screened independently by one of two reviewers (MP and RG). Inclusion decisions were made by a single reviewer (MP or RG), and checked by a second reviewer (MP or RG) where there was uncertainty (<0.2% of abstracts). A checklist (see Appendix 4, p.190) was used to assess adherence to the inclusion criteria. If the abstract provided insufficient information to assess for inclusion, or if no abstract was available and the report was not clearly excludable on the basis of the title alone, then the full text of the report was obtained. The full text of reports was independently assessed for inclusion by one of two reviewers (MP or RG); where there was uncertainty over the inclusion or exclusion of a report (about 7% of full-text reports), this was resolved by discussion. Reports and the reason for their exclusion at the full-text stage are listed in Appendix 7 (p.300).

Where systematic reviews were identified, the lists of included and excluded reports were scanned to identify potentially relevant reports that could enter the screening

[4] However, a study that reported injury outcomes in (for example) the age range 5-18 years would be included if the majority of the data related to children aged 15 years or under.

process detailed above. Citations for these reviews are also listed in Appendix 7 (p.300).

4.2. Methods of analysis/synthesis: Effectiveness review

4.2.1. Quality assessment

All included reports were quality appraised using the revised GATE checklist in the *Methods for the development of NICE public health guidance* (National Institute for Health and Clinical Excellence 2009)

There are five sections of the revised GATE. Section 1 seeks to assess the key population criteria for determining the study's **external validity** – that is, the extent to which the findings of a study are generalisable beyond the confines of the study to the study's source population.

Sections 2 to 4 assess the key criteria for determining the study's **internal validity** – that is, making sure that the study has been carried out carefully, and that the outcomes are likely to be attributable to the intervention being assessed, rather than some other (often unidentified) factor. In an internally valid study, any differences observed between groups of patients allocated to receive different interventions may (apart from the possibility of random error) be attributed to the intervention under investigation. Biases are characteristics that are likely to make estimates of effect differ systematically from the truth. Each of the critical appraisal checklist questions covers an aspect of methodology that research has shown makes a significant difference to the conclusions of a study.

In accordance with the CPHE methods manual (National Institute for Health and Clinical Excellence 2009), checklist items were worded so that one of five responses was possible:

++	Indicates that for that particular aspect of study design, the study has been designed/conducted in such a way as to minimise the risk of bias
+	Indicates that either the answer to the checklist question is not clear from the way the study is reported, or that the study may not have addressed all potential sources of bias for that particular aspect of study design
-	Should be reserved for those aspects of the study design in which significant sources of bias may persist
Not reported (nr)	Should be reserved for those aspects in which the study under review fails to report how they have/might have been considered
Not applicable (na)	Should be reserved for those study design aspects which are not applicable given the study design under review (for example, allocation concealment would not be applicable for case control studies)

Each effectiveness study is then awarded an overall study quality grading for internal validity (IV) and a separate one for external validity (EV):

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

Quality appraisal was conducted independently by one of two reviewers (MP or RG). Double-checking of a percentage of these study quality appraisals was unfortunately not feasible within the reviewer resources available across the various public health reviews. However, there was a constant flow of communication between the two reviewers (MP and RG) about the appraisal of specific aspects of included studies. In the latter stages of the review, this discussion widened to include revisiting each report’s quality appraisal in order to ensure consistency between reviewers in the application of the appraisal checklist and judgement made about study quality. This resulted in the revision of some of the initial gradings so as to ensure consistency between reviewers.

Within the evidence statements, specific terms were used to describe the strength of the evidence (quality, quantity and consistency). These were defined by the reviewers as follows:

Weak evidence: one study only, or two studies that show consistent results, but only one scores a [+] for internal validity.

Moderate evidence: two or more studies where at least two of them score a [+] for internal validity, and results are all consistent.

Strong evidence: two or more studies where at least two of them score a [++] for internal validity, and results are all consistent.

Inconsistent evidence: more than one study where the results do not agree.

4.2.2. Data extraction

All included reports were read independently by one of two reviewers (MP or RG) and data extracted into evidence tables (see Appendix 5, p.191) using the NICE CPHE Methods Manual (2009) format. Data extracted from a random sample of 10% of the included papers was double-checked by a third reviewer (ZL). In addition to data on the core outcomes of interest, research methods used and statistical analyses conducted, data was extracted about sample characteristics and the components of interventions in order to inform considerations about the applicability of findings to the UK context. Limitations identified by both report authors and the review team are also recorded (separately) in the evidence tables.

4.2.3. Data analysis and synthesis

In order to identify variations in effectiveness for interventions comprising different components, the interventions evaluated in the included studies were classified as shown in Table 3 (p.38). It should be noted that 'education about home safety', for the purposes of this review, is defined as a semi-structured discussion with parents (or carers) of at least 10 minutes duration about how to reduce unintentional injuries to children in the home (that is, the definition does not include the use of safety information leaflets, unless these are used to augment the in-person discussion).

Table 3: Intervention components and their reporting in this review.

Free or discounted supply of home safety equipment	Installation of home safety equipment	Home safety education	Home risk assessment	Review section (page no.)
●				5.4 (p.54)
●	●			5.5 (p.57)[1]
●		●		5.6 (p.66)
●	●	●		5.7 (p.80)
			●	5.8 (p.92)
●			●	5.9 (p.96)
●	●		●	5.10 (p.112)
●		●	●	5.11 (p.120)

Note:
[1] Smoke alarms were the only items of home safety equipment which were both supplied *and* installed.

Odds ratios (with 95% confidence intervals) of outcomes comparing intervention and control groups are used wherever these have been presented by a report's authors, or where sufficient data is provided to have allowed calculation by this review's authors. Where the reporting of continuous data (for example, in 'safety scores') precluded the calculation of odds ratios, mean differences (with 95% confidence intervals) have been calculated. Mean differences are highlighted in the tables concerned in order to distinguish this data from the odds ratios. In some reports, the limited data published prevented the calculation of data in a common metric that would facilitate synthesis.

A formal meta-analysis was not conducted in view of the heterogeneity of interventions and measurement of outcomes. Instead, outcomes are tabulated under each intervention heading (as specified in Table 3, p.38) in order to provide an overview of interventions' effectiveness, and are also narratively summarised in the text. The contexts in which interventions were implemented and the methodological strengths and weaknesses of the evaluation are detailed at the end of each section to inform considerations about the applicability of evidence and extent to which report findings can be considered rigorous.

4.2.4. Approach to judging the applicability of studies

The applicability of the findings of the included effectiveness studies was judged on the basis of:

- The perceived feasibility of providing a similar programme in the UK (e.g. in terms of types of trained staff involved, levels of resources, and delivery organisations)

- The social, economic and geographical context of the programme evaluated compared with equivalent UK settings

The lack of an empirical framework for judging applicability has meant that these judgements have necessarily been based upon reviewers' perceptions of similarities and differences between (for example) social and health care systems. In view of this dearth of information about what can be considered to be reasonable grounds for stating that findings in one country may be applicable in the UK, we have largely judged studies conducted in the UK to be 'highly applicable' and all others of 'partial or low applicability'.

4.3. Methods of analysis and synthesis: Cost-effectiveness review

4.3.1. Method of study quality appraisal

Quality appraisal was assessed using the 19-item CHEC Criteria list (which has many items in common with the more well-known 'Drummond checklist') (Evers et al. 2005). It has some advantages over the Drummond checklist because (a) it has been developed and validated through a systematic review of previous checklists and an international consensus process, and because (b) key questions about the identification, measurement and valuation of costs and consequences are asked separately for costs and consequences/effects. Since there were no analyses based on decision models it is appropriate that there are no specific quality assessment items relating to the quality of decision models.

Note that we used the 19-point list as published in the 2005 paper by Evers et al., rather than the adapted checklist in the (2009) Second Edition of *Methods for the development of NICE public health guidance*. This is in order to maintain consistency with the other reviews of economic evaluations being conducted to support the development of public health guidance on unintentional injury to children (and also because, at the time of the earlier review - on injuries on the road – the NICE-recommended methodology checklist for economic evaluations was the one from the Drummond et al. 1997 textbook on economic evaluation)(Drummond et al. 1997).

4.3.2. Data extraction

Details of each included economic evaluation and UK-based cost analysis have been extracted to a table containing each study's design/methods, and another table to show the main results.

The **study design table** recorded the following details: author and publication year; type of economic study (e.g. cost-effectiveness analysis or cost analysis), main data years (e.g. time period of before-and-after effectiveness study); country and setting; population and/or localities; interventions and comparators; perspective of the analysis; time horizon and discount rates used (if applicable); costs and savings included; type of cost-effectiveness estimate, and; sensitivity analysis.

The **study results table** recorded the following details: the 'from' and 'to' intervention (i.e. the comparison); the cost of the intervention(s); the benefits associated with the intervention(s); the incremental cost-effectiveness ratio (where appropriate; or other cost-effectiveness estimate).

4.3.3. Approach to judging the applicability of studies

The applicability of the findings of the included economic evaluations was judged on the basis of:

- The perceived feasibility of providing a similar programme in the UK (e.g. in terms of types of trained staff involved, levels of resources, and delivery organisations)
- The social, economic and geographical context of the programme evaluated compared with equivalent UK settings (including the background prevalence or incidence of the unintentional injury types of interest, and the patterns of causes of injuries where known/described)
- The number of years since the study was conducted

- The extensiveness of sensitivity analyses - potentially allowing some estimation of the programme's cost-effectiveness to settings where particular characteristics of the intervention (e.g. grade and pay of staff delivering it) or its context (e.g. injury incidence rates or severity) are known to vary.

These criteria broadly reflect the majority of the criteria specified for judging the applicability of economic evaluation findings as described in the CPHE Methods Manual (2009), except those relating to whether and how QALYs were estimated. (NB. This version of the manual had not been published at the time the protocol for this review was developed). Inevitably, given that the main reviewer is not an expert on the topic of home injury or child injury prevention, these judgements should be viewed as provisional assessments.

4.3.3.1. Analysing and synthesising the findings

A narrative synthesis approach was adopted, in which:

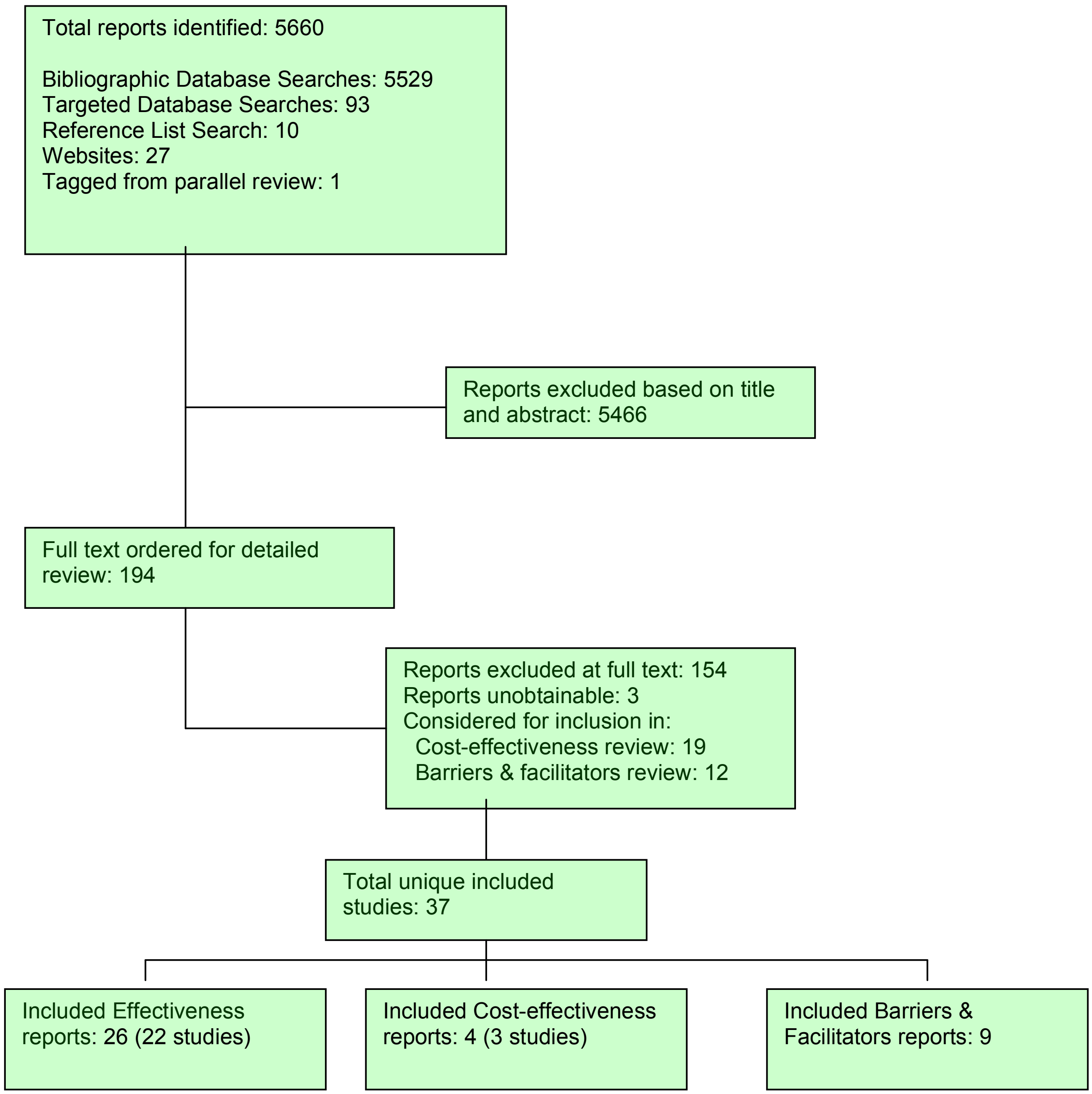
- studies were first grouped according to the type of intervention evaluated
- the key features of each study were described individually, and then
- notable similarities and differences in the methods and results across studies were described and interpreted

Particular emphasis was placed on critically appraising and comparing any recent, good quality and UK-based studies.

5. Findings: Effectiveness

5.1. Identified reports

Figure 1: Review flowchart



5.2. Included reports

5.2.1. Report characteristics

A total of 26 reports were included in the effectiveness review (Table 4, p.44). Four of these reports included additional analyses of datasets from an earlier included report, or outcomes data from a later follow-up of the same sample (DiGuiseppi et al 2002; Mallonee et al 1996; Kendrick et al 2009; King et al 2005), meaning that a total of 22 studies were included.

Evaluations were conducted using a range of study types; ten were RCTs (Babul et al 2007; Clamp & Kendrick 1998; Gielen et al 2002; King et al 2001; Paul et al 1994; Posner et al 2004; Sangvai et al 2007; Sznajder et al 2003; Watson et al 2005; Woolf et al 1992), three were cluster RCTs (DiGuiseppi et al 2002; Harvey et al 2004; Kendrick et al 1999), four were controlled before & after studies (Hendrickson 2005; Johnston et al 2000; Mallonee et al 1996; Schwarz et al 1993), and five were uncontrolled before & after studies (Bablouzian et al 1997; Cagle et al 2006; Carman et al 2006; Klitzman et al 2005; Metchikian et al 1999).

Table 4 (p.44) also shows that 13 of the 22 included studies were conducted in the USA (Bablouzian et al 1997; Cagle et al 2006; Gielen et al 2002; Harvey et al 2004; Hendrickson 2005; Johnston et al 2000; Klitzman et al 2005; Mallonee et al 1996; Metchikian et al 1999; Posner et al 2004; Sangvai et al 2007; Schwarz et al 1993; Woolf et al 1992); five were conducted in the UK (Carman et al 2006; Clamp & Kendrick 1998; DiGuiseppi et al 2002; Kendrick et al 1999; Watson et al 2005), two in Canada (Babul et al 2007; King et al 2001), one in France (Sznajder et al 2003), and one in Australia (Paul et al 1994). Details of the study quality appraisal, intervention components, and key contextual characteristics of the interventions are also contained in Table 4 (p.44).

Table 4: Included study characteristics

Report	HSE	Ed.	S&I	HRA	Part of a wider programme?	Ongoing contact with intervention team?	Other key characteristics of intervention
Bablouzian et al 1997 (BA, IV-, EV-, USA)	√			√	Yes – the Healthy Baby Programme (initiated 1987)	Yes – in-so-far as participants continued to have routine child health contact with community staff.	Small safety kit (electrical outlet covers, safety latches). Home risk assessment conducted by home visitors during routine perinatal home visits.
Babul et al 2007 (RCT, IV+, EV+, Canada)	√			√	No	Yes – in-so-far as participants continued to receive routine care visits from their Community Health Nurse.	Comprehensive safety kit (smoke alarm, 50% discount safety gate coupon, corner cushions, cupboard locks, blind cord windups, water temperature card, doorstoppers, electrical outlet covers, and poison control sticker). Home risk assessment conducted using checklist (based on Bablouzian et al, 1997) by Community Health Nurse.
Cagle et al 2006 (BA, IV-, EV-, USA)	√		√	√	No	No	Safety kit supplied contained anti-scald equipment (for sinks, bath, shower head) only. Home risk assessment conducted by bi-lingual health educator using 21-item checklist.
Carman et al 2006 (BA, IV-, EV-, UK)	√		√	√	Yes – undertaken as part of a Sure Start programme; also part of a multi-agency programme within the Primary Care Trust that delivered population-wide outreach and child injury prevention education.	Unclear – nature of Primary Care Trust programme suggests that there would have been ongoing contact, but this is not explicitly stated.	Comprehensive safety kit – items such as safety gates, fireguards, and smoke alarms were installed by technicians. Home risk assessment conducted by project worker.
Clamp & Kendrick 1998 (RCT, IV++, EV+, UK)	√	√			No	No	Safety counselling delivered by general practitioner. Comprehensive range of home safety equipment offered at a discounted price.
DiGuiseppi et al 1999; 2002 (Cluster RCT, IV++, EV++, UK)	√				No	Potentially – for example, where district nurses or health visitors were responsible for smoke alarm distribution.	Smoke alarms provided free of charge in the course of community workers' day-to-day visits to people in their homes.

Report	HSE	Ed.	S&I	HRA	Part of a wider programme?	Ongoing contact with intervention team?	Other key characteristics of intervention
Gielen et al 2002 (RCT, IV++, EV++, USA)	√	√		√	No	Yes – Children's Safety Centre provided a central point for parents to call to discuss safety issues.	Safety counselling delivered both by paediatric residents (who had received a 5 hour training programme) during child health clinics and a professional health educator at the Children's Safety Centre. Home risk assessments conducted by specially trained community health workers. Children's Safety Centre (specifically constructed for this project) housed in a renovated building and acted as a centre for the provision of discounted home safety equipment and ongoing safety counselling.
Harvey et al 2004 (Cluster RCT, IV+, EV-, USA)	√		√		No	No	Smoke alarm (or voucher for free smoke alarm) provided through door-to-door canvassing by trained health workers, firefighters and local residents (mix varied from state to state). Where a smoke alarm was provided, it was also installed.
Hendrickson 2005 (CBA, IV+, EV+, USA)	√			√	No	Intervention took place on 3 occasions over a 6-week period – no ongoing contact after this time.	No details provided regarding the home safety equipment that was supplied. Home risk assessment conducted using 15-item checklist. Safety counselling delivered by the researcher – aimed to not only identify hazards but also to foster mother's abilities to address them (self-efficacy).
Johnston et al 2000 (CBA, IV+, EV-, USA)	√			√	Yes – part of a Head Start programme (USA equivalent of Sure Start).	Yes – in-so-far as participants continued to have contact with their case workers.	Smoke alarms supplied if indicated. Home risk assessments conducted by case worker.
Kendrick et al 1999 (Cluster RCT, IV++, EV+, UK)	√			√	No	Yes – participants continued to have contact with Health Visitors and Community Nurses during routine home visits.	Range of discounted (20p - £5.00) safety equipment made available. Home risk assessment conducted by Health Visitors during routine visits.
King et al 2001; 2005 (RCT, IV++, EV+, Canada)	√			√	No	No	Discount coupons ($10 per item) for obtaining home safety equipment from a national store. Home risk assessment conducted by trained research assistants.
Klitzman et al 2005 (BA, IV+, EV-, USA)	√		√	√	Yes – a relatively minor component of a programme that assessed for and addressed pre-1940 property issues related to mould, vermin, and lead-based paint hazards.	No	Safety kit supplied free of charge; contained window guard, smoke alarm and fire extinguisher. Home risk assessment conducted by trained community residents using a checklist adapted from previous New York City Fire Department instruments.

Report	HSE	Ed.	S&I	HRA	Part of a wider programme?	Ongoing contact with intervention team?	Other key characteristics of intervention
Mallonee et al 1996; Douglas et al 1998 (CBA, IV+, EV-, USA);	√		√		No	No	Programme promoted through mass media, churches, and schools and meetings held with the principals of all elementary school in the sample area in order to promote the smoke alarm giveaway (through schools, door-to-door canvassing, fire stations). Free installation was offered (note that only 6% of participants took up the offer of free installation).
Metchikian et al 1999 (BA, IV-, EV-, USA)	√			√	Yes – 'Project SafeCare', which provided services to families who had been referred from the child protection service because of abuse or neglect, or if the mother is considered to be 'young and at-risk'.	Yes – research assistants returned to participants' homes on 7-9 occasions (over the course of 9 months to 1 year) in order to monitor progress and discuss home safety behaviour.	Small safety kit provided free of charge (electrical outlet covers, safety latches). Home risk assessment conducted by trained research assistants using HAPI-R tool.
Paul et al 1994 (RCT, IV-, EV-, Australia)				√	No	No	Home risk assessment (using a written home safety booklet) provided by a mix of volunteers and staff from a local community health centre.
Posner et al 2004 (RCT, IV++, EV++, USA)	√	√			No	No	Comprehensive safety kit. Safety counselling delivered by trained lay personnel.
Sangvai et al 2007 (RCT, IV-, EV-, USA)	√	√			No	No	Family practice medical staff provided safety counselling based upon responses to a computerised assessment.
Schwarz et al 1993 (CBA, IV+, EV+, USA)	√		√	√	No	Yes – community liaison workers endeavoured to cultivate a network of community-based representatives who would continue to be involved with home safety education.	Comprehensive safety kit – smoke alarms were installed by community workers. Home risk assessment conducted by trained community-based outreach workers using a checklist.
Sznajder et al 2003 (RCT, IV+, EV+, France)	√	√			No	No	Comprehensive safety kit. Health professional provided safety counselling in participants' own home.
Watson et al 2005; Kendrick et al 2009 (RCT, IV++, EV++, UK)	√	√	√		No	Yes – in-so-far as participants continued to receive routine care visits from their Health Visitor.	Comprehensive safety kit. Safety counselling delivered by Health Visitors.

Report	HSE	Ed.	S&I	HRA	Part of a wider programme?	Ongoing contact with intervention team?	Other key characteristics of intervention
Woolf et al 1992 (RCT, IV+, EV+, USA)	√				No	No	Limited safety kit (safety latches and now non-recommended Ipecac syrup). No personal contact with participants as safety kit was mailed to participants' homes.

Key:
IV - Internal validity
EV - External validity
HSE - Home safety equipment
Ed. - Education (a safety counselling component that was semi-structured and lasted for ten or more minutes)
S&I - Supply & installation (of home safety equipment)
HRA - Home risk assessment

An overview of the variety of interventions evaluated and the mixtures of home safety equipment that were supplied and/or installed is shown in **Table 5** (p.49). Reference to **Table 5** whilst considering the synthesis presented in this review may be helpful for obtaining an overview of the differences between interventions (for example, whether equipment was supplied but not installed) and some of the complexities of the interventions concerned (for example, where equipment was supplied in a number of ways, or where there were differences in what was charged).

Home safety equipment was classified as follows:

- Buffers – equipment designed to cushion any impact (e.g. table corners, anti-door slam devices)
- Electrical – electric socket covers only
- Latches – drawer and cupboard safety latches or locks
- Bathroom – non-slip bathroom items
- Anti-scald – equipment designed to prevent contact with scalding water (e.g. thermostatic regulators, spout covers, or bathwater thermometers)
- Windows – equipment designed to minimise injuries from impact with glass (e.g. window guards, window safety film)
- Individual items of home safety equipment (i.e. window locks, fire guards, stair gates, and smoke alarms)

Table 5: Interventions: Home safety equipment supplied and/or installed

Report	Buffer	Electr-ical	Latch	Bath-room	Anti-scald	Wind-ows	Wind-ow locks	Fire guards	Stair gates	Smoke alarms	Not repor-ted
Free or discounted supply of home safety equipment											
Woolf et al 1992			○								
Free or discounted supply and installation of smoke alarms											
DiGuiseppi et al 1999; 2002										○/●	
Douglas et al 1998										£/○/●	
Harvey et al 2004										●/£	
Mallonee et al 1996										£/○/●	
Free or discounted supply of home safety equipment with safety education											
Clamp & Kendrick 1998	£	£	£				£	£	£	£	
Posner et al 2004		○ (undifferentiated)									
Sangvai et al 2007			○							○	
Sznajder et al 2003	○	○	○	○						○	
Free or discounted supply and installation of home safety equipment with safety education											
Watson et al 2005; Kendrick et al 2009			●				●	●	●	●	
Home risk assessment only											
Paul et al 1994	N/A – no home safety equipment supplied or installed										
Home risk assessment and free or discounted supply of home safety equipment											
Bablouzian et al 1997		○					○				
Babul et al 2007	○	○	○						£	○	
Hendrickson 2005											√
Johnston et al 2000										○	
Kendrick et al 1999			£					£	£	£	
King et al 2001; 2005											£
Metchikian et al 1999		○	○								
Home risk assessment and free or discounted supply and installation of home safety equipment											
Cagle et al 2006					●						
Carman et al 2006	○	○	●	○		●		●	●	●	
Klitzman et al 2005						●				●	
Schwarz et al 1993					○					●	
Home risk assessment and free or discounted supply of home safety equipment with safety education											
Gielen et al 2002											£

Key (More than one symbol in a category indicates that the intervention consisted of a mixture of the indicated methods):
● - supplied & installed for free
○ - supplied free, but not installed
£ - discount voucher provided, or items had to be collected

5.3. Study methodology and quality appraisal

Study quality appraisal is summarised in Table 6 (p.51). Ten of the 22 included studies were RCTs, three were cluster RCTs, four were controlled before & after studies, and five were uncontrolled before & after studies. The internal validity of five of the ten RCTs and two of the three cluster RCTs was appraised as being methodologically strong (rated ++). The internal validity of three of the ten RCTs, one of the three cluster RCTs, all four of the CBAs and one of the five BAs were was appraised as being methodologically weaker in-so-far as not all potential sources of bias had been addressed in the study design (rated +). The internal validity of the remaining studies (two RCTs and four BAs) was appraised as methodologically weak, where substantial sources of bias were not addressed in the study design (rated -).

Table 6: Quality assessment of included reports

	(Bablouzian et al. 1997)	(Babul et al. 2007)	(Cagle et al. 2006)	(Carman et al. 2006)	(Clamp & Kendrick 1998)	(DiGuiseppi et al. 1999)	(DiGuiseppi et al. 2002)	(Douglas et al. 1998)	(Gielen et al. 2002)	(Harvey et al. 2004)	(Hendrickson 2005)	(Johnston et al. 2000)	(Kendrick et al. 1999)	(Kendrick et al. 2009)	(King et al. 2001)	(King et al. 2005)	(Klitzman et al. 2005)	(Mallonee et al. 1996)	(Metchikian et al. 1999)	(Paul et al. 1994)	(Posner et al. 2004)	(Sangvai et al. 2007)	(Schwarz et al. 1993)	(Sznajder et al. 265)	(Watson et al. 2005)	(Woolf et al. 1992)
Is the source area well described?	+	+	+	+	+	+	+	++	++	+	+	+	++	++	+	+	+	++	-	-	+	+	+	+	++	+
Eligible areas representative of the source areas of interest?	-	++	-	-	++	++	++	+	++	-	+	NR	+	++	+	+	-	+	-	-	+	-	+	-	++	+
Does the selected area represent the eligible area?	NR	+	-	NR	+	++	++	NR	+	-	-	NR	NR	++	NR	NR	-	NR	-	-	++	-	-	-	++	+
Allocation to intervention (or comparison) groups - how was confounding minimised?	NA	++	NA	-	++	++	++	NA	+	+	+	+	++	++	++	++	NA	NA	NA	+	++	-	+	+	++	+
Interventions (and comparisons) well described and appropriate?	+	+	+	+	+	++	++	++	++	++	+	+	++	+	+	+	++	++	++	+	++	+	++	+	+	+
Allocation concealed?	NA	++	NA	NA	NR	++	++	NA	+	+	NA	NA	++	++	++	++	NA	NA	NA	NR	++	++	NA	++	++	++
Participants and/or investigators blind to exposure and comparison?	NA	+	NA	NA	NR	NA	NA	NA	NR	+	-	+	-	+	++	++	NA	NA	NA	+	+	+	+	-	+	+
Exposure to intervention and comparison adequate?	NA	+	NA	-	+	+	+	NA	++	+	NA	NA	+	+	+	+	NA	NA	NA	-	NR	+	+	-	+	+
Contamination acceptably low?	NA	NR	NA	-	NR	+	+	NA	+	-	NA	NA	NA	++	NA	NA	NA	NA	NA	+	+	+	+	+	++	NR

	(Bablouzian et al. 1997)	(Babul et al. 2007)	(Cagle et al. 2006)	(Carman et al. 2006)	(Clamp & Kendrick 1998)	(DiGuiseppi et al. 1999)	(DiGuiseppi et al. 2002)	(Douglas et al. 1998)	(Gielen et al. 2002)	(Harvey et al. 2004)	(Hendrickson 2005)	(Johnston et al. 2000)	(Kendrick et al. 1999)	(Kendrick et al. 2009)	(King et al. 2001)	(King et al. 2005)	(Klitzman et al. 2005)	(Mallonee et al. 1996)	(Metchikian et al. 1999)	(Paul et al. 1994)	(Posner et al. 2004)	(Sangvai et al. 2007)	(Schwarz et al. 1993)	(Sznajder et al. 265)	(Watson et al. 2005)	(Woolf et al. 1992)
Were other interventions or their components similar in the areas compared?	NA	NR	NA	+	NR	+	+	NA	+	+	NA	NA	NR	+	NR	NR	NA	NA	NA	+	NR	+	+	+	+	NR
All participants accounted for at study conclusion?	NA	++	+	NR	+	+	+	NR	-	+	NA	NA	++	++	++	++	++	NR	-	-	+	-	-	++	++	++
Did the setting reflect usual practice?	NR	++	+	+	++	++	++	-	+	+	-	-	+	++	-	-	-	-	-	+	++	+	+	++	++	++
Did the intervention or control comparison reflect usual practice?		+	-	+	++	++	++	NA	-	+	-	-	+	++	-	-	NA	NA	NA	+	+	+	+	+	++	++
Outcome measures reliable?	+	-	+	-	+	+	+	+	++	++	+	+	++	++	+	+	+	+	-	-	+	-	+	-	++	-
Outcome measurement complete?	+	-	+	NR	++	++	++	NR	+	+	++	-	++	+	+	+	+	NR	+	-	+	-	-	+	+	+
Were all important outcomes assessed?	+	+	+	-	+	++	++	+	+	+	-	+	++	++	+	+	+	+	+	-	NR	-	-	+	++	+
Were outcomes relevant?	+	-	+	-	NA	++	++	+	++	+	+	-	++	++	+	+	-	+	+	+	+	+	+	++	++	+
Similar timing of outcome measurements in exposure and comparison groups?	NA	+	NA	-	++	+	+	NA	++	NR	++	+	+	++	+	+	NA	NA	NA	-	-	+	++	++	++	++
Was follow-up time meaningful?	+	+	+	-	++	++	++	+	++	+	-	-	+	++	+	+	+	++	+	+	+	+	++	-	++	-
Similar outcome measurement methods used in exposure and comparison groups?	NA	+	NA	-	+	++	++	NA	++	++	++	++	++	++	+	+	NA	NA	NA	-	+	+	+	+	++	+

	(Bablouzian et al. 1997)	(Babul et al. 2007)	(Cagle et al. 2006)	(Carman et al. 2006)	(Clamp & Kendrick 1998)	(DiGuiseppi et al. 1999)	(DiGuiseppi et al. 2002)	(Douglas et al. 1998)	(Gielen et al. 2002)	(Harvey et al. 2004)	(Hendrickson 2005)	(Johnston et al. 2000)	(Kendrick et al. 1999)	(Kendrick et al. 2009)	(King et al. 2001)	(King et al. 2005)	(Klitzman et al. 2005)	(Mallonee et al. 1996)	(Metchikian et al. 1999)	(Paul et al. 1994)	(Posner et al. 2004)	(Sangvai et al. 2007)	(Schwarz et al. 1993)	(Sznajder et al. 265)	(Watson et al. 2005)	(Woolf et al. 1992)
Exposure and comparison groups similar at baseline? If not, were these adjusted?	NA	+	NA	-	+	++	++	+	++	NR	NA	NA	++	++	++	++	NA	NA	NA	-	+	NR	+	++	++	+
Intention to treat analysis?	NA	+	NA	-	++	++	++	NA	NR	NR	NA	NA	+	++	++	++	NA	NA	NA	NR	++	NR	NA	++	++	-
Estimates of effect size given or calculable?	NA	+	NR	-	NR	++	++	NR	+	-	++	+	++	++	++	++	NA	NR	NA	NR	NR	NR	++	-	++	NR
Analytical methods appropriate?	-	++	+	-	+	++	++	+	++	-	+	+	++	++	+	+	+	+	-	-	-	-	++	+	++	NA
Precision/uncertainty of intervention effects given or calculable? Were they meaningful?	-	-	NR	NR	+	++	++	NR	+	-	-	+	+	++	+	+	NR	NR	NR	-	+	-	++	+	++	+
Was the study sufficiently powered to detect an intervention effect (if one exists)?	NA	++	NA	NA	++	NR	NR	NR	+	NR	NA	NA	+	+	+	+	NA	NR	NA	NR	++	-	NR	NR	+	++
Are the study results internally valid (ie unbiased)?	-	+	-	-	++	++	++	+	++	+	+	+	+	++	++	++	+	+	-	-	++	-	+	+	++	+
Are the findings generalisable to the source population (ie externally valid)?	-	+	-	-	+	++	++	-	++	-	+	-	++	+	+	+	-	-	-	-	++	-	+	-	++	+

Key:

++ Indicates that for that particular aspect of study design, the study has been designed/conducted in such a way as to minimise the risk of bias

\+ Indicates that either the answer to the checklist question is not clear from the way that the study is reported, or that the study may not have addressed all potential sources of bias for that particular aspect of study design

\- Indicates aspects of study design in which significant sources of bias may persist

NR Not reported

NA Not applicable

5.4. Free or discounted supply of home safety equipment

5.4.1. Report characteristics

Outcomes of interventions where home safety equipment was supplied free or at a discount (together with a safety information leaflet) were presented in one report (Woolf et al 1992, RCT, IV+, EV+, USA). This report presented data on rates of installation and changes in home safety behaviour (Table 7, p.54).

Table 7: Free of discounted supply of home safety equipment: Report characteristics

REPORT DETAILS: Woolf et al 1992
Aim of study To evaluate the effectiveness of a poison-centre initiated mailed intervention on improving the preventive practices of families whose pre-school child had recently experienced a poisoning incident.
Study design RCT (IV+, EV+)
Study year, sample size & follow-up Year not reported – N=336, follow-up (n=301) at 3 months.
SETTING
Context (country, setting, location) • USA, participants' homes
Key socio-economic characteristics of sample • ~90% White • Mean maternal age – 30 years • Mean parental education (in years) - ~14
Study inclusion criteria All children aged <=5 years for whom a phone call had been made (within the 17-day period of recruitment) to the Massachusetts poison control centre with regard to an acute poisoning episode
DESCRIPTION OF INTERVENTION
Home safety information pamphlets, slide lock for kitchen cupboards, syrup of ipecac discount coupon, and 2 stickers with telephone number of poison centre mailed to home address of family.
OUTCOMES REPORTED
• Installation of home safety equipment (self-reported). • Home safety behaviour (self-reported).

5.4.2. Study quality and context

An intention to treat analysis was not conducted in Woolf et al (1992), although the attrition rate of approximately 10% (equally distributed between the two trial arms) was not high given the community-based nature of the intervention. The follow-up period of 3 months is only sufficient to measure short term behaviour change and knowledge. Whilst there are no strong reasons to believe that outcomes would be dissimilar in a UK population, it should be noted that the study sample was predominantly White, well-educated and of a high socio-economic status.

5.4.3. Findings

Injuries

The report evaluating the effectiveness of discounted supply of safety equipment did not present data on injury outcomes.

Installation of home safety equipment

One report (Woolf et al 1992, RCT, IV+, EV+, USA), in which cupboard locks were mailed free-of-charge to families where a child had recently suffered an acute poisoning episode, presented data (self-reported) on the installation of this safety equipment. Participants in the intervention arm were statistically significantly more likely (p=.001; odds ratio not reported or calculable) to have installed a cupboard lock than those in the control arm.

Home safety knowledge and behaviour

One report (Woolf et al 1992, RCT, IV+, EV+, USA), in which a safety information leaflet was included with the mailed safety equipment, presented data (self-reported) on changes in home safety behaviour. No statistically significant changes in safety behaviour were found between the intervention and control arms with regard to the disposal of old medicines, household cleaning products, and poisonous plants; the storage of all medicines in containers with childproof caps; or of having held a discussion with the child’s grandparents about poisoning prevention measures that they could take.

Evidence statement 1: Free or discounted supply of home safety equipment
There is evidence from 1 RCT (Woolf et al 1992 [+], USA) about interventions with free or discounted supply of home safety equipment. This evidence is only partially applicable as it was not conducted in the UK.
Injuries
a. There is no evidence presented on injury outcomes in the report evaluating the free or discounted supply of home safety equipment (Woolf et al 1992).
Installation of home safety equipment
b. There is weak evidence from 1 RCT (Woolf et al 1992 [+]) to suggest that mailing cupboard locks free-of-charge (to families where a child had recently experienced a poisoning incident) had a statistically significant effect on the installation of such locks (p=.001).
Home safety knowledge and behaviour
c. There is weak evidence from 1 RCT (Woolf et al 1992 [+]) 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.

5.5. Free or discounted supply and installation of smoke alarms

5.5.1. Report characteristics

Outcomes of interventions where smoke alarms were supplied and installed (where requested by recipients) were presented in five reports (DiGuiseppi et al 1999; 2002, cluster RCT, IV++, EV++, UK; Douglas et al 1998, CBA, IV+, EV-, USA); Harvey et al 2004 (Cluster RCT, IV+, EV-, USA; Mallonee et al 1996, CBA, IV+, EV-, USA) (Table 8, p.58). Two studies reported fire-related injuries (DiGuiseppi et al 1999; 2002; Mallonee et al 1996), three studies reported the installation of home safety equipment (DiGuiseppi et al 2002; Harvey et al 2004; Mallonee et al 1996), and none reported home safety knowledge or behaviour. There were no interventions that both supplied and installed items of home safety equipment other than smoke alarms.

Mallonee et al (1996) reports 48 month follow up of the Okalahoma city intervention. Although it did not meet the inclusion criteria for this effectiveness review, a cost-effectiveness study by Haddix et al (2001), which is included in the review of cost-effectiveness (see section 6, p.133) actually supplies some effectiveness data about this same intervention after longer follow up, and we report this detail only here.

Table 8: Free or discounted supply and installation of smoke alarms: Report characteristics

REPORT DETAILS: DiGuiseppi et al 1999; 2002
Aim of study To describe the process of implementing an intervention designed to increase smoke alarm installation in a densely populated, multicultural, and materially deprived community; to document the costs of implementation; and to report the evaluation study design (DiGuiseppi et al 1999). To evaluate the effectiveness of a smoke alarm giveaway programme on rates of fires and rates of fire related injury in a deprived multiethnic urban population (DiGuiseppi et al 2002).
Study design Cluster RCT (IV++, EV++)
Study year, sample size & follow-up 1997-1998 – N=7372, follow-up based on registries (injuries)/ n=220-258 (installation) at 24 months.
SETTING
Context (country, setting, location) • UK (London), participants' homes, urban
Key socio-economic characteristics of sample • c. 7% households with children aged <=5 years • 18% of population from minority ethnic groups • 51% of residents lived in council or other social housing
Study inclusion criteria Households in the 40 electoral wards that had Jarman scores of >=1 standard deviation from the mean (within the two London boroughs concerned).
DESCRIPTION OF INTERVENTION
Distribution of free smoke alarms and safety information by community workers (district nurses, health visitors, home care workers, meals-on-wheels services, voluntary sector workers, sheltered housing wardens, caretakers, and managers of council properties) in the course of their usual work activities in which they visited people's homes. Representatives of residents' and tenants' associations also took part. Some additional distribution was provided by paid workers recruited through borough councils. ***Note:*** Only 8% of alarm recipients took up the offer of installation
OUTCOMES REPORTED
• Fire-related injuries (local health authority, coroner, emergency departments, hospitals, and emergency services records). • Installation and functioning of smoke alarms (observed).

REPORT DETAILS: Douglas et al 1998; Mallonee et al 1996
Aim of study To evaluate the effectiveness of different methods (canvassing and flyers) of advertising and distributing free smoke alarms in a high risk urban population (Douglas et al 1998); To evaluate the effectiveness of a smoke alarm giveaway programme in reducing residential fire-related morbidity and mortality in a high-risk population (Mallonee et al 1996).
Study design CBA (IV+, EV-)
Study year, sample size & follow-up 1990 – N=976, follow-up (n=976) at 3 months (Douglas et al 1998); N=9291, follow-up at 3 (n=875 (installation)), 12 (n=5617 (installation)) and 48 months (n=749 (installation); injury data based on ‘State records’ (Mallonee et al 1996).
SETTING
Context (country, setting, location) • USA (Oklahoma City), participants’ homes, urban
Key socio-economic characteristics of sample Area of Oklahoma City described as having a fire-related injury rate over four times that of other areas in the city.
Study inclusion criteria Residents who had obtained a smoke alarm as part of the intervention (no other criteria stated)
DESCRIPTION OF INTERVENTION
Free smoke alarms - advertised through door-to-door canvassing (including the use of a fire engine sounding its siren and announcing the giveaway over a loudspeaker), flyers in public places, mailed flyers, and hand- delivered flyers, but smoke alarms had to be collected from local fire stations (although a number were also distributed door-to-door and some (9%) were installed).
OUTCOMES REPORTED
• Installation and functioning of smoke alarms (self-reported) (Douglas et al 1998). • Fire-related injuries (probably from ‘State records’, as fire-related injuries were a reportable condition, but source not explicitly stated) (Mallonee et al 1996). • Installation and functioning of smoke alarms (observed) (Mallonee et al 1996).

REPORT DETAILS: Harvey et al 2004
Aim of study To evaluate two methods (direct installation and distribution of vouchers) of promoting residential smoke alarm installation and maintenance in high risk households across five US states.
Study design Cluster RCT (IV+, EV-)
Study year, sample size & follow-up Not stated – N=4455, follow-up (n=3140) at 6-12 months.
SETTING
• **Context (country, setting, location) -** USA, participants’ homes
Key socio-economic characteristics of sample - Varied substantially by state.
Study inclusion criteria Households with >=1 individual aged <5 years and/or >65 years within ‘high-risk’ areas of Arkansas, Maine, Maryland, Massachusetts, and North Carolina (high-risk areas defined as with primarily low income residents)
DESCRIPTION OF INTERVENTION
Programme staff (firefighters, nurses, welfare-to-work recipients, neighbourhood representatives) canvassed door-to-door and provided a free smoke alarm (which was installed) or a voucher for a free smoke alarm.
OUTCOMES REPORTED
• Installation and functioning of smoke alarms (observed).

5.5.2. Study quality and context

The study reported by DiGuiseppi et al (1999; 2002, UK) was conducted to a high standard; random allocation to intervention and control groups was conducted by an independent statistician, balance in key socio-economic characteristics between these groups was attained and reported, and details of the intervention were clearly documented. Whilst the difficulties of rigorously evaluating a large-scale public intervention should be acknowledged, the study by Mallonee et al (1996, USA) was not conducted to a similar standard; for example, analyses were not adjusted for differences in important socio-economic characteristics or changes in contributory behavioural factors during the course of the evaluation. This may be of particular significance in view of the distinctive nature of the intervention area at baseline, where 47% of fires (compared with 8% in the remainder of Oklahoma city) were identified as resulting from children playing with fire.

The manner in which distribution of smoke alarms took place differed considerably between the UK study (DiGuiseppi et al 1999; 2002) and the USA study (Mallonee et al 1996). Whilst both interventions endeavoured to involve community groups in the process, there were some important differences in how this was done. In the DiGuiseppi et al study (1999; 2002) the focus was more upon door-to-door canvassing by a range of community professionals and volunteers. However, in the Mallonee et al study (1996), whilst door-to-door canvassing was used, the intervention was largely promoted and implemented by members of the fire service driving a decommissioned fire engine through the streets, sounding a siren and encouraging residents to come out and collect a free smoke alarm. In both studies, the actual uptake of the offer to install the free smoke alarm was low (DiGuiseppi et al – 8%; Mallonee et al – 6%).

The study conducted by DiGuiseppi et al (1999; 2002) took place in socially-deprived, multiethnic populations in London for which detailed socio-economic characteristics were summarised that can inform judgements about applicability in other UK contexts. Whilst it is noted by Mallonee et al (1996) that households in the intervention area had a lower median income and a poorer quality of housing than in the remainder of the city, no further details are provided.

The lack of analyses adjusted for differences in baseline characteristics of participants places limits on the usefulness of the findings reported by Harvey et al (2004, USA). This is compounded by the aggregation of findings across all five states in the reporting of the intervention vs. control odds ratio. In the absence of the reporting of data that would allow a more stratified analysis that could potentially show important differences in effectiveness (related to the different characteristics of the sample in each of the five states), it is very difficult to comment upon the applicability of the findings. The authors also note some potentially important differences in the ways that the intervention was delivered in the five states, but again these cannot be further investigated due to the aggregation of data.

The study by Douglas et al (1998, USA) is substantially limited by the short timeframe (one month post-intervention) in which outcomes were measured and descriptive data only being reported. The authors acknowledge that the method of evaluation (telephone survey) may have resulted in an over-estimation of functioning smoke alarms; for example, respondents’ belief that they had correctly installed the smoke alarms may not have actually been the case.

5.5.3. Findings

Injuries

Two of the five reports (DiGuiseppi et al 2002, cluster RCT, IV++, EV++; Mallonee et al 1996, CBA, IV+, EV-) presented data on fire-related injuries where interventions had distributed smoke alarms in London, UK (DiGuiseppi et al 2002) and Oklahoma City, USA (Mallonee et al 1996) (Table 9, p.62).

DiGuiseppi et al (2002) reported an adjusted rate ratio (based on local health authority, hospital and other records) for intervention vs. control groups. This favoured the intervention, but was statistically non-significant for both minor and major injuries (including mortalities) that were identified as having been likely to have been preventable with an installed and functioning smoke alarm.

Mallonee et al (1996) reported unadjusted annual injury rates (likely, although not explicitly stated, to have been based on State records) in the intervention area that showed a dramatic post-intervention decrease, whereas injury rates in other areas of the city remained broadly unchanged. The report’s authors calculated an incidence-density ratio (within-group pre-post intervention comparison) of 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 Oklahoma city, indicating that injuries were less likely to occur in the intervention group. Haddix et al (Haddix et al. 2001) reported a decrease of 77.1% in non-fatal fire related injuries in the intervention area compared with an increase of 15.6% in other areas of the city at 60 months after the intervention. As these data are presented differently to those in the Mallonee study, direct comparison between the results at these different follow up times is not possible.

Table 9: Fire-related injuries following supply & installation of smoke alarms

	Hospitalisations & deaths			Preventable injuries			Preventable hospitalisations & deaths		
	In.	Con.	Effect estimate (95%CI)	In.	Con.	Effect estimate (95%CI)	In.	Con.	Effect estimate (95%CI)
DiGuiseppi et al 2002[1] Cluster RCT (UK)	9.1	7.2	***Rate ratio*** 1.3 (0.7, 2.3)	29.4	26.3	***Rate ratio*** 1.2 (0.8, 1.8)	5.6	5.6	***Rate ratio*** 1.0 (0.5, 2.0)
Mallonee et al 1996[2] CBA(USA)	***Incidence density ratio*** 0.2 (95% CI 0.1, 0.4)	***Incidence density ratio*** 1.1 (95% CI 0.7, 1.7)	-	-	-	-	-	-	-

Notes:
[1] Follow-up at 24 months; No. of events/ 100 000 person years; rate ratio (95% CI) obtained from Poisson model, taking into account clustering by ward and matching by Jarman score, and adjusted for baseline rates (calculated by report's authors).
[2] Follow-up at 48 months.

Installation of home safety equipment

Three of the five reports (DiGuiseppi et al 2002, cluster RCT, IV++, EV++, UK; Harvey et al 2004, cluster RCT, IV+, EV-, USA; Mallonee et al 1996, CBA, IV+, EV-, USA) presented data on the correct installation and functioning of supplied smoke alarms at between 3 and 48 months post-intervention (Table 10, p.63).

DiGuiseppi et al (2002) reported an adjusted odds ratio (based on observed installation) that showed no statistically significant difference between intervention and control groups with regard to the proper installation or functioning of a smoke alarm. Similar statistically non-significant outcomes were reported with regard to the presence of a smoke alarm (OR 1.0 (95% CI 0.6, 1.9)) and the incorrect installation of a smoke alarm (OR 0.9 (95% CI 0.5, 1.7)).

Mallonee et al (1996) reported much greater success (data based on observed installation), with 51% of households having an installed and functioning smoke alarm 12 months after the intervention; this percentage had fallen from 61% at 3 months, and fell further to 45% at 48 months. In the period from 3 to 48 months following the intervention, the percentage of smoke alarms that were not functioning rose from 2% to 7%; in addition to these, there was a rise from 2% to 19% of smoke alarms from which the batteries had been removed. No comparisons with smoke alarm installation and functioning rates in control areas were reported and the published data does not allow this to be calculated.

Harvey et al (2004) compared the free supply and installation of a smoke alarm in five US states with the provision of a discount voucher for a smoke alarm. Based on data collected by observing installed smoke alarms, households where smoke alarms were supplied and installed had a higher percentage (ranging from 87% in Arkansas and Maine to 95% in Massachusetts) of functioning smoke alarm 6-12 months after the intervention than in households that just received a discount voucher (ranging from 48% in Maryland to 81% in North Carolina). The odds ratio for intervention vs. control (see Table 10, p.63) for all five states statistically significantly favoured the intervention (supply and installation of smoke alarms compared to receiving a discount voucher) (p<.00001).

Table 10: Installation and functioning of smoke alarms following intervention

	Smoke alarm properly installed and functioning			Smoke alarm improperly installed		
	In. (%)	Con. (%)	OR (95%CI)	In. (%)	Con. (%)	OR (95%CI)
DiGuiseppi et al 2002[1] Cluster RCT (UK)	9	9	1.0 (0.4, 2.4)	-	-	-
Mallonee et al 1996[2] CBA (USA)	51	Not reported	-	2	Not reported	-
Harvey et al 2004[3] Cluster RCT (USA)	90	65	4.82 (3.97, 5.85)	-	-	-

Notes:
[1] Follow-up at between 12 and 18 months; odds ratio (95% CI) calculated by report's authors.
[2] Follow-up at 12 months.
[3] Follow-up at between 6 and 12 months; mean of outcomes of intervention in five different US states; odds ratio (95% CI) calculated by report's authors. Note that control arm received a discount voucher for a smoke alarm.

One of the five reports (Douglas et al 1998, BA, IV+, EV-, USA) simply presented data on the supply and installation of smoke alarms (self-reported) to households in the initial stages of the Oklahoma City intervention (also reported in Mallonee et al 1996). Table 11 (p.64) shows the supply of smoke alarms by different methods of distribution; door-to-door and street canvassing resulted in more homes than were identified as being without a smoke alarm being supplied, whilst flyers distributed in public places, through the mail, and door-to-door through voluntary workers resulted in 10%, 25%, and 20% of the identified homes being successfully supplied.

Table 11: Supply of smoke alarms (by different methods of distribution) at one month post-intervention

			Pre-intervention		Post-intervention	
Area	**Total no. of homes**	**Distribution method**	**Smoke alarm prevalence**	**No. of homes without smoke alarm**	**No. of homes receiving smoke alarm**	**% of homes with smoke alarm (that did not have smoke alarm pre-intervention)**
1	6182	Canvassing (door-to-door and street)	71	1793	1925	107[1]
2	9171	Flyers (public places)	70	2751	278	10
3	11525	Flyers (mailed)	74	2996	751	25
4	8067	Flyers (placed on doors)	70	2420	479	20

Source: Douglas et al 1998
Note:
[1] The figure of >100% is explained by the authors to result from distributing more smoke alarms to households than were estimated to require one.

Home safety knowledge and behaviour

No reports presented data on the effectiveness of discounted supply and installation of safety equipment on home safety knowledge and behaviour outcomes.

Evidence statement 2: Free or discounted supply and installation of smoke alarms
There is evidence from two cluster RCTs (DiGuiseppi et al 2002 [++], UK; Harvey et al 2004 [+], USA) and two CBAs (Douglas et al 1998 [+]; Mallonee et al 1996 [+], both USA) about interventions with free or discounted supply and installation of smoke alarms. This evidence is only partially applicable to the UK as only one study was conducted in the UK.
Injuries
a. There is inconsistent evidence about impact on injury from one cluster RCT (DiGuiseppi et al 2002 [++]) and one CBA (Mallonee et al 1996 [+]). There is evidence from the better quality cluster RCT (DiGuiseppi et al 2002) 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 % CI 0.5, 2.0)). However, the CBA study (Mallonee et al 1996) 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).
Installation of home safety equipment
b. There is inconsistent evidence about impact on rates of installation of home safety equipment from two cluster RCTs (DiGuiseppi et al 2002 [++]; Harvey et al 2004 [+]) and one CBA (Mallonee et al 1996 [+]). There is evidence from the better quality cluster RCT (DiGuiseppi et al 2002) 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 another cluster RCT that the free supply and installation of smoke alarms had a significant effect on the installation and functioning of smoke alarms: OR 4.82 (95% CI 3.97, 5.85) (Harvey et al 2004). Mallonee et al (1996) 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.
Home safety knowledge and behaviour
c. There is no evidence presented on home safety knowledge and behaviour outcomes in the reports evaluating the free or discounted supply and installation of smoke alarms (DiGuiseppi et al 2002; Douglas et al 1998; Harvey et al 2004; Mallonee et al 1996).

5.6. Free or discounted supply of home safety equipment with safety education

5.6.1. Report characteristics

Outcomes of interventions where free or discounted home safety equipment was supplied (in conjunction with safety education) were presented in four reports (Clamp & Kendrick 1998, RCT, IV++, EV+, UK; Posner et al 2004, RCT, IV++, EV++, USA; Sangvai et al 2007, RCT, IV-, EV-, USA; Sznajder et al 2003, RCT, IV+, EV-, France) (Table 12, p.66). Smoke alarms were supplied as part of the range of home safety equipment offered in three of these interventions, either for free (Sangvai et al 2007; Sznajder et al 2003) or at a discount (Clamp & Kendrick 1998). None of these reports presented data on injury outcomes. All four reports presented data on outcomes regarding the installation and use of home safety equipment and changes in home safety knowledge and behaviour.

Table 12: Free or discounted supply of home safety equipment with safety education: Report characteristics

REPORT DETAILS: Clamp & Kendrick 1998
Aim of study To assess the effectiveness of general practitioner advice about child safety, use of safety equipment and safe practices at home (and the provision of low-cost safety equipment to low-income families).
Study design RCT (IV++, EV+)
Study year, sample size & follow-up Year not reported – N=165, follow-up (n=165) at 6 weeks.
SETTING
Context (country, setting, location) • UK, General practice surgery, urban
Key socio-economic characteristics of sample • 1.2% ethnic minority group, ~10% single-parent families, ~20% *not* owner occupiers • ~32% of families in receipt of means tested benefits • Jarman score - <0 (~8%); 0.1-22.9 (~75%); >23 (17%) • ~12% of families lived in overcrowded accommodation (>1 person/room)
Study inclusion criteria Families registered with the general practice with children aged <=5
DESCRIPTION OF INTERVENTION
Standardised advice and safety leaflets (regarding a range of home safety equipment) provided by general practitioner (mean length 20 minutes) during child health surveillance, opportunistically during other consultations, or the family was asked to make an appointment in order to receive the intervention. Families in receipt of means tested state benefits were offered discounted safety equipment - smoke alarm, window locks, cupboard locks, electric socket covers, door slam device (all available from the GP surgery) and stair gates and

fireguards (available from local health centre).
OUTCOMES REPORTED
• Installation of home safety equipment (self-reported). • Home safety behaviour (self-reported).
REPORT DETAILS: Posner et al 2004
Aim of study To assess the effectiveness of an emergency department-based home safety intervention on caregivers' behaviours and practices related to home safety.
Study design RCT (IV++, EV++)
Study year, sample size & follow-up 2001 – N=136, follow-up (n=98) at ~2 months
SETTING
Context (country, setting, location) • USA, Emergency department, urban
Key socio-economic characteristics of sample • Children aged <5 years who presented to an emergency department with an unintentional injury • 74% African-American • 5% of parents had less than a high-school education; 30% had a high-school education
Study inclusion criteria Caregivers of children aged <5 years who presented to a paediatric emergency department for treatment of unintentional injuries sustained in the home
DESCRIPTION OF INTERVENTION
Enhanced emergency department discharge care ('comprehensive home safety counselling') + safety tips leaflet + free home safety kit (cupboard latches, drawer latches, electrical outlet covers, tub spout covers, nonslip bath decals, bathwater thermometer, small parts tester (choking tube), poison control telephone number stickers, literature related to fire and window safety)
OUTCOMES REPORTED
• Injury prevention knowledge (self-reported) • Safety device use (self-reported)

REPORT DETAILS: Sangvai et al 2007
Aim of study To evaluate the effectiveness of a Chronic Care Model approach to injury prevention in primary care settings.
Study design RCT (IV-, EV-)
Study year, sample size & follow-up 2002-2004 – N=319, follow-up (n=299) at ~6 months
SETTING
Context (country, setting, location) • USA, private and academic family practices, both urban and rural
Key socio-economic characteristics of sample • Children aged <5 years • Practices were selected for their contrasting characteristics, e.g. – Practice 1 (94% White, 63% had private medical insurance), Practice 3 (81% African-American, 11% had private medical insurance)
Study inclusion criteria Parents of children aged 0-5 years attending child health clinic at the included family practices
DESCRIPTION OF INTERVENTION
Counselling (10-15 minutes) regarding the use of smoke detectors, safe storage of hazardous household materials, and

setting of safe hot water tap temperature delivered by family practice medical staff, based upon a computerised 6-question assessment of parent's home safety knowledge. A research health assistant also delivered generic safety counselling. A free, tailored safety equipment pack (smoke alarm, cupboard locks, water temperature information card)
OUTCOMES REPORTED
• Installation and functioning of smoke alarms (observed) (Note: only 8% of participants agreed to visit for assessment)
REPORT DETAILS: Sznajder et al 2003
Aim of study To evaluate the effectiveness of home delivery of an injury prevention kit
Study design RCT (IV+, EV-)
Study year, sample size & follow-up 2000-2001 – N=99, follow-up (n=98) at 6-8 weeks
SETTING
Context (country, setting, location) • France, participants' homes, urban
Key socio-economic characteristics of sample • Mean age of parents 32.4 years (SD 5.1) in intervention arm; 32.3 years (SD 5.9) in control arm • Over 80% of families were 2-parent households • Around half of participants had a university education
Study inclusion criteria Families with newborns were 'selected' by Mother & Child Protection Services (inclusion criteria not stated)
DESCRIPTION OF INTERVENTION
Safety counselling + safety pamphlets + safety kit (cupboard & drawer latches, door handle covers, table corners, electric outlet covers, non-skid bath mat, smoke alarm, phone sticker with contact number of poison control centre)
OUTCOMES REPORTED
• Installation and functioning of smoke alarms and electrical outlet covers (self-reported) • Home safety behaviours (self-reported)

5.6.2. Study quality and context

Study quality varied considerably, with the higher quality studies benefiting from shorter follow-up times (not more than 8 weeks) that minimised attrition (Clamp & Kendrick 1998 – 0%; Sznajder et al 2003 – 1%; although Posner et al 2004 – 28%). Study power was calculated and judged to be adequate, and an intention to treat analysis was conducted in two of these studies (Clamp & Kendrick 1998; Posner et al 2004). The baseline characteristics of participants in all four studies were comparable.

The study in which a longer follow-up (6 months) was planned in order to allow for observation of the installation of smoke alarms (Sangvai et al 2007) was limited by the very low rate (8%) of agreement of participants to allow access to their homes to conduct this assessment. This small sample size severely limited the validity of the analysis. In addition, the very limited analysis of results comparing intervention and control groups in Sangvai et al (2007) raises the possibility of reporting bias. Of the three studies with a shorter follow-up period (6-8 weeks), only Sznajder et al (2003) directly observed the installation of home safety equipment rather than relying upon participants' self-report. However, Clamp & Kendrick (1998) did conduct a small random sample of home visits (n=10 from each of the intervention and control groups), reporting 'high concordance' between self-reported and actual behaviours[5].

The nature of the interventions delivered also varied considerably in terms of the manner in which the home safety equipment was supplied and the context in which the educational information was delivered. The educational intervention was delivered by medical staff in a primary care setting in two studies (Clamp & Kendrick 1998; Sangvai et al 2007), whilst one was delivered as part of an emergency department's discharge care (following the treatment of a child for an injury) (Posner et al 2004), and one was delivered in participants' homes by health professionals (Sznajder et al 2003). The home safety equipment supplied was limited to safety latches and smoke alarms in the study reported by Sangvai et al (2003). A much wider range of equipment was provided in the other studies (Clamp & Kendrick 1998; Posner et al 2004; Sznajder et al 2003), although it should be noted that the safety equipment was not available free of charge in the Clamp & Kendrick (1998) study; rather, it was available at a discount and also required collection from the GP surgery.

All of the studies reported an educational intervention of approximately 15-20 minutes duration, but the exact manner in which the intervention was delivered and its contents (beyond broadly discussing home safety and the use of home safety equipment) are not detailed any further in any of the four reports.

The study by Clamp & Kendrick (1998) was conducted in a socially-deprived, urban setting in the UK (see details in Table 12, p.66) that allows the application of the study's findings to other similar settings in the UK to be made. Posner et al's (2004)

[5] Kappa coefficients for consistency of responses to questionnaire and observed safety equipment use were 1 (for 21 questions), 0.75-0.99 (for 5 questions), 0.59-0.74 (for 6 questions), and <0.60 (for 4 questions). The areas of home safety behaviours for which higher and lower κ coefficients were obtained is not noted, except for the lowest (storage of sharp objects in the kitchen (κ=0.49) and use of electrical socket covers (κ=0.33)).

study was conducted in an urban USA setting with a majority African-American population, and the study's findings may be applicable to other similar areas. Despite the efforts reported by Sznajder et al (2003) to recruit a sample that included socio-economically deprived groups, over 60% of participants were in salaried occupations and more than half had a university education; this limits the applicability of the study's findings to similar socio-economically advantaged groups.

5.6.3. Results

Injuries

No studies evaluating the effectiveness of discounted supply of safety equipment with safety education reported injury outcomes.

Installation of home safety equipment

All four of the reports (Clamp & Kendrick 1998, RCT, IV++, EV+, UK; Posner et al 2004, RCT, IV++, EV++, USA; Sangvai et al 2007, RCT, IV-, EV-, USA; Sznajder et al 2003, RCT, IV+, EV-, France) presented data on the installation (Table 13, p.72) and use of home safety equipment (Table 14, p.73). Three of these four reports Clamp & Kendrick 1998; Posner et al 2004; Sznajder et al 2003) used upon parents' self-report to assess installation and use; the one report that attempted to observe installation and use (Sangvai et al 2007) only attained agreement from 8% of participants for follow-up (n=13).

A consistent and statistically significant difference that favoured the intervention group in the installation of smoke alarms was presented in three of the four reports (Clamp & Kendrick 1998; Sangvai et al 2007; Sznajder et al 2003), although it should be noted that the confidence interval around the odds ratio was extremely wide in one study (Sangvai et al 2007).

Two of the four reports presented mixed results regarding the rate of use of locks on cupboards containing cleaning products, one reporting results that statistically significantly favoured the intervention group (Clamp & Kendrick 1998) and another reporting no statistically significant difference (Sznajder et al 2003). The use of locks on cupboards containing medicines post-intervention showed a consistent but statistically non-significant difference between intervention and control groups (Clamp

& Kendrick 1998; Sznajder et al 2003), although the confidence interval around the odds ratio was wide in the latter study.

One of the four reports presented data on the rates of installation of stair gates and window catches; no statistically significant differences between intervention and control groups were found (Clamp & Kendrick 1998).

Posner et al (2004) reported a statistically significant difference ($p<.001$) between intervention and control groups that favoured the intervention in the installation of a wide range of supplied safety equipment (including safety latches, electrical outlet covers, and non-slip bathroom items). However, it should be noted that the confidence intervals around the mean differences between intervention and control arms were wide. Posner et al (2004) do not report differences in the uptake of these various items, instead simply reporting 'device use' as a whole.

The use of home safety equipment that does not require specific skills to install is reported in Table 14 (p.73). A statistically significant difference that favoured the intervention in the use of fire guards, electrical outlet covers and door slam devices was reported by Clamp & Kendrick (1998), although one of the two reports which presented data on the use of electrical outlet covers found no significant difference between intervention and control groups (Sznajder et al 2003). Similarly, the use of supplied non-slip bath mats and decals was found to have no significant difference between intervention and control groups (Sznajder et al 2003), but the use of cushioned table corners was found to statistically significantly favour the intervention group, although the confidence interval was wide (Sznajder et al 2003).

Table 13: Installation of home safety equipment after intervention with free or discounted supply and education

	Smoke alarm			Stair gate			Window catch			Cupboard lock (cleaning items)			Cupboard lock (medicine)		
	In. (%)	**Con. (%)**	**Odds ratio (95% CI)**	**In. (%)**	**Con. (%)**	**Odds ratio (95% CI)**	**In. (%)**	**Con. (%)**	**Odds ratio (95% CI)**	**In. (%)**	**Con. (%)**	**Odds ratio (95% CI)**	**In. (%)**	**Con. (%)**	**Odds ratio (95% CI)**
Clamp & Kendrick 1998[1] RCT (UK)	99	87	1.14 (1.04, 1.25)	62	51	1.26 (0.95, 1.67)	96	88	1.10 (1.00, 1.20)	59	43	1.38 (1.02, 1.88)	18	18	0.99 (0.52, 1.89)
Sangvai et al 2007[2] RCT (USA)	94	50	16.0 (1.50, 171.21)	-	-	-	-	-	-	-	-	-	-	-	-
Sznajder et al 2003[3] RCT (France)	53	10	2.57 (1.77, 3.75)	-	-	-	-	-	-	41	34	1.32 (0.41, 4.18)	27	16	4.06 (0.63, 26.13)
Posner et al 2004[4] RCT (USA)	-	-	-	-	-	-	*Safety score 65.4*	*Safety score 44.3*	*Mean difference 21.1 (13.90, 28.30)*	*Safety score 65.4*	*Safety score 44.3*	*Mean difference 21.1 (13.90, 28.30)*	*Safety score 65.4*	*Safety score 44.3*	*Mean difference 21.1 (13.90, 28.30)*

Notes:
[1] Follow-up at 6 weeks; odds ratio calculated by report's authors.
[2] Follow-up at 6 months; odds ratio calculated by PenTAG. Note that only 8% of participants (n=26) agreed to home visit at follow-up.
[3] Follow-up at 6-8 weeks; odds ratio calculated by PenTAG.
[4] Follow-up at 2 months; mean difference calculated by PenTAG. 'Safety score' reflects 'desirable responses' to questionnaire, but no further details provided (Posner et al 2004). Note: Outcomes not disaggregated by type of equipment, but is tabulated here by the equipment supplied in the intervention.

Table 14: Use of home safety equipment after intervention with free or discounted supply and education

	Fire guard			Electrical socket cover			Door slam devices/ Table corners			Non-skid bath mats		
	In. (%)	**Con. (%)**	**Odds ratio (95% CI)**	**In. (%)**	**Con. (%)**	**Odds ratio (95% CI)**	**In. (%)**	**Con. (%)**	**Odds ratio (95% CI)**	**In. (%)**	**Con. (%)**	**Odds ratio (95% CI)**
Clamp & Kendrick 1998[1] RCT (UK)	55	32	1.89 (1.18, 2.94)	92	72	1.27 (1.10, 1.48)	61[2]	17	3.60 (2.17, 5.97)	-	-	-
Sznajder et al 2003[3] RCT (France)	-	-	-	33	22	2.10 (0.67, 6.60)	51[4]	26	5.38 (1.59, 18.26)	22	38	0.41 (0.14, 1.17)

Notes:
[1] Follow-up at 6 weeks; odds ratio calculated by report's authors.
[2] Door slam devices.
[3] Follow-up at 6-8 weeks; odds ratio calculated by PenTAG.
[4] Table corners.

Home safety knowledge and behaviour

Four reports (Clamp & Kendrick 1998, RCT, IV++, EV+, UK; Posner et al 2004, RCT, IV++, EV++, USA; Sangvai et al 2007, RCT, IV-, EV-, USA; Sznajder et al 2003, RCT, IV+, EV-, France) presented data on changes in home safety knowledge and behaviour (Table 15 (p.76)); Table 16 (p.77)). As detailed in the preceeding section, all of the reports used upon self-reported data or observation of behaviour with only a very small sample.

All four studies (Clamp & Kendrick 1998; Posner et al 2004; Sangvai et al 2007; Sznajder et al 2003) reported statistically significant improvements in the intervention group in knowledge and behaviour relating to the prevention of poisoning; whilst the odds ratio confidence intervals in two of these studies were wide (Posner et al 2004; Sangvai et al 2007), they were much narrower in the two studies that reported a smaller effect size (Clamp & Kendrick 1998; Sznajder et al 2003). One of the three reports that presented data on changes in knowledge and behaviour relating to the prevention of falls found a statistically significant difference that strongly favoured the intervention group (Sznajder et al 2003), whilst two studies reported no statistically significant difference between intervention and control groups (Clamp & Kendrick 1998; Posner et al 2004).

Two of the four reports presented data that showed statistically significant improvements in the intervention group in knowledge and behaviour relating to the prevention of wounds (Clamp & Kendrick 1998; Posner et al 2004), although one found no statistically significant difference (Sznajder et al 2003).

Two of the four reports presented data showing statistically significant improvements in the intervention group in knowledge and behaviour relating to the prevention of scalds (Clamp & Kendrick 1998; Posner et al 2004), and two of the four reports presented data showing statistically significant improvements in the intervention group in knowledge and behaviour relating to the prevention of fires (Clamp & Kendrick 1998; Sznajder et al 2003).

Other improvements in home safety knowledge and behaviour were presented in two reports, one relating to the prevention of drowning (Posner et al 2004) and one to the prevention of suffocation (Sznajder et al 2003); large effect sizes that favoured the intervention group were reported in both of these studies, but the confidence intervals around the odds ratios were wide.

Table 15: Improvements in home safety knowledge and behaviour (fires, scalds, and falls) after intervention with free or discounted supply of home safety equipment and education

	Fires			**Scalds**			**Falls**		
	In. (%)	**Con. (%)**	**Odds ratio (95% CI)**	**In. (%)**	**Con. (%)**	**Odds ratio (95% CI)**	**In. (%)**	**Con. (%)**	**Odds ratio (95% CI)**
Clamp & Kendrick 1998[1] RCT (UK)	96	87	1.11 (1.01, 1.22)	67	37	1.84 (1.34, 2.54)	64	61	1.05 (0.83, 1.33)
Sangvai et al 2007[2] RCT (USA)	-	-	-	-	-	-	-	-	-
Sznajder et al 2003[3] RCT (France)	33	15	2.84 (1.65, 4.90)	-	-	-	45	31	1.85 (1.13, 3. 02)
Posner et al 2004[4] RCT (USA)	*Safety score* 81.7	*Safety score* 80.6	*Mean difference* 1.1 (-2.40, 4.60)	*Safety score* 76.0	*Safety score* 68.4	*Mean difference* 7.6 (2.16, 13.04)	*Safety score* 58.9	*Safety score* 57.4	*Mean difference* 1.5 (-7.55, 10.55)

Notes:
[1] Follow-up at 6 weeks; odds ratio calculated by report's authors.
[2] Follow-up at 6 months; odds ratio calculated by PenTAG. Note that only 8% of participants (n=26) agreed to home visit at follow-up.
[3] Follow-up at 6-8 weeks; more than one improvement per type of safety behaviour could be recorded; odds ratio calculated by PenTAG.
[4] Follow-up at 2 months; mean difference calculated by PenTAG.

Table 16: Improvements in home safety knowledge and behaviour (poisonings, wounds, drowning, and suffocation) after intervention with free or discounted supply of home safety equipment and education

	Poisonings			Wounds			Drowning			Suffocation		
	In. (%)	Con. (%)	Odds ratio (95% CI)	In. (%)	Con. (%)	Odds ratio (95% CI)	In. (%)	Con. (%)	Odds ratio (95% CI)	In. (%)	Con. (%)	Odds ratio (95% CI)
Clamp & Kendrick 1998[1] RCT (UK)	95	83	1.15 (1.03, 1.28)	63	32	1.98 (1.38, 2.83)	-	-	-	-	-	-
Sangvai et al 2007[2] RCT (USA)	81	30	10.1 (1.60, 64.0)	-	-	-	-	-	-	-	-	-
Sznajder et al 2003[3] RCT (France)	66	47	2.15 (1.24, 3.73)	48	46	1.10 (0.51, 2.40)	-	-	-	55	22	4.35 (1.81, 10.43)
Posner et al 2004[4] RCT (USA)	*Safety score 74.4*	*Safety score 64.9*	*Mean difference 9.5 (2.89, 16.11)*	*Safety score 81.0*	*Safety score 66.4*	*Mean difference 14.6 (7.73, 21.47)*	*Safety score 95.9*	*Safety score 92.9*	*Mean difference 3.0 (-1.99, 7.99)*	-	-	-

Notes:
[1] Follow-up at 6 weeks; odds ratio calculated by report's authors.
[2] Follow-up at 6 months; odds ratio calculated by PenTAG. Note that only 8% of participants (n=26) agreed to home visit at follow-up.
[3] Follow-up at 6-8 weeks; more than one improvement per type of safety behaviour could be recorded; odds ratio calculated by PenTAG.
[4] Follow-up at 2 months; mean difference calculated by PenTAG.

Evidence statement 3: Free or discounted supply of home safety equipment with safety education
There is evidence from four RCTs (Clamp & Kendrick 1998 [++], UK; Posner et al 2004 [++], USA; Sangvai et al 2007 [-], USA; Sznajder et al 2003 [+], France) about interventions with free or discounted supply of home safety equipment in conjunction with safety education. This evidence is only partially applicable to the UK as only one study was conducted in the UK.
Injuries
a. There is no evidence presented on injury outcomes in the reports evaluating the free or discounted supply of home safety equipment in conjunction with safety education (Clamp & Kendrick 1998; Posner et al 2004; Sangvai et al 2007; Sznajder et al 2003).
Installation of home safety equipment
b. There is moderate evidence from three RCTs (Clamp & Kendrick 1998 [++]; Sangvai et al 2007 [-]; Sznajder et al 2003 [+]) that the free or discounted supply of **smoke alarms** in conjunction with safety education **increases the rate of installation** of these devices (OR 1.14 (95% CI 1.04, 1.25) (Clamp & Kendrick 1998); 16.0 (95% CI 1.50, 171.21) (Sangvai et al 2007); 2.57 (95% CI 1.77, 3.75) (Sznajder et al 2003)). c. There is weak evidence from two RCTs (Clamp & Kendrick 1998 [++]; Sznajder et al 2003 [+]) 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 (Clamp & Kendrick 1998), with only fire guards reported as being more likely to be present post-intervention (based on self-report). d. There is weak evidence from 1 RCT (Posner et al 2004 [++]) 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** (MD 21.1 (95% CI 13.90, 28.30) (Posner et al 2004)) (based on self-report).
Home safety knowledge and behaviour
e. There is strong evidence from four RCTs (Clamp & Kendrick 1998 [++]; Posner et al 2004

[++]; Sangvai et al 2007 [-]; Sznajder et al 2003 [+]) that the free or discounted supply of a range of safety equipment in conjunction with safety education **increases knowledge** about the prevention of **poisoning** (Clamp & Kendrick 1998; Posner et al 2004; Sangvai et al 2007); Sznajder et al 2003) and **scalds** (Clamp & Kendrick 1998; Posner et al 2004).

f. There is inconsistent evidence from three RCTs (Clamp & Kendrick 1998 [++]; Posner et al 2004 [++]; Sznajder et al 2003 [+]) about the effect of free or discounted supply of a range of safety equipment in conjunction with safety education upon **knowledge about:** the prevention of **fires** (Clamp & Kendrick 1998 (increased); Posner et al 2004 (no effect); Sznajder et al 2003 (increased)), **falls** (Clamp & Kendrick 1998 (no effect); Posner et al 2004 (no effect); Sznajder et al 2003 (increased)), and **wounds** (Clamp & Kendrick 1998 (increased); Posner et al 2004 (increased); Sznajder et al 2003 (no effect)).

g. There is weak evidence from one RCT (Posner et al 2004 [++]) that the free or discounted supply of a range of safety equipment in conjunction with safety education **does not increase knowledge** about the prevention of **drowning** (Posner et al 2004).

h. There is weak evidence from one RCT (Sznajder et al 2003 [+]) that the free or discounted supply of a range of safety equipment in conjunction with safety education **increases knowledge** about the prevention of **suffocation** (Sznajder et al 2003).

5.7. Free or discounted supply and installation of home safety equipment with safety education

5.7.1. Report characteristics

Outcomes of an intervention where free or discounted home safety equipment was supplied and installed in conjunction with safety education were presented in two reports based upon the same study (Watson et al 2005, IV++, EV++, UK; Kendrick et al 2009, IV++, EV++, UK) (Table 17, p.80). One report presented data on injury outcomes (Watson et al 2005), both reports presented data on installation of home safety equipment (Watson et al 2005; Kendrick et al 2009), and one report presented data on changes in home safety knowledge and behaviour (Watson et al 2005).

Table 17: Free or discounted supply and installation of home safety equipment: Report characteristics

REPORT DETAILS: Watson et al 2005; Kendrick et al 2009
Aim of study To assess the effectiveness of safety advice and safety equipment in reducing unintentional injuries for families with children aged under 5 and living in deprived areas.
Study design RCT (IV++, EV++)
Study year & follow-up 2000-2002 – N=3428, follow-up at 12 months (n=3428 (injuries)/ n=1880 (knowledge and behaviour) (Watson et al 2005); n=744 (installation) (Kendrick et al 2009)) and 24 months (n=1580 (knowledge and behaviour) (Watson et al 2005).
SETTING
Context (country, setting, location) • UK, participants' homes or health clinics, urban
Key socio-economic characteristics of sample • Children aged <5 years • 50% of families in receipt of means tested benefits • ~33% had no access to a car • 45% of families lived in rented accommodation • 11% of households had >1 person per room • 71% of sample resided in a deprived area (Townsend score >0) • ~33% of households had both parents unemployed
Study inclusion criteria Families with >=1 children aged <5 years who were on the caseload of Health Visitors within the 47 GP practices.
DESCRIPTION OF INTERVENTION
Safety counselling by Health Visitor + safety kit (stair gates, fire guards, smoke alarms, cupboard locks & drawer locks). Families on a low-income (defined as being in receipt of benefits) could have the safety equipment installed free of charge; others were offered free delivery only.
OUTCOMES REPORTED
• Injuries (primary and secondary care records) (Watson et al 2005) • Installation and functioning of smoke alarms and stair gates (self-reported) (Kendrick et al 2009; Watson et al 2005) and other home safety equipment (self-reported) (Watson et al 2005) • Home safety behaviours (self-reported) (Watson et al 2005)

5.7.2. Study quality and context

Both reports (Kendrick et al 2009; Watson et al 2005), based upon the same dataset, were designed and conducted to high methodological standards. The socio-economic and home safety behaviour characteristics were sufficiently well-balanced at baseline to not warrant adjustments for baseline differences in the statistical analysis, the analysis plan was pre-specified, used an intention to treat analysis, and appropriately used logistic regression to compare the intervention and control groups. A sufficient sample size was obtained at follow-up to give 80% power to detect a relative reduction of 10% (at the 5% significance level) in medically attended injuries between the intervention and control groups. The use of primary care records for assessing injury outcomes (in Watson et al 2005) allowed analysis of a sample with 0% attrition; attrition in the samples assessing home safety equipment installation and knowledge and behaviour outcomes was reasonable (8% in the intervention group and 4% in the control group at 12 months follow-up (Kendrick et al 2009; Watson et al 2005); 18% in the intervention group and 24% in the control group at 24 months (Watson et al 2005)). The authors acknowledge the possibility of the intervention's effectiveness being overestimated; the low initial participation rate (35%) may be a sign that only those families who were already more motivated to address home safety issues agreed to take part. Despite the use of a validated questionnaire, there also remains a risk of social desirability bias in the responses given by study participants.

The intervention was implemented in a socio-economically deprived urban area in the UK and used existing community health infrastructure to deliver the safety education. The safety equipment was provided and delivered free of charge regardless of a household's income, but free installation was only provided for households in receipt of means tested benefits. The results are directly applicable to areas in the UK with similar socio-economic characteristics.

5.7.3. Findings

Injuries

One of the two reports presented data on a range of child injury outcomes in the 24 months following the supply and installation of home safety equipment in conjunction with safety education (Watson et al 2005, RCT, IV++, EV++, UK) (Table 18, p.83).

Interestingly, primary care attendance (assessed using primary care records) related to unintentional injuries showed a statistically significant *increase* in the intervention group (IRR 1.37 (95% CI 1.11, 1.70)), whilst across all other measures of injury (assessed using primary and secondary care records) a statistically non-significant difference between intervention and control groups was reported (IRR secondary care attendance: 1.02 (95% CI 0.90, 1.13); IRR hospital admission: 1.02 (95% CI 0.70, 1.48); IRR severity score on abbreviated injury scale: 1.14 (95% CI 0.76, 1.71)).

Table 18: Child injuries in the 24 months following supply and installation of home safety equipment with safety education.

	Intervention				Control				Effect size	
Injury outcomes	**n (%)**	**Denominator**	**Rate/1000 person years**	**Person years**	**n (%)**	**Denominator**	**Rate/1000 person years**	**Person years**	**Odds ratio (95% CI)**	**Incidence rate ratio (95% CI)**
Primary care attendance	220	-	61.2	3595.1	172	-	44.2	3887.7		1.37 (1.11, 1.70)
Secondary care attendance	685	-	175.9	3895.0	743	-	174.1	4267.8	-	1.02 (0.90, 1.13)
Hospital admission	54	-	13.9	3895.0	58	-	13.6	4267.8	-	1.02 (0.70, 1.48)
Abbreviated injury scale >=2	57 (12.1)	472	-	-	49 (10.8)	456	-	-	1.14 (0.76, 1.71)	-
Minor injury severity score >=2	215 (45.0)	478	-	-	206 (45.3)	455	-	-	0.98 (0.75, 1.27)	-

Source: Watson et al (2005)

Installation of home safety equipment

Both reports presented data on the continued use of home safety equipment following its supply and installation in conjunction with safety education (Kendrick et al 2009, RCT, IV++, EV++, UK; Watson et al 2005, RCT, IV++, EV++, UK), both differentiated at 12 and 24 months (Table 19, p.85), and by specific types of safety equipment (Table 20 – stair gates (p.86); Table 21 – smoke alarms (p.87)). The dataset (self-reported by parents) analysed in both reports was the same, with the focus in Kendrick et al (2009) being upon differences in continued use of the safety equipment by markers of socio-economic inequalities.

At follow-up at 12 months (see Table 19, p.85), Watson et al (2005) reported a statistically significant difference that moderately to strongly favoured the intervention group with regard to the installation and use of stair gates (OR 1.46 (95% CI 1.19, 1.80)), smoke alarms (OR 1.83 (95% CI 1.33, 2.52)), and window locks (OR 1.28 (95% CI 1.02, 1.59)), but no statistically significant difference between intervention and control groups with regard to the installation and use of fire guards (OR 1.14 (95% CI 0.93, 1.40)). This effect failed to persist at follow-up at 24 months (e.g. use of stair gates: OR 0.92 (95% CI 0.74, 1.14)) except for the installation of a working smoke alarm (OR 1.67 (95% CI 1.21, 2.32)).

One of the two reports presented data on the continued use of supplied and installed stair gates and smoke alarms (in conjunction with safety education) at 12 month follow-up, analysed by key socio-economic characteristics (Kendrick et al 2009). The intervention was reported to have had a statistically significant effect on reducing inequalities in the continued use of installed stair gates among families living in rented housing (*p* value for interaction term=0.006) and families who were in receipt of means-tested benefits (*p* value for interaction term=0.04), but not on any other markers of socio-economic inequalities (see Table 20, p.86). However, the intervention had no statistically significant effect on reducing inequalities in the continuing use of smoke alarms across any of the markers of socio-economic inequalities (see Table 21, p.87).

Table 19: Installation of home safety equipment after intervention with supply of home safety equipment with safety education and installation

	12 months follow-up			24 months follow-up		
Safety practices	**Intervention n (%) (N=771)**	**Control n (%) (N=744)**	**Odds ratio (95% CI)**	**Intervention n (%) (N=803)**	**Control n (%) (N=754)**	**Odds ratio (95% CI)**
Fitted and always used fire guard	414 (54.3)	374 (50.9)	1.14 (0.93, 1.40)	328 (42.1)	299 (40.0)	1.09 (0.88, 1.33)
Fitted and used stair gate	408 (55.0)	328 (45.7)	1.46 (1.19, 1.80)	239 (30.1)	240 (31.9)	0.92 (0.74, 1.14)
Fitted and working smoke alarm	692 (90.6)	619 (84.0)	1.83 (1.33, 2.52)	728 (91.5)	648 (86.5)	1.67 (1.21, 2.32)
Fitted window locks	550 (71.7)	493 (66.5)	1.28 (1.02, 1.59)	577 (72.4)	525 (72.0)	1.12 (0.90, 1.40)

Source: Watson et al (2005); odds ratios calculated by report's authors.

Table 20: Installation of *stair gates* (at 12 month follow-up): analysis of effect of intervention involving supply and installation of stair gates (with safety education) upon reducing health inequalities

Socio-economic characteristics	All participants at baseline		Control group at 1-year follow-up		Intervention group at 1 year f-up		*p* value
	Fitted and used stair gate n (%)	OR (95% CI)	Fitted and used stair gate n (%)	OR (95% CI)	Fitted and used stair gate n (%)	OR (95% CI)	
Ethnic group							
White	1301/2705 (48.1)		269/571 (47.1)		332/590 (56.3)		0.50
Other	133/463 (28.7)	0.48 (0.38, 0.60)	31/92 (33.7)	0.57 (0.36, 0.91)	43/90 (47.8)	0.71 (0.46, 1.11)	
Maternal age at birth of 1st child							
>=20 years	1092/2297 (47.5)		240/494 (48.6)		285/516 (55.2)		0.06
<=19 years	269/707 (38.1)	0.71 (0.59, 0.85)	54/140 (38.6)	0.67 (0.46, 0.99)	78/135 (57.8)	1.13 (0.77, 1.67)	
Housing tenure							
Owner occupier	861/1745 (49.3)		196/395 (49.6)		222/407 (54.6)		0.006
Rented	588/1469 (40.0)	0.72 (0.63, 0.84)	106/279 (38.0)	0.62 (0.46, 0.85)	165/285 (57.9)	1.15 (0.84, 1.56)	
Family type							
2-parent family	1123/2303 (48.8)		242/495 (48.9)		286/502 (57.0)		0.07
1-parent family	320/886 (36.1)	0.62 (0.52, 0.73)	58/174 (33.3%)	0.52 (0.36, 0.75)	99/190 (52.1)	0.82 (0.59, 1.15)	
Receipt of means-tested benefits							
Not receiving benefits	785/1548 (50.7)		162/335 (48.4)		189/350 (54.0)		0.04
Receiving benefits	606/1542 (39.3)	0.67 (0.57, 0.77)	130/318 (40.9)	0.74 (0.54, 1.01)	183/317 (57.7)	1.16 (0.86, 1.58)	

Source: Kendrick et al (2009); odds ratios and *p* values calculated by report's authors; *p* value is for interaction term between control and intervention groups at 12 month follow-up

Key:

Reference group

Table 21: Installation of *smoke alarms* (at 12 month follow-up): analysis of effect of intervention involving supply and installation of smoke alarms (with safety education) upon reducing health inequalities

Socio-economic characteristics	All participants at baseline		Control group at 1-year follow-up		Intervention group at 1 year f-up		*p* value
	Functional smoke alarm n (%)	OR (95% CI)	Functional smoke alarm n (%)	OR (95% CI)	Functional smoke alarm n (%)	OR (95% CI)	
Ethnic group							
White	2095/2618 (80.0)		504/589 (85.6)		562/611 (92.0)		0.73
Other	232/438 (53.0)	0.33 (0.26, 0.42)	63/90 (70.0)	0.39 (0.23, 0.66)	75/90 (83.3)	0.45 (0.24, 0.85)	
Maternal age at birth of 1st child							
>=20 years	1752/2226 (78.7)		439/509 (86.3)		492/534 (92.1)		1.00
<=19 years	467/677 (69.0)	0.64 (0.52, 0.78)	108/143 (75.5)	0.49 (0.31, 0.78)	117/138 (84.8)	0.49 (0.27, 0.86)	
Housing tenure							
Owner occupier	1393/1683 (82.8)		355/407 (87.2)		389/417 (93.3)		0.79
Rented	968/1417 (68.3)	0.47 (0.39, 0.56)	223/284 (78.5)	0.54 (0.35, 0.82)	257/295 (87.1)	0.49 (0.29, 0.83)	
Family type							
2-parent family	1758/2223 (79.1)		433/511 (84.7)		476/519 (91.7)		0.78
1-parent family	592/857 (69.1)	0.60 (0.50, 0.73)	142/175 (81.1)	0.77 (0.48, 1.22)	172/195 (88.2)	0.69 (0.40, 1.19)	
Receipt of means-tested benefits							
Not receiving benefits	1251/1498 (83.5)		304/344 (88.4)		331/355 (93.2)		0.61
Receiving benefits	1031/1487 (69.3)	0.48 (0.40, 0.58)	257/326 (78.8)	0.47 (0.30, 0.72)	294/332 (88.6)	0.56 (0.32, 0.96)	

Source: Kendrick et al (2009); odds ratios and *p* values calculated by report's authors; *p* value is for interaction term between control and intervention groups at 12 month follow-up.
Key:
Reference group

Home safety knowledge and behaviour

One of the two reports presented data on improvements in home safety knowledge and behaviour (self-reported by parents) after the supply and installation of home safety equipment in conjunction with safety education (Watson et al 2005, RCT, IV++, EV++, UK) (Table 22, p.89). A statistically significant difference that favoured the intervention group at 12 months follow-up was reported in knowledge and behaviour related to the safe storage of cleaning products and sharp objects in the kitchen (OR 1.34 (95% CI 1.09, 1.66) and 1.34 (95% CI 1.09, 1.65), respectively). However, at the same time, no statistically significant difference between intervention and control groups was found relating to the safe storage of medicines in the kitchen, or cleaning products or sharp objects in the bathroom. At 24 months follow-up, the statistically significant difference that favoured the intervention group only persisted for knowledge and behaviour related to the safe storage of cleaning products in the kitchen (OR 1.31 (95% CI 1.07, 1.60)).

Table 22: Improvements in home safety knowledge and behaviour after intervention with supply of home safety equipment with safety education and installation

	12 months follow-up			24 months follow-up		
Safe storage of:	**Intervention n (%) (N=771)**	**Control n (%) (N=744)**	**Odds ratio (95% CI)**	**Intervention n (%) (N=803)**	**Control n (%) (N=754)**	**Odds ratio (95% CI)**
Medicines in kitchen	712 (93.4)	683 (92.6)	1.15 (0.76, 1.73)	765 (95.5)	701 (93.2)	1.55 (1.00, 2.40)
Cleaning products in kitchen	496 (65.5)	428 (58.6)	1.34 (1.09, 1.66)	442 (55.3)	365 (48.5)	1.31 (1.07, 1.60)
Sharp objects in kitchen	346 (45.4)	279 (38.2)	1.34 (1.09, 1.65)	296 (36.9)	262 (34.8)	1.10 (0.91, 1.32)
Cleaning products in bathroom	493 (70.4)	463 (68.5)	1.09 (0.87, 1.38)	497 (63.1)	459 (61.7)	1.06 (0.86, 1.31)
Sharp objects in bathroom	545 (81.2)	505 (78.3)	1.20 (0.92, 1.57)	568 (73.2)	548 (75.1)	0.91 (0.72, 1.14)

Source: Watson et al (2005); odds ratios calculated by report’s authors.

Evidence statement 4: Free or discounted supply and installation of home safety equipment with safety education
There is evidence from one RCT (resulting in two study reports: Kendrick et al, 2009 [++]; Watson et al 2005 [++], UK) about an intervention with free or discounted supply and installation of home safety equipment (in conjunction with safety education). This evidence is judged as highly applicable as it is recent and from the UK.
Injuries
a. There is moderate evidence from one RCT that free home safety equipment (or its delivery) and installation with safety education has **no statistically significant impact** on **serious injury rates** in children as measured by secondary care attendance (IRR 1.02 95% CI 0.90, 1.13), hospital admission (IRR 1.02 95% CI 0.70, 1.48), the abbreviated injury scale (OR 1.14 95% CI 0.76, 1.71) or the minor injury severity score (OR 0.98 95% CI 0.75, 1.27) (Watson et al 2005). Primary care attendance appeared to increase (IRR 1.37 95% CI 1.11, 1.70) (Watson et al 2005).
Installation of home safety equipment
b. 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) (Watson et al 2005). The intervention **did not have a statistically significant impact on reducing socio-economic inequalities** in the uptake and continued use (12 months post-intervention) of **smoke alarms** (Kendrick et al 2009). c. There is weak evidence from one RCT about free home safety equipment (or its delivery) and installation with safety education. Outcomes showed mixed evidence of effect: **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 (Watson et al 2005). The intervention **had a statistically significant impact on reducing socio-economic inequalities** in the uptake and continued use (12 months post-intervention) of **stair gates** (Kendrick et al 2009).
Home safety knowledge and behaviour
d. 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 that these effects are **no longer seen after 24 months** for safe storage of sharp objects (Watson et al 2005).

5.8. Home risk assessment only

5.8.1. Report characteristics

Outcomes of an intervention where a home risk assessment only was conducted were presented in one report (Paul et al 1994, RCT, IV-, EV-, Australia) (Table 23, p.92). The report presented outcomes relating to the installation of home safety equipment and changes in home safety knowledge and behaviour.

Table 23: Home risk assessment only: Report characteristics

REPORT DETAILS: Paul et al 1994
Aim of study To evaluate the effectiveness of a 'low-cost' home risk assessment strategy aimed at reducing home safety hazards.
Study design RCT (IV-, EV-)
Study year, sample size & follow-up Year not reported – N=198, follow-up (n=98) at 5-9 months.
SETTING
Context (country, setting, location) • Australia, participants' homes, rural
Key socio-economic characteristics of sample • 93% of parents were married • 16% of parents had <High school certificate
Study inclusion criteria Parents of children born at a rural hospital between ten months and two years previously
DESCRIPTION OF INTERVENTION
Home risk assessments were conducted, following a one-hour small group training session, by volunteers from a local Rotary club, staff members from the local community health centre, or paid interviewers (volunteers conducted 52% of the workload). The assessment was made using a safety education booklet (which participants could keep) that allowed each potential type of hazard to marked as present/not present; this was followed by a list of action points and contact details of local outlets where safety equipment could be purchased.
OUTCOMES REPORTED
• Installation of home safety equipment (observed) • Home safety knowledge and behaviour (observed)

5.8.2. Study quality and context

The study (Paul et al 1994) suffered from a number of significant weaknesses. No details are provided on the trial arm randomisation process, study power is not reported, no intention to treat analysis is conducted, and attrition rates were high (57% in intervention group, 44% in control group). Although a χ^2 test was conducted to assess for differences in 'baseline' socio-economic characteristics of participants, this analysis was conducted only on those participants where follow-up was successful, meaning that any systematic difference between the two groups that may have resulted in higher rates of attrition will not be apparent in the analysis. There is a substantial risk of reporting bias. The implementation of the intervention appears to have been severely constrained by resources. A number of different attempts to enrol community organisations and their members (with varying degrees of interest and aptitude for the implementing the intervention) were made, and the authors acknowledge that the intervention's delivery was hampered by resource constraints.

The intervention, which took place in rural Australia, was unusual in that the home risk assessment was a stand-alone intervention *without* the opportunity being taken to supply free or discounted home safety equipment. Although the home risk assessors (52% of whom were volunteers, the remainder being community health centre staff or temporary project staff) recorded home safety hazards in a safety education booklet that was given to participants and provided advice about home safety equipment and behaviour, it was left to participants' to source, fund, and install appropriate equipment. The lack of methodological rigour in the study design and the particular characteristics of rural areas in Australia severely limit the applicability of this study's findings to the UK.

5.8.3. Findings

Injuries

The study (Paul et al 1994) evaluating the effectiveness of home risk assessments did not report injury outcomes.

Installation of home safety equipment

The report presented data (observed) on the installation of home safety equipment following a home risk assessment (Paul et al 1994, RCT, IV-, EV-, Australia). Only the statistically significant result comparing intervention and control group outcomes is reported, and insufficient data is reported to allow calculation of odds ratios. The report presented data showing that at follow-up at between 5 and 9 months, the use of smooth table-top corners was statistically significantly greater in the intervention group (χ^2=40.695, df=1, p<0.001).

Home safety knowledge and behaviour

The report presented data (observed) about improvements in home safety knowledge and behaviour following a home risk assessment (Paul et al 1994, RCT, IV-, EV-, Australia) (Table 24, p.94). A statistically significant difference that strongly favoured the intervention group was reported in safety knowledge and behaviour relating to hazards in the bathroom and garden (OR 4.24 (95% CI 1.74, 10.30) and OR 4.43 (95% CI 1.86, 10.54), respectively) and with regard to toys and glass doors (OR 3.16 (95% CI 1.27, 7.83) and OR 7.07 (95% CI 2.32, 21.53), respectively)). The confidence intervals around all of these odds ratios are wide. Statistically non-significant differences between the intervention and control groups were reported for safety knowledge and behaviour relating to hazards in the kitchen and on stairs, and with regard to electrical outlets, hot water taps, poisonous substances and a range of other household features (see Table 24, p.94).

Table 24: Improvements in home safety knowledge and behaviour after intervention involving home risk assessment only

Household feature	Intervention group n (%) (N=40)	Control group n (%) (N=58)	Odds ratio (95% CI)
Steps/stairs	22 (55)	22 (38)	1.29 (0.60, 2.78)
Verandah/balcony	16 (40)	14 (24)	1.93 (0.81, 4.60)
Yard/garden	28 (70)	20 (34)	4.43 (1.86, 10.54)
Power points	8 (20)	17 (29)	0.60 (0.23, 1.57)
Stove	12 (30)	13 (22)	1.48 (0.59, 3.71)
Hot water taps	13 (33)	9 (16)	2.62 (0.99, 6.92)
Kitchen	15 (38)	14 (24)	1.89 (0.78, 4.54)
Bathroom	21 (53)	12 (21)	4.24 (1.74, 10.30)
Heater/fire	5 (13)	5 (9)	1.51 (0.41, 5.62)
Poisonous substances	16 (40)	13 (22)	2.31 (0.95, 5.58)
Toys	17 (43)	11 (19)	3.16 (1.27, 7.83)
Glass doors	16 (40)	5 (9)	7.07 (2.32, 21.53)
Pool/pond	18 (45)	17 (29)	1.97 (0.85, 4.58)

Source: Paul et al (1994); odds ratios calculated by PenTAG.
Note: n refers to number of participants who were able to correctly name two or more safety precautions for each household feature at follow-up (5-9 months post-intervention).

Evidence statement 5: Home risk assessment only
There is evidence from one RCT (Paul et al 1994 [-], Australia) about an intervention with home risk assessment only. This evidence is of low applicability to the UK as the intervention is not recent and took place in a rural Australian setting.
Injuries
a. The study about home risk assessments only did not report injury outcomes.
Installation of home safety equipment
b. There is weak evidence from one RCT suggesting that an intervention with home risk assessment only may **increase the use of smooth table top corners** at 5-9 months after the intervention. However, the study does not report the other measured results which do not favour the intervention.
Home safety knowledge and behaviour
c. There is weak evidence from one RCT suggesting that an intervention with home risk assessment only **does not affect knowledge and behaviour around nine out of the 13** measured safety items at 5-9 months.

5.9. Home risk assessment and free or discounted supply of home safety equipment

5.9.1. Report characteristics

Outcomes of interventions where a home risk assessment was conducted and free or discounted home safety equipment supplied were presented in eight reports (Bablouzian et al 1997, BA, IV-, EV-, USA; Babul et al 2007, RCT, IV+, EV+, Canada; Hendrickson 2005, CBA, IV+, EV+, USA; Johnston et al 2000, CBA, IV+, EV-, USA; Kendrick et al 1999, Cluster RCT, IV++, EV+, UK; King et al 2001, RCT, IV++, EV+, USA; King et al 2005, RCT, IV++, EV+, USA; Metchikian et al 1999, BA, IV-, EV-, USA) (Table 25, p.96). Three of the eight reports presented data on injury outcomes (Kendrick et al 1999; King et al 2001; King et al 2005), four reports presented data on rates of installation of home safety equipment (Bablouzian et al 1997; Babul et al 2007; King et al 2001; Johnston et al 2000), and seven reports presented data on changes in home safety knowledge and behaviour (Bablouzian et al 1997; Babul et al 2007; Hendrickson 2005; Johnston et al 2000; King et al 2001; King et al 2005; Metchikian et al 1999).

Table 25: Home risk assessment and free or discounted supply of home safety equipment: Report characteristics

REPORT DETAILS: Bablouzian et al 1997
Aim of study To evaluate the effectiveness of a community based childhood injury prevention programme.
Study design BA (IV-, EV-)
Study year, sample size & follow-up 1994 – N=72, follow-up (n=72) at 3.5 months (mean)
SETTING
Context (country, setting, location) • USA, participants' homes, urban
Key socio-economic characteristics of sample • 67% African-American, 25% Latina, Mean monthly income $614, 'high risk' pregnant women
Study inclusion criteria Recruited from participants in the 'Health Baby Programme' (home visiting programme for high-risk pregnant women in a socio-economically deprived area)
DESCRIPTION OF INTERVENTION
Community based home risk assessment, including education, counselling and dispensing specific safety supplies – (poison centre stickers for phones, outlet plugs for unused sockets, safety latches for windows and doors, and syrup of ipecac). Risk assessment using a standardised tool – the HomeSafe report.
OUTCOMES REPORTED
• Installation of home safety equipment (observation and self-report). • Home safety behaviour (observation and self-report).

REPORT DETAILS: Babul et al 2007
Aim of study To evaluate the effectiveness of an infant home safety programme
Study design RCT (IV+, EV+)
Study year, sample size & follow-up 2001-2003 – N=600, follow-up (n=487) at 2, 6 and 12 months.
SETTING
Context (country, setting, location) • Canada, participants' homes, urban (82%) and rural (18%)
Key socio-economic characteristics of sample • ~10% mother's aged <20 years • ~12% were single-parent households • ~35% of parents had <High school education
Study inclusion criteria Parents of newborn infants at a General Hospital
DESCRIPTION OF INTERVENTION
Home visit conducted by community health nurse walking through each room in the participant's house, using a 41-item checklist (based on Bablouzian et al, 1997) to identify potential hazards. Where identified, parents were taught how to remove or modify these hazards. Nine-item home safety kit contained: smoke alarm, 50% discount safety gate coupon, corner cushions, cupboard locks, blind cord windups, water temperature card, doorstoppers, electrical outlet covers, and poison control sticker.
OUTCOMES REPORTED
• Installation of home safety equipment (self-report) • Home safety behaviour (self-report)

REPORT DETAILS: Hendrickson 2005
Aim of study To access an underserved mobile segment of a monolingual Spanish speaking population and to improve maternal self-efficacy for home safety behaviours using a culturally appropriate intervention.
Study design CBA (IV+, EV+)
Study year, sample size & follow-up Year not reported – N=82, follow-up (n=78) at 4-6 weeks.
SETTING
Context (country, setting, location) • USA, participants' homes, 'non-urban'
Key socio-economic characteristics of sample • Low income, Mexican immigrant or Mexican-American mothers.
Study inclusion criteria Low income, Mexican immigrant or Mexican American mothers in Texas
DESCRIPTION OF INTERVENTION
Home risk assessment by parental self assessment at visit 1 using 15 item hazards list. Researcher counselled about risk based on this list. Free safety items (not listed) supplied.
OUTCOMES REPORTED
• Home safety behaviour (potential assessed in terms of self-efficacy measure).

REPORT DETAILS: Johnston et al 2000
Aim of study To evaluate the feasibility, acceptability and effectiveness of an injury prevention programme delivered by school-based home visitors.
Study design CBA (IV+, EV-)
Study year, sample size & follow-up 1998 – N=418, follow-up (n=362) at 6 months
SETTING
Context (country, setting, location) • USA, participants' homes, urban
Key socio-economic characteristics of sample • Families of children aged 4-5 years who were enrolled in a Head Start programme
Study inclusion criteria Families of children aged 4-5 in a defined geographical area enrolled in Head Start
DESCRIPTION OF INTERVENTION
Home safety inspection (smoke detectors present and function; poisoning prevention knowledge; presence of ipecac; presence of hazardous substances; self reported use of car seat). Tested smoke alarms where present. Provision of smoke alarms, batteries, ipecac as needed.
OUTCOMES REPORTED
• Home safety behaviour (self-reported).

REPORT DETAILS: Kendrick et al 1999
Aim of study To assess the effectiveness of safety advice at child health surveillance consultation, provision of low-cost safety equipment to families receiving means tested state benefits, home safety check, and first aid training on the frequency and severity of unintentional injuries to children in the home.
Study design Cluster RCT (IV++, EV+)
Study year, sample size & follow-up 1995 – N=2119, follow-up (n=1980) at 25 months
SETTING
Context (country, setting, location) • UK, participants' homes, urban
Key socio-economic characteristics of sample • Families of children aged 3-12 months who were registered with the participating GP practices. • ~30% of families were in receipt of means tested benefits • ~20% of families did not have access to a car • ~10% of families lived in homes that were overcrowded (>1 person/room) • ~15% of parents were teenage mothers • ~6% non-White ethnic group
Study inclusion criteria Children aged 3-12 months registered with the participating GP practices.
DESCRIPTION OF INTERVENTION
Low cost safety equipment (£5 each stair gates and fire guards, 20p for 3 cupboards locks, 50p smoke alarms), home safety checks by trained health visitors (standard checklists, information sheets, literature for parents provided).
OUTCOMES REPORTED
• Injuries (Abbreviated Injury Scale, based on primary and secondary care records)

REPORT DETAILS: King et al 2001; King et al 2005
Aim of study To examine the effectiveness of a home visit programme to improve home safety and decrease the frequency of injury in children.
Study design RCT (IV++, EV+)
Study year, sample size & follow-up 1994-1996 – N=1172, follow-up (n=951) at 8 and 12 months (King et al 2001) and 36 months (n=768) (King et al 2005).
SETTING
Context (country, setting, location) • Canada, participants' homes
Key socio-economic characteristics of sample • Children aged <8 years who had presented to an emergency department with an unintentional injury • Average age of parents – 33 years • Median age mother had 1st child – 27 years
Study inclusion criteria Children aged <8 presenting to the emergency department of participating centres with an unintentional injury
DESCRIPTION OF INTERVENTION
Home inspection by research assistants trained to make structured observations about specific safety hazards. These were reviewed and informed instruction about how to correct any existing deficiencies. A set of coupons for a national store of $10/item (to a max of $50). Detailed instruction about how to use the equipment.
OUTCOMES REPORTED
• Injuries (self-report) (King et al 2001; 2005) • Installation of home safety equipment (self-report) (King et al 2001) • Home safety behaviours (self-report) (King et al 2001; 2005) • Home safety knowledge (self-report) (King et al 2001; 2005)

REPORT DETAILS: Metchikian et al 1999
Aim of study To evaluate the home safety component of 'Project SafeCare'
Study design BA (IV-, EV-)
Study year, sample size & follow-up Year not reported – N=3, follow-up (n=2) at 4-6 months
SETTING
Context (country, setting, location) • USA, participants' homes, urban
Key socio-economic characteristics of sample • Note only 2 participants: • Mother A – age 27, completing drug treatment programme, previously referred for neglect of children • Mother B – age 41, 'developmental delay', unemployed, previously referred for neglect of children
Study inclusion criteria – Not reported
DESCRIPTION OF INTERVENTION
Trained research assistants conducted a home risk assessment using the Home Accident Prevention Inventory-Revised (HAPI-R). Training consisted of discussing appropriate strategies for making hazards inaccessible and the free supply of appropriate safety items (cupboard latches, cupboard slide lock, electrical outlet blanks) Parents were also encouraged to identify other hazards and to identify how they could be made safe. On subsequent visits where the home risk assessment was completed, feedback was given to the parents regarding how they had addressed safety hazards.
OUTCOMES REPORTED
• Home safety behaviours (observed).

5.9.2. Study quality and context

The before and after studies (Bablouzian et al 1997; Metchikian et al 1999) and one of the two controlled before and after studies (Johnston et al 2000) contained a number of significant methodological weaknesses; no study power calculations were performed, convenience samples were obtained (with no rationale being provided for doing so), and potential sources of bias (in particular, observation bias) in the conduct and analysis of the research were not considered. Attrition was reasonable (<20%) in the controlled study (Johnston et al 2000), but was either not reported (Bablouzian et al 1997) or unacceptably high (33% (Metchikian et al 1999)) in the uncontrolled studies. None of these three reports made any adjustments in their analyses for what were potentially very important baseline differences in the socio-economic characteristics of their participants. The very small sample size (n=2) in one of the uncontrolled studies (Metchikian et al 1999), which *may* have allowed a deeper understanding of participants' characteristics and their home safety behaviour, was *not* used in this way by the report's authors.

The other controlled before and after study (Hendrickson 2005) was conducted to a higher methodological standard; study power and the sample size required was calculated, the selection of statistical tests was justified, an intention to treat analysis was conducted, and attrition was less than 5%. However, details of the recruitment of the sample are not supplied and the likelihood is that the sample was self-selected. The researcher conducting the home visits at which self-efficacy was assessed was also not blinded to the participant's assignment to intervention or control group.

The four RCTs were all well-conducted (Babul et al 2007; Kendrick et al 1999; King et al 2001; King et al 2005); randomisation procedures were clearly documented, intervention and control groups were well-balanced at baseline on key socio-economic characteristics, and intention to treat analyses (with the exception of Babul et al 2007) were conducted. Kendrick et al (1999) report a large intraclass correlation coefficient (0.017) that is greater than the sample size estimation and which may indicate that the study was underpowered in its assessment of effect upon minor injuries, but this weakness should not be considered serious. Attrition rates reported by Babul et al (2007 – 14-22%) and King et al (2001 – 19%) were acceptable and equally balanced between intervention and control groups; at 36 month follow-up, King et al (2005) reported attrition of between 33 and 36% (broadly comparable in each trial arm), but again this is reasonable given the community-based nature of the trial and the extended time period of the follow-up. With the exception of Kendrick et al (1999) which utilised primary care records, the RCTs all contained the potential for social desirability bias in the responses given by participants.

The majority of the studies used community health workers (usually health visitors or community nurses) to conduct the home risk assessments, deliver home safety education, and advise on equipment that could be supplied (Bablouzian et al 1997; Babul et al 2007; Johnston et al 2000; Kendrick et al 1999). In three of the studies, the intervention was integrated into wider child health programmes that were already established, such as ‘Healthy Baby’ (Bablouzian et al 1997), ‘Project Safe Care’ (Metchikian et al 1999), and ‘Head Start’ (analagous to ‘Sure Start’ in the UK) (Johnston et al 2000). Home safety equipment was supplied free of charge in all of the studies except for Kendrick et al (1999) and King et al (2001; 2005), where it was supplied at a discounted rate. In one study (Babul et al 2007), all equipment except stair gates was supplied free of charge.

With the excetion of the study conducted in the UK (Kendrick et al 1999), the lack of detail in the reports about the socio-economic characteristics of participants makes judgement about their applicability to the UK problematic. Whilst all of the studies made some effort to focus interventions on communities or households that were in some way considered ‘at risk’, the basis upon which these judgements were made is frequently unclear. The exception in this regard is King et al (2001; 2005), in which all households sampled had a child who had previously presented to an emergency department with an unintentional injury.

5.9.3. Findings

Injuries

Three of the eight reports presented data on medically attended injuries in children over different follow-up periods after an intervention involving home risk assessment and supply of home safety equipment (Kendrick et al 1999, Cluster RCT, IV++, EV+, UK; King et al 2001, RCT, IV++, EV+, Canada; King et al 2005, RCT, IV++, EV+, Canada) (Table 26, p.103).

At 12 months follow-up, one report presented data (self-reported) showing a statistically significant decrease in the incidence of medically attended injuries between intervention and control groups (OR 0.75 (95% CI 0.58, 0.96) (King et al 2001)), whilst at 25 months follow-up, one report presented data (based on primary and secondary care records) showing no statistically significant difference between intervention and control groups (OR 0.97 (95% CI 0.72, 1.30) (Kendrick et al 1999)). At 36 month follow-up, one report presented data (self-reported) showing a borderline statistically non-significant difference between intervention and control groups in the incidence of medically attended injuries (OR 0.80 (95% CI 0.64, 1.00) (King et al 2005)).

Table 26: Child injuries (any medically attended injury) in the 36 months following home risk assessment and free or discounted supply of home safety equipment.

	12 months			25 months			36 months		
	Intervention (%)	Control (%)	Odds ratio (95% CI)	Intervention (%)	Control (%)	Odds ratio (95% CI)	Intervention (%)	Control (%)	Odds ratio (95% CI)
Kendrick et al 1999 RCT (UK)	-	-	-	31.4[1] (weighted mean of %)	32.4[1] (weighted mean of %)	0.97 (0.72, 1.30)	-	-	-
King et al 2001 RCT (Canada)	7	9	0.75 (0.58, 0.96)[2] (rate of injury per person-year)	-	-	-	-	-	-
King et al 2005 RCT (Canada)	-	-	-	-	-	-	35	44	0.80 (0.64, 1.00)[2] (rate of injury per person-year)

Notes:
[1] Weighted mean of %
[2] Rate of injury per person-year

Installation of home safety equipment

Four of the eight reports presented data about the rates of installation and use of home safety equipment (Bablouzian et al 1997, BA, IV-, EV-, USA; Babul et al 2007, RCT, IV+, EV+, Canada; Johnston et al 2000, CBA, IV+, EV-, USA; King et al 2001, RCT, IV++, EV+, Canada) (Table 27, p.106). Three of these reports used upon parents' self-report to assess installation (Babul et al 2007; Johnston et al 2000; King et al 2001) and one used both self-report and observation to assess installation, but does not state what items were assessed using each method (Bablouzian et al 1997).

Across all the types of home safety equipment that was supplied and installed (smoke alarms, stair gates, locks, latches and childproof caps, and electrical socket covers), statistically significant effects were obtained only in studies that were uncontrolled (Bablouzian et al 1997) or methodologically less rigorous (Johnston et al 2000).

Three of the eight reports presented data about the continuing use of smoke alarms at between 6 and 12 months after the intervention (Babul et al 2007; Johnston et al 2000; King et al 2001). Two reports presented data showing no significant difference between intervention and control groups (OR 1.15 (95% CI 0.72, 1.83) (Babul et al 2007); OR 1.45 (95% CI 0.94, 2.22) (King et al 2001)) and one study, in which the confidence interval was wide, reported a statistically significant odds ratio that strongly favoured the intervention group (OR 3.3 (95% CI 1.3, 8.6) (Johnston et al 2000)).

Two of the eight reports presented data about the continuing use of stair gates at 12 months after the intervention (Babul et al 2007; King et al 2001), both reporting no statistically significant difference between intervention and control groups (OR 0.80 (95% CI 0.50, 1.27) (Babul et al 2007); OR 0.89 (95% CI 0.71, 1.13) (King et al 2001)).

Three of the eight reports presented data about the continuing use of locks or safety latches to prevent the opening of windows or cupboards in which hazardous substances were stored, or the use of childproof caps medicine bottles (Bablouzian et al 2007; Babul et al 2007; King et al 2001) at 3-12 months after the intervention. However, the two controlled studies reported no statistically significant difference between intervention and control groups for using these pieces of safety equipment

(OR 1.32 (95% CI 0.82, 2.13) (Babul et al 2007); OR 0.98 (95% CI 0.81, 1.19) (King et al 2001)), whilst the uncontrolled study reported a highly statistically significant before and after difference in the use of safety latches (p<0.01 (Bablouzian et al 1997)).

Two of the eight reports presented data about the continued use of electrical socket covers at 3-12 months after the intervention (Bablouzian et al 1997; Babul et al 2007). The controlled study reported no statistically significant difference between intervention and control groups (OR 1.51 (95% CI 0.74, 3.06) (Babul et al 2007)), whilst the uncontrolled study reported a statistically significant before and after difference in the use of the covers (p<0.05 (Bablouzian et al 1997)).

Table 27: Installation of home safety equipment following home risk assessment and free or discounted supply of home safety equipment.

	Smoke alarm			Stair gate			Locks, latches, or childproof caps			Electrical socket cover		
	In. (%)	**Con. (%)**	**Odds ratio (95% CI)**	**In. (%)**	**Con. (%)**	**Odds ratio (95% CI)**	**In. (%)**	**Con. (%)**	**Odds ratio (95% CI)**	**In. (%)**	**Con. (%)**	**Odds ratio (95% CI)**
Bablouzian et al 1997[1] BA (USA)	-	-	-	-	-	-	24	N/A	p<0.01	26	N/A	*p*<0.05
Babul et al 2007[2] RCT (Canada)	64.2	61.6	1.15 (0.72, 1.83)	32.9	39	0.80 (0.50, 1.27)	71.1	64.6	1.32 (0.82, 2.13)	90.8	85.4	1.51 (0.74, 3.06)
Johnston et al 2000[3] CBA (USA)	100	30	3.3 (1.3, 8.6)	-	-	-	-	-	-	-	-	-
King et al 2001[4] RCT (Canada)	-	-	1.45 (0.94, 2.22)	-	-	0.89 (0.71, 1.13)	-	-	0.98 (0.81, 1.19)	-	-	-

Notes:
[1] Follow-up at 3.5 months; *p* value is for pre- and post-intervention difference.
[2] Follow-up at 12 months; odds ratios calculated by report's authors.
[3] Follow-up at 6 months; odds ratios calculated by report's authors.
[4] Follow-up at 12 months; odds ratios calculated by report's authors.

Home safety knowledge and behaviour

Seven of the eight reports presented data about changes in home safety knowledge and behaviour (Bablouzian et al 1997, BA, IV-, EV-, USA; Babul et al 2007, RCT, IV+, EV+, Canada; Hendrickson 2005, CBA, IV+, EV+, USA; Johnston et al 2000, CBA, IV+, EV-, USA; King et al 2001, RCT, IV++, EV+, Canada; King et al 2005, RCT, IV++, EV+, Canada; Metchikian et al 1999, BA, IV-, EV-, USA).

Four of these reports used parental self-report to assess changes in knowledge and behaviour (Babul et al 2007; Johnston et al 2000; King et al 2001; King et al 2005), and one used both self-report and observation to assess these changes, but does not state what behaviours were assessed using each method (Bablouzian et al 1997). Two reports used measures of self-efficacy to assess parental beliefs in the amount of control they had to prevent unintentional injuries occurring to their children (Hendrickson 2005; King et al 2005). One report used observation in the home to assess changes in parental behaviour (Metchikian et al 1999).

Changes in home safety knowledge and behaviour relating to specific types of injury are shown in Table 28 (p.109) and changes in perceived self-efficacy (the extent to which parents feel they have the ability to prevent unintentional injuries occurring to their children) are reported in the text.

Two of the eight reports presented data showing no statistically significant difference between the intervention and control groups in changes to home safety knowledge and behaviour about prevention of fires or falls (Bablouzian et al 1997; Babul et al 2007) and one about preventing drowning (Babul et al 2007). In one study there appeared to be more fire extinguishers present in the control group than the intervention group at twelve month follow up (OR 0.81 (95% CI 0.67, 0.97)) (King et al 2001).

Two of the eight reports presented data showing statistically significant improvements in the intervention group compared to the control group in knowledge and behaviour relating to the prevention of scalds (OR 2.65 (95% CI 1.57, 4.46) (Babul et al 2007); OR 1.31 (95% CI 1.14, 1.50) (King et al 2001)), whilst one uncontrolled study reported no statistically significant pre- and post-intervention difference in the intervention group (Bablouzian et al 1997) (Table 28, p.109). Three of the eight reports presented data showing mixed results regarding improvements in knowledge about the prevention of poisoning (Babul et al 2007; Johnston et al 2000; King et al 2001). One of the eight reports presented data showing a statistically significant difference between intervention and control groups (OR 2.1 (95% CI 1.3, 3.2) (Johnston et al 2000)), whilst two of the eight reports presented data showing no statistically significant difference between intervention and control groups (OR 1.20 (95% CI 0.16, 8.91) (Babul et al 2007); OR 1.04 (95% CI 0.89, 1.22) (King et al 2001)).

Two of the eight reports presented data comparing intervention and control groups' knowledge and behaviour about the prevention of falls. This favoured the intervention but was statistically non-significant (OR 1.25 (95% CI 0.17, 9.32) (Babul et al 2007); OR 1.08 (95% CI 0.93, 1.25) (King et al 2001)). One uncontrolled study reported a non-significant p value (odds ratio not reported or calculable) for the pre- and post-intervention difference in knowledge and behaviour about the prevention of falls (Bablouzian et al 1997).

One of the seven studies (Metchikian et al 1999) measured improvements in home safety knowledge and behaviour by the researcher counting the number of hazards in each room of the household (see shaded area of Table 28, p.109), meaning that the results cannot be reported in terms of knowledge about preventing particular injury types. The very small sample size (n=2) prohibits any meaningful transformation of the data into a common metric. The study reports a dramatic reduction in both participants' households in the number of hazards present in each room (Metchikian et al 1999).

Two of the eight reports presented data about parents' perceived self-efficacy in preventing their children from sustaining an unintentional injury (Hendrickson 2005; King et al 2001). A statistically significant difference between intervention and control groups (showing increased levels of self-efficacy in the intervention group) was reported by Hendrickson (2005) ($F(2, 77) = 7.50$, p=0.01), whereas a statistically non-significant difference between intervention and control groups was reported by King et al (2001) (MD 5.1 (95% CI -1.3, 11.5)).

Table 28: Improvements in home safety knowledge and behaviour following home risk assessment and free or discounted supply of home safety equipment.

	Fires			Scalds			Falls			Poisonings			Drowning		
	In. (%)	**Con. (%)**	**Odds ratio (95% CI)**	**In. (%)**	**Con. (%)**	**Odds ratio (95% CI)**	**In. (%)**	**Con. (%)**	**Odds ratio (95% CI)**	**In. (%)**	**Con. (%)**	**Odds ratio (95% CI)**	**In. (%)**	**Con. (%)**	**Odds ratio (95% CI)**
Bablouzian et al 1997[1] BA (USA)	-	-	*p* =ns	-	-	*p* =ns	-	-	*p* =ns						
Babul et al 2007[2] RCT (Canada)	64	66.2	1.22 (0.67, 2.21)	69.9	98.7	2.65 (1.57, 4.46)	98.8	98.6	1.25 (0.17, 9.32)	98.8	53.7	1.20 (0.16, 8.91)	99.4	97.3	3.51 (0.36, 34.31)
Johnston et al 2000[3] CBA (USA)	-	-	-	-	-	-	-	-	-	30.2	14.7	2.1 (1.3, 3.2)	-	-	-
King et al 2001[4] RCT (Canada)	-	-	0.81 (0.67, 0.97)	-	-	1.31 (1.14, 1.50)	-	-	1.08 (0.93, 1.25)	-	-	1.04 (0.89, 1.22)	-	-	-

	Mother A	Bathroom	Kitchen	Living room	Bedroom	**Mother B**	Bathroom	Kitchen	Living room	Bedroom
Metchikian et al 1999[5] BA (USA)	**No. of hazards: Baseline**	30	27	10	4		121	44	2	13
	Follow-up	3	1	6	0		2	1	0	0

Notes:
[1] Follow-up at 3.5 months; *p* value is for pre- and post-intervention difference.
[2] Follow-up at 12 months; odds ratios calculated by report's authors.
[3] Follow-up at 6 months; odds ratios calculated by report's authors.
[4] Follow-up at 12 months; odds ratios calculated by report's authors.
[5] Follow-up at 4-6 months; insufficient data reported to allow calculation of odds ratios.

Evidence statement 6: Home risk assessment and free or discounted supply of home safety equipment
There is evidence from two RCTs (Babul et al 2007 [+], Canada; King et al 2001; 2005 [++], Canada), one cluster RCT (Kendrick et al 1999 [++], UK), two CBAs (Hendrickson 2005 [+], USA; Johnston et al 2000 [+], USA), and two BAs (Bablouzian et al 1997 [-], USA; Metchikian et al 1999 [-], USA) about interventions with a home risk assessment and free or discounted supply of home safety equipment. This evidence is partially applicable to the UK as only one of the studies was conducted in the UK.
Injuries
a. There is inconsistent evidence from one RCT (King et al 2001; 2005 [++]) and one cluster RCT (Kendrick et al 1999 [++]) about the effect of a home risk assessment and free or discounted supply of home safety equipment on the **occurrence of medically attended injuries**. There is evidence that injury rates decreased at **12 months** following the intervention (OR 0.75 (95% CI 0.58, 0.96) (King et al 2001)) (outcomes self-reported), but not at **25 months** following the intervention (OR 0.97 (95% CI 0.72, 1.30) (Kendrick et al 1999)). There is evidence that injury rates were decreased (at borderline statistical significance) at **36 months** (OR 0.80 (95% CI 0.64, 1.00) (King et al 2005)) (outcomes self-reported).
Installation of home safety equipment
b. There is inconsistent evidence from two RCTs (Babul et al 2007 [+]; King et al 2001 [++]) and one CBA (Johnston et al 2000 [+]) 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** (Babul et al 2007 (no effect); King et al 2001 (increased); Johnston et al 2000 (increased)). c. There is inconsistent evidence from two RCTs (Babul et al 2007 [+]; King et al 2001 [++]) and two BAs (Bablouzian et al 1997 [-]; Metchikian et al 1999 [-]) about interventions with a home risk assessment and free or discounted supply of home safety equipment. Outcomes about three types of **home safety equipment** (electrical outlet covers, cupboard locks/ latches, and stair gates) are reported, showing **mixed evidence of effect**.

Home safety knowledge and behaviour
d. There is moderate evidence from two RCTs (Babul et al 2007 [+]; King et al 2001 [++]) and one BA (Bablouzian et al 1997 [-]) that a home risk assessment and free or discounted supply of home safety equipment **does not improve home safety knowledge** and behaviour about preventing **fires** or **falls** (Bablouzian et al 1997; Babul et al 2007; King et al 2001 (fires only)). e. There is inconsistent evidence from two RCTs (Babul et al 2007 [+]; King et al 2001 [++]), one CBA (Johnston et al 2000 [+]) and one BA (Bablouzian et al 1997 [-]) about the effect of a home risk assessment and free or discounted supply of home safety equipment on home safety knowledge. Knowledge about preventing **scalds was improved** (Babul et al 2007; King et al 2001), however there was mixed evidence of effect upon knowledge about the prevention of **poisoning** (Babul et al 2007 (no effect); Johnston et al 2000 (improved); King et al 2001 (no effect)). f. There is weak evidence from one RCT (Babul et al 2007 [+]) that a home risk assessment and free or discounted supply of home safety equipment **does not improve home safety knowledge** and behaviour about preventing **drowning** (Babul et al 2007). g. There is inconsistent evidence from one RCT (King et al 2001 [++]) and one CBA (Hendrickson 2005 [+]) about the effect of a home risk assessment and free or discounted supply of home safety equipment on parents' perceived **self-efficacy**. There is evidence from one CBA that there was a significant difference between intervention and control groups in self-efficacy at **6 weeks** follow-up (Hendrickson 2005). However, there is evidence from one RCT that self-efficacy did not improve at **12 months** follow-up (King et al 2001). h. There is evidence from one BA (Metchikian et al 1999 [-]) that a home risk assessment and free or discounted supply of home safety equipment improves home safety knowledge and behaviour (as a whole) at **4-6 months** follow-up (descriptive data only).

5.10. Home risk assessment and free or discounted supply and installation of home safety equipment

5.10.1. Report characteristics

Outcomes of interventions where a home risk assessment was conducted and home safety equipment was supplied and installed were presented in four reports (Cagle et al 2006, BA, IV+, EV-, USA; Carman et al 2006, BA, IV-, EV-, UK; Klitzman et al 2005, BA, IV+, EV-, USA; Schwarz et al 1993, CBA, IV+, EV+, USA) (Table 29, p.112). Two of the four reports presented data on injury outcomes (Cagle et al 2006; Carman et al 2006), three of the four reports presented data on the continuing use of home safety equipment (Cagle et al 2006; Klitzman et al 2005; Schwarz et al 1993), and two of the four reports presented data on changes in home safety knowledge and behaviour (Cagle et al 2006; Schwarz et al 1993).

Table 29: Home risk assessment and free or discounted supply and installation of home safety equipment: Report characteristics

REPORT DETAILS: Cagle et al 2006
Aim of study To evaluate the effectiveness of a scald-prevention programme in a predominantly Spanish-speaking community.
Study design BA (IV-, EV-)
Study year, sample size & follow-up Year not reported – N=48, follow-up (n=48) at 6-9 months (home safety behaviours) and 24 months (injuries).
SETTING
Context (country, setting, location) • USA, participants' homes
Key socio-economic characteristics of sample • Homeowners – 75% • Single-family dwellings – 63%; Two-family dwellings – 33%; Three-familiy dwellings – 4% • Two-parent families – 88%
Study inclusion criteria Families in the target zip code were identified through a women's health centre, elementary school parents' groups, refugee and migrant service centres, high school teen parent groups, a perinatal addiction treatment centre,and the Mexican Consulate.
DESCRIPTION OF INTERVENTION
Bi-lingual health educator conducted home risk assessment (21-item checklist relating to scald risks – 13 in kitchen, 8 in bathroom) whilst walking through the home with the parent(s). Identified scald risks and how to address them were discussed with the parent(s), anti-scald devices were supplied and the parent(s) assisted to install them.
OUTCOMES REPORTED
• Injuries (burns registry). • Installation of home safety equipment (observed). • Home safety behaviours (observed).

REPORT DETAILS: Carman et al 2006
Aim of study To evaluate the effectiveness of a home safety consultation and provision of low-cost safety equipment in deprived families.
Study design BA (IV-, EV-)
Study year, sample size & follow-up 2001-2004 – N=1234, follow-up (n=not reported) at between 12 and 36 months.
SETTING
Context (country, setting, location) • UK, participants' homes
Key socio-economic characteristics of sample No data reported, but intervention area wards were more socio-economically disadvantaged than the control wards as it was only the socio-economically deprived wards that were eligible to receive the safety scheme through the Sure Start programme. (As a whole, the areas served by the Primary Care Trust in which the intervention was delivered are ranked 37th, 71st, and 92nd most deprived (out of 354 in England). 11.5% of Pendle's population, and 4.3% of Burnley's, are of Pakistani descent)
Study inclusion criteria All parents in the eligible wards who had children aged under 5 years and who were registered with the designated Sure Start programmes were recruited to the intervention group. Parents in the remaining wards (more affluent and not eligible for this Sure Start programme) served as the control group.
DESCRIPTION OF INTERVENTION
Equipment supplied (not installed) by project workers: bath mat, harness & reins, cupboard locks, corner cushions, adhesive multi-purpose lock, and electrical socket outlet covers). Equipment fitted by home care and repair technicians (as indicated by project worker's home risk assessment): safety gates, fireguards, smoke alarms,kitchen cupboard locks, and safety film for door glass panels.
OUTCOMES REPORTED
• Injuries (Accident & Emergency records)

REPORT DETAILS: Klitzman et al 2005
Aim of study To complete a pilot study of a programme designed to address a range of home safety hazards (fire, lead-based paint, mould, vermin) in pre-1940 properties.
Study design BA (IV+, EV-)
Study year, sample size & follow-up 2001-2003 – N=70, follow-up (n=70) at 5 months.
SETTING
Context (country, setting, location) • USA, participants' homes
Key socio-economic characteristics of sample All residences were located in a 'low income' community
Study inclusion criteria Households with a child aged <11 years, where the residence was part of a larger 'multiple-dwelling structure' (>=3 residences)
DESCRIPTION OF INTERVENTION
Free supply and Installation of smoke alarms, fire extinguishers, window guards. Electrical hazards replaced. Part of a wider programme that assessed and addressed for mould, vermin, and lead based paint hazards.
OUTCOMES REPORTED
• Installation of home safety equipment (observed).

REPORT DETAILS: Schwarz et al 1993
Aim of study To evaluate the impact of the 'Safe Block Project' on home hazards and injury prevention knowledge in a poor urban African-American community.
Study design CBA (IV+, EV+)
Study year, sample size & follow-up 1989 – N=2722, follow-up (n=784) at 12 months.
SETTING
Context (country, setting, location) • USA, participants' homes, urban
Key socio-economic characteristics of sample • 97% African-American • Median yearly income $11810 • Sample drawn from census tracts with the highest rates of unintentional injuries in the city
Study inclusion criteria All households within the 9 census tracts that had the highest injury rates in the target community
DESCRIPTION OF INTERVENTION
Home risk assessment & education (by trained community-based outreach workers) and comprehensive safety pack (bathwater thermometer, nightlight, syrup of ipecac, telephone sticker with emergency contact numbers, and poster (& fridge magnet) with emergency contact numbers and information on presenting burns, poisonings, falls, and domestic violence. Smoke alarms were installed by the community workers. Community workers endeavoured to cultivate a network of community-based representatives who would continue to be involved with home safety education.
OUTCOMES REPORTED
• Installation of home safety equipment (observed). • Home safety behaviours (self-report).

5.10.2. Study quality and context

All three of the uncontrolled studies (Cagle et al 2006; Carman et al 2006; Klitzman et al 2005) provided only sparse details of the baseline characteristics of study participants, although Carman et al (2006) do note that their sample was drawn from UK wards that were in the upper third of the country's most socio-economically deprived areas. A convenience sampling strategy was used in these three studies (Cagle et al 2006; Carman et al 2006; Klitzman et al 2005) without any sound rationale being put forward for doing so. In contrast, the controlled study (Schwarz et al 1993) used a purposive sampling strategy that successfully recruited participants for intervention and control groups that were balanced in terms of previous injury rates, income and other key socio-economic characteristics. A reasonable argument was also put forward for not using random allocation to trial arms; feedback from consultation with community leaders had raised the issue of how to prevent contamination between arms in contiguous residential blocks given the substantive community involvement component of the intervention (Schwarz et al 1993).

Attrition rates were not reported in two of the three uncontrolled studies (Cagle et al 2006; Carman et al 2006), and was reported as 0% in Klitzman et al (2005). The controlled study lost 28% of participants to follow-up (equally balanced between intervention and control groups), which was not unreasonable given the nature of the intervention and the length of follow-up (12 months) (Schwarz et al 1993).

One of the uncontrolled studies (Carman et al 2006) had significant weaknesses in the methods used to evaluate outcomes (for example, it is unclear whether the Accident & Emergency attendance measured related to unintentional injuries or *all* reasons for attendance, and the numbers of children aged under 5 years attending is estimated from proportions in area wards rather than using hospital data), meaning that its findings should be treated with great caution.

Although the four studies (Cagle et al 2006; Carman et al 2006; Klitzman et al 2005; Schwarz et al 1993) were similar in the sense that they all placed great importance on gaining the trust of study participants (the likelihood of participants agreeing to allow access to their homes for assessment and installation of home safety equipment otherwise being very low), they differed considerably in the nature of the communities in which they were conducted and the wider programmes of which they were a part. The UK study (Carman et al 2006) was attached to a 'Sure Start' scheme in an urban area of northern England that was socio-economically deprived and which had substantive (c.5-12%) of Pakistani descent; the intervention supplied and installed a wide range of home safety equipment, including smoke alarms. In contrast, the three studies conducted in the USA (Cagle et al 2006; Klitzman et al 2005; Schwarz et al 1993) focused upon a much narrower spectrum of home safety equipment, but did so within an approach that endeavoured to foster wider community health. For example, Cagle et al (2006) supplied and installed only thermostatic valves, but this was preceeded by community focus groups in which parents were encouraged to discuss home safety issues. Klitzman et al's (2005) home safety equipment intervention was part of a much wider health programme in which hazards such as mould and infestations in poorly-maintained housing stock were addressed. Finally, Schwarz et al (1993), in an intervention that took place in a predominantly African-American community resident in blocks of flats, adopted an approach to the intervention that prioritised community involvement and therefore also endeavoured to address issues (such as violence and homicides in the community) that were not directly related to unintentional injuries in children.

5.10.3. Findings

Injuries

Two of the four reports presented data on child injury outcomes following an intervention involving a home risk assessment and the free or discounted supply and installation of home safety equipment (Cagle et al 2006, BA, IV-, EV-, USA; Carman et al 2006, BA, IV-, IV-, UK). The data presented in these reports is based upon a burns registry (Cagle et al 2006) and A&E records (Carman et al 2006), but its limited presentation prevents synthesis using a common metric.

Admissions to hospital (as a result of scalds) for children aged under 5 years in the intervention area were reported to have fallen from 137/100000 in the two years prior to the intervention to 59/100000 chidren (aged 0-5 years) in the two years after the intervention, a statistically significant difference (p<.01) (Cagle et al 2006). Attendances at Accident & Emergency by children aged under 5 years (for all but minor ailments) were reported to fall in both intervention and control groups over the lifetime of the intervention (from 36% to 28.6%, and from 28.2% to 24.2%, in the intervention and control groups respectively), but no analysis is attempted (nor sufficient data presented to allow calculation by the review team) to test for statistically significant differences between the groups (Carman et al 2006).

Installation of home safety equipment

Three of the four reports presented data (observed) on the continuing use of home safety equipment following an intervention involving a home risk assessment and the free or discounted supply and installation of home safety equipment (Cagle et al 2006, BA, IV-, EV-, USA; Klitzman et al 2005, BA, IV+, EV-, USA; Schwarz et al 1993, CBA, IV+, EV+, USA).

One report simply presents the percentage (60%) of installed thermostatic valves that remained in-situ and functioning at follow-up at between 6 and 9 months (Cagle et al 2006). One report presented data showing a statistically significant (p<0.0001) pre- and post-intervention difference for the installation of window guards, smoke alarms, and fire extinguishers (Klitzman et al 2005). Finally, the one controlled study that reported odds ratios found a strong, statistically significant difference between intervention and control groups in the installation of smoke alarms (OR 0.14 (95% CI 0.09, 0.20), indicating that the *absence* of smoke alarms was significantly reduced in the intervention group (Schwarz et al 1993)

Home safety knowledge and behaviour

Two of the four reports presented data about changes in home safety knowledge and behaviour following an intervention involving a home risk assessment and the free or discounted supply and installation of home safety equipment (Cagle et al 2006, BA, IV-, EV-, UK; Schwarz et al 1993, CBA, IV+, EV+, USA). One report used data based on observation (Cagle et al 2006) and one used self-reported data (Schwarz et al 1993).

One study simply measured the average number of scald risks per household, reporting a statistically significant (p<.01) pre- to post-intervention fall from 7 (+/-2) to 2 (+/-1) (Cagle et al 2006) (Table 30, p.118). The controlled study reported the opposite effect, with the intervention group being statistically significantly more likely to have *not* adjusted the household's hot water temperature to below 125°F (OR 1.73 (95% CI 1.39, 2.15) (Schwarz et al 1993). An effect in the same direction, but which was not statistically significant, was reported in the same study for the non-use of childproof caps on medication bottles (OR 1.53 (95% CI 0.95, 2.46)). However, the intervention was reported as having a statistically significant effect on the *absence* of fire escape plans in the intervention group (OR 0.30 (95% CI 0.24, 0.38) Schwarz et al 1993)).

Table 30: Improvements in home safety knowledge and behaviour following home risk assessment and free or discounted supply and installation of home safety equipment.

	Presence of scald risks/ Hot water temperature >125°F			No fire escape plan			Medications without childproof caps (where children aged <5 yrs)		
	Intervention (%)	Control (%)	Odds ratio (95% CI)	Intervention (%)	Control (%)	Odds ratio (95% CI)	Intervention (%)	Control (%)	Odds ratio (95% CI)
Cagle et al 2006[1] BA (USA)	*No. of scald risks before* 7 (+/- 2)	*No. of scald risks after* 2 (+/- 1)	-	-	-	-	-	-	-
Schwarz et al 1993[2] CBA (USA)	36.8	26.8	1.73 (1.39, 2.15)	68.7	84.9	0.30 (0.24, 0.38)	26.2	16.3	1.53 (0.95, 2.46)

Notes:
[1] Follow-up at 6-9 months.
[2] Follow-up at 12 months; odds ratios calculated by report's authors.

Evidence statement 7: Home risk assessment and free or discounted supply and installation of home safety equipment
There is evidence from one CBA (Schwarz et al 1993 [+], USA) and three BAs (Cagle et al 2006 [-], USA; Carman et al 2006 [-], UK; Klitzman et al 2005 [+], USA) about an intervention with a home risk assessment and free or discounted supply and installation of home safety equipment. This evidence is partially applicable as only one of the studies was conducted in the UK.
Injuries
a. Two studies report injury outcomes after home risk assessment and free or discounted supply and installation of home safety equipment (Cagle et al 2006; Carman et al 2006). Carman only presents descriptive statistics, making impact unclear. Cagle suggests that scald injuries are significantly reduced post-intervention, however this conclusion may be unsound due to lack of control group and contamination issues.
Installation of home safety equipment
b. Three studies 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 (Cagle et al 2006; Klitzman et al 2005; Schwarz et al 1993). 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 6-9 months (Cagle et al 2006). One study found significant improvements in the numbers of households with working window guards and fire extinguishers post-intervention (Klitzman et al, 2005). Finally, two studies showed significantly more smoke alarms installed and working post intervention (Klitzman et al 2005 $p<0.0001$; Schwarz et al 1993 OR 0.30 95% CI 0.24, 0.38: showing less alarm absence in the intervention group).
Home safety knowledge and behaviour
c. There is mixed evidence from 2 studies about the impact of home risk assessment and free or discounted supply and installation of home safety equipment on safety knowledge and behaviour. Of the four safety knowledge and behaviour outcomes (reduced hot water temperature, number of scald risks, fire escape plan and medications with child proof caps) reported by these 2 studies, one was positively affected by the intervention (fire escape plan), one negatively affected (hot water temperature increased in intervention group), and the others were not significantly affected..

5.11. Home risk assessment and discounted supply of home safety equipment with education

5.11.1. Report characteristics

Outcomes of an intervention where a home risk assessment was conducted and discounted home safety equipment was supplied and installed (in conjunction with safety education) were presented in one report (Gielen et al 2002, RCT, IV++, EV-, USA) (Table 31, p.120). The report presented outcomes relating to the installation of home safety equipment and changes in home safety knowledge and behaviour.

Table 31: Home risk assessment and discounted supply of home safety equipment with education: Report characteristics

REPORT DETAILS: Gielen et al 2002
Aim of study To evaluate the effectiveness of a home risk assessment, safety counselling, and provision of reduced cost products in increasing home safety practices.
Study design RCT (IV++, EV++)
Study year, sample size & follow-up Year not stated – N=187, follow-up (n=122) at 12 months.
SETTING
Context (country, setting, location) • USA, paediatric resident continuity clinic, Children's Safety Centre, and participants' homes, urban
Key socio-economic characteristics of sample • 39% household income <$5000/year • 13% of parents were married • 12% of parents had >High school education
Study inclusion criteria Parents attending well-child clinics (with infants aged under 6 months)
DESCRIPTION OF INTERVENTION
Safety counselling delivered by paediatric residents on a one-to-one basis during well-child clinics; duration differed according to individual needs. Children's Safety Centre (for provision of discounted (10-15% below retail price) home-safety supplies and further safety counselling) was built in a renovated building and staffed by a professional health educator with training in injury prevention. No details provided regarding scale or duration of safety counselling provided. Home safety visits (conducted when infant aged between 6 and 9 months) conducted by specially trained community health workers. Visit involved hazard assessment (falls, burns, poisoning), recommendations for safety practices and products, and referral to Children's Safety Centre.
OUTCOMES REPORTED
• Installation and functioning of home safety equipment (observed).

5.11.2. Study quality and context

The study (Gielen et al 2002) was conducted to a high standard; randomisation procedures were clearly documented, intervention and control groups were well-balanced at baseline on key socio-economic characteristics, the regression analysis conducted adjusted for exposure to key intervention componenents, and the depth and breadth of the intervention itself is described fully. However, it should also be noted that an intention to treat analysis was not conducted and that difficulties in contacting participants at follow-up meant that attrition was high (51% intervention, 49% control, although no significant differences were found between intervention and control groups lost to follow-up). The study was moderately underpowered (using α=.05 and β=.20) in obtaining a sample size of 93 and 94 in the intervention and control groups respectively (100 participants in each group were required).

The intervention reported by Gielen et al (2002), in which 94% of the participants were African American, is distinctive for its extent. Safety counselling was delivered by paediatric residents (who had taken part in a 5-hour training programme on childhood injuries and safety counselling) during well-child clinics, and was re-enforced by a professional health educator at the Children's Safety Centre which had been specifically constructed as part of the intervention. This Centre also acted as an outlet from which parents could obtain home safety equipment at 10-15% below retail prices. In addition, families in the intervention arm received a home risk assessment (conducted by a specially trained community health worker) at between 6 and 9 months following the initial safety counselling. The report's authors note that a likely self-selection bias existed in that families who visited the Centre and made use of the opportunity to obtain home safety equipment and advice were socio-economically more advantaged than those who did not.

5.11.3. Findings

Injuries

The study (Gielen et al 2002) evaluating the effectiveness of home risk assessments and discounted supply of home safety equipment in conjunction with education did not report injury outcomes.

Installation of home safety equipment

The study evaluating the effectiveness of home risk assessments and discounted supply of home safety equipment in conjunction with education reported the (observed) installation and use of home safety equipment (Gielen et al 2002, RCT, IV++, EV++, USA) (Table 32, p.122; Table 33, p.122). No statistically significant difference was found between intervention and control groups with regard to the installation and use of smoke alarms, stair gates, or cupboard locks or latches (Table 32, p.122). In addition, no statistically significant difference between participants in the intervention arm who had and had not used the Children's Safety Centre (built as part of the intervention) was found (Table 33, p.122).

Table 32: Installation and continued use of home safety equipment 12 months after home risk assessment and diascounted supply of safety equipment in conjunction with education

	Intervention (%)	Control (%)	Odds ratio (95% CI)
Working smoke alarm	81	84	0.82 (0.31, 2.16)
Stair gate(s)	27	23	1.25 (0.49, 3.16)
Cupboard latches (where poisons stored)	10	12	0.81 (0.25, 2.57)

Source: Gielen et al (2002); odds ratios calculated by PenTAG

Table 33: Installation and continued use of home safety equipment 12 months after home risk assessment and discounted supply of safety equipment in conjunction with education; intra-arm comparison of intervention group by use of Children's Safety Centre (CSC)

Safety practice	% observed with safety practice who had visited CSC	% observed with safety practice who had not visited CSC	Odds ratio (95% CI) (adjusted for counselling and home visit)
Working smoke alarm	81	84	0.98 (0.33-2.96)
Stair gate(s)	27	13	2.64 (0.77-9.14)
Cupboard latches (where poisons stored)	13	6	2.59 (0.52-12.80)

Source: Gielen et al (2002); odds ratios calculated by report's authors

Home safety knowledge and behaviour

The study evaluating the effectiveness of home risk assessments and discounted supply of home safety equipment in conjunction with education reported changes in home safety knowledge and behaviour (Gielen et al 2002, RCT, IV++, EV++) (**Table 34**, p.123). A statistically significant difference (between those who had and had not visited the Children's Safety Centre) that favoured those who had visited the Centre was reported in the form of a proportional odds ratio (3.39 (95% CI 1.30, 8.82)), although the confidence intervals around the effect estimate are wide.

Table 34 Safety score 12 months after home risk assessment and discounted supply of safety equipment in conjunction with education; intra-arm comparison of intervention group by use of Children's Safety Centre (CSC)

Safety score[1]	n (%) observed with safety score who had visited CSC	n (%) observed with safety score who had *not* visited CSC	Proportional odds ratio (95% CI)[2]
0	0	4 (11)	-
1	12 (24)	15 (43)	-
2	21 (42)	10 (29)	-
>=3	17 (34)	6 (17)	-
Total safety score	-	-	3.39 (1.30, 8.82)

Notes:
[1] One point was scored for each of the following: working smoke alarm, hot water temperature <48.9°c, all stairs protected by stair gate or door, all poisons kept in a locked or latched cupboard, >=1 unexpired bottles of ipecac syrup.
[2] Adjusted for exposure to safety counselling and home risk assessment; calculated by report's authors.

Evidence statement 8: Home risk assessment and discounted supply of home safety equipment with education

There is evidence from one RCT about an intervention with a home risk assessment and discounted supply of home safety equipment (in conjunction with education) (Gielen et al 2002 [++], USA).

This evidence is of low applicability to the UK as it is from the USA.

Injuries

a. The study about home risk assessments and discounted supply of home safety equipment with education did not report injury outcomes.

Installation of home safety equipment

b. There is weak evidence from one RCT suggesting that home risk assessments and discounted supply of home safety equipment with education **do not increase** the presence and use of smoke alarms, stair gates, or cupboard locks of latches or the use of a specially built children's safety centre (Gielen et al 2002).

Home safety knowledge and behaviour

c. The RCT does not report on differences in behaviour between the control and intervention groups in terms of safety knowledge and behaviour. It does suggest that those who had visited a safety centre took more action to prevent injury, but no more people from the intervention arm visited the centre than from the control arm.

5.12. Results organised by outcome

The previous sections of this chapter have reported results by intervention type, in order to try and discern the possible impact of different intervention components on effectiveness. Given the extremely diverse nature of the findings, however, we represent them here in summary form to show results by two key outcome groups: injury outcomes and correctly installed, functioning presence of safety equipment. We have not done this for the knowledge and behaviour outcomes as these are even more diversely recorded and reported, and because there is no way of quantifying any possible relationship in changing knowledge and ultimate impact on injury outcomes.

This section also considered the reliability of this evidence in terms of the study design, external validity and applicability to a UK setting.

There are a number of dimensions of good study design. We believe that the best quality evidence will come from studies in which an appropriate control group is present, which has sufficient length of follow up, and which uses observed, rather than self-reported, outcome measures. In reality, these dimensions may be traded off, for example, longer follow up being desirable, but also likely to lead to greater attrition, which may limit the meaningfulness of the findings.

5.12.1. Impact of all interventions on injury rates

Of the 22 included studies, only seven directly measured the impact of their interventions on injury rates (see Table 35). Of these seven studies, four found no significant reduction in injury with any intervention (three RCTs - DiGuiseppi et al 1999, 2000; Watson et al, 2005; Kendrick et al, 1990; and one uncontrolled before and after study – Carmen et al, 2006). Indeed the study by Watson et al suggest that minor injuries (those for which GP consultation is sought) actually increased in the intervention group. The three that *did* suggest injury rates are reduced all have limitations, which are discussed below (Cagle et al, 2006; King et al, 2001, 2005; Mallonee et al, 1996).

Cagle et al (2006) reported a significant reduction in scald injuries to children aged 0-5, using an uncontrolled before and after study design with 24 month follow up. It assessed a focused scald prevention programme among 48 households from a largely Spanish-speaking community in USA (Cagle et al, 2006). This represented a self selected sample from over 900 parents who attended an initial safety education workshop and who agreed to have a home assessment and follow up. Data about scald injury was taken from a burn registry and assessed scalds in children from the zip code from which these households were selected. Although such numbers are likely to be objective, it remains impossible to judge the impact of the intervention which involved a home risk assessment with supply and installation of anti-scald devices, given that there were only 48 households in the zip code accepting this intervention while 900 attended the educational workshop. In addition, the registry shows home address, not necessarily address where the injury occurred.

One RCT suggested a significant decrease in injury rates at 12 months of follow up but not at 36 months after a home risk assessment and the supply of home safety equipment to those whose child had previously attended a Canadian emergency department due to injury to a child aged five or less (King et al, 2001, 2005). The post-intervention injury rates were based on the report of parents to a telephone follow-up inquiry, which may be unreliable, as such information may be subject to recall and social desirability bias. There was also high attrition, with 20% drop out at 12 months and 34% of participants unable to be contacted at 36 months.

The study by Mallonee et al (1996) about the Oklahoma City fire prevention intervention reported annualised “incidence density ratios” after four year follow up. Injury rates were based on ICD codes for deaths and hospital admissions in the city. These showed a post-intervention decrease in the targeted area, whereas injury rates in other areas of the city remained broadly unchanged: incidence-density ratio (within-group pre-post intervention comparison) of 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, indicating that injuries were less likely to occur in the intervention group. The study used a controlled before and after design, but these analyses were not adjusted for differences in important socio-economic characteristics or changes in contributory behavioural factors during the course of the evaluation.

The study also suffers from a number if important limitations in its applicability to the UK situation as, while it is noted that households in the intervention area had a lower median income and a poorer quality of housing than in the remainder of the city, no further details are provided by the study authors. In addition, the targeted area was atypical, in the sense that 47% of fires there were identified as resulting from children playing with fire, compared with 8% in the remainder of the city. Records are not kept by age in the UK, but figures from 2006 record the cause of fires in dwellings and other buildings as “playing with fire” in 400 out of a total of 45,700 fires (0.88%).(Communities and Local Government 2008)

Disappointingly, we therefore suggest that there is no convincing evidence applicable to the UK situation that any of the interventions included in this review reduced unintentional injury to children in the home.

Table 35: Injury data reported by all included studies

Free or discounted supply of home safety equipment									
No injury data reported by 1 of 1 study: Woolf et al 1992									
Free or discounted supply & installation of home safety equipment									
No injury data reported by 1 of 3 studies: Harvey et al 2004									
	Admission to Hospital & death			**Preventable injuries**			**Preventable Hospital & deaths**		
	Intervention	Control	OR	Intervention	Control	OR	Intervention	Control	OR
DiGuiseppi et al, 1999,2002 12/18mFU	9.1	7.2	1.3 (0.7, 2.3)	29.4	26.3	1.2 (0.8, 1.8)	5.6	5.6	1.0 (0.5, 2.0)
Douglas et al 1998 Mallonee et al,1996 48mFU (annualised rate presented)	***Incidence density ratio*** 0.2 (95% CI 0.1, 0.4)	***Incidence density ratio*** 1.1 (95% CI 0.7, 1.7)		-	-	-			
Free or discounted supply of home safety equipment and safety education									
No injury data reported by 4 of 4 studies: Champ & Kendrick 1998; Posner et al 2004; Sangvai et al 2007; Sznajder et al 2003									
Free or discounted supply & installation of home safety equipment and safety education									
	Hospital admissions			**Secondary care attendance**			**Abbreviated injury scale >=2**		
	Intervention	Control	Incident RR	Intervention	Control	Incident RR	Intervention	Control	OR
Watson et al 2005 24mFU[6] (Kendrick et al 2009)	-	-	1.02 (0.7, 1.48)	-	-	1.02 (0.9, 1.13)	-	-	1.14 (0.76, 1.71)
Home risk assessment only									
No injury data reported by 1 of 1 study: Paul et al, 1994									
Home risk assessment & supply of home safety equipment									
No injury data reported by 5 of 7 studies: Balouzian et al 1997; Babul et al 2007; Hendrickson 2005; Johnston et al 2000; Metchikian et al1999									
	Any medically attended injury								
	Intervention (%) 12mFU	Control (%)	OR	Intervention (%) 25mFU	Control (%)	OR	Intervention (%) 36mFU	Control (%)	OR
Kendrick et al 1990 25mFU		-	-	31.4[7]	32.4[7]	0.97 (0.72, 1.30)	-	-	-
King et al 2001 12mFU King et al 2005 36mFU	7	9	0.75 (0.58, 0.96)[8]	-	-	-	35	44	0.80 (0.64, 1.00)[8]

[6] Rates/1000 person years, Primary care attendance and ,minor injury severity score>=2 not reproduced here (see Table 10).

[7] Weighted mean of %

Home risk assessment & supply and installation of home safety equipment									
No injury data reported by 2 of 4 studies: Kitzman et al 2005; Schwarz et al 1993									
	Admission to Hospital due to scalds			**A&E attendances**					
	Pre	Post	OR (95% CI)	Intervention(%)	Control (%)	OR			
Cagle et al 2006 6-9mFU	137/100,000	59/100,000	0.43 (0.32, 0.58)	-	-	-			
Carman et al 2006 12mFU	-	-	-	Pre 36 Post 29	Pre 28 Post 24	-[9]			
Home risk assessment & supply and installation of home safety equipment with safety education									
No injury data reported by 1 of 1 studies: Gielen et al 2002									

Key: mFU = Months of follow up. OR = Odds ratio. RR = Rate ratio. CI = Confidence interval. A&E = accident and emergency.

[8] Rate of injury per person year.

[9] Insufficient data supplied to calculate OR.

5.12.2. Impact of all interventions on the presence of correctly installed safety equipment

Given the paucity of evidence reported about injuries in the included studies and the difficulties of accurately measuring such changes, we were also interested in the impact of interventions on intermediate indicators of change, such as the presence of safety equipment. The absolute numbers of fatal and serious unintentional injuries to children in the home may be small in the context of a trial, and may be considered as “rare events”, on which it is difficult to measure an impact. Caution should be taken when interpreting the results about presence of safety equipment however as, although there is a logical link between the presence of such equipment and injury reduction, this link was not explored in the studies and cannot be quantified.

Nineteen of the 22 included studies reported on outcomes related to the use of safety equipment after an intervention, and these are summarised in Table 36. The way in which such outcomes were measures varied widely, with some studies directly assessing whether equipment was properly installed and/or functioning, while others relied on the self-report of the householders. As with the self-reported injury outcomes, there is a risk of social desirability bias with such reporting.

In each cell in Table 36, it is indicated if the results were in favour of the intervention (+) or if no significant increase in the presence of safety equipment was seen post-intervention (-). It also shows whether these outcomes were based on self-reported measures (SR) or observed measures (Obs). Where cells are blank, the outcome was not measured by the study. Where cells contain “NR”, this indicates that the piece of safety equipment was supplied and or/fitted as part of the intervention, but that the outcome was not reported. Table 36 also shows the study design.

We consider that the most reliable evidence will come from studies which both included a control group in the design, *and* which used observed, rather than self-reported, outcome measures. These findings have been highlighted as bold text in Table 36.

Table 36: Presence of safety equipment reported by all studies

Report	Study design	Buffer	Electr-ical	Latch	Bath-room	Anti-scald	Wind-ows	Wind-ow locks	Fire guards	Stair gates	Smoke alarms
Free or discounted supply of home safety equipment											
Woolf et al 1992	RCT			SR+							
Free or discounted supply and installation of smoke alarms											
DiGuiseppi et al 1999; 2002	Cluster RCT										**Obs-**
Douglas et al 1998; Mallonee et al 1996	CBA										SR+/ **Obs+**
Harvey et al 2004	Cluster RCT										**Obs+**
Free or discounted supply of home safety equipment with safety education											
Clamp & Kendrick 1998	RCT	SR+	SR+	SR+/-				SR-	SR+	SR-	SR+
Posner et al 2004	RCT		SR (undifferentiated) +								
Sangvai et al 2007	RCT			NR							**Obs+**
Sznajder et al 2003	RCT	SR+	SR-	SR-	SR-						SR+
Free or discounted supply and installation of home safety equipment with safety education											
Watson et al 2005; Kendrick et al 2009	RCT			NR				SR+	SR-	SR+	SR+
Home risk assessment only											
Paul et al 1994	N/A – no home safety equipment supplied or installed										
Home risk assessment and free or discounted supply of home safety equipment											
Bablouzian et al 1997	BA		Obs& SR+	Obs& SR+				NR			
Babul et al 2007	RCT		SR-	SR-						SR-	SR-
Hendrickson 2005	N/A – no outcomes about home safety equipment supply or installation reported										
Johnston et al 2000	CBA										SR+
Kendrick et al 1999	N/A – no outcomes about home safety equipment supply or installation reported										
King et al 2001; 2005	RCT			SR-						SR-	SR-
Metchikian et al 1999	BA		Obs+	Obs+							
Home risk assessment and free or discounted supply and installation of home safety equipment											
Cagle et al 2006	BA					Obs+					
Carman et al 2006	N/A – no outcomes about home safety equipment supply or installation reported										
Klitzman et al 2005	BA						Obs+				Obs+
Schwarz et al 1993	CBA					NR					**Obs+**
Home risk assessment and free or discounted supply of home safety equipment with safety education											
Gielen et al 2002	RCT			**Obs-**						**Obs-**	**Obs-**

Key:
- BA: Before and after study (uncontrolled)
- CBA: Controlled before and after study
- NR: Home safety equipment was supplied, but installation was not measured
- Obs: Presence of equipment observed
- SR: Presence of equipment self-reported
- +: Statistically significant outcome that favoured the intervention
- -: No statistically significant evidence of effect of intervention

Of the 14 studies which reported on the presence of smoke alarms post-intervention, six both use observed measures and used a controlled study design (Table 36). Four suggest that the intervention increased functioning presence (Harvey et al, 2004 USA [+] RCT 6-12 months FU; Mallonee et al, 1996 USA [+] CBA 48 months FU; Sangvai et al 2007 USA [-] RCT 6 months FU; Schwarz et al, 1993 USA [+] CBA 12 months FU) and two suggest that no significant impact was seen on smoke alarms (DiGuiseppi et al, 1999; 2002 UK [++] RCT 24 months FU; Gielen et al, 2002 USA [++] RCT 12 months FU).

Twelve of the 22 included studies also report on the presence of a range of other safety equipment, sometimes a reporting a whole series of outcomes, sometimes focussing on just one (see Table 36). A minority of studies (n=5) used observation methods rather than self-report to measure these outcomes. Of these five, four report an increase in the presence of measured outcomes (Bablouzian et al, 1997 USA [-] BA 3.5 months FU; Cagle et al 2006 USA [-] BA 6-9 months FU; Klitzman et al 2005 USA [+] BA 5 months FU; Metchikian et al, 1999 USA [-] BA 4-6 months FU) but none of these studies used a controlled study design. The only RCT to use observed outcome measures found no significant increase in the functional presence of latches or stair gates post intervention (Gielen et al, 2002 USA [++] RCT 12 months FU).

We therefore suggest that there is inconsistent evidence from robust studies about the impact of interventions on fire alarms, although this is the most promising finding in a disappointing picture. There is no evidence of increased functional use of other safety equipment in the home post-intervention.

Summary evidence statement 9: Overall impact of home based interventions on rates of injury and installation of safety equipment
Injuries Of the 22 included studies, seven report the impact of interventions on injury rates.
a. There is inconsistent evidence about impact on injury rate from seven studies: four found no significant reduction in injury with any intervention (three RCTs - DiGuiseppi et al 1999, 2000, [++] UK; Kendrick et al, 1990 [+] UK; Watson et al, 2005, [++] UK; and one uncontrolled before and after study – Carmen et al, 2006 [-] UK). The three that *did* suggest injury rates were reduced have limitations due to difficulty in attributing the change to the intervention (Cagle et al, 2006 USA [-], BA) the use of self-reported outcomes and high attrition rates (King et al, 2001, 2005 Canada [++], RCT) and the use of unadjusted analyses, and an atypical high risk setting (Mallonee et al, 1996 USA [+], RCT). The applicability of these findings is partial, with all the studies finding no impact being set in the UK, and those suggesting positive results in North America.
Installation of smoke alarms Of the 22 included studies, 14 provide information about the installation of smoke detectors post intervention, however, only six used robust designs which both reported observed outcomes and had a control group.
b. 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 (Harvey et al, 2004 RCT [+] USA; Mallonee et al, 1996 CBA [+] USA; Sangvai et al 2007 RCT [-] USA; Schwarz et al, 1993 CBA [+] USA) and two suggest that no significant impact was seen on smoke alarms (DiGuiseppi et al, 1999; 2002 RCT [++] UK; Gielen et al, 2002 RCT [++] USA).
Installation of other home safety equipment Of the 22 included studies, 19 provide information about the installation of home safety equipment post intervention, however, only one used a robust designs which both reported observed outcomes and had a control group.
c. There is evidence from one RCT that home risk assessments with free or discounted supply of home safety equipment with safety education does not increase the functional presence of safety equipment (Gielen et al, 2002, RCT [++]USA).

6. Findings: Cost-effectiveness

6.1.1. Study reports identified

A single search strategy was designed to identify both effectiveness, cost-effectiveness studies (see section 4.1.1) and the same screening procedures for identifying potentially includable papers was used (section 4.1.2.2). Papers/reports were flagged as being potentially includable economic evaluations or cost analyses. These were obtained in full text for assessment against the inclusion criteria for the cost-effectiveness review (see section 4.1.2.1). In addition, some papers obtained as full text for possible inclusion in the review of effectiveness studies, were discovered to also contain a section describing a cost analysis. Copies of these were also forwarded to the review team's health economist for assessment against the cost-effectiveness review's inclusion criteria.

In all 19 reports/papers were identified as potentially includable economic evaluations or cost analyses and obtained in full text version (see QUORUM flowchart, Figure 1 (p.42)). Of these 15 were excluded, on the basis that they:

- Describing cost of illness studies (i.e. not economic evaluations or cost analyses of specific hone safety interventions or programmes), mostly assessing the economic impact of injury and child injury: in the USA (6 studies); 2 in Norway; 2 in France.

- Present intervention/programme costing studies from outside the UK (2 USA: one of a smoke alarm installation and fire safety programme (Parmer et al. 2006), the other of a process for managing the admission of children with fall injuries (Pillai et al. 2000).

- Describe a home visiting intervention targeting intentional rather than unintentional injuries to young children (McIntosh et al. 2009).

The references of excluded studies and their reasons for exclusion are listed in Appendix 8 (p.311).

6.1.2. Included studies

Three studies (described in four papers) were identified which met our inclusion criteria of either being full economic evaluations or UK-based cost analyses of the relevant interventions, all of which were found by the electronic literature searches. These were identified from the electronic literature searches. Two of the economic evaluations were of smoke alarm give-away programmes; in Oklahoma City, USA (Haddix et al. 2001), and in a part of inner London in the UK (Ginnelly et al. 2005). Information about the economic evaluation by Ginnelly et al was also supplemented by an earlier cost analysis (DiGiuseppi et al. 1999). This study was data extracted but not assessed against the quality assessment criteria for economic evaluations (it mainly provides one table of detailed costs which feed into the Ginnelly et al cost-effectiveness study). We only found one economic evaluation of a relevant child safety programme involving home visits, which was conducted alongside an RCT in four Canadian cities (King et al. 2001).

All three published economic evaluations are cost-effectiveness analyses, aiming to report the incremental cost per injury prevented (although, both the smoke alarm give-away programme studies one comparator was estimated to be both cost saving and more effective than the other, so – correctly - no incremental cost-effectiveness ratios were calculated or reported). Both the cost-effectiveness analyses of the smoke alarm give-away programmes (Ginnelly et al, 2005 and Haddix et al 2001) were conducted from a societal perspective, whereas the cost-effectiveness study of the intensive home visiting programme appears to have been conducted from the health sector perspective.

None of the included economic evaluations were based on a decision model, being instead conducted alongside RCTs (Ginnelly et al, 2005 and King et al 2001) or a controlled before-and-after study (Haddix et al. 2001).

All three included economic evaluations were published between 2001 and 2005. The paper describing the intensive home visiting programme (King et al 2001) was primarily reported as an effectiveness evaluation, including a relatively small ‘economic analysis’ paper sections. Therefore, in assessing the quality of this study, an assessment of poor study quality may be more a reflection of limited reporting rather than poor study design or conduct *per se*. (NB. The health economist author of this study was contacted by e-mail to find out if the economic analysis has been published or documented more fully elsewhere; however there is no fuller report of this study (personal communication with Doug Coyle, University of Ottawa, 7th July 2009).

The assessment of the quality of each study against the CHEC criteria list is shown in Appendix 6.

6.1.3. Findings: smoke alarm giveaway programmes

Table 37 below shows the study characteristics and study designs of the three included economic studies of smoke alarm giveaway programmes (one cost analysis and two cost-effectiveness analyses), and Table 40 shows their results.

Table 37. Published economic studies of smoke alarm give-away schemes: Study designs

Author, year **Quality**	**Analysis type, data**	**Country, setting**	**Population, data**	**Interventions or comparators**	**Perspective**	**Time horizon, discounting**	**Costs & savings included**	**Statistic estimated**	**Sensitivity analyses**
DiGuiseppi et al, 1999 Overall study quality: not assessed as not full economic evaluation	Cost analysis (documenting cost of intervention) Data years: 1997-1998 Base year: 1999	United Kingdom, Inner London	80,000 households in 20 intervention wards Data: From programme records	"Let's Get Alarmed!" smoke alarm giveaway programme (see below)	Societal	NR NR	Programme costs only: • Alarms • Brochures • Distribution costs • Installation costs • Programme coordination • Reminder postcards and processes	NR	NR
Ginnelly et al, 2005 Overall study quality: +	Cost-effectiveness analysis Data years: 1997-1998 Base year: 1999	United Kingdom, Inner London	80,000 households approached in 20 intervention wards; 20,050 alarms distributed Data: From programme records;	"Let's Get Alarmed!" smoke alarm giveaway programme (also including installation in some homes, distribution of fire safety brochures and smoke alarm brochures, and follow-up reminder postcards)	Societal	2 years (22.9 months of injury and death data from intervention wards, 25 in control wards No discounting	Programme costs: • Smoke alarms • Educational material • Distribution costs • Installation costs • Programme coordination • Reminder postcards and processes Potential injury savings: • Fire service • Police • Property	Cost per additional death/injury avoided (but not calculated)	Probabilistic sensitivity analysis only

Author, year Quality	Analysis type, data	Country, setting	Population, data	Interventions or comparators	Perspective	Time horizon, discounting	Costs & savings included	Statistic estimated	Sensitivity analyses
Haddix et al, 2001 Overall study quality: +	Cost-effectiveness analysis Data years: 1990-1994 Base year: 1990	United States Oklahoma City	10,100 smoke alarms given to 9,291 households	Lifesavers Residential Fire and Injury Prevention Program (LRFIPP), comprising: Door-to-door distribution of free smoke alarms, plus education &instruction materials on alarm installation and how to prevent and escape from residential fires. Supply of batteries for 2 years	Societal, & Health system perspective	5 years Costs discounted at 3% per year	Programme costs: • Smoke alarms • Batteries • Brochures • Personnel • Office expenses • Contractual expenses • Transportation • Evaluation Potential injury savings (estimated for fatal and non-fatal injuries): • Hospitalisations • Inpatient physician visits • Other medical costs • Ambulance transport • Productivity losses	Cost per	Limited one-way sensitivity analysis

Table 38 (on the following pages) shows the main results of these studies. The programmes evaluated, study designs and results are described and discussed more fully in the sections following the table.

Table 38: Economic studies of smoke alarm give-away schemes: Results

Author, Year, Country	Intervention(s)	Cost of the intervention	Effectiveness the intervention	Cost-effectiveness estimate(s)
DiGiuseppi et al. 1999 UK	The give-away programme:		NB. COSTING STUDY ONLY – no effectiveness data	NA
	Smoke alarm packs (20,050)	£49,200		
	Brochures (25,750+25,000)	£1,392		
	Bags	£125		
	Supplies	£45		
	Photocopying	£2,225		
	Transport	£6,250		
	Storage	£200		
	Training	£217		
	Bagging	£1,638		
	Distribution	£23,915		
	Installation	£12,000		
	Programme coordination	£47,791		
	Pilot test	£89		
	Giveaway programme:			
	Mailing list preparation	£9,228		
	Reminder postcards	£3,508		
	Total programme cost:	£157,823		

Author, Year, Country	Intervention(s)		Cost of the intervention		Effectiveness the intervention			Cost-effectiveness estimate(s)
Ginnelly et al. 2005 UK			Programme cost per household	Plus: mean fire-related costs per household[a]: (95% CI)	Expected* number of fires per ward[a] (95% CI)	Expected* fire-related injuries/ deaths per ward[a] (95% CI)	Expected* fire-related injuries/deaths per household[a] (95% CI)	Giveaway programme *is dominated by* the absence of the programme
	Give-away programme:		£2.15	£10.61 (£9.48 to £11.87)	29.04 (27.67 to 30.48)	6.455 (5.627 to 7.418)	0.0018 (0.0015 to 0.0020)	
	No programme		0	£10.64 (£9.60 to £12.02)	26.03 (24.92 to 27.19)	5.172 (4.492 to 5.964)	0.0014 (0.0012 to 0.0016)	
Haddix et al. 2001 USA	Undiscounted cost of delivering programme (over 5 years, by component)		Mean cost per fatal and non-fatal fire-related injury:		Change in each area, pre- to post-	Net change[b]	No. prevented per year	Giveaway programme *dominates* absence of the programme
	Personnel: paid	$288,701	**Non-fatal:** Medical	$31,317	Fires: control -17.58%			
	Personnel: voluntary	$17,578	Productivity	$7,800	Fires: intervention -23.66%	-6.08%	13.64	
	Office expenses	$45,858	Cost per non-fatal injury	$39,117	Fatalities: Control -22.96%			
	Contractual expenses	$46,250	**Fatal:** Medical	$39,185	Fatalities: Intervention: -90%	-67.04	4.02	

Author, Year, Country	Intervention(s)		Cost of the intervention		Effectiveness the intervention			Cost-effectiveness estimate(s)
	Transport	$38,974	Productivity	$764,797	Non-fatal injuries: Control: +15.56%			
	Evaluation	$18,160	Cost per non-fatal injury	$803,982	Non-fatal injuries: Intervention: -77.14%	-92.70	4.87	
	Smoke alarms	$61,165						
	Batteries	$27,704						
	TOTAL:	$548,080						

* Expected rather than actual outcome rates because of the regression-based method for estimating the effect of the programme.
[a] Estimated costs over 24 month period
[b] Which is the % change in intervention area (target area) less the % change in the control area (rest of the city).

Estimates of the cost-effectiveness of smoke alarm giveaway schemes are available from one UK and one USA study, which were both conducted in parallel with the effectiveness evaluations of these programmes. The relevant effectiveness studies were included and assessed as part of the effectiveness systematic review (Section 5.5.3).

Let's get alarmed!: programme description and study design

The study by Ginnelly et al (2005) reports the results of a cluster-randomised controlled trial-based effectiveness and cost-effectiveness analysis of the 'Let's Get Alarmed!' smoke alarm giveaway scheme, which took place in the Camden and Islington areas of inner London in the late 1990s. The design of the programme was based on the successful Oklahoma City giveaway scheme which ran from 1990 to 1994 (Haddix et al 2001), but the London scheme used a mixed approach to distributing the alarms and educational materials – both door-to-door distributors (paid and voluntary) and collection from/distribution via community groups (e.g. tenants and residents associations). It aimed to target 'high risk' households, specifically: rental accommodation, low income households, elderly people and families with children. Prior to the programme, it was estimated that only 47% of homes in the intervention and control areas had a smoke alarm. The trial design and results on which the cost-effectiveness study is based has been published elsewhere (DiGuiseppi et al. 2000;DiGuiseppi et al. 2002), (and is also summarised in the review of effectiveness in this Report: Section 5.5)

As well as distributing the free alarms and fire safety brochures, the programme included the offer for the smoke alarm to be properly installed; however, only 8% of those receiving smoke alarms took up this offer. Ultimately 20,050 smoke alarms were distributed in the approximately 80,000 households which were contacted in the intervention areas. Most (18,550) of these had been distributed by door-to-door home visits, rather than by collection from community centres or health centres etc. Also, year after receipt of the free smoke alarm a reminder postcard was sent (to 14,039 of the households) to encourage householders to change the alarm batteries and check that the alarms still worked.

The cost-effectiveness analysis estimated the incremental cost per injury/death avoided from a societal perspective, and with a two-year time horizon (the approximate duration of fire-related injury data collection). Costs included were: programme delivery costs; injury costs (both to NHS and coroners, funeral and autopsy); Police and fire services costs; self-extinction costs (e.g. extinguisher use and replacement), and: property damage. Injury and death data was obtained from "A&E department registers", hospital case records and coroners' reports.

Econometric methods of data analysis were used to adjust for the clustered nature of the data, the high number of zero counts (for costs and outcomes) in many wards, and slight differences in baseline characteristics between the trial arms; as a result, this analysis method produced estimates of the 'expected' numbers of fires and 'expected' numbers of injuries after adjusting for these factors. A comprehensive assessment of the resource use and related costs of delivering the scheme (presented in DiGiuseppi et al. 1999), was supplemented by the estimation of a range of fire-related and fire-related injury costs (see Table 38). These fire-related potential cost savings comprised: the cost of attending fires by the police and fire service; the cost of property damage; and health service costs (ambulance, A&E, hospitalisation); and costs related to deaths (funeral, coroners, and autopsy).

Let's get alarmed!: results

The total cost (in 1999) of the programme was £157,823 (of which £49,200 was the cost of the smoke alarm packs, and £12,736 was for the reminder postcards; the remainder being for the distribution and installation of brochures and alarms). This equates to a programme cost per household targeted (in the intervention areas) of £2.15. The mean fire-related costs in the intervention and control wards were very similar; £10.61 (95% CI: £9.48 to £11.87) in intervention wards, and £10.74 (95% CI: £9.60 to £12.02) in control wards. This is due to a combination of intervention wards experiencing a slightly higher probability of having a fire and a higher than expected number of injuries and deaths, yet also a lower mean cost of a fire (£1,345 compared with £1,520 – mostly due to differences in property damage costs). When the costs of the programme and the fire-related costs/savings are added together, the mean cost per household (over 24 months) was £12.86 (95% CI: £11.63 to £14.02.) in intervention wards, and £10.74 (95% CI: £9.60 to £12.02) in control wards. These complicated findings are summarised in Table 39 below.

Table 39: Relative differences in events and costs in wards with and without the giveaway programme

Outcome	Difference between intervention and control wards
Expected number of fires	11.6% higher
Expected number of fire-related injuries or deaths	24.8% higher
Expected total cost of a fire (where there has been a fire)	11.5% lower*
Resulting mean total fire-related cost per household	1.2% lower

Source: calculated from data in Table 2 of Ginnelly et al. 2005
* Which in turn is a result of higher injury-related costs being offset by a much lower property damage costs in intervention wards.

In terms of programme effectiveness, the expected number of fires experienced (over 24 months) was 26.03 in each control ward, and 29.04 in each intervention ward, and the expected number of fire-related injuries or deaths per ward was 5.172 in control wards and 6.455 in intervention wards (see Table 38 for confidence intervals) (NB. there were 20 electoral wards in each arm of the cluster-RCT). That is, unexpectedly, in the wards targeted by the giveaway programme there were actually both more fires and more fire-related injuries and deaths than in the wards not targeted.

Given that taken together the programme plus fire-related costs were, on average, higher per household in intervention than control wards, and that higher rates of fire-related injuries and deaths were also experienced, the Let's Get Alarmed! scheme can be described as a 'dominated intervention' (i.e. it would not be chosen regardless of the magnitude of the cost and effectiveness differences between the two trial arms).

Using probabilistic sensitivity analysis to explore and express the uncertainty in the various cost and effectiveness estimates indicated that even if society was willing to pay £0 per injury or death avoided, the chances of the giveaway programme being cost-effective would be only 18%, and should the willingness to pay increase to £10,000 per injury or death avoided the probability of it being cost-effective would reduce to only 10%.

LRFIPP: programme description and study design

The study by Haddix et al (2001) reports the results of a cost-effectiveness analysis conducted alongside a before-and-after study of the Lifesavers Residential Fire and Injury Prevention Program (LRFIPP) smoke alarm giveaway scheme, which took place in Oklahoma City in 1990. The design of programme was based on door-to-door distributors giving out smoke alarms and supporting education materials. Like the later Lets's Get Alarmed! scheme in the UK, it was also aimed at a 'high risk' area (in south Oklahoma City) which experienced a disproportionately high number of the residential fire-related injuries in the city (45% of the city's fire-related injuries, in 16% of the city's dwellings). Notably, the authors reported that fires started by children accounted for almost half (47%) of residential fire-related injuries in the targeted area, but only 8% in the rest of the city. The area was characterised by lower property values, lower median household income and poorer quality housing – although similar numbers of people per occupied dwelling. Prior to the programme, it was estimated (via a survey) that 66% of homes in the target area had a functioning smoke alarm.

As well as distributing the free smoke alarms, smoke alarm recipients were given education/instruction materials on alarm installation and how to prevent and escape from residential fires. By the end of the programme 10,100 smoke alarms had been distributed to 9,291 households (mean of 1.09 alarms per household); estimated to be about 78% of the target households. The programme also included relatively intense follow-up, with a number of repeat visits (up to four per household) over the five years, including the provision of new batteries and the replacement of any faulty smoke alarms identified.

The cost-effectiveness analysis estimated the incremental cost per injury/death avoided from a societal perspective, and with a five-year time horizon (the approximate duration of cost data and fire-related injury data collection, from May 1990 to April 1995). Again, an assessment of the resource use and related costs of delivering the programme, was supplemented by the estimation of a range of fire-related injury treatment costs (see Table 37, p.136). These fire-related injury costs (or savings) comprised: the cost of ambulance retrieval and medical treatment of non-fatal injuries; the cost of ambulance retrieval and medical treatment of fatal injuries;

and (lost) productivity costs for non-fatal and fatal injuries (respectively, for four months, or for the expected remaining working life of fire victim).

LRFIPP: results

The undiscounted cost of providing the programme during the 5-year time horizon of the analysis was $548,080 over half of which was staffing costs ($306,279) and about 11% of which ($61,165) was the cost of the smoke alarms (see Table 39). Also, over half ($306,075) of this total programme cost was incurred in the first year of the programme (when smoke alarms were distributed), and over 96% of which was incurred in the first three years of the programme (with only battery purchases by participants and some evaluation costs in years four and five). The discounted cost of the programme over the five years was $530,611.

However, these programme costs were set against the substantial estimated savings associated with the 20 fatal and 24 non-fatal injuries estimated to have been avoided due to the giveaway programme. Each non-fatal fire-related injury was estimated to have incurred medical costs of $31,317 and productivity losses of $7,800 (total saving of $39,117), while fatal injuries were estimated to have incurred mean medical costs of $39,185 and more substantial productivity losses of $764,797 (total saving of $803,982). Thus the savings from a single fatal injury avoided would more than cover the total cost of the programme.

Since the programme was assessed to be both more effective and less costly than the absence of the programme, no cost-effectiveness ratios were calculated. This was true from either a societal or a health care system perspective. One-way sensitivity analyses showed that either programme costs would have to double or programme effectiveness would have to decrease by 64% in order for the programme to cost more than the fire injury-related savings (that is, if the net percentage reduction in fatalities changed from 67 to 43 or less, and if the net percentage change in non-fatal fire-related injuries changed from 92% to 59%). However, the very high productivity savings ($0.75 million per death prevented) largely account for the resilience of the main result to these alternative assumptions.

Evidence statement 10: Cost-effectiveness of smoke alarm giveaway schemes
There is inconsistent evidence from 2 cost-effectiveness analyses of smoke alarm giveaway schemes with education materials, that such schemes when targeted at high risk areas and households may be cost-effective from a societal perspective (Ginnelly et al. 2005 [+];Haddix et al. 2001 [+]). The UK-based alarm giveaway programme (Ginnelly et al. 2005) was found to be both less effective and more costly than no giveaway programme, whereas the USA-based programme (Haddix et al. 2001) was found to be both highly effective and cost-saving, compared with no programme. In addition to the fact that one study was in inner-city London (UK) and the other was in a large US city, there were a number of other differences in the characteristics of the intervention, the targeted intervention areas and analysis methods which may explain the directly opposite effectiveness and cost-effectiveness results. In particular, the UK study was based on effectiveness data from an RCT whereas the US study was based on an uncontrolled before and after study; also, the US study included the value of productivity losses associated with fire-related injuries (and for each fatal injury these were over $0.75 million). The evidence from the UK-based cost-effectiveness study is judged as directly applicable to UK urban settings (Ginnelly et al. 2005). However, the evidence from the older USA-based study (Haddix et al. 2001) is judged as only partially applicable to UK urban settings. There was no evidence from non-urban settings, or of schemes which did not target high risk and low socio-economic status areas.

6.1.4. Findings: home risk assessment programmes

Ontario programme: description and study design

There is one cost-effectiveness study of an intensive home visiting programme in Canada, to reduce unintentional injury to children in homes where a child had already been treated in hospital for an injury (King et al. 2001). The cost-effectiveness analysis was conducted alongside a year-long RCT which, in turn, was an extension of a case-control study. The economic analysis was presented in only two paragraphs within the effectiveness study paper, thus severely limiting the amount of detail about methods and only giving base case results.

The home visit itself involved the provision of a single home visit (although, not clear from what type of worker) which included the provision of: an information package; discount coupons for the purchase of home safety equipment; and specific instruction on home safety measures based on reviewing an earlier (at trial baseline) assessment of risks by a trained research assistant. The targeted homes had been identified subsequent to a case-control study, and therefore were all households where a child under 8 years of age had recently sustained an injury requiring emergency department attendance (see footnote to Table 40 for relevant injuries).

Table 40. Published economic studies of relevant home risk assessment schemes: Study designs

Author, year	Analysis type, data	Country, setting	Population, data	Interventions or comparators	Perspective	Time horizon, discounting	Costs & savings included	Statistic estimated	Sensitivity analyses
King et al, 2001 Overall study quality: -	Cost-effective ness analysis Data years: 1994-1996 Base year: 1999	Canada, 4 cities in Ontario	1,172 child patients (<8 years old) initially randomised (951 in trial by 1 year follow-up visit) Data: Effectiveness data from trial records; resource use data estimated from hospital attendance records plus panel of physicians; unit costs from Schedule of Fees and Benefits.	Single home visit to families of children aged <8 years who recently experienced a target injury requiring an A&E visit[10] Visit involved: information pack on injury prevention; review of findings of previous home visit, advice on reducing identified risks; discount coupons (5 × $10); demonstration of the safety devices provided	Health system	1 year No discounting	Programme costs: • Single home visit Potential injury savings • Treatment of injuries (Costs for 12 different types: abrasion, burn, concussion, cut/ laceration, dental jniury, foreign body, fracture, hematoma, minor head injury, poisoning, sprain, other injury)	Incremental cost per injury prevented	None presented

[10] Target injuries were: tap water scald; burn from a household fire; poisoning or ingestion; choking from the ingestion of a foreign object; fracture, sprain, strain, cut or bruise from a fall from a height; and head injury while riding a bicycle

Table 41. Economic studies of relevant home risk assessment schemes: Results

Author, Year	Intervention(s)	Cost of the intervention (1990 Canadian $, per child per year)		Effectiveness the intervention	Cost-effectiveness estimate(s)
King et al. 2001 Canada		Programme Cost	Injury costs	Overall n (%) injured by 1 year after	
	Targeted home visit programme (n=357)	60.03	11.69	24 (7%)	$372 per injury prevented
	No programme (n=343)	0	23.61	30 (9%)	

Ontario programme: results

Each home visit was estimated to cost C$60.03. Children in intervention areas sustained injuries at lower rates than in control areas for all injury types other than burns and dental injuries, and the treatment costs for the twelve different injury types ranged from C$36.40 (for treating abrasions or haematomas) to C$214.33 for concussion (these being based on typical resource profiles for treating each injury type obtained from a panel of physicians). The injury types for which the rates were lower in the intervention than control areas were: abrasions, concussion, cut/laceration, foreign body, fracture, haematoma, minor head injury, poisoning, sprain, other injury. While most of these types of injury relate to the home safety risks targeted by the intervention, many might also be sustained outside the home. The estimated total cost of health care for injuries in the intervention group (C$7,028) was "significantly lower" than the cost for the control group (C$13,482; although no p-values or confidence intervals were reported). The injury treatment cost per participant over the trial year was therefore C$11.69 in the intervention group, and C$23.61 in the control group. However, including the cost of the home visits, the incremental cost per participant of the home visit programme was C$48.11 (= 11.69 + 60.03 – 23.61).

Then, applying the lower injury rate experienced in the intervention group (7% vs 9%; a per person-year rate ratio of 0.75 [95% CI: 0.58 to 0.96]) gives an incremental cost per injury prevented of C$372. No sensitivity analyses were presented to explore how much this result would alter under different cost and effectiveness assumptions. The authors suggest that this estimate "is likely to be small in proportion to the benefits gained by society", and point out that this estimate does not include the additional direct and indirect savings due to things like the value of time and foregone earnings of family members in caring for the injured child.

Evidence statement 11: Cost-effectiveness of home risk assessments
There is weak evidence from one cost-effectiveness study based on a randomised controlled trial in Canadian cities, that a single home visit involving an information package, discount vouchers, and home-specific risk-reduction advice (based on a previous risk assessment) is cost-effective from a heath system perspective (King et al. 2001 [-]). This cost-effectiveness conclusion either relies on the assumption that avoiding such injuries to children is worth over C$372 to society, and/or that the value of other benefits to families and carers (e.g. gained leisure or earnings not lost caring for the injured child) exceeds C$372. Assessment of the quality of this study was highly compromised by the very small amount of space devoted to describing it within the effectiveness paper. The evidence is from a Canadian study which uses 15-year old data and is therefore judged as only partially applicable to UK family homes; the generalisability of the study's findings beyond Canada is also hindered by the absence of sensitivity analyses.

7. Discussion

7.1. Statement of principal findings

This review has systematically searched the literature, critically appraised included study reports, and synthesised research evidence with the aim of answering the following questions:

1. Which interventions involving the supply and/or installation of home safety equipment (free of charge or at a reduced cost) are effective and cost effective in preventing unintentional injuries among children and young people aged under 15 in the home?

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

3. What are the factors which either enhance or reduce the effectiveness of interventions involving the supply and/or installation of home safety equipment and/or home risk assessments, or which help or hinder their implementation?

4. What are the main causal relationships which seem to explain how the different combinations of resources (and levels of costs) of these interventions are related to intended outcomes?

These are considered below.

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

Effectiveness findings:

The results of the included studies are disappointing. Only seven of the 22 included studies, directly measured the impact of their interventions on injury rates. Of these seven, four found no significant reduction in injury with any intervention (three RCTs - DiGuiseppi et al 1999, 2000; Watson et al, 2005; Kendrick et al, 1990; and one uncontrolled before and after study – Carmen et al, 2006). The three that *did* suggest injury rates are reduced all have limitations relating to the difficulty of assigning any change in injury to the impact of the intervention, the use of self-reported outcomes, or unadjusted analyses in an atypical urban area (Cagle et al, 2006; King et al, 2001, 2005; Mallonee et al, 1996).

Although this review also sought to assess the impact of home safety equipment interventions on measures such as increased installation rates and increased knowledge, it is difficult to know how to interpret these findings without any empirical evidence linking them to decrease in injury rates. Over-emphasis on proxy measures, in the absence of primary outcomes being measured or in the event of non-significant results for primary outcomes, may be the result of interpretation bias, which is a risk in both individual research reports and reviews of such reports. Indeed, a recent assessment of how trials interpret non-significant results (Hewitt et al. 2008) used one of our included studies as an example of potential interpretation bias: Watson et al (2005) are criticised for emphasising the possibility that free home safety equipment might improve safety practices in families, whilst downplaying the main study results which suggested an increase in minor medically attended injury among those receiving the intervention.

We found some inconsistent evidence that intervention may increase the functional presence of fire alarms but no robust evidence for increased use of other home safety equipment.

Cost-effectiveness findings:

The two economic evaluations of the smoke alarm give-away schemes, one in the UK (of the Let's Get Alarmed! scheme) and one in the USA (of the LRFIPP), give opposite results: the UK give-away scheme was estimated to be both less effective and more costly than no scheme, while the LRFIPP scheme in Oklahoma City was estimated to be both more effective and less costly than no scheme. However, these two studies exhibit a number of important differences in terms of the nature of the programme evaluated and how they were evaluated, which may explain their conflicting findings.

The UK study by Ginnelly et al. is based on an RCT which shows no significant difference in injury rates between intervention and control, whereas the non-randomised LRFIPP study reports a substantional injury reduction, based upon the relative reductions in fatal and non-fatal injuries in an unmatched control area (the rest of Oklahoma City). This means that although the LRFIPP programme reports impressive after-vs-before reductions in fatalities (90%) and non-fatal injuries (77%), some of these changes may not be due to the programme but to other differences in the causes of fires or the prior prevalence of fire-safety behaviours (i.e. the study is subject to considerable potential biases and may overestimate the effectiveness of the intervention). The LRFIPP Oklahoma City programme also appeared to be a considerably more intensive programme, with a number of repeat visits (up to four per household) over the five years, including the provision of new batteries and the replacement of faulty smoke alarms. This may also partly explain the different effectiveness estimates on which the two economic evaluations are based.

Both studies appear to have conducted comprehensive cost analyses of the programme. Howver, there were some notable differences in cost structure. For example, in the UK programme the cost of the smoke alarms comprised 31% of the total programme cost, compared with 11% of the cost of the LRFIPP programme, and “bagging and distribution comprised 16% of the UK programme, but paid and voluntary personnel accounted for over 50% of the total cost of the LRFIPP programme.

However it is the inclusion of productivity costs (savings) in the study by Haddix et al. – that is, the value to the economy of lost productive outputs due to fatal and non-fatal injuries – which explains why the LRFIPP programme in the USA is estimated to be so overwhelmingly cost-saving. The inclusion of productivity costs or losses in economic evaluations is, in any case, a fairly controversial aspect of economic evaluation (Drummond et al. 2005;Garber et al. 1996). This is particularly true where it is not clear by what method these costs have been estimated. The Haddix et al study, by basing their productivity loss estimates on annual mean earnings (i.e. apparently using the ‘human capital approach’) are likely to have over-estimated the true cost to society of people who leave the workforce, or never enter it, because of their injuries (p. 85, Drummond et al. 2005).

In addition to the fact that there were only two economic evaluation studies, with conflicting findings, further caution is warranted given the very varied and uncertain findings across the larger number of effectiveness studies found. In other words, had there been more economic evaluations alongside these other effectiveness studies it seems likely that their assessed cost-effectiveness would give an equally mixed pattern of results.

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

Effectiveness findings:

Evidence for the effectiveness of home risk assessments alone is weak as it based on one small, poor quality RCT which suggests no impact of the intervention across most of the measured outcomes (Paul et al 1994). The addition of the supply of home safety equipment does not appear to make a substantive difference to their effectiveness in terms of the installation and use of stair gates, locks and latches, or electrical outlet covers (Babul et al 2007; King et al 2001). An increase in the installation of home safety equipment is reported in one study, but this relies on self-reported outcome measures (Johnston et al 2000).

There was evidence for the effectiveness of home risk assessments (in conjunction with the supply of home safety equipment) in reducing unintentional injuries at follow-up at 12 months (King et al 2001), but this used self-reported outcomes and this effect was anyway not maintained at 36 months (King et al 2005), and another trial showed no impact at 25 months (Kendrick et al 1999). Finally, there is no evidence to suggest that the addition of an explicit educational component (as well as the construction of a Safety Centre) increases effectiveness and, in fact, this may increase health inequalities through providing a resource that only the more socio-economically advantaged and motivated may make use of (Gielen et al 2002).

There were considerable differences in who provided a home risk assessment ranging from one-off visits from those trained for the research project, to health visitors who also provided ongoing social support for new mothers, and may have already built a relationship with those in the study. We speculate that such differences may be important in supporting some vulnerable families and those who are unwilling to admit unknown people to their home, although this was not demonstrated in the study findings.

Cost-effectiveness findings:

We found only one published economic evaluation of a child home safety programme involving a home risk assessment and advice visit plus discount vouchers to buy home safety devices (King et al., 2001). This study was reported primarily as an effectiveness evaluation, with the economic evaluation part of the study only reported in two short paragraphs which severely limited quality assessment of this study. Although the study authors concluded a positive cost-effectiveness result, this relies on assuming that the value of avoiding each injury to a child which requires a trip to the doctor is greater than (Canadian) $372. In addition, as noted in the effectiveness review, injury outcomes were parent-reported visits to the doctor for a child's injury (rather than actual primary care or hospital attendance records). For these and other reasons therefore, and even though this study was based upon an RCT, this study was assessed as both a poor quality economic evaluation and a poor quality effectiveness study by our reviews.

It is therefore not possible, on the basis of this weak evidence, to conclude that this or similar home safety visiting programmes would be cost-effective in the UK. This, and the fact that it was based in Canada rather than the UK, also meant it was not used as the basis for our economic modelling of general home safety assessment programmes (see Report 3).

Question 3: What are the factors which either enhance or reduce the effectiveness of interventions involving the supply and/or installation of home safety equipment and/or home risk assessments, or which help or hinder their implementation?

Most studies also reported a range of intermediate outcomes related to the presence of correctly installed or correctly used safety equipment, and knowledge, behaviour or observed injury risks within the home. This might be expected to influence injury to children in the home, however, there is no evidence in this review that can quantify any relation between these measures and injury rates. The evidence is also very mixed for these outcomes.

At the most basic level, the supply alone of home safety equipment can be effective in increasing its installation and use when such equipment is directly aimed at preventing the re-occurrence of a recent unintentional injury such as poisoning (see Woolf et al 1992, although this study uses self-reported outcomes).

Although it may be that the supply and installation of smoke alarms results in greater uptake than simply providing a discount voucher for an alarm (Harvey et al 2004), the evidence from a key controlled study suggests that supply and installation has no greater effect on rates of installation and fire-related injuries than no intervention (DiGuiseppi et al 2002). This may be partly explained by the very low uptake by households of the offer of installation in this study, which may be linked to resistance to strangers entering the home (see below).

An educational component may result in greater uptake of an intervention involving the supply and installation of home safety equipment (smoke alarms, stair gates, and window locks; Watson et al 2005, although these were based in self-reported outcomes). Other evidence suggests, however, that where interventions were embedded within wider community programmes, interventions that supplied and installed home safety equipment without an explicit educational component could be effective (Klitzman et al 2005 – smoke alarms, fire extinguishers, and window guards using observed outcomes although this study had no control group; Schwarz et al 1993 – smoke alarms, controlled design and observed outcomes). It is difficult to weight the validity of these different findings by study design: while the latter studies may be less reliable as they use before and after study designs (one controlled), whilst the Watson was an RCT, they do use observed outcomes (rather than the self-reported outcomes of the Watson study.)

Evidence for the effectiveness of the supply (without installation) of home safety equipment in conjunction with an educational component is highly mixed and does not appear to be linked to the ease (or otherwise) of installing the equipment (for example, Clamp & Kendrick 1998, and Sznajder et al 2003 – cupboard locks and latches, and electrical outlet covers, although both are RCTs they use self-reported outcome measures). This suggests that there may be other key factors that influence parents' behaviour beyond a lack of access to (or funds for) home safety equipment and the skills necessary for its proper installation. The exception here is smoke alarms, where interventions involving the supply of smoke alarms in conjunction with education were reported uniformly as being effective (Clamp & Kendrick 1998; Sangvai et al 2004; Sznajder et al 2003).

Previous studies have highlighted the steep social gradients in child injury, which are evident using a range of measures of deprivation including occupational class, deprivation of residential area, family make-up, income and maternal age (Kendrick et al. 2009). However, a trial aimed at reducing inequalities in the possession and use of various safety equipment, through home safety visits and free or low cost supply of equipment had mixed results. No evidence of reduced inequalities seen in smoke alarms but increases in stair gates recorded post-intervention in those with low income and those in rented accommodation (Kendrick et al. 2009).

A previous review of interventions to promote smoke alarm ownership and function used innovative narrative synthesis methods to try and explain the very mixed results from the RCTs that had informed both it, and a previous Cochrane review ((Arai et al. 2007;DiGuiseppi & Higgins 2000)). The authors of the narrative review identify a range of possible questions about what elements of the intervention might impact on the effectiveness of smoke alarm promotion interventions, which included safety education as well as provision of safety equipment. They used information provided by study authors which attempted to explain the results to identify possible barriers and facilitators to successful programmes and their implementation although this information is not fully reported. Similarly, we extracted information provided by study authors, usually in the discussion section of the effectiveness papers, and reported it in the evidence tables. These are reported briefly below in Table 42, where we also show where similar barriers and facilitators were noted in the qualitative research reviewed for Report 2. Note that other potential factors were also identified by the review of qualitative research, and the fact that a theme is present only in the review of effectiveness, or only in the review of qualitative research, does not necessarily weaken its validity as an observation.

Most of the factors identified by authors of the effectiveness review were around the barriers and facilitators to householders acquiring safety equipment, and none related to maintaining such equipment. This may be a reflection of the studies experiences in gaining access to households as part of the trial, and the relatively short term follow up of many of the studies.

Themes which came up repeatedly included the suggestion that home risk assessment programmes may be more successful where they use those, like health visitors, who already have an ongoing, supportive relationship with parents and where these relationships addressed other needs as well as unintentional injury. However, for some, the prospect of allowing home visits, perhaps repeatedly, was a barrier to participation. We note that the study by Watson et al (2005) found an increase in GP attendances for unintentional injury among those intervention group (but not for more serious injuries). A possible interpretation of this is that those who received the safety counselling from a health visitor became more confident that they would not be judged if their child had been hurt accidentally.

Similarly, the involvement of community groups in interventions may help to promote and legitimise it, and may help to allay any suspicion of officials or mistrust of apparently free equipment.

Table 42: Barriers and facilitators to effective interventions reported in effectiveness studies

Barriers	Facilitators	In review of qualitative research?
Acquisition of safety devices		
In poorer households, safety device purchase low priority compared to other basic needs (Henrickson, 2005)		Not directly
The possibility of home visits may discourage potential intervention participants from taking part (Sangvai et al 2007)		Yes
Mistrust of local government initiatives may reduce participation (DiGuiseppi et al 1999, 2002)		Yes
Mistrust of free supply – some people called police not believing the offer was genuine, and of people at the door. (DiGuiseppi et al 1999, 2002)		Yes
	Home visits create positive links to the community, especially if in community language (Henrickson, 2005) Where case workers used already have a relationships with the householders, they saw the additional work of carrying out safety checks as minimal, and provision of supplies especially beneficial (Johnston et al 2000). Successful home visit programmes characterised by establishment of a strong therapeutic relationship developed over frequent visits to address underlying factors related to maternal and child health (King et al 2001). Implementing home risk assessments through home visiting programmes that are already established may increase acceptability and uptake. (Cagel et al 2006)	Yes.

Barriers	Facilitators	In review of qualitative research?
	Involvement of community groups/ leaders may decrease suspicions about involvement in the programme (Cagle et al 2006) Involvement of community groups useful to promote networks, raise profile and identify families in need of ongoing support (not just about fire safety) (DiGuiseppi et a 1999, 2002) Involvement of community coalition particularly facilitated engagement with ethnic minority groups as well as providing resources, including materials and people, which made a large project possible. (Douglas et al 1998)	Not directly
Installation of safety devices		
Housing repair needs may be linked to poverty (Henrickson 2005)		Yes
Passive activities (not requiring repeated action to ensure functioning) are easier to adopt than active ones (King et al, 2001, 2005)		Yes
Easy to install devices (such as those to reduce hot water temperature) arte ,more likely to be used than more difficult ones (such as monitoring the size of small objects in terms of their swallowing safety). (King et al 2001)		Yes – though different examples given.
Use of safety devices		
Cultural differences – in some cases, more willingness to leave children alone (Henrickson, 2005)		Yes.
Parental vigilance and responsibility required by more active safety measures are difficult to motivate (King et al 2001)		Not directly
Maintenance of safety devices	None reported	

Question 4: What are the main causal relationships which seem to explain how the different combinations of resources (and levels of costs) of these interventions are related to intended outcomes?

Given the paucity of economic evaluations found, and their scant reporting of variations in costs and effectiveness between different neighbourhood areas or different households, it is very difficult to arrive at firm conclusions about how different elements within these programmes may produce more or less cost-effective results. This is particularly disappointing because there are a number of aspects of programme design and implementation in such child home safety schemes where there is a clear trade-off between investing extra resources and anticipated greater effectiveness. Some key ones are:

- Do the extra resources devoted to targeting neighbourhoods or households which are (a) at most risk of fire or (b) least likely to already have the safety feature or (c) where more children and adults live, increase the overall efficiency (and effectiveness) of the programme?
- Do the extra resources (especially the time of trained staff) of providing personalised and tailored home safety advice and the targeted supply of selected home safety devices (most needed in each home) lead to greater compliance or home safety awareness?
- Do the extra resources of developing and disseminating child home safety education materials augment the likely take-up and proper use of home safety equipment and/or the more general improved awareness of child safety issues or injury risks around the home?
- Do the extra resources for professionally installing key safety devices lead to sufficiently higher rates of correct instalment to justify the additional cost?
- Does the extra cost of long-life, hard-wired or tamper-resistant safety devices (particularly smoke alarms) justify the extra presumed benefits of a longer effective lifetime of the device.

- Are the extra resources of having a much larger (e.g. city-wide) programme largely offset by economies of scale, and attributing the fixed costs of programmes across a larger number of potential beneficiaries?

This is not an exhaustive list of the many “economic” trade-offs inherent within each instance of home safety programme design and implementation.

Unfortunately, the costing and other studies excluded at full-text stage only provided a few additional insights. The evaluation of a home safety equipment scheme, linked to a Sure Start programme in East Lancashire, presented such scant details of its cost-savings estimates that it was impossible to draw reliable insights (Carman et al. 2006). However, a recent economic evaluation of an intensive home visiting programme for vulnerable families – to prevent *intentional* injuries to children – conducted from both a societal and a health service perspective, showed the large difference that analyses from these different perspectives can make (McIntosh et al. 2009). This study also highlighted the importance of observing or estimating long-term impacts. Finally, the very comprehensive cost analysis by Parmer et al, of a smoke alarm and fire safety education programme in four USA states, highlighted that the more intensive the intervention (and, perhaps, the more thorough the costing methods), then the more expensive the programme may be estimated to cost (e.g. they included all training, canvassing, installation and follow-up costs, arriving at a cost per alarm installed of $132) (Parmer et al. 2006). They also highlighted the marginal cost advantages of having larger schemes (i.e. economies of scale).

7.2. Effectiveness review strengths and limitations

7.2.1. Strengths of the review

This systematic review has been based on explicit and policy-relevant review questions, according to a pre-defined review protocol, and used search strategies developed by an information specialist which were specifically designed to identify potentially relevant studies. A wide range of electronic databases has been searched, including some which are specific to the area of safety policy/research. These searches have also been supplemented by other targeted searches, and searches of relevant websites and the reference lists of included studies.

7.2.2. Limitations of the review

Limitations of the systematic review methods used

Resource limitations meant that we did not use double data extraction or double check quality assessment which may limit the reliability of the review. However, multiple reviewers did discuss issues throughout the project and this led to some reassessment of the quality of some studies and to noted corrections in the extracted data. Despite this, it remains possible that inaccuracies may remain.

There are a number of limitations with the methodological checklist for quality that was applied to this body of research. Using the same checklist to assess a number of different study designs means that a large number of the questions may be inappropriate, particularly for uncontrolled studies. In addition, much of the language used in the checklist comes from clinical studies, and may not be clearly transferable to public health interventions. Many studies also included several strands of data collection – for example, registry or hospital data relating to injuries, observations of safety measures taken in the home and a questionnaire to assess knowledge, while the quality appraisal checklist makes no provision for such different strands which may all have different strengths and weaknesses, although clearly it is impractical to provide lengthy assessment of every part of the study. In addition, some key elements which relate to the intervention itself rather than research conduct may be important when considering quality, such as: recruitment rates; the presence of other community based safety interventions or simply the level of detail provided about the intervention itself.

Limitations of the included studies

In many instances, evidence for the effectiveness of interventions is inconsistent; with some studies showing effectiveness across some of their measured outcomes, but not for other outcomes in the same study, and/or across studies. In order to rationalise this picture, we have summarised the data which is based on the most robust designs, using a control group, and which used observed measurements rather than self-report for the outcomes.

Few of the studies report injury outcomes, and where they do, they are reported in disparate ways precluding pooling. This is particularly limiting where outcomes, such as severe or fatal injuries, are relatively rare events, and so pooling across studies may enhance the power of studies to detect actual differences. Within individual studies, this could be addressed by longer term follow up although this is clearly complicated by implications for attrition. However, in nearly half of the studies (11/23) follow-up was for six months or less, and only six studies had follow up of more than one year. Longer follow up may also be important because devices may fail, stop being used or get broken over time. Family composition may also change, with some children growing out of the need for some devices, while newly born children may have continued or new safety needs.

Outcomes used to assess the impact of interventions on either the continued presence and use of safety equipment, or changes in safety knowledge and behaviour, also use many different measures, preventing meaningful pooling.

In some cases, it is difficult to understand from the study reports exactly which components made up the intervention. In addition, there may be references to other ongoing activities in the wider community that may also have had an impact on safety related behaviour in the home. This is clearly most important in studies with no control group, making nay changes difficult to attribute to the intervention alone.

There were low levels of uptake for the intervention offered by some studies, and there may be problems in gaining the trust of parents required to allow access to households.

Contamination may be a problem where control groups are based on the same, or nearby communities to those receiving the intervention.

We are aware that there are a number of local initiatives, such as those offered by local authorities and the fire service in the UK, which provide information and smoke alarms to householders but we did not identify any evaluations of these programmes for inclusion in this review.

7.3. Cost-effectiveness review strengths and limitations

7.3.1. Strengths of the review

This systematic review has been based on explicit and policy-relevant review questions, according to a pre-defined review protocol, and used search strategies developed by an information specialist which were specifically designed to identify potentially relevant studies. A wide range of electronic databases has been searched, including some which are specific to the area of safety policy/research. These searches have also been supplemented by other targeted searches, and searches of relevant websites and the reference lists of included studies.

The study inclusion/exclusion decisions, study data extraction and quality assessment has been conducted by a health economist who is experienced in both conducting economic evaluations and in conducting systematic reviews of economic evaluations. Also, the main bibliographic searches which supplied potentially includable papers/reports for all three linked systematic reviews, was run in appropriate economic literature databases such as NHSEED and EconLit.

7.3.2. Limitations of the review

Limitations of the systematic review methods used

Due to unavoidable time and other resource constraints, this systematic review was largely conducted by one person (the team's health economist). There was therefore little time available for checking study inclusion/exclusion choices or for checking data extraction and study quality assessment. Nevertheless, given the small number of papers included, and therefore the number of times they were re-read, we feel it is unlikely that errors of data extraction would not have come to light.

The initial searches were not restricted by study design, so the identification of economic evaluations (or UK-based cost analyses) were either identified in the initial full search results (i.e. by title and abstract), or on retrieval of full-text effectiveness studies (some of which turned out to incorporate an economic analysis). This should actually be a strength of our approach, because we did not rely upon dedicated search terms or study design filters to identify potential economic evaluations, which may miss relevant studies.

Main limitations of the included studies

- There were only 3 published and relevant economic studies of these types of home safety programmes. This is in contrast to the relatively large number of cost analysis and cost-of-illness studies of childhood injury (e.g. seven from the USA)

- Sometimes very brief descriptions of economic analysis methods used, in most studies. This is especially the case for the cost-effectiveness analysis reported as a part of a paper mainly reporting effectiveness evaluation and results.

- Of the three studies, two had quite short time horizons (1 to 4 years), which may – if the effectiveness results are extrapolated into the future – overestimate the effectiveness (and cost-effectiveness) of the programmes; in particular the smoke-alarm giveaway programmes, where both the function of the device and batteries may deteriorate over time.

- No or very limited sensitivity analyses (only one study conducted a probabilistic sensitivity analysis; Ginnelly et al. 2005).

7.4. Further research

Further research is required of robust study design and sufficiently long term, preferably repeated follow up, which relates to the actual impact of interventions on injury rates in children.

It would be useful for future studies to use consistent measures for injury rates, installations rates, and knowledge and behaviour which may facilitate synthesis in the future. Where possible, these should not be self-reported measures although if these are to be used, their accuracy should tested in a sub-sample or pilot study.

Appendices

Appendix 1 Review Protocol

Titles

Long title:

An evaluation of the effectiveness and cost-effectiveness of the supply and/or installation of safety equipment and risk assessments for preventing unintentional injuries in the home to children and young people aged under 15

Short title:

Preventing unintentional injuries among under 15s in the home

Review team

This project will be conducted by a team from PenTAG. The team members, and their roles on the review, will be:

Dr Mark Pearson, Associate Research Fellow	Lead systematic reviewer. Project managing the delivery of the various parts of the project. Making key methodological choices within the systematic review of effectiveness studies, and the review of evidence about barriers and facilitators. Screening, appraisal and data extraction of included studies. Writing and editing drafts and final report.
Dr Ruth Garside, Senior Research Fellow	Second systematic reviewer. Screening, appraisal and data extraction of included studies. Writing and editing drafts and final report.
Tiffany Moxham, Information Specialist	Developing and conducting any formal searches (web-based, grey literature) for relevant reports. Writing up any relevant report methods sections.
Dr Rob Anderson, Deputy	Overall responsibility for delivery to NICE, ensuring

Director (PenTAG)	report meets agreed protocol, discussing and agreeing with NICE any divergences from protocol. Conducting any original economic analysis, and leading the systematic review of cost-effectiveness evidence. Writing and editing drafts and final report.

Key deliverables and dates

Deliverable	Date	Comments back from NICE CPHE by:
Draft review protocol	19th February	25th February
Draft search strategy	27th February	4th March
Signing-off of review protocol and search strategy	5th March	
Interim progress meeting/ teleconference (1) – Including discussion of the feasibility, value and focus of a review of barriers and facilitators and any economic modelling	8th May (2:00-3:30pm)	
Interim progress meeting/ teleconference (2) – Including discussion of the nature of the emerging evidence and issues to do with how best to summarise and synthesise it	16th June (2:00-3:30pm)	
Draft Reports (main reviews, including cost-effectiveness, with draft evidence statements)	13th July	20th July
Draft Report[11] (barriers & facilitators)	29th July	5th August
Draft Report[12] (economic modelling)	29th July	5th August

[11] Where a review of barriers and facilitators is agreed to be feasible and useful, via discussion between the Collaborating Centre and the relevant lead analyst and associate director at CPHE (see Interim progress meeting (1))

[12] Where an original economic analysis is agreed to be feasible and useful, via discussion between the Collaborating Centre and the relevant lead analyst and associate director at CPHE (see Interim

Final Report (main reviews with final evidence statements)	12th August	
Final report (barriers & facilitators)	12th August	
Final Report (economic modelling)	12th August	
PHIAC 1st meeting	11th September	

Clarification of scope

Populations

Groups that will be covered

Children and young people aged under 15, particularly those in disadvantaged circumstances (for example, those living with families on a low income, living in overcrowded housing or with a lone parent).

Parents and carers of children and young people aged under 15.

Groups that will not be covered

Anyone aged 15 or older, except parents and carers of children and young people aged under 15 (where they are the focus of research about their children, or where they are targeted as key agents to reduce unintentional injuries in their children).

Interventions /Activities that will be covered

Activities

Activities/measures that will be covered

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progress meeting (1)). If no economic analysis is deemed to be feasible or useful, the timelines for the other reviews may be renegotiated.

NICE is developing a range of public health guidance to prevent unintentional injuries among children and young people aged under 15. This protocol relates to producing evidence about interventions which prevent such injuries in the home.

In parallel with this work, NICE will also be developing public health guidance (also developed using the intervention development process) to prevent unintentional injuries on road, street and other external environments. There will also be public health guidance (developed through the programme guidance process) focusing on the broader legislative/regulatory and related activities which aim to prevent unintentional injuries in children. The present guidance will complement these publications and will focus on the following interventions in the home, either combined or delivered separately:

a) Supply and/or installation of safety equipment (free of charge or at a reduced cost) inside of a home

b) Home risk assessments[13], where the unintentional injury outcomes in children and young people aged under 15 can be disaggregated

Activities/measures that will not be covered

a) Policy and legislative interventions

b) National and local media campaigns

c) Educational interventions (unless delivered alongside the included activities listed above)

d) Reward and incentive schemes, hazard and risk counselling (unless delivered alongside the included activities listed above)

[13] Defined as: A systematic assessment of a home to identify potential hazards, evaluate the risk, and provide information or advice on appropriate actions to reduce those risks. The assessment may either be by a trained assessor visiting the home, or by a householder assessing their own home

e) Design, manufacture and measures of efficacy of safety equipment

Key questions

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?

Reports

Report 1 will include Reviews 1 (effectiveness) and 2 (cost-effectiveness). Report 2 will include Review 3 (barriers and facilitators) if it is to be included as a separate review. Report 3 will include an economic analysis of one or more types of intervention (if deemed feasible and useful). The division of resources for the production of each of the reports will be finalised in discussion with the relevant lead analyst and associate director at NICE CPHE in accordance with what is deemed feasible and useful.

Reviews

Aims, key review questions and key outcomes

Report 1: Systematic review of effectiveness and cost-effectiveness studies

a) Aim

To identify, critically appraise, summarise and synthesise evidence relating to the effectiveness (review 1) and cost-effectiveness (review 2) of the specified types of interventions in the home aimed at reducing unintentional injuries in children and young people aged under 15.

b) Key review questions

Review 1 (effectiveness)

a. What is the effectiveness (in terms of preventing and reducing unintentional injuries in children) of interventions involving the supply (free of charge or at a reduced cost) and/or installation of home safety equipment or devices?

b. What is the effectiveness (in terms of reducing the number or severity of unintentional injuries in children) of home risk assessments?

c. What are the factors which either enhance or reduce the effectiveness of interventions involving the supply and/or installation of home safety equipment and/or home risk assessments, or which help or hinder their implementation?

Expected outcomes:

a) Changes in injuries and deaths in children and young people aged under 15.

b) Changes in knowledge, attitude, skills and behaviour in relation to preventing unintentional injuries among children and young people aged under 15 in the home.

c) The rates of supply, correct installation and proper maintenance of safety equipment resulting in a reduction in unintentional injuries among children and young people aged under 15 in the home.

Review 2 (cost-effectiveness)

a. What is the cost-effectiveness of interventions involving the supply and/or installation of home safety equipment?

b. What is the cost-effectiveness of home risk assessments?

c. What are the main causal relationships which seem to explain how the different combinations of resources (and levels of costs) of these interventions are related to intended outcomes?

In addition, for Review 2:

- costs and/or resource use
- cost-benefit estimates
- cost-effectiveness ratios

Report 2: Systematic review of evidence about 'barriers and facilitators'

Production of a separate review of barriers and facilitators is conditional upon (a) the number of studies identified for inclusion in the effectiveness and cost-effectiveness reviews (the "main reviews"); and (b) the number of studies eligible for inclusion in a "barriers and facilitators" review. The number, range, and complexity of the identified studies will be discussed at the first interim progress meeting (8th May) with regard to the feasibility of producing a separate barriers and facilitators reviews. If the production of a set of high quality reviews under each of these headings is deemed unmanageable given the time and resources available, then a separate review of barriers and facilitators will not be conducted. However, in order to still answer the "barriers and facilitators" review question – it is proposed that relevant observations from the 'Discussion' and 'Conclusion' sections of all the included effectiveness papers will be extracted as part of that review (e.g. where authors try to explain why their evaluated outcomes differed from others, or differed from what they expected).

a) Aim

To identify, critically appraise, summarise and synthesise qualitative and/or quantitative evidence relating to contextual or other factors which either enhance or reduce the effectiveness of interventions involving the supply and/or installation of home safety equipment and/or home risk assessments, or which help or hinder their implementation.

b) Key review questions

What are the factors which either enhance or reduce the effectiveness of interventions involving the supply and/or installation of home safety equipment and/or home risk assessments, or which help or hinder their implementation?

Methods

1.1 Overview

An electronic search of relevant bibliographic databases, and also selected websites, will be conducted in order to identify relevant primary research (to be supplemented by communication with experts and/or organisations involved in the relevant research or policy areas).

1.2 Search process and methods

- To review published literature and relevant unpublished/grey literature in order to identify ineffective as well as effective interventions and approaches, as far as time and other resources allow.

- To include all relevant primary research that meet the inclusion criteria (see section 1.3). Searches will be conducted in the following databases:

  The following databases will be searched.

  From the "core databases":

  - ASSIA (Applied Social Science Index and Abstracts)
  - CINAHL
  - Database of Abstracts of Reviews of Effectiveness (DARE); NHS EED; HTA (all in the CRD database)
  - HMIC (or Kings Fund catalogue and DH data)
  - MEDLINE

- PsycINFO
- Social Science Citation Index
- Cochrane Database of Systematic Reviews [predominantly for reference checking]
- EconLit

From the "topic-specific databases":

- SafetyLit
- EPPI Centre databases
  - Bibliomap
  - DoPHER
  - TRoPHI
- The Campbell Collaboration

- Search terms – ***See Annex A***

Websites of the following relevant organisations will also be searched for published and unpublished research:

- Child Accident Prevention Trust (http://www.capt.org.uk)
- Children in Wales (http://www.childreninwales.org.uk/areasofwork/childsafety)
- Injury Observatory for Britain & Ireland (http://www.injuryobservatory.net)
- Public Health Observatory website for the South West (lead on Injuries) http://www.swpho.nhs.uk/)
- The Royal Society for the Prevention of Accidents (http://www.rospa.org)
- International Society for Child and Adolescent Injury Prevention (http://www.iscaip.net/)

- Integris (EU Injuries programme for coordinating injury data) (http://www.rp7integris.eu/en/pages/home-1.aspx)
- Eurosafe

And may include the following, should time and resources allow:

- Scottish Executive
- Welsh Assembly Government
- Expert contacts in the relevant policy/practice areas as well as key researchers of these types of intervention will also be consulted

1.3 Study selection

Inclusion criteria (common to all reviews):

Studies published from 1990

Studies published in English language

Studies conducted in OECD countries

Criteria specific to Review 1 (effectiveness):

Inclusion criteria:

Evaluations (prospective or retrospective) of interventions involving the supply and/or installation of home safety equipment and/or home risk assessments using comparative designs (randomized controlled trials, non-randomized controlled trials, before and after studies, or natural experiments)

Studies reporting the relevant injury outcomes (see page 8) in children (or in both adults and children but with the outcomes for children shown separately). This inclusion criteria will only be applied at full-text assessment stage. In other words, no papers will be excluded on the basis of age at the title and abstract screening stage.

Where a study reports relevant outcomes related to an age range which overlaps with, but is not restricted to, the focus for this review (for example, aged 5-18 rather than under 15), it will be included only where the majority are of the appropriate age.

Exclusion criteria:

Empirical studies which only document interventions and related outcomes without evidence regarding injury outcomes (see page 8) prior to or without the intervention.

Empirical studies which do not separately report injury-related outcomes for children or young people aged under 15.

Criteria specific to Review 2 (cost-effectiveness):

Inclusion criteria:

Full economic evaluations of relevant types of intervention, and high quality costing studies conducted in the UK or countries of a similar level of economic development.

Exclusion criteria:

Cost-of-illness studies, or other studies which do not involve assessing the cost and related benefits/effectiveness of particular interventions (or class of intervention).

Criteria specific to Review 3 (barriers & facilitators):

Inclusion criteria:

Primary qualitative research involving the analysis of written or spoken speech/evidence, regarding attitudes towards, or experiences of, the relevant interventions; OR

Quantitative or qualitative surveys of attitudes towards, or experiences of the relevant interventions.

Exclusion criteria:

> Research which does not involve the collection and analysis of qualitative data using established qualitative research methods[14].

Study selection process

Assessment for inclusion will be undertaken initially at title and/or abstract level (to identify potential papers/reports for inclusion) by a single reviewer (and a sample checked by a second reviewer), and then by examination of full papers. Where the research methods used are not clear from the abstract, assessment will be based upon a reading of the full paper. Any relevant systematic reviews will be used first as a further source of references for primary studies, but where there is a recent and high quality systematic review that substantively answers an aspect of the review question(s), we shall include the review, updating and extending it if it is considered feasible to do so. All such decisions regarding the utilisation of systematic reviews will be made in consultation with the NICE CPHE team.

If there are a large number of includable studies, such that a high quality review of them all would not be feasible within the time and resources available, then studies may be excluded from the full review on the basis of the study quality and/or applicability to the UK context. The reasons for such exclusions will be discussed and agreed with the CPHE team at the interim progress meeting (8th May).

1.4 Quality assessment and data extraction

All included studies will be quality assessed using the checklists in the *Methods for development of NICE public health guidance 2006* where these are appropriate (so

[14] Primary qualitative research designs which use recognised methods of data collection and analysis (including, but not limited to, observational methods, interviews and focus groups for the former and grounded theory, thematic analysis, hermeneutic phenomenological analysis, discourse analysis etc. for the latter).

if, for example, one is not available for a particular included study design we will seek a valid checklist from other sources such as CRD or CASP). Any departure from the methods manual will be discussed and agreed with the NICE CPHE Team. Data extraction and quality assessment will be conducted by a single reviewer, and checked by a second reviewer for a sample of studies, as agreed with the NICE CPHE team.

1.5 Data synthesis and presentation, including evidence statements

Data synthesis and presentation, including evidence statements will be conducted according to the procedures outlined in the *Methods for development of NICE public health guidance 2006*. Key choices in how to synthesise the included evidence, or in how to develop evidence statements, will be discussed with the relevant analysts at CPHE.

Report 3: Economic analysis of a selected type of intervention

(IF FEASIBLE AND USEFUL)

c) Aim

For a specific type(s) of intervention(s), to assess the relationship between the amounts and combinations of resources and costs, and the levels of resulting benefits and/or effectiveness (related to avoiding unintentional injuries to, and death in, children).(ie. To look at the costs and benefits of all impacts of an intervention in relation to unintentional injuries including death in children).

d) Perspective

The analysis will adopt both a health and Personal Social Services perspective, and a broader public sector perspective in relation to costs and benefits (as in *Methods for development of NICE public health guidance 2006)*. Injury-related health outcomes will be expressed in terms of QALYs or life-years gained/lost wherever possible. If good data are available, and where appropriate, impacts in terms of other outcomes, such as lost school days may also be part of a broader cost-consequence approach to analysis. Also, if sufficient good data are available, outcomes may be expressed in monetary terms and an assessment of whether benefits exceed costs made.

Appendix 2 Search Strategy

Searches were performed to find relevant primary research using a comparative design, qualitative studies, and cost-effectiveness studies. The reference list of systematic reviews of found studies will also be utilised. Searches were conducted in medical, social science and policy databases along with a search for grey literature.

All searches were limited to those in English published since 1990, where possible. No study design filters were applied.

PART 1: Bibliographic Databases

The following databases were searched. Use of "core and topic specific" based on NICE guidance wording:

From the "core databases":

- ASSIA (Applied Social Science Index and Abstracts)
- CINAHL
- Database of Abstracts of Reviews of Effectiveness (DARE); NHS EED; HTA (all in the CRD database)
- HMIC (or Kings Fund catalogue and DH data)
- MEDLINE
- PsycINFO
- Social Science Citation Index
- Cochrane Database of Systematic Reviews [predominantly for reference checking]
- EconLit

From the "topic-specific databases":

- SafetyLit
- EPPI Centre databases
    - Bibliomap
    - DoPHER

- TRoPHI
- The Campbell Collaboration

Search Strategy

Search Strategies for the bibliographic databases were based on text words and thesaurus headings applicable to the individual database. The searches were carried out in 3 parts but the results were de-duplicated against each other before the screening process. The list of named devices included in the search terms was compiled in collaboration with the NICE CPHE Information Scientist team so as to strike an appropriate balance (given the time and resources available) between sensitivity and specificity. It included suggestions made through the stakeholder consultation process.

The Medline search strategy examples follow and were "translated" according to the appropriate thesaurus terms for each individual database. Where a database does not have a thesaurus or does not have a search facility to incorporate thesaurus searching, text words were used.

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

Search a): Safety Devices AND injuries in the home

1. (accident* or injur*).tw.
2. (home* or house* or residen*).tw.
3. 1 and 2
4. Accidents, Home/
5. exp Accident Prevention/
6. 1 or 4 or 5
7. Protective Devices/
8. (safety adj2 (device* or equipment* or appliance*)).mp.
9. ((fire* or smoke* or carbon or CO) adj2 alarm*).tw.
10. ((fire* or smoke* or carbon or CO) adj2 detector*).tw.
11. (temperature adj3 (restrictor* or restricter*)).tw.
12. (thermostat* or TMV).tw.
13. ((cut-off or cut off) adj2 (tap* or valve*)).mp. [mp=title, original title, abstract, name of substance word, subject heading word]
14. water AJD2 tap*.tw.
15. (temperature adj3 (control* or regulat*)).tw.
16. (anti-scald* or anti scald*).mp.
17. (stair* gate* or stair* guard*).mp.
18. ((bed* or bath*) adj3 (guard* or gate*)).mp.
19. fireguard*.mp.
20. (fire* adj2 guard*).mp.
21. door* guard*.tw.
22. ((oven* or stove*) adj2 guard*).mp.
23. ((child* or resistant* or lock*) adj4 container*).tw.
24. ((cupboard* or appliance*) adj4 (lock* or latch*)).tw.

25. ((window* or door*) adj2 (locks or latch*)).tw.
26. rail guard*.tw.
27. (safe* adj2 (glass* or film)).tw.
28. (wall adj2 strap*).tw.
29. (door adj3 (cover* or jamm* or stop*)).tw.
30. (bath* adj4 (mat* or rail* or handle*)).tw.
31. (corner adj2 cushion*).tw.
32. ((electrical* or blind*) adj2 cord).tw.
33. ((outlet or radiator*) adj2 cover*).tw.
34. (thermometer* adj2 room*).tw.
35. socket* cover*.tw.
36. (window* adj2 (guard* or safe* or mechanism* or bar*)).mp.
37. ((poison adj2 cupboard) or harness).tw.
38. or/7-30
39. 6 and 38
40. limit 39 to (english language and yr="1990 - 2009")
41. (animals not humans).sh.
42. 40 not 41

Search b): Type of scheme AND injuries in the home

1. (accident* or injur*).tw.
2. (home* or house*).tw.
3. 1 and 2
4. Accidents, Home/
5. exp Accident Prevention/
6. 4 or 3 or 5
7. (giveaway* or give-a-way).mp.
8. distribut*.mp.
9. discount*.mp.
10. free.tw.
11. home deliver*.tw.
12. (low-cost* or (low adj2 cost*)).tw.
13. loan*.tw.
14. (subsidized or subsidised).tw.
15. (fit or fitted).tw.
16. instal*.tw.
17. (provision* or provid*).mp.
18. suppl*.tw.
19. scheme*.tw.
20. or/7-19
21. 6 and 20
22. (device* or equipment*).mp.
23. 21 and 22
24. limit 23 to (english language and yr="1990 - 2009")
25. (animals not humans).sh.
26. 24 not 25

Search c): Home Assessments AND injuries

1. (accident* or injur*).tw.
2. (resident* or home* or house*).tw.
3. 1 and 2
4. Accidents, Home/
5. exp Accident Prevention/
6. 4 or 3 or 5
7. (home adj4 visit*).tw.

8. inspect*.tw.
9. visit.tw.
10. (safety adj2 (assessment* or check*)).tw.
11. home visit*.tw.
12. safety consult*.tw.
13. (home adj2 (assessment* or evaluation*)).tw.
14. 8 or 13 or 9 or 11 or 7 or 12 or 10
15. 6 and 14
16. limit 15 to (english language and yr="1990 - 2009")
17. (animals not humans).sh.
18. 16 not 17
19. (1 or 5) and 2
20. 19 or 4
21. (visit* or inspection* or assessment* or check* or evaluation* or (safety adj consult*)).tw.
22. 20 and 21
23. limit 22 to (english language and yr="1990 - 2009")
24. 23 not 17
25. 18 or 24

Part 2: Organisation web-sites and in-house databases:

Websites of the following relevant organisations were searched for published and unpublished research:

- Child Accident Prevention Trust (http://www.capt.org.uk)
- Children in Wales (http://www.childreninwales.org.uk/areasofwork/childsafety)
- Injury Observatory for Britain & Ireland (http://www.injuryobservatory.net)
- Public Health Observatory website for the South West (lead on Injuries) (http://www.swpho.nhs.uk/)
- The Royal Society for the Prevention of Accidents (http://www.rospa.org)
- International Society for Child and Adolescent Injury Prevention (http://www.iscaip.net/)
- Integris (EU Injuries programme for coordinating injury data) (http//www.rp7integris.eu/en/pages/home-1.aspx)
- Department for children schools and families (http://www.dcsf.gov.uk/pns/DisplayPN.cgi?pn_id=2009_0036)
- Eurosafe (http://www.eurosafe.eu.com/csi/eurosafe2006.nsf/wwwvwcontent/l3childsafety-cxvbcx.htm)
- Vauxhall home safety initiative (http://www.vnc.org.uk/vhsi/vhsi.htm)

- Collaboration for Accident Prevention and Injury Control (CAPIC) (http://www.capic.org.uk/)
- Health and Safety Executive (http://www.hse.gov.uk/)
- Communities and Local Government (http://www.communities.gov.uk/fire/firesafety/prevention/)

PART 3: Additional Searches

Additional "targeted" searches were performed of the following named programmes on Medline and using an Internet search engine (Google):

safe block, dangerpoint, care and repair, sure start, early start, project safe care, safe at home, child injury prevention program (SCIPP), Let's Get Alarmed!, family safety scheme, safe place project, eastside childsafe project, Care and Repair Programme, Handy Person Scheme, Lifetime Homes, Lifetime Neighbourhoods, Safe @home, child safe: safer Cardiff.

PART 4: Citation and Reference Searching

The reference lists of systematic reviews, key reports, and included studies were searched for additional papers.

Appendix 3 OECD countries

Austria	Korea
Australia	Luxembourg
Belgium	Mexico
Canada	Netherlands
Czech Republic	New Zealand
Denmark	Norway
Finland	Poland
France	Portugal
Germany	Slovak Republic
Greece	Spain
Hungary	Sweden
Iceland	Switzerland
Ireland	Turkey
Italy	United Kingdom
Japan	United States

Source: http://www.oecd.org/

Appendix 4 Screening checklist

	Title/abstract criteria
1	Not addressing the supply and/or installation of home safety equipment (free of charge or at a reduced cost) inside of a home OR the provision of home risk assessments[15]
2	Not addressing admissions to hospital or preventable deaths (in children under 15) related to unintentional injuries in the home OR changes in knowledge, skills and behaviour in relation to preventing unintentional injuries OR the rates of supply, correct installation and proper maintenance of safety equipment OR the costs associated with interventions to prevent such outcomes OR barriers & facilitators to such interventions
4	Not a comparative design OR full economic evaluation OR high quality costing study OR primary qualitative research OR survey of attitudes/experiences
5	Not set in an OECD country
6	Published prior to 1990
7	Not in English
8	Duplicate
9	Applicability fatally flawed (e.g. setting completely inappropriate)
10	Maybe (Discuss with 2nd reviewer)
A	Review for refs [this must be applied in addition to an exclusion criteria]
	Further criteria at full text stage
1	Outcomes not reported separately for children under 15 years (or where the majority are not under 15 years)
2	Not a comparative design OR economic evaluation OR high quality costing study OR findings do not relate to barriers and facilitators
3	Unobtainable

[15] Defined as: A systematic assessment of a home to identify potential hazards, evaluate the risk, and provide information or advice on appropriate actions to reduce those risks. The assessment may either be by a trained assessor visiting the home, or by a householder assessing their own home

Appendix 5 Evidence tables: Effectiveness

Study details	Population and setting	Method of allocation to intervention/control	Outcomes, subgroups and methods of analysis	Notes
Authors Bablouzian et al **Year (of publication)** 1997 **Aim of study** To evaluate the effectiveness of a community based childhood injury prevention program **Study design** BA **Internal validity score** [++, + or -] - **External validity score** [++, + or -] -	**Source area/s** Boston, Massachusetts USA (developed, private HC) **Setting** Home visits **Location** Urban **Population demographics** **Age** NR **% Female** 100 **Ethnicity** Black 67% Latina 25% White 25% Other 3% **Other socioeconomic variables** Low income (mean monthly $614). "High risk" pregnant women in areas with the highest child mortality rates. **Study year** 1994 **Eligible population:**	**Method of allocation** Women are referred to the Healthy Baby Program based on risk assessments during prenatal care visits at neighbourhood centres and As pilot study, participants were selected because both initial and discharge assessment data was available. **Intervention/s description** Healthy Baby Program (initiated 1987) **Type of intervention** Community based home risk assessment Education and counselling Dispensing specific safety supplies – Poison centre stickers for phones, outlet plugs for unused sockets, safety latches for windows and doors, syrup of ipecac. Risk assessment Using a standardised tool – the HomeSafe report (developed by Massachusetts Dept Of	**Outcomes** 14 / 44 home hazards were reassessed on discharge of clients at follow up (7 are the minimum safety standard for State Sanitary code, and 7 designated High Priority by Dept PH). **How is the data for each outcome collected?** Using a standard SafeHome Report questionnaires - 68% of items are assessed by observation or measurement and the rest by parent self report. **Did the study collect data on and report resource use and/or costs** No **Timing of data collection** January – June 1994 **Method of analysis** Pre-test post-test design to assess differences between initial and discharge home assessment. McNemar's test for matched	**Limitations identified by author** No control group as delivered as part of a publicly funded program. Selection bias cannot be ruled out due to differential sizes for each hazard assessed. Observer bias possible as responsible fro both before and after data collection. Longer FU required to see if this is sustainable over time. Generalisability is limited by the characteristics of the sample. **Limitations identified by review team** Only 13 items reported although stated that 14 were assessed. Very basic demographic details are given. Convenience sample used with no indication about whether this is reflective of the targeted population overall. No measure of uncertainty provided. Note that it is no longer recommended by the AAP that syrup of ipecac be kept in the home. **Evidence gaps and/or recommendations for future research**

Study details	Population and setting	Method of allocation to intervention/control	Outcomes, subgroups and methods of analysis	Notes
	Those receiving Health Baby programme. **Selected population:** Receiving healthy baby programme. Having initial and discharge data for 14 key questions on a Risk assessment questionnaire. No data about people on the program who failed to meet this criteria. **Excluded population/s:** (as above) NR	PH) which asses 44 potential home hazards in 6 categories – kitchen safety, bathroom safety, child area safety, general safety, safety supplies & safety practices. **Other components of scheme/intervention?** Undertaken as part of routine home visits for pregnant women. Home visitors also promoted the use of child restraint systems in cars and referred to a car seat loan service for new mothers. **Intervention delivered:** – When/where At home – By whom Nurses and advocates – How often Once Mean time to follow up was 3.5 months **<u>Control/comparison/s description</u>** Before and after study **<u>Sample sizes</u>** **Total n=** 72	pairs of dichotomous data conducted for each hazard. All analyses conducted using SAS. **Were there any subgroups for which outcomes were reported?** No **If so, which subgroups were outcomes reported for?** NA **Were the subgroup analyses prespecified?** NA	Cost effectiveness of the program **Source of funding** NR **Did the study collect data on and report information about barriers and facilitators to/of effectiveness?** No **Observations from the Discussion section regarding barriers & facilitators** None

Study details	Population and setting	Method of allocation to intervention/control	Outcomes, subgroups and methods of analysis	Notes
		Intervention n= 72 **Control n=** n/a **Baseline comparisons** N/A. **Study sufficiently powered?** NR		

Outcomes: Bablouzian et al, 1997

On average 85% of homes that did not show statistically significant changes were assessed as safe at both initial and follow up test. For 5/13 hazards, a significant increase in resolved hazards at follow up was seen.

Hazard	N	% safe initial and follow up	% Resolved	P value	Supplied free?
Access to windows blocked	53	75	11	NS	
Children ride buckled in autos	48	75	15	0.001<p<0.01	N – referral to loan
Electrical cords in safe condition	44	95	4	NS	
Hall and stairway lighting adequate	51	92	2	NS	
Massachusetts Poison Centre sticker on telephone	50	54	32	0.001<p<0.01	Y
Outlet plugs in all unused electrical outlets	47	32	26*	0.01<p<0.05	Y
Safe hot water temperature	49	82	12	NS	
Safety latches on cupboards and drawers	46	37	24	0.001<p<0.01	Y
Secure screens on windows	51	88	6	NS	
Syrup of ipecac in home	50	42	40	p<0.001	Y
Stairs and balconies sturdy	51	84	8	NS	
Two unobstructed exits	49	75	12	NS	
Working smoke detectors	49	86	6	NS	

Attrition rates: NA

Study details	Population and setting	Method of allocation to intervention/control	Outcomes, subgroups and methods of analysis	Notes
Authors Babul et al **Year (of publication)** 2007 **Aim of study** To evaluate the effectiveness of an infant (age 2-12 months) home safety programme **Study design** RCT **Internal validity score** [++, + or -] + **External validity score** [++, + or -] +	**<u>Source area/s</u>** **Country** Canada **Setting** Participants' homes **Location** Urban/suburban – 82% Rural – 18% **<u>Population demographics</u>** **Age** Mother's age <20 years: Kit+home visit – 10.6% Kit only – 8.6% Control – 9.9% (p=0.78) **% Female** Kit+home visit – 47.2% Kit only – 49.7% Control – 48.2% (p=0.89) **Ethnicity** Not stated **Other socioeconomic variables** Single parent: Kit+home visit – 11.6% Kit only – 12.8% Control – 8.5% (p=0.40)	**Method of allocation** Participants randomised to one of three groups when infant brought for immunisation at age 2 months: 1) Home visit plus safety kit 2) Safety kit alone 3) Control (no home visit or safety kit, but received standard child health services) **<u>Intervention/s description</u>** **Type of intervention** Home risk assessment & supply or supply only **Other components of scheme/intervention?** None **Intervention delivered:** Home visit conducted by community health nurse walking through each room in the participant's house, using a 41-item checklist (based on Bablouzian et al, 1997) to identify potential hazards. Where identified, parents were taught how to	**<u>Outcomes</u>** Results only presented for outcomes at 12 months. **How is the data for each outcome collected?** Self-report questionnaire (unvalidated) administered by community nurse **Other relevant outcomes** None. **Did the study collect data on and report resource use and/or costs** (of compared interventions)? No **Timing of data collection** 2, 6 and 12 months following intervention **Method of analysis** No ITT analysis conducted. Logistic regression of safety kit item use adjusted for income. χ^2 statistic used to assess differences between trial arms. **Were there any subgroups for which outcomes were reported?** No **If so, which subgroups were outcomes reported for?** Not applicable	**Limitations identified by author** Apparent effectiveness of water temperature test card may be related to assistance given by community nurses to test water temperature (parents' self-report of behaviour may therefore have focused upon this area). Outcomes measured by parental self-report rather than observation. Community nurses' role in distributing safety kits prevented them from being blinded to intervention and control groups. 12 months may not be a sufficiently long period in which to evaluate changes in behaviour. **Limitations identified by review team** None in addition to those identified by the authors. **Evidence gaps and/or recommendations for future research** Evaluation of the effectiveness of intervention programmes that involve *multiple* (rather than single) visits ('a successful home visitation programme may require a number of visits to develop a therapeutic relationship to address broader maternal and child health issues' (p.115) **Source of funding** Not stated

Study details	Population and setting	Method of allocation to intervention/control	Outcomes, subgroups and methods of analysis	Notes
	First baby: Kit+home visit – 49.7% Kit only – 51.0% Control – 47.8% (p=0.82) <High school education: Kit+home visit – 36.4% Kit only – 41.4% Control – 33.0% (p=0.255) Rent home: Kit+home visit – 37.2% Kit only – 38.0% Control – 43.1% (p=0.45) Household income <$20000 Kit+home visit – 14.3% Kit only – 21.7% Control – 14.5% (p=0.36) **Study year** 2001-2003 **Eligible population:** Parents of a new infant born at Chilliwack General Hospital and resided in the district of Chilliwack in the period April 2001 to August 2003.	remove or modify these hazards. Nine-item home safety kit contained: smoke alarm, 50% discount safety gate coupon, corner cushions, cupboard locks, blind cord windups, water temperature card, doorstoppers, electrical outlet covers, and poison control sticker. **Control/comparison/s description** Standard community health unit services for families with newborns (including growth assessment, advice and information on feeding, child development and immunisation) **Sample sizes** **Total n=** 600 **Intervention (Kit + HV) n=** 202 **Intervention (Kit only) n=** 206 **Control n=** 192 **Baseline comparisons** No statistically significant differences between trial	**Were the subgroup analyses prespecified?** Not applicable	**Did the study collect data on and report information about barriers and facilitators to/of effectiveness?** No **Observations from the Discussion section regarding barriers & facilitators** None

Study details	Population and setting	Method of allocation to intervention/control	Outcomes, subgroups and methods of analysis	Notes
	Selected population: Attempts were made to recruit all eligible parents within the study period (26% declined to participate) **Excluded population/s:** Non-English speakers Residents of a First Nations reserve Parents of infants who were transferred to a tertiary facility in the neonatal period.	arms on a range of socio-economic indicators. **Study sufficiently powered?** Yes. Sample size of 200 per trial arm achieved so as to allow 80% power and type I error of p=0.05 in detecting an absolute increase of 15% from a baseline of 30%.		

Outcomes

Question numbers in tables below refer to the following questions (obtained from study lead author, as these details not provided in the published paper):

1. Are halls and stairway lighting adequate (to prevent falls)?
2. Are hall and stairways cluttered?
3. Many injuries to babies have resulted from falls from high surfaces (i.e. change tables). Despite your best efforts, have you ever left your baby unattended for a split second?
4. How often, if ever, does your baby use a babywalker?
5. Does your toy chest have a lightweight lid, no lid or a safe closing mechanism?
6. Do you always keep small items and food that can choke your child out of his or her reach?
7. Do your blinds have long blind-cords that are accessible to your child?
8. Are coffee, hot liquids and hot foods placed out of your childs reach?
9. Do you have a working fire extinguisher?
10. Is your home hot water adjusted to a safe temperature?
11. Are medicine and vitamins stored beyond your childs reach?
12. Are plants placed out of your childs reach?
13. Is your child always watched by an adult while in the tub?
14. Are pools on your property or neighbourhood fully protected (i.e. fenced) from use by unsupervised children?

Parental self-reported safety behaviours and removal of hazards at 12 months (adjusted for income and baseline measure of dependent variable) - Kit only vs. control:

Question no.	Intervention (Kit only) n (%)	Control n (%)	Odds ratio (95% CI)
1	161 (91%)	144 (98.6%)	2.90 (0.25, 34.10)
2	152 (93.8%)	135 (93.8%)	0.91 (0.34, 2.42)

Study details	Population and setting	Method of allocation to intervention/control	Outcomes, subgroups and methods of analysis	Notes

3	89 (55.3%)	69 (46.6%)	1.23 (0.74, 2.06)
4	140 (86.4%)	117 (79.1%)	1.90 (1.00, 3.62)
5	139 (89.1%)	126 (87.5%)	1.36 (0.61, 3.00)
6	136 (83.4%)	134 (91.2%)	0.55 (0.27, 1.14)
7	145 (90.1%)	125 (85.6%)	1.79 (0.86, 3.71)
8	158 (96.9%)	147 (98.7%)	0.56 (0.10, 3.17)
9	94 (58.0%)	98 (66.2%)	0.86 (0.48, 1.57)
10	113 (69.3%)	80 (53.7%)	2.21 (1.32, 3.69)
11	160 (98.2%)	147 (98.9%)	3.05 (0.26, 35.32)
12	123 (76.9%)	112 (76.2%)	1.12 (0.62, 2.04)
13	159 (97.5%)	145 (97.3%)	0.91 (0.20, 4.21)
14	105 (65.2%)	104 (72.2%)	0.85 (0.49, 1.47)

Parental self-reported safety behaviours and removal of hazards at 12 months (adjusted for income and baseline measure of dependent variable) - Kit+home visit vs. control:

Question no.	Intervention (Kit + home visit) n (%)	Control n (%)	Odds ratio (95% CI)
1	169 (98.8%)	144 (98.6%)	1.25 (0.17, 9.32)
2	160 (94.7%)	135 (93.8%)	1.44 (0.51, 4.09)
3	84 (49.4%	69 (46.6%)	1.15 (0.69, 1.92)
4	147 (85.0%)	117 (79.1%)	1.53 (0.83, 2.82)
5	158 (93.5%)	126 (87.5%)	2.31 (0.97, 5.49)
6	150 (86.7%)	134 (91.2%)	0.68 (0.32, 1.42)
7	150 (87.7%)	125 (85.6%)	1.26 (0.64, 2.49)
8	167 (97.1%)	147 (98.7%)	0.68 (0.11, 4.29)
9	110 (64.0%)	98 (66.2%)	1.22 (0.67, 2.21)
10	121 (69.9%)	147 (98.7%)	2.65 (1.57, 4.46)
11	171 (98.8%)	80 (53.7%)	1.20 (0.16, 8.91)
12	136 (79.1%)	112 (76.2%)	1.90 (1.03, 3.52)
13	172 (99.4%)	145 (97.3%)	3.51 (0.36, 34.31)
14	112 (65.1%)	104 (72.2%)	0.76 (0.44, 1.32)

Study details	Population and setting	Method of allocation to intervention/control	Outcomes, subgroups and methods of analysis	Notes

Safety kit item use at 12 months - Kit+Home Visit vs. Kit only, adjusted for income:

Safety kit items	Kit + home visit n (%)	Kit only n (%)	Odds ratio (95% CI)
Smoke alarm	111 (64.2%)	101 (61.6%)	1.15 (0.72, 1.83)
Stair gate coupon	57 (32.9%)	64 (39%)	0.80 (0.50, 1.27)
Blind cord windups	95 (54.9%)	82 (50.0%)	1.20 (0.77, 1.88)
Drawer latches	123 (71.1%)	106 (64.6%)	1.32 (0.82, 2.13)
Corner cushions	75 (43.4%)	69 (42.1%)	0.92 (0.58, 1.46)
Door stops	97 (56.1%)	86 (52.4%)	1.17 (0.75, 1.83)
Electrical outlet covers	157 (90.8%)	140 (85.4%)	1.51 (0.74, 3.06)
Water temperature test card	135 (78%)	104 (63.4%)	2.38 (1.42, 3.97)
Poison control emergency number	120 (69%)	98 (59.8%)	0.64 (0.40, 1.03)

Other relevant outcomes
None

Attrition details:
Home Visit+Kit – 29 (14%)
Kit only – 42 (20%)
Control – 42 (22%)

Study details	**Population and setting**	**Method of allocation to intervention/control**	**Outcomes, subgroups and methods of analysis**	**Notes**

Study details	Population and setting	Method of allocation to intervention/control	Outcomes, subgroups and methods of analysis	Notes
Authors Cagle et al **Year (of publication)** 2006 **Aim of study** To evaluate the effectiveness of a scald-prevention programme in a predominantly Spanish-speaking community. **Study design** BA **Internal validity score** [++, + or -] - **External validity score** [++, + or -] -	**<u>Source area/s</u>** **Country** USA **Setting** Participants' homes **Location** Not reported. **<u>Population demographics</u>** **Age** Not reported. **% Female** Not reported. **Ethnicity** Not reported. **Other socioeconomic variables** Homeowners – 75% Single-family dwellings – 63% Two-family dwellings – 33% Three-family dwellings – 4% Two-parent families – 88% Spanish primary language spoken – 96% Zip code accounted for one of the highest scald injury rates in the county. **Study year**	**Method of allocation** Not applicable. **<u>Intervention/s description</u>** **Type of intervention** Home risk assessment + supply & installation. **Other components of scheme/intervention?** Initial safety education workshops (held before recruitment to the home visit component) also included a focus group and exercises designed to encourage parents to discuss and consider home safety in relation to scald injuries. An educational pamphlet was also distributed. **Intervention delivered:** 'Children Safe at Home' project. Bi-lingual health educator conducted home risk assessment (21-item checklist relating to scald risks – 13 in kitchen, 8 in bathroom) whilst walking through the home with the parent(s). Identified scald	**<u>Outcomes</u>** Number of scald risks in households (assessed using safety checklist). Number of functioning anti-scaled devices in households. Scald injuries in children aged <6 years (burn registry). **How is the data for each outcome collected?** See above. **Other relevant outcomes** None. **Did the study collect data on and report resource use and/or costs** Not reported. **Timing of data collection** 6-9 months post-intervention **Method of analysis** Pre-post differences tested using *t*-test and Poisson distribution test. **Were there any subgroups for which outcomes were reported?** Not applicable. **If so, which subgroups were outcomes reported for?** Not applicable.	**Limitations identified by author** Small sample size – although note community's likely mistrust of the health care system, immigration issues, and fear of being reported to child protection services. No control group. Participants knew when visits would take place and therefore may have prepared their homes in advance. **Limitations identified by review team** Convenience sample. Limited baseline socio-economic data of participants. **Evidence gaps and/or recommendations for future research** Replication using experimental study design. **Source of funding** First 5 Fresno Country (state-funded programme that provides direct and indirect services to children aged 0-5). **Did the study collect data on and report information about barriers and facilitators to/of effectiveness?** Yes. **Observations from the Discussion section regarding barriers & facilitators** Greater involvement of community groups/ leaders in order to decrease suspicions about involvement with the programme. Implementing home risk assessments through home visiting programmes that are already established may

Study details	Population and setting	Method of allocation to intervention/control	Outcomes, subgroups and methods of analysis	Notes
	Not reported. **Eligible population:** Families in the target zip code were identified through a women's health centre, elementary school parents' groups, refugee and migrant service centres, high school teen parent groups, a perinatal addiction treatment centre,and the Mexican Consulate. **Selected population:** No inclusion criteria stated – convenience sample. Of the 'more than 900' parents who attended the initial home safety education workshops, 48 agreed to participate in the home visits and follow-up. **Excluded population/s:** Not reported.	risks and how to address them were discussed with the parent(s), anti-scald devices were supplied and the parent(s) assisted to install them. **Control/comparison/s description** Not applicable. **Sample sizes** **Total n=** 48 **Intervention n=** n/a **Control n=** n/a **Baseline comparisons** Not applicable. **Study sufficiently powered?** Not applicable.	 **Were the subgroup analyses prespecified?** Not applicable.	increase their acceptability and uptake.

Outcomes
Average number of scald risks in households:
Pre-intervention – 7 (+/- 2)
Post-intervention – 2 (+/-1)
Significant difference between pre- and post-intervention groups (95% CI, p<.01)

60% of the households in which anti-scald devices had been installed were in-situ and functioning at follow-up.

Admissions to hospital in children aged <=5 from the target population as a result of scalds:
In the 2 years prior to the intervention: 7 (equivalent to 137/100000 children aged 0-5)
In the 2 years after the intervention: 2 (equivalent to 59/100000 children aged 0-5)
Using Poisson distribution, significant difference between pre- and post-intervention groups (95% CI, p<.01)

Study details	Population and setting	Method of allocation to intervention/control	Outcomes, subgroups and methods of analysis	Notes
Other relevant outcomes None. **Attrition details:** Not applicable.				

Authors Carman et al **Year (of publication)** 2006 **Aim of study** To evaluate the effectiveness of a home safety consultation and provision of low-cost safety equipment in deprived localities. **Study design** BA **Internal validity score** [++, + or -] - **External validity score** [++, + or -] -	**<u>Source area/s</u>** **Country** England. **Setting** Parents' homes. **Location** (urban, rural) Not reported. **<u>Population demographics</u>** **Age** Not reported. **% Female** Not reported. **Ethnicity** Not reported. **Other socioeconomic variables** (where available) No data reported, but intervention area wards were more socio-economically disadvantaged than the control wards as it was only the socio-economically deprived wards that were eligible to receive the safety scheme through the Sure Start programme. (As a whole, the areas served by the Primary Care Trust in which the intervention was delivered are ranked 37th, 71st,	**Method of allocation** All parents with children aged under 5 who were registered with Sure Start in the eligible wards were allocated to the intervention group. No measures taken to address confounding. **<u>Intervention/s description</u>** **Type of intervention** Home safety assessment, supply & installation of safety equipment. Equipment supplied (not installed) by project workers: Bath mat, harness & reins, cupboard locks, corner cushions, adhesive multi-purpose lock, and electrical socket outlet covers. Equipment fitted by home care and repair technicians (as indicated by project worker's home risk assessment): Safety gates, fireguards, smoke alarms, kitchen cupboard locks, and	**<u>Outcomes</u>** **How is the data for each outcome collected?** A&E attendance data (excluding minor ailments) to the General Hospital within the study area. **Other relevant outcomes** None. **Did the study collect data on and report resource use and/or costs** (of compared interventions)? Yes. **Timing of data collection** Varied (between 1 and 3 years), as the intervention was implemented in different wards over a period of 3 years. **Method of analysis** ITT not conducted. No adjustments made for potential confounding variables. **Were there any subgroups for which outcomes were reported?** No. **If so, which subgroups were outcomes reported for?** Not applicable. **Were the subgroup analyses**	**Limitations identified by author** Families in both the intervention and control groups may have received home safety advice and education via national and local media, word of mouth and local safety events, thereby contaminating the groups' exposure. **Limitations identified by review team** Significant doubts over the methods used to evaluate outcomes: Unclear whether outcome data (A&E attendance, excluding 'minor ailments') is specifically for injuries resulting from unintentional injuries in the home or for *all* child attendances at A&E (whatever the aetiology). Attempting to link A&E attendances to the postcodes of the wards in which the intervention was delivered is a method with a high risk of inaccuracy. A&E attendance data for the under-5s is calculated from data pertaining to children (possibly aged up to 16, although this is not stated), i.e. the percentage of under-5s within each ward is used to calculate the percentage of A&E attendances from the raw data (by postcode) that would have been accounted for by under-5s – this assumes that A&E attendances are equally distributed throughout the childhood age range. Using only A&E attendance data alone is likely to miss out on less serious, but nevertheless important, childhood injuries incurred in the home. **Evidence gaps and/or recommendations for future research** None.

	and 92nd most deprived (out of 354 in England). 11.5% of Pendle's population, and 4.3% of Burnley's, are Pakistani). **Study year** 2001-2004 **Eligible population:** All parents in the eligible wards who had children aged under 5 years and who were registered with the designated Sure Start programmes were recruited to the intervention group. Parents in the remaining wards (more affluent and not eligible for this Sure Start programme) served as the control group. **Selected population:** As detailed under eligible population. **Excluded population/s:** None.	safety film for door glass panels. **Other components of scheme/intervention?** Part of a wider, multi-agency programme within the Primary Care Trust that delivered population-wide outreach and child injury prevention education. **Intervention delivered:** Structured home safety assessment conducted by project worker in order to identify areas where advice required and appropriate home safety equipment to supply and install. **<u>Control/comparison/s description</u>** No intervention. **<u>Sample sizes</u>** **Total n=** 1234 **Intervention n=** 1234 **Control n=** Not applicable **Baseline comparisons** Not reported, although it is noted that the control group were less socio-	**prespecified?** Not applicable.	**Source of funding** Not stated. **Did the study collect data on and report information about barriers and facilitators to/of effectiveness?** No. **Observations from the Discussion section regarding barriers & facilitators** Not applicable.

		economically disadvantaged. **Study sufficiently powered?** Not calculated.		

Outcomes

Number of Burnley and Pendle children aged under 5 attending A&E at Burnley General Hospital (excluding minor ailments):

Year	Intervention area	Control area	Total
2000/01	2012	1099	3111
2001/02	1982	1175	3157
2002/03	1732	1057	2789
2003/04	1551	900	2451
% reduction	22.9%	18.1%	21.2%

Proportion of Burnley and Pendle children aged under 5 attending A&E at Burnley General Hospital (excluding minor ailments):

Year	Intervention area	Control area
2000/01	36.0%	28.2%
2001/02	35.6%	31.4%
2002/03	35.0%	31.9%
2003/04	28.6%	24.2%

Other relevant outcomes
None.

Attrition details:
Not applicable.

Study details	Population and setting	Method of allocation to intervention/control	Outcomes, subgroups and methods of analysis	Notes
Authors Clamp & Kendrick **Year (of publication)** 1998 **Aim of study** To assess effectiveness of general practitioner advice about child safety, use of safety equipment and safe practices at home (and the provision of low cost safety equipment to low income families) **Study design** RCT **Internal validity score** [++, + or -] ++	**Source area/s** **Country** England **Setting** A single-handed general practice in Nottingham **Location** Urban **Population demographics** **Age** Not reported **% Female** Not reported **Ethnicity** Ethnic minority group: Intervention - 1.2% Control – 1.2% **Other socioeconomic variables** Single parent family: Intervention - 8.4% Control – 12.2% Not owner occupiers: Intervention - 24% Control – 18.3% Receiving means tested state benefits:	**Method of allocation** Randomised using random number tables **Intervention/s description** **Type of intervention** Discounted supply **Other components of scheme/intervention?** None **Intervention delivered:** Standardised advice and safety leaflets (regarding a range of home safety equipment) provided by general practitioner (mean length 20 minutes) during child health surveillance, opportunistically during other consultations, or the family was asked to make an appointment in order to receive the intervention. Families in receipt of means tested state benefits were offered discounted safety equipment - smoke alarm, window locks, cupboard locks, electric socket covers, door slam device (all available from	**Outcomes** Use of safety equipment was self-reported (questionnaire), although responses were validated by researcher home visit to a random sample of 10 families from each of the intervention and control groups (Kappa coefficients for consistency of responses to questionnaire and observed safety equipment use: 1 (for 21 questions) 0.75-0.99 (for 5 questions) 0.59-0.74 (for 6 questions) <0.60 (for 4 questions) **How is the data for each outcome collected?** Questionnaire on families' use of safety equipment; storage of sharp objects, cleaning equipment and medicines; risk factors for unintentional injury; sociodemographic factors. (Conducted by telephone, or by post if family had no phone) **Other relevant outcomes** Not applicable **Did the study collect data on and report resource use and/or costs** (of compared interventions)? No **Timing of data collection**	**Limitations identified by author** Self-reporting of behaviour, but consistency of observed and self-reported behaviours was high in random sample where home visit conducted. Short follow-up period (6 weeks); it is not known whether use of safety equipment persisted. Sample drawn from a single GP practice. **Limitations identified by review team** Behavioural (rather than injury) outcomes were measured. Few details provided regarding what the safety advice consisted of. **Evidence gaps and/or recommendations for future research** Replication in other GP practices and using larger sample sizes. **Source of funding** Nottingham Health Authority provided a grant for the purchase of the safety equipment offered at a discount in the study. **Did the study collect data on and report information about barriers and facilitators to/of effectiveness?** No **Observations from the Discussion section regarding barriers & facilitators** None

Study details	Population and setting	Method of allocation to intervention/control	Outcomes, subgroups and methods of analysis	Notes
External validity score [++, + or -] +	Intervention - 36% Control – 28% No access to car: Intervention - 18% Control – 13.4% Jarman score <0: Intervention - 6% Control – 11% Jarman score 0.1-22.9: Intervention - 77.1% Control – 72% Jarman score >23: Intervention - 16.9% Control – 17.1% Overcrowded (>1 person/room): Intervention - 14.5% Control – 9.8% Respondent not in paid employment: Intervention - 50.6% Control – 46.3% Partner of respondent not in paid employment: Intervention - 13.3% Control – 7.3% **Study year** Not reported	the GP surgery) and stair gates and fireguards (available from local health centre). **Control/comparison/s description** Routine child health surveillance and/or routine consultations without the intervention. **Sample sizes** **Total n=** 165 **Intervention n=** 83 **Control n=** 82 **Baseline comparisons** Intervention and control groups broadly comparable at baseline for key socioeconomic variables. **Study sufficiently powered?** Power not stated, but sample size greater than the minimum number calculated based on beta=0.1, alpha=0.05	6 weeks after intervention (Non-responders to postal questionnaire contacted again after 2 weeks) **Method of analysis** ITT analysis conducted. No adjustment made for minor differences in baseline characteristics. **Were there any subgroups for which outcomes were reported?** No **If so, which subgroups were outcomes reported for?** Not applicable **Were the subgroup analyses prespecified?** Not applicable	

Study details	Population and setting	Method of allocation to intervention/control	Outcomes, subgroups and methods of analysis	Notes
	Eligible population: Families registered with the general practice with children aged <=5 **Selected population:** Study aimed to recruit all potentially includable families – 98% agreed to participate **Excluded population/s:** None			
Outcomes **Use of safety equipment by families after safety intervention (Relative risk (95% CI)) (Outcomes relating to fireguards and stair gates were analysed only in families with fires (open, gas or electric) or stairs, respectively):** Fireguard – 1.89 (1.18, 2.94) Stair gate – 1.26 (0.95, 1.67) Smoke alarm – 1.14 (1.04, 1.25) Socket covers – 1.27 (1.10, 1.48) Window catches – 1.10 (1.00, 1.20) Door slam devices – 3.60 (2.17, 5.97) Cupboard locks to lock away: Sharp objects – 0.78 (0.50, 1.23) Cleaning materials – 1.38 (1.02, 1.88) Medicines – 0.99 (0.52, 1.89) **Safe family behaviour after safety intervention (Relative risk (95% CI)) (Families without fires (open, gas or electric) or stairs were classified as behaving safely):** Fireplace safety – 1.84 (1.34, 2.54) Stairway safety – 1.05 (0.83, 1.33) Smoke alarm safety – 1.11 (1.01, 1.22) Socket cover safety – 1.77 (1.37, 2.28) Window safety – 1.30 (1.06, 1.58) Door slam safety – 7.00 (3.15, 15.6) Storage of sharp objects – 1.98 (1.38, 2.83) Storage of cleaning materials – 1.19 (0.95, 1.49)				

Study details	Population and setting	Method of allocation to intervention/control	Outcomes, subgroups and methods of analysis	Notes
Storage of medicines – 1.15 (1.03, 1.28) **Other relevant outcomes** None **Attrition details**: None lost to follow-up				

Study details	Population and setting	Method of allocation to intervention/control	Outcomes, subgroups and methods of analysis	Notes
Authors DiGuiseppi et al **Year (of publication)** 1999; 2002 **Aim of study** To describe the process of implementing an intervention designed to increase smoke alarm installation in a densely populated, multicultural, and materially deprived community; to document the costs of implementation; and to report the evaluation study design (1999); To evaluate the effectiveness of a smoke alarm giveaway programme on rates of fires and rates of fire related injury in	**<u>Source area/s</u>** **Country** UK (London) **Setting** Participants' homes **Location** Urban **<u>Population demographics</u>** **Age** Households with children <5 years - % (SD): Intervention: 6.7% (1.1) Control: 6.4% (1.3) **% Female** Not reported **Ethnicity** 18% of population were from a minority ethnic group **Other socioeconomic variables** Residents of council or other social housing – 51% Jarman score – Mean (SD): Intervention: 34.8 (9.4) Control: 34.3 (8.5) Single parent households – % (SD):	**Method of allocation** Independent statistician used a computer-generated list of random numbers to allocate wards to intervention and control arms. **<u>Intervention/s description</u>** **Type of intervention** Supply only. **Other components of scheme/intervention?** None. **Intervention delivered:** Distribution of free smoke alarms and safety information by community workers (district nurses, health visitors, home care workers, meals-on-wheels services, voluntary sector workers, sheltered housing wardens, caretakers, and managers of council properties) in the course of their usual work activities in which they visited people's homes. Representatives of residents' and tenants' associations also took	**<u>Outcomes</u>** Fire-related injuries (local health authority, coroner, emergency departments, hospitals, and emergency services records). Installation and functioning of smoke alarms (observed). **Other relevant outcomes** None. **Did the study collect data on and report resource use and/or costs** (of compared interventions)? Yes. **Timing of data collection** 24 months post-intervention (injuries). 12-18 months post-intervention (smoke alarm installation). **Method of analysis** ITT analysis conducted. Data analysts were blinded. Intracluster correlation coefficients, and between and within components of variance, were estimated from baseline data. Incidence rates analysed using a multilevel Poisson model with pairs included as a level.	**Limitations identified by author** Programme was not publicised, as the aim within the trial was to limit requests for smoke alarms by residents in the control arm as much as possible – this meant that extra time was spent by the distributors explaining the programme and overcoming the mistrust of (some) residents. **Limitations identified by review team** None. **Evidence gaps and/or recommendations for future research** None. **Source of funding** Medical Research Council. Home Office (Fire Research & Development group and National Community Fire Safety Centre). Department of Health (Health Promotion Division). Camden and Islington councils. British Medical Association. Camden and Islington Health Authority. **Did the study collect data on and report information about barriers and facilitators to/of effectiveness?** Yes. **Observations from the Discussion section regarding barriers & facilitators** Mistrust of local government initiatives could act as a barrier to participation. Intervention's organisation as a trial led to several community groups (who were to be involved with smoke

Study details	Population and setting	Method of allocation to intervention/control	Outcomes, subgroups and methods of analysis	Notes
a deprived multiethnic urban population. (2002). **Study design** Cluster RCT **Internal validity score** [++, + or -] ++ **External validity score** [++, + or -] ++	Intervention: 13.4% (7.7) Control: 11.6% (7.1) **Study year** 1997-1998 **Eligible population:** Within the two London boroughs, the 40 electoral wards that had Jarman scores of >=1 standard deviation from the mean were randomly allocated to trial arms (wards were pair matched by Jarman score). **Selected population:** All households within the wards. **Excluded population/s:** None.	part. Some additional distribution was provided by paid workers recruited through borough councils. **Control/comparison/s description** No intervention. **Sample sizes** **Total n=** 7372 **Intervention n=** 3670 **Control n=** 3702 **Baseline comparisons** No formal analysis conducted, but baseline socio-economic characteristics appear well-balanced. **Study sufficiently powered?** Not reported.	For alarm outcomes, logistic binomial models were analysed for distinguishable data, matched on ward and controlling for Jarman score. **Were there any subgroups for which outcomes were reported?** Yes – planned sub-group analysis (by 2 researchers blinded to intervention status) of injuries judged to have been preventable had a working smoke alarm been present (e.g. smoke inhalation when the resident was asleep) – disagreements resolved by independently repeating the rating to exclude errors and then by discussion – κ statistic for inter-rater reliability = 0.85 (95% CI 0.71, 0.98). **If so, which subgroups were outcomes reported for?** See above. **Were the subgroup analyses prespecified?** Yes.	alarm distribution) withdrawing as they disagreed with some of their clients receiving smoke alarms and others not. The demands on time of volunteers who were distributing smoke alarms meant that project staff offered additional assistance (e.g. distributing flyers). Some residents called the police when distributors knocked at the door in order to offer the free smoke alarms, as they did not believe that the distributors were genuine (belief that Council would not give anything away). There was a perception amongst the community groups that their involvement had been useful in developing community networks, raising their profile in the local community, and identifying residents who required ongoing assistance (not just with regard to home fire safety).

Study details	Population and setting	Method of allocation to intervention/control	Outcomes, subgroups and methods of analysis	Notes

Outcomes
Rates of injuries related to fire, admissions to hospital, and deaths and of fires attended by the fire department:

	No. of events per total person years (per 100 000 person years)					
	Intervention		**Control**		**Rate ratio (95% CI)**	
	Baseline	**Follow-up**	**Baseline**	**Follow-up**	**Crude**	**Adjusted for baseline rates**
All injuries	66/181 667 (36.3)	137/340 275 (40.3)	77/173 285 (44.4)	104/319 710 (32.5)	1.3 (0.9, 1.8)	1.3 (0.9, 1.9)
Hospitalisations and deaths	19/181 667 (10.5)	31/340 275 (9.1)	25/173 285 (14.4)	23/319 710 (7.2)	1.3 (0.7, 2.4)	1.3 (0.7, 2.3)
Preventable injuries	51/181 667 (28.1)	100/340 275 (29.4)	65/173 285 (37.5)	84/319 710 (26.3)	1.1 (0.8, 1.7)	1.2 (0.8, 1.8)
Preventable hospitalisations and deaths	15/181 667 (8.3)	19/340 275 (5.6)	20/173 285 (11.5)	18/319 710 (5.6)	1.0 (0.5, 1.9)	1.0 (0.5, 2.0)
Attended fires	270/79 516 (339.6)	524/147 080 (356.3)	322/80 215 (401.4)	487/147 558 (330.0)	1.0 (0.9, 1.2)	1.1 (0.96, 1.3)

- Intervention group includes one death at baseline and three during follow-up; control group includes two deaths at baseline and two during follow-up.
- Incidence rate of attended fires is measured in number of events per total household years (per 100 000 household years).

Household characteristics and smoke alarm ownership:

	Intervention n (%)	**Control n (%)**	**Odds ratio (95% CI)**
Household characteristics			
>2 years at current address	102/122 (84%)	101/113 (89%)	
Any occupant aged >=65 years	42/122 (34%)	34/113 (30%)	
Any occupant aged 0-15 years	45/122 (37%)	32/112 (29%)	
Single parent household	16/122 (13%)	15/113 (13%)	
Home is flat or bedsit	107/120 (89%)	105/111 (94%)	
Inspection and testing results			
>=1 alarm present	47/119 (39%)	42/109 (38%)	1.0 (0.6, 1.9)
>=1 alarm installed	36/119 (30%)	35/109 (32%)	0.9 (0.5, 1.7)
>=1 alarm correctly installed	19/119 (16%)	19/109 (17%)	0.9 (0.4, 1.7)
>=1 alarm installed and working	19/118 (16%)	18/108 (17%)	0.9 (0.4, 1.8)
>=1 alarm correctly installed and working	11/118 (9%)	10/108 (9%)	1.0 (0.4, 2.4)

Study details	Population and setting	Method of allocation to intervention/control	Outcomes, subgroups and methods of analysis	Notes
Other relevant outcomes None. **Attrition details:** Not reported.				

Study details	Population and setting	Method of allocation to intervention/control	Outcomes, subgroups and methods of analysis	Notes
Authors Douglas et al **Year (of publication)** 1998 **Aim of study** To evaluate the effectiveness of different methods of distributing free smoke alarms in a high risk urban population. **Study design** CBA **Internal validity score** [++, + or -] + **External validity score** [++, + or -] -	**<u>Source area/s</u>** **Country** USA (Oklahoma City) **Setting** Participants' homes **Location** Urban **<u>Population demographics</u>** **Age** Not reported. **% Female** Not reported. **Ethnicity** Not reported. **Other socioeconomic variables** Source: Mallonee et al (1996) Intervention took place in an area of Oklahoma City described as having a fire-related injury rate over four times that of other areas in the city. This area had a distinctive pattern of fire causation compared with the rest of the city: % of fires by different causes in intervention area (% in remainder of Oklahoma City):	**Method of allocation** Not applicable. **<u>Intervention/s description</u>** **Type of intervention** Free supply of smoke alarms. **Other components of scheme/intervention?** No. **Intervention delivered:** Free smoke alarms - advertised through canvassing (including the use of a fire engine sounding its siren and announcing the giveaway over a loudspeaker), flyers in public places, mailed flyers, and hand- delivered flyers, but smoke alarms had to be collected from local fire stations (although a number were also distributed door-to-door and some (9%) were installed) **<u>Control/comparison/s description</u>** Not applicable.	**<u>Outcomes</u>** Installation and functioning of smoke alarms (telephone survey). **How is the data for each outcome collected?** Telephone survey. **Other relevant outcomes** None. **Did the study collect data on and report resource use and/or costs** (of compared interventions)? Only costs of pay per hour for personnel distributing the smoke alarms. **Timing of data collection** 1 month post-intervention. **Method of analysis** No statistical analysis conducted – descriptive data only reported. **Were there any subgroups for which outcomes were reported?** No. **If so, which subgroups were outcomes reported for?** Not applicable. **Were the subgroup analyses prespecified?** Not applicable.	**Limitations identified by author** Survey analysis did not adjust for those homes which did not have a telephone. Random sample drawn from a population for which 30% of the applications from a canvassing area did not report a home telephone number. Self-report of functioning of smoke alarms – participants did not test the alarms whilst the phone survey was taking place and therefore may have been under the impression that the alarms were correctly functioning when this was not in fact the case. **Limitations identified by review team** No baseline data of sample socio-economic characteristics given (only data for the intervention area as a whole). Follow-up at 1 month can only give an initial indication of the effectiveness of the intervention. Analysis of descriptive data only conducted. **Evidence gaps and/or recommendations for future research** None. **Source of funding** Centers for Disease Control & Prevention. **Observations from the Discussion section regarding barriers & facilitators** 'Community coalition' approach, which involved community groups and organisations, facilitated

Study details	Population and setting	Method of allocation to intervention/control	Outcomes, subgroups and methods of analysis	Notes
	'Fire play' i.e. fires started by children playing with fire – 47% (8%) Cigarettes – 17% (11%) Flammable liquids – 13% Heating device – 10% Other – 13% Data not presented, but reported that intervention area had 'a lower median household income, lower property values, and a poorer quality of housing' (p.28) than the remainder of the city. **Study year** 1990 **Eligible population:** Residents who had obtained a smoke alarm as part of the intervention. **Selected population:** Random sample of residents who had obtained a smoke alarm as part of the intervention. **Excluded population/s:** None.	**Sample sizes** **Total n=** 976 **Intervention n=** 976 **Control n=** Not applicable **Baseline comparisons** No formal analysis conducted, although prevalence of households with smoke alarms already installed pre-intervention was broadly similar. **Study sufficiently powered?** Not reported.		engagement with particular ethnic groups (e.g. Hispanics) within the communities as well as providing equipment, materials, credibility, and expertise. Authors note that: "Without the coalition members and their resources (time, people, money, and effort), such a large project would not have been possible" (p.31)

Study details	Population and setting	Method of allocation to intervention/control	Outcomes, subgroups and methods of analysis	Notes

Outcomes

Distribution of smoke alarms by different methods; smoke alarms installed 1 month post-intervention:

			Pre-intervention		**Post-intervention**	
Area	**Total no. of homes**	**Distribution method**	**Smoke alarm prevalence**	**No. of homes without smoke alarm**	**No. of homes receiving smoke alarm**	**% of homes with smoke alarm (that did not have smoke alarm pre-intervention)**
1	6182	Canvassing	71	1793	1925	107%
2	9171	Flyers (public places)	70	2751	278	10%
3	11525	Flyers (mailed)	74	2996	751	25%
4	8067	Flyers (placed on doors)	70	2420	479	20%

Other relevant outcomes

None.

Attrition details:

Not applicable.

Study details	Population and setting	Method of allocation to intervention/control	Outcomes, subgroups and methods of analysis	Notes
Authors Gielen et al **Year (of publication)** 2002 **Aim of study** To evaluate the effectiveness of a home risk assessment, safety counselling, and provision of reduced cost products in increasing home safety practices. **Study design** RCT **Internal validity score** [++, + or -] ++ **External validity score** [++, + or -] ++	**<u>Source area/s</u>** **Country** USA **Setting** Paediatric resident continuity clinic, Children's Safety Centre, and participants' homes. **Location** Urban **<u>Population demographics</u>** *Note:* Only baseline data on participants who completed the study are reported: **Age** Mean age of mother (years) 24 Mean age of infant (months) 3 **% Female** Not reported. **Ethnicity** African American 94% **Other socioeconomic variables** Only 1 child younger than 5 years 66% <5 people in the home 60% Previous child injury 4% Employed (full or part-time) 23%	**Method of allocation** Random number table used to assign paediatric residents to intervention and control arms (the parents and children were assigned to the same arm that their Doctor had been assigned to). **<u>Intervention/s description</u>** **Type of intervention** Home risk assessment & discounted supply **Other components of scheme/intervention?** Paediatric residents (responsible for referral of participants) received a 5-hour training programme on childhood injuries and safety counselling (*both* intervention and control groups received this counselling). **Intervention delivered:** Safety counselling delivered by paediatric residents on a one-to-one basis during well-child clinics; duration differed according to individual	**<u>Outcomes</u>** Home safety practices. **How is the data for each outcome collected?** Measured/ assessed by trained community worker visiting the parents' home. 'Safe' was defined as: Hot water temperature <=48.9°C Smoke alarm working (tested) Stairs – access protected by safety gate or door Poison storage – kept in a locked or latched cupboard Ipecac syrup – at least 1 bottle within expiry date. **Other relevant outcomes** None. **Did the study collect data on and report resource use and/or costs** (of compared interventions)? No. **Timing of data collection** 12 months post-intervention **Method of analysis** Student's t test and χ^2 analyses conducted to test for between group differences. Regression analysis conducted to compare between-group safety	**Limitations identified by author** Finding of no effect may have been as a result of safety products only being supplied, not installed (authors cite concern over liability if study had also installed safety equipment). Final sample size smaller than anticipated in original sample-size calculations. Use of the Children's Safety Centre primarily used upon self-report, as the day-to-day pressures on workers running the Centres made keeping records on attendance problematic. All safety practices were scored as having equal impact on the reduction on incidence or severity of injuries; authors acknowledge that such practices may have differential impacts, but note that evidence lacking in how to more precisely assign a weighting to the different practices. Families visiting the Children's Safety Centre were more advantaged (e.g. higher income, smaller families, better educated) than those who did not (i.e. a self-selection bias may exist as attendance at the CSC was not randomised). **Limitations identified by review team** Blinding of researchers observing safety practices to trial arm allocation not reported. High rate of attrition (35%) which was not further investigated.

Study details	Population and setting	Method of allocation to intervention/control	Outcomes, subgroups and methods of analysis	Notes
	Income <US$5000/year 39% Married 13% More than high school education 12% Baseline safety practices (self-reported): Hot water temperature <=48.9°C 39% Working smoke alarm 92% Safety gates (plan to use) 84% Poisons latched or locked 26% Ipecac syrup 12% **Study year** Not stated. **Eligible population:** Parents attending well-child clinics of residents in the study. **Selected population:** Caretakers with infants aged under 6 months. Infants with no serious medical problems. English-speaking caretakers (who also lived with the infant). 91% of the paediatric residents approached agreed to participate. 71% of parents/caretakers approached agreed to participate.	needs. Children's Safety Centre (for provision of discounted (10-15% below retail price) home-safety supplies and further safety counselling) was built in a renovated building and staffed by a professional health educator with training in injury prevention. No details provided regarding scale or duration of safety counselling provided. Home safety visits (conducted when infant aged between 6 and 9 months) conducted by specially trained community health workers. Visit involved hazard assessment (falls, burns, poisoning), recommendations for safety practices and products, and referral to Children's Safety Centre. Parents/caretakers received US$10 for each completed interview and home observation.	practices, adjusting for exposure to safety counselling and home visit. ITT not conducted. No adjustments made as no significant differences were found in baseline socio-demographic characteristics or home safety behaviours between intervention and control arms. **Were there any subgroups for which outcomes were reported?** No. **If so, which subgroups were outcomes reported for?** Not applicable. **Were the subgroup analyses prespecified?** Not applicable.	**Evidence gaps and/or recommendations for future research** A home visit on more than one occasion might have had a greater impact, but this remains untested. Evaluation of the cost-effectiveness of Children's Safety Centres. A randomised trial to evaluate the effectiveness of attendance at Children's Safety Centres on safety practices. **Source of funding** Maternal & Child Health Bureau. Health Resources and Services Administration. National Center for Injury Prevention & Control, Centers for Disease Control and Prevention. **Did the study collect data on and report information about barriers and facilitators to/of effectiveness?** No. **Observations from the Discussion section regarding barriers & facilitators** Not applicable.

Study details	Population and setting	Method of allocation to intervention/control	Outcomes, subgroups and methods of analysis	Notes
	Participating families were similar to those who declined to take part with regard to educational level, age, relationship to the infant, infant's age, and infant's previous injuries. A smaller proportion who declined participation were African American. **Excluded population/s:** Those who did not fulfil the above inclusion criteria.	**<u>Control/comparison/s description</u>** Safety counselling delivered by paediatric residents on a one-to-one basis during well-child clinics; duration differed according to individual needs. **<u>Sample sizes</u>** **Total n=** 187 **Intervention n=** 93 **Control n=** 94 **Baseline comparisons** No significant differences found in baseline sociodemographic characteristics or home safety behaviours between intervention and control arms. **Study sufficiently powered?** Nearly. Based on sample sizes for 'moderate effect sizes' (using α=.05 and β=.20), each arm would require 100 participants – 93 (intervention) and 94 (control) were recruited.		

Study details	Population and setting	Method of allocation to intervention/control	Outcomes, subgroups and methods of analysis	Notes

Outcomes

Observed safety practices at follow-up (12 months):

Observed safety practices	Intervention	Control
Hot water temperature <=48.9°C (n=115)	27 (47%)	27 (47%)
Working smoke alarm (n=114)	47 (81%)	47 (84%)
All stairs protected by gate or door (n=96)	13 (27%)	11 (23%)
Poisons kept in latched or locked cupboard (n=121)	6 (10%)	7 (12%)
Ipecac syrup (n=121)	19 (31%)	16 (27%)
Total safety score (n=89) = 0	4 (9%)	2 (5%)
Total safety score =1	22 (48%)	22 (51%)
Total safety score =2	14 (30%)	13 (30%)
Total safety score >=3	6 (13%)	6 (14%)

Note:
No significant differences between intervention and control in any of the safety practices.
Total number of parents varies due to missing observations (unexplained) and homes without stairs.
Safety score calculated by adding binary score (yes=1, no=0) for presence of each of the safety practices.

Other relevant outcomes

Observed safety practices *(Intervention arm only)* at follow-up (12 months), by use of Children's Safety Centre (CSC):

Safety practice	No. (%) observed with safety practice who had visited CSC	No. (%) observed with safety practice who had not visited CSC	Adjusted (for counselling and home visit) odds ratio (95% CI)
Hot water temperature <=48.9°C (n=115)	33 (48%)	19 (40%)	1.36 (0.57-3.27)
Working smoke alarm (n=114)	57 (81%)	37 (84%)	0.98 (0.33-2.96)
All stairs protected by gate or door (n=96)	18 (32%)	6 (15%)	1.82 (0.56-5.86)
At least 1 safety gate (n=96)	21 (27%)	5 (13%)	2.64 (0.77-9.14)
Poisons kept in latched or locked cupboard (n=121)	10 (13%)	3 (6%)	2.59 (0.52-12.80)
Ipecac syrup (n=121)	32 (43%)	3 (6%)	11.63 (2.55-53.05)

Study details	Population and setting	Method of allocation to intervention/control	Outcomes, subgroups and methods of analysis	Notes

Safety score *(Intervention arm only)* at follow-up (12 months), by use of Children's Safety Centre (CSC):

Safety score	No. (%) observed with safety score who had visited CSC	No. (%) observed with safety score who had not visited CSC
0	0	4 (11%)
1	12 (24%)	15 (43%)
2	21 (42%)	10 (29%)
>=3	17 (34%)	6 (17%)

Note:
Proportional odds ratio adjusted for exposure to safety counselling and home visit (95% CI) was 3.39 (1.30-8.82)

Attrition details:
35% attrition – 51% intervention, 49% control (of which, 16% became ineligible, 23% refused further contact, 60% could not be contacted for follow-up) – however, analysis showed completers and non-completers to differ significantly only with regard to marital status (non-completers less likely to be married).

Study details	Population and setting	Method of allocation to intervention/control	Outcomes, subgroups and methods of analysis	Notes
Authors Harvey et al **Year (of publication)** 2004 **Aim of study** To evaluate two methods (direct installation and distribution of vouchers) of promoting residential smoke alarm installation and maintenance in high risk households across five US states. **Study design** Cluster RCT **Internal validity score** [++, + or -] +	**<u>Source area/s</u>** **Country** USA **Setting** Participants' homes **Location** Not stated. **<u>Population demographics</u>** **Age** Not reported. **% Female** Not reported. **Ethnicity** See table below. **Other socioeconomic variables** See table below. **Study year** Not stated. **Eligible population:** Households with >=1 individual aged <5 years and/or >65 years within 'high-risk' areas of Arkansas, Maine, Maryland, Massachusetts, and North Carolina. High-risk areas were defined as:	**Method of allocation** Areas, counties, or census tracts were randomly allocated to trial arms. **<u>Intervention/s description</u>** **Type of intervention** Supply & installation of smoke alarms. **Other components of scheme/intervention?** None. **Intervention delivered:** Programme staff (firefighters, nurses, welfare-to-work recipients, neighbourhood representatives) canvassed door-to-door and provided a *free smoke alarm* (which was installed). **<u>Control/comparison/s description</u>** Programme staff (firefighters, nurses, welfare-to-work recipients, neighbourhood representatives) canvassed door-to-door and provided a *voucher*	**<u>Outcomes</u>** Installation and functioning of smoke alarms (observed). **How is the data for each outcome collected?** Observed. **Other relevant outcomes** None. **Did the study collect data on and report resource use and/or costs** (of compared interventions)? No. **Timing of data collection** Between 6 and 12 months post-intervention. **Method of analysis** ITT not conducted. No adjustments made for baseline differences in confounders. χ^2 test for proportions conducted to compare trial arm outcome data. **Were there any subgroups for which outcomes were reported?** No. **If so, which subgroups were outcomes reported for?** Not applicable.	**Limitations identified by author** In a small number of homes, study personnel redeemed the vouchers on behalf of the participants and brought the smoke alarm to them, thereby artificially inflating the proportion of voucher households with functioning smoke alarms at follow-up. **Limitations identified by review team** No formal analysis of the baseline differences in socio-demographic characteristics of participants. It is unclear how the home heating fuel sources in participants' households impacted upon the effectiveness of the intervention. Unable to assess whether or not the analysis (unadjusted for potentially important baseline differences in confounders) is justified, as baseline characteristics data by trial arm are not presented. Differences in the way that intervention was delivered in different states and the way that these interacted with the different socio-demographic baseline characteristics of participants are not controlled for or explored in the analysis. Odds ratios are only presented for the aggregate of all the states where the intervention was implemented, rather than disaggregated (even though the characteristics of participants in different states differed considerably). **Evidence gaps and/or recommendations for future research**

Study details	Population and setting	Method of allocation to intervention/control	Outcomes, subgroups and methods of analysis	Notes
External validity score [++, + or -] -	- high prevalence of residential fire deaths - low prevalence of functional residential smoke alarms - primarily low income residents - high proportion of rented residential units **Selected population:** Areas within states that had comparable demographics and fire risks. No data reported on participation rates. **Excluded population/s:** Not reported.	for a free smoke alarm. **<u>Sample sizes</u>** **Total n=** 4455 **Intervention n=** 2206 **Control n=** 2249 **Baseline comparisons** Baseline characteristics by trial arm are reported as being 'comparable', but cannot assess this as they are only presented in aggregate by state. **Study sufficiently powered?** Not reported.	**Were the subgroup analyses prespecified?** Not applicable.	Evaluation of the impact of the intervention upon injury rates. **Source of funding** Not stated. **Did the study collect data on and report information about barriers and facilitators to/of effectiveness?** No. **Observations from the Discussion section regarding barriers & facilitators** Not applicable.

Baseline characteristics

Baseline characteristics of households enrolled in the study:

Characteristic	Arkansas (n=808) (%)	Maine (n=702) (%)	Maryland (n=1617) (%)	Massachusetts (n=633) (%)	North Carolina (n=695) (%)
Household income					
<$15 000/year	42	36	81	18	53
Ethnic group					
White	39	96	3	55	24
Black	57	0	97	13	63
Native American	0	3	0	0	0
Asian	<1	0	0	9	0
Other	3	1	0	23	13
Home heating fuel source					
Oil	0	57	21	28	0

Study details	Population and setting	Method of allocation to intervention/control	Outcomes, subgroups and methods of analysis	Notes

Gas	78	0	76	57	0
Oil/gas furnace	0	0	0	0	31
Wood	2	9	0	<1	6
Oil/wood	0	24	0	0	0
Kerosene/propane heater	0	6	0	0	21
Electric heater	17	2	3	13	31
Other	3	2	0	2	11
Smoker present	38	48	N/A	39	28
Home ownership	73	77	27	66	51

Outcomes
Households with installed and working smoke alarms at between 6 and 12 months (time of follow-up differed by state):

	Households canvassed at follow-up		**Households with working smoke alarms**	
	Intervention (Installation)	**Control (Voucher)**	**Intervention (Installation)**	**Control (Voucher)**
Arkansas	345 (86%)	365 (90%)	301 (87%)	245 (67%)
Maine	272 (75%)	201 (59%)	237 (87%)	147 (73%)
Maryland	530 (66%)	500 (62%)	473 (89%)	239 (48%)
Massachusetts	191 (83%)	313 (78%)	181 (95%)	232 (74%)
North Carolina	245 (61%)	166 (57%)	229 (93%)	134 (81%)
Total	1583 (72%)	1545 (69%)	1421 (90%)	997 (65%)

Across all 5 states:
90% of households in the intervention arm had functioning smoke alarms (vs. 65% in control group) (p <.0001)
Functioning smoke alarms at 6-12 months follow-up, Intervention vs.control, OR 4.82 (95% CI 3.97, 5.85) (p <.00001)

Other relevant outcomes
Averaged across all 5 states, 47% (range 26-63%) of all households did *not* redeem their vouchers.

Attrition details:
28% of intervention arm, and 31% of control arm were lost to follow-up – non-responding households reported as being ‘similar in demographic characteristics’ (p.381), but no data presented to support this.

Study details	Population and setting	Method of allocation to intervention/control	Outcomes, subgroups and methods of analysis	Notes
Authors Hendrickson **Year (of publication)** 2005 **Aim of study** To access an underserved mobile segment of a monolingual Spanish speaking population and to improved maternal self efficacy for home safety behaviours using a culturally appropriate intervention **Study design** CBA **Internal validity score** [++, + or -] + **External validity score** [++, + or -] +	**<u>Source area/s</u>** **Country** Texas USA (private health care system) **Setting** Participants' homes **Location** Non-urban area – 5 recruitment sites **Study year** NR **Eligible population:** Low income, Mexican immigrant or Mexican American mothers in Texas. Not known if the eligible population was representative of the source area **Selected population:** Mother of a child aged 1-4yrs, English or Spanish speaking **Excluded population/s:** (as above) NR	**Method of allocation** Selection not clear – self selected group? Participants randomly assigned to groups by allowing them to toss a coin. **<u>Intervention/s description</u>** **Type of intervention** Home risk assessment by parental self assessment at visit 1 using 15 item hazards list. Researcher counselled about risk based on this list. ? Free safety items supplied **At the FU visits** **Other components of scheme/intervention?** (beyond those which are the focus of our review) Encourage "behaviour accomplishment" through maternal participation in placing free safety items, with photo taken if desired. **Intervention delivered:** At home, three times over 6 weeks (Initial, 1-2 wks and 4-6 weeks later), by the researcher. Content of these not outlined	**<u>Outcomes</u>** Maternal childhood injury health beliefs (MCIHB) scores Observed Controllable Safety Hazards (CHS) scored Outcome measures "were piloted and validated before implementation in this study" Exceeded Cronbach alphas of 0.70. **How is the data for each outcome collected?** MCIHB – self reported. CHS – observation by researcher (not blinded) **Other relevant outcomes** None **Did the study collect data on and report resource use and/or costs** (of compared interventions)? NR **Timing of data collection** Intervention, at baseline, at visits 1-2 wks and at 4-6 wks later. Control wk 1 and wk 6.	**Limitations identified by author** Self report and unblinded researcher observation used to collect data. Safety items were provided but no cost data collected. Injury data not collected. Results no generaliaable to other populations, age groups or injury sources. In attempt to long term FU 18 months later only 20 women could be contacted. **Limitations identified by review team** Self selected sample – not clear how approach was made for inclusion. No details about how those participating might differ form target population as a whole. Baseline assessment for difference reported by study area, but not by group. **Evidence gaps and/or recommendations for future research** Long term follow up with injury rate data. **Source of funding** Motorola small grant fund. **Did the study collect data on and report information about barriers and facilitators to/of effectiveness?** No

Study details	Population and setting	Method of allocation to intervention/control	Outcomes, subgroups and methods of analysis	Notes
		<u>Control/comparison/s description</u> **(as above)** Two visits, at recruitment and 6 weeks later. Not clear what else was **<u>Sample sizes</u>** **Total n=** 82 **Intervention n=** 38 **Control n=** 40 **Baseline comparisons** Tukey's HSD test determined no significant difference between 5 centres. **Study sufficiently powered?** Yes – analysis for 2X2 ANCOVA (α = 0.05, power 0.87, r=0.34) required sample of 40 in each arm. Analysis for regression equation (α = 0.05, power=0.89, r=0.28) required a sample of 80.	**Method of analysis** ITT reported. Paired samples t-tests compared groups MCIHB and CHS scores at T1 (n=82) and T2 (n=78). All p-values 2 tailed. Selection of variables for the hierarchical regression analysis was based on significant bivariate correlations of the variables with CHS. **Were there any subgroups for which outcomes were reported?** NR **If so, which subgroups were outcomes reported for?** NA **Were the subgroup analyses prespecified?** NA	**Observations from the Discussion section regarding barriers & facilitators** Cultural differences discussed by mothers – more lenient about leaving children alone. Housing repair needs are linked to poverty. Purchase of safety devices may be low priority compared to food and shelter. Home visits create positive links to the community, especially where they are conducted in the native language.

Demographic profile of mothers n=82						
	Experimental n=41		**Control n=41**		**Total =82**	
	N	**%**	**N**	**%**	**N**	**%**
Marital status						
Married	24	58.5	20	48.4	44	53.6
Never married	3	7.3	10	24.4	13	15.9
Living together	10	24.4	6	14.6	16	19.5
Separated/divorced	4	9.7	5	12.2	9	11
Housing repair needs						
In need of repair	14	34.2		41.5	31	37.8
Female					82	100
Ethnicity						
Hispanic						87
White						13
Education						
Mean (Yrs)	8.95 (range 1-17) (SD 3.63)		9.20 (range 1-16) (SD 3.17)			
Moved 3-5 times in the last 4 years						23
Use seatbelt						93
No. of children aged 10-47 months						
1						82
2						11
3						5
4						2

Outcomes
Difference in MCIHB and CHS tests at T2:
Control – no significant difference;
Intervention - significant improvement on recognition of injury consequences and self efficacy scales.
CHS score decreased significantly in the experimental group.
Hazards were predicted by mothers never being married, more housing repair needs, lower self efficacy and being in the control group.

ANCOVA: maternal self efficacy (SE) effect size measures and power								
Source	Sum of squares	Df	Mean Square	F	P value	η^2	Noncent parameter	Observed power
Group	1970.06	1	1970.1	7.5	0.01	0.09	7.50	0.77
T1 SE	6748.20	1	6748.2	25.7	0.00	0.26	25.71	0.99
Total	367625.36	78						
r^2 = 0.30 Covariate = T1 SE scores								

Significant differences between groups for self-efficacy (see Table above) but none for the four other MCIHB subscales.

Hierarchical regression analysis for personal MCIHB and group variables predicting visit 2 CHS (n=78)				
Variable	B	SEB	β	P value
Step 1				
Never married	1.87	0.66	0.21	0.006
Housing repair	-1.17	0.42	-0.20	0.007
Step 2				
Self efficacy	-0.03	0.01	-0.20	0.006
Step 3				
Group (1= experimental, 0= control)	-3.52	4.60	-0.57	0.000
Beta weights and values shown are from the full model at Step 3 Step 1: $r^2 = 0.25$; F (2, 75) = 12.61, p<=0.01 Step 2: $r^2 = 0.37$; $r^{2\Delta} = 0.12$ F^{Δ} (2, 73) = 6.61, p<=0.01 Step 3: $r^2 = 0.65$; $r^{2\Delta} = 0.29$ F^{Δ} (1, 72) = 52.72, p<=0.01				

Significant differences in CHS between groups F (1,770) = 99.6, p=0.00.

Visit 1 MCIHB and CHS Pearson correlation coefficient (n=82)					
MCHIB & CHS	Consequences	Possibilities	Benefits	Barriers	Self efficacy
Consequences	1.00				
Possibilities	0.03*	1.00			
Benefits	0.21	0.10	1.00		
Barriers	0.34*	-0.07	0.32*	1.00	
Self efficacy	-0.04	0.04	-0.08	0.17	1.00
CHS	0.02	0.02	0.01	-0.01	-0.35*
*P<=0.05 (all 2 sided)					

Attrition details:
4 mothers in the intervention group did not receive the intervention due to relocations (2), employment (1) and death (1).
Evidence for all 82 participants available at T1, while 4 did not supply data at T2 follow up.

Study details	Population and setting	Method of allocation to intervention/control	Outcomes, subgroups and methods of analysis	Notes
Authors Johnston et al **Year (of publication)** 2000 **Aim of study** To evaluate the feasibility, acceptability and effectiveness of an injury prevention program delivered by school based home visitors. **Study design** CBA **Internal validity score** [++, + or -] + External validity score [++, + or -] -	**<u>Source area/s</u>** **Country** USA **Setting** Recruitment in schools. Intervention in homes **Location** Seattle - urban **<u>Population demographics</u>** See below. **Study year** 1998 **Eligible population:** All families of children attending preschool Head Start programs in 9 centres 2 regions. HeadStart (preschool program) is a government funded preschool enrichment program designed to provide services to children at risk of poor educational outcomes due to socioeconomic deprivation. Home visits, by family service case workers, occurring at least once a month – are part of this, they reinforce the curriculum, support parental follow through & facilitate access to	**Method of allocation** The 9 eligible Head Start/ ECEAP centres were put into 2 groups of based in size, geographical proximity and location of program staff. 6 (containing 274 eligible families) were put into one group and 3 (containing 207 eligible families (were put into another. A coin toss determined which one received the intervention. **<u>Intervention/s description</u>** **Type of intervention** Home safety inspection (smoke detectors present and function; poisoning prevention knowledge; presence of ipecac; presents of hazardous substances; self reported use of car seat). Tested smoke alarms where present. Provision of smoke detectors, batteries, ipecac as needed. **Other components of scheme/intervention?** Educational materials. Age appropriate car safety	**<u>Outcomes</u>** Change in injury prevention knowledge, behaviour. Smoke detector presence and function. **How is the data for each outcome collected?** Questionnaires. Assessor observation and testing of smoke alarms. **Did the study collect data on and report resource use and/or costs** No **Timing of data collection** Baseline information collected at time of risk assessment and outcome three moths later. **Method of analysis** ITT not reported – all analyses used those with both measurements. Change indicator (positive change, neutral, negative change) was used. Occurrence of knowledge or behaviour change at follow up was compared and relative risk of positive change calculated.	**Limitations identified by author** Randomisation at level of individual or centre not used. Not possible to compare baseline characteristics of enrolled families and data about individual children were not available. Authors believe that any difference would anyway be difficult to interpret because families rather than children were the targets of the intervention. Authors believe key differences are unlikely to have resulted from differences at baseline. Limited by reliance of self report for many items – only smoke detectors tested. Longer follow up required to test durability of changes. Would also be desirable to measure actual injury rates. Unique in the sense that case workers already had relationship with the families and were visiting monthly anyway. **Limitations identified by review team** Note that ipecac no longer recommended buy the AAP The report does not mention baseline differences in eligible populations although eyeballing suggests some differences between intervention and control (for eg more single parents in intervention group 63.8% v. 48.6%; and more child's educational disability in control group

<table>
<tr><th>Study details</th><th>Population and setting</th><th>Method of allocation to intervention/control</th><th>Outcomes, subgroups and methods of analysis</th><th>Notes</th></tr>
<tr><td></td><td>community resources.

Selected population:
Families of children aged 4-5 in a defined geographical area enrolled in Head Start or ECEAP.
Case workers approached all 274 eligible families in the experimental group and 207 in the control group.
78% (n=213) of those eligible participated and completed the trial in experimental site,
72% (149) of those eligible form comparison sites agreed to participate and completed the trial.

Excluded population/s: (as above)
NR</td><td>restraints.
(full intervention package provided to the control group after FU surveys completed)

Intervention delivered:
– When/where
Home safety inspection Jan – June 1998
– Intensity
Once, the with FU data collected 3 months later
– By whom
19 trained school personnel for Head Start

<u>Control/comparison/s description</u>
(as above)
Standard Head Start visits With written information encouraging smoke alarm provision and battery checks,
<u>Sample sizes</u>
Total n= 418
Intervention n= 258
Control n= 160

Baseline comparisons
Indicate if there were any baseline differences between groups in important confounders.
Demographics and injury related knowledge look</td><td>Mantel-Haenszel risk estimate and 95% CI performed using EPI-info. Analysis only for those who completed both initial and FU assessment.

Were there any subgroups for which outcomes were reported?
No

If so, which subgroups were outcomes reported for?
NA

Were the subgroup analyses prespecified?
NA</td><td>11.1% v. 20.1%)

Note also that the data for baseline injury knowledge all have different denominators – 126-211 intervention, 62-143 control.

Evidence gaps and/or recommendations for future research
Impact of additional safety aspects such as firearms storage.
Longer FU.
Impact on injury rates
Source of funding
Washington State Dept. for Health, Injury Prevention Program
Did the study collect data on and report information about barriers and facilitators to/of effectiveness?
Yes – questionnaire sent top case workers.

Observations from the Discussion section regarding barriers & facilitators
Case workers already had a relationship with the households, and saw the additional work of safety checks as minimal – and provision of safety supplies as especially beneficial.</td></tr>
</table>

Study details	Population and setting	Method of allocation to intervention/control	Outcomes, subgroups and methods of analysis	Notes
		similar at baseline, but not formally assessed for differences. Comparison group more likely to have poisons within reach of the child (40% v. 23%) **Study sufficiently powered?** NR		

Baseline characteristics for all eligible families (not not enrolled or completed trial sample)

Child/family characteristics	Eligible families at intervention centres (n=274; %)	Eligible families at comparison centre (n=207; %)
Child gender		
Male	52.5	52.9
Female	47.5	47.1
Child's race/ ethnicity		
Caucasian	69.4	70.0
African American	7.4	2.3
Hispanic	10.6	13.8
Asian/pacific islander	0.8	2.7
Native American/ Alaskan native	4.6	10.7
Other	1.3	0.3
Child's primary language		
English	86.9	89.3
Non-English	13.1	10.6
Child resides with		
Both parents	35.2	48.2
Single parent	63.8	48.6
Foster family	0.9	3.2
At least one parent employed	45.0	40.2
Child has educational disability	11.1	20.1
Median household income	$9442	$8745

Outcomes
Relative proportions of families reporting positive knowledge or behaviour change over three month follow up

	Intervention group n/N (%)	Control group n/N (%)	RR (95% CI)
Smoke detector			
Obtained first working detector*	13/13 (100)	3/10 (30.0)	3.3 (1.3, 8.6)
Added at least one working detector	58/203 (28.6)	20/137 (14.6)	2.0 (1.2, 3.1)
Poisoning prevention			
Removed poisons from home	61/202 (30.2)	20/135 (14.7)	2.1 (1.3, 3.2)
Disposed of unused medicine	18/202 (8.9)	16/134 (11.9)	0.8 (0.4, 1.4)
Earned about poisoning resources	15/203 (7.4)	11/134 (8.2)	0.9 (0.4, 1.9)

Learned about use of ipecac	68/200 (34.0)	27/137 (19.7)	1.7 (1.2, 2.5)
Obtained ipecac for home	124/198 (62.6)	18/134 (13.4)	4.7 (3.0, 7.3)
Child safety restraints			
Obtained child safety seat	42/195 (21.5)	7/132 (5.3)	4.1 (1.9, 8.8)
Learned about car seat use**	22/66 (33.3)	3/34 (8.8)	3.8 (1.2, 11.7)
“Always” buckle up child	26/189 (13.8)	10/132 (7.6)	1.8 (0.9, 3.7)

* Among those with no working detector at baseline
** Among those reporting no instruction at baseline

Other relevant outcomes
Families in both groups were receptive to the home safety assessment conducted by a non-medical caseworker previously known to the family (89% of both groups judged “very receptive” by case workers).
Home safety assessment took 10-30 minutes. Concerns of case workers included reservations to inspecting private areas while testing smoke detectors and “dispensing medication” (ipecac). Other dispensing was felt to be rewarding.

Attrition details:
258/274 eligible intervention families were enrolled (94%) and 213 completed baseline and FU assessment. FU data for indvicual question available for 189-203 participants.
160/207 eligible control families enrolled, 149 completed both baseline and FU assessment. In addition FU data for individual questions available for 132-137 participants.

Study details	Population and setting	Method of allocation to intervention/control	Outcomes, subgroups and methods of analysis	Notes
Authors Kendrick et al **Year (of publication)** 1999 **Aim of study** To assess the effectiveness of safety advice at child health surveillance consultation, provision of low cost safety equipment to families receiving means tested state benefits, home safety checks, and first aid training on frequency and severity of unintentional injuries in children in the home	**<u>Source area/s</u>** **Country** UK **Setting** 36 general practices **Location** Nottingham - urban **<u>Population demographics</u>** See below **Study year** 1995 **Eligible population:** Children aged 3-12 months registered with participating GP practices. **Selected population:** All of the eligible population was included, randomly allocated (by GP practice) to the intervention or control group. 73.2% of those approached in the intervention group, and 75.0% in the control group, agreed to take part. **Excluded population/s:** Those not meeting the inclusion criteria detailed above.	**Method of allocation** 18 GP practices were randomly allocated to intervention group using random number tables (by blind investigator). Each then matched with a control practices based on Jarman deprivation score. **<u>Intervention/s description</u>** **Type of intervention** Low cost safety equipment (£5 each stair gates and fire guards, 20p for 3 cupboards locks, 50p smoke alarms), home safety checks by trained health visitors (standard checklists, information sheets, literature for parents provided). **Other components of scheme/intervention?** Age specific advice at routine child health surveillance checks. First aid training (with free crèche). **Intervention delivered:** – When/where At home visits (? And GP practice?) – Scale Three	**<u>Outcomes</u>** Include details of all relevant outcome measures and whether measures are objective or subjective or otherwise validated. Primary outcome = medically attended unintentional injuries and severity of injuries as assessed by the abbreviated injury scale (scoring validated by systematic scoring of 1/7 sample in September 1995 by 2 independent observers, but outcome assessment undertaken by assessor unblinded to Tx group). Secondary outcomes (assessed by postal questionnaire, reliability assessed by a test retest procedure with 53 parents from outside study area. Consistency assessed by calculating K coefficients – 92% of questions had K coefficients >= 0.70, correlation coefficients – p=0.001, p=0.03 & Cronbach's α coefficient for scales for perceived risk of injury & of household Hazards, 0.77 and 0.84) = safety practices, possession & use of safety equipment, knowledge	**Limitations identified by author** Low response rate to FU questionnaire, limiting interpretation of secondary outcomes. Larger trials required to test the suggestion that the frequency of hospital admissions reduced, the effectiveness of interventions singly, at different levels of risk, and over a longer period of time. Larger intraclass correlation coefficient 0f 0.017, is greater that sample size estimation – possibility that study is underpowered to assess impact at reducing minor injury. Large reduction in injury required by power calculation, but not unreasonable given previous projects' findings. **Limitations identified by review team** The methods are rather unclear, but the practices appear to have been randomised before they were matched, and recruited before the sample size calculation was done. **Evidence gaps and/or recommendations for future research** Further, larger trial research is required to investigate the suggestion that the intervention may reduce severe injury – since this study was underpowered to detect such an impact. Longer FU may also be needed to assess impact over time. **Source of funding** Trent NHS executive

Study details	Population and setting	Method of allocation to intervention/control	Outcomes, subgroups and methods of analysis	Notes
Study design Cluster RCT with matching **Internal validity score** [++, + or -] ++ **External validity score** [++, + or -] +		– Intensity NR – By whom Health visitors and nurses – How often At 6-9, 18-24 months HV 12-15 months Nurses – How long for etc NR **<u>Control/comparison/s description</u>** **(as above)** Usual care (not defined) **<u>Sample sizes</u>** **Total n=** 2119 **Intervention** ITT = 1100 (baseline data on 823, requested interventions 286, primary outcome data on 1020) **Control** ITT = 1019 (baseline data on 771; primary outcome data on 960) **Baseline comparisons** Similar at baseline **Study sufficiently powered?** Using child as the unit of analysis, determined that 785 children were needed in each arm to show a 25% reduction in A&E dept. attendances based on	and confidence in undertaking first aid. **How is the data for each outcome collected?** See above **Other relevant outcomes** N/A **Did the study collect data on and report resource use and/or costs** No **Timing of data collection** Injury data 1995-1997. Survey data collected at baseline and 25 months FU. **Method of analysis** Categorical data analysed by Chi-sq tests and ORs, continuous data and ordinal data by Mann-Whitney U tests. All ITT. Using practice as unit of analysis, mean injury rates compared using sample *t* test weighted by the number of children in each practice. Using child as unit of analysis, a random effects logistic model, using the MLn macro, was used to allow for clustering.	**Did the study collect data on and report information about barriers and facilitators to/of effectiveness?** Little **Observations from the Discussion section regarding barriers & facilitators** Contact with the intervention may encourage more consultations with the doctors, confounding the impact.

Study details	Population and setting	Method of allocation to intervention/control	Outcomes, subgroups and methods of analysis	Notes
		estimated attendance of 32% over 2 years, an intraclass coefficient of 0.01, mean cluster size of 60% and 80% power. 1049/arm required for 90% power. (18 practices allowed a detection of a reduction in frequency of injury of 16% based on a mean injury rate of 0.32 (SD 0.05) & 80% power. They comprised 1124 children in intervention and 1028 control arms.) See limitation notes.	For hospital admissions, the MLn macro for random effects logistic model did not converge, therefore generalised estimating equations (SAS macro) were used to estimate OR. Random effects Poisson regression analysis to compare the occurrence of injury, using length of time the child remained in the study as the denominator. The time to first injury was also compared between Tx groups using Cox's proportional hazards regression analysis. **Were there any subgroups for which outcomes were reported?** No **If so, which subgroups were outcomes reported for?** NA **Were the subgroup analyses prespecified?** NA	

Baseline

Factors	**Intervention n=823. n (%)**	**Control n=771. n (%)**
Receipt of means tested benefit	246 (29.9)	262 (34.0)
No access to car	149 (18.1)	164 (21.3)
Non-owner occupied	231 (28.1)	285 (37.0)
Overcrowding*	64 (7.8)	77 (10.0)
>= 4 children in family	55 (6.3)	61 (7.9)
Single parent	89 (10.8)	100 (13.0)
Teenage mother	114 (13.9)	125 (16.2)
Non white ethnic group	52 (6.3)	50 (6.5)
Resident in deprived area**	96 (11.7)	126 (16.3)
Employment: One parent employed	73 (8.9)	64 (8.3)
Employment: single parent or both parents unemployed	22 (2.7)	12 (1.6)
Previous medically attended injury	42 (5.1)	48 (6.2)
* >one person/room. ** Living in ward with >30 Jarman score		
Secondary outcomes at baseline n (%) of children unless otherwise stated		
Median no unsafe practices (interquartile range)	3 (2)	3 (2)
Median score for confidence at first aid$ (interquartile range)	9 (2)	8 (3)
Correct action for:		
Burns	713 (86.6)	663 (86.0)
Choking	759 (92.2)	715 (92.7)
Lacerations	629 (76.4)	604 (78.3)
Bleach ingestion	418 (50.8)	359 (46.6)
Perceived risk of injury (interquartile range)$$	57.5 (28)	55 (27)
Perceived risk of hazard (interquartile range)$$	91.5 (50)	89 (51)
$ Maximum score 12, minimum 0. $$ Scores based on Glik et al developed questions		
Intervention received		
Advice at child health surveillance consultation		-
6-9 months	315 (28.6)	-
12-15 months	463 (42.1)	-
18-24 months	35 (48.6)	-
Home safety check	235 (21.4)	-
Low cost equipment	107 (9.7)	-

First aid training for parents	152 (13.8)	-

Outcomes

Injury Outcome	Intervention group (weighted mean of %; SD)	Control group (weighted mean of %, SD)	Difference (95% CI)	P value ^	Odds ratio (95% CI)	No. needed to treat
Any medically attended injury	346 (31.4; 8.18)	220 (32.4; 10.4)	-0.93 (-2.13 to 1.59)	0.77	0.97 (0.72 to 1.30)	100
Attendance at A&E dept.	292 (26.6; 8.2)	264 (25.9; 8.3)	0.64 (-4.94 to 6.22)	0.82	1.02 (0.76 to 1.37)	-
Primary care attendance	63 (5.7; 3.6)	82 (8.1; 4.6)	-2.32 (-5.09 to 0.45)	0.10	0.75 (0.48 to 1.17)	42
Hospital admission ^^	24 (2.2; 1.7)	32 (3.1; 2.2)	-0.96 (-2.30 to 0.38)	0.15	0.69 (0.42 to 1.12)	111
^ t test (34df). ^^Odds ration and 95% confidence limits estimated generating equations.						

No sig differences also seen with Poisson and Cox's proportional hazards regression analysis in injury outcome, with rate ratios of 1.00 (0.78 to 1.28) and 1.04 (0.90 to 1.22) respectively.
Median severity score for injuries in both groups 1.0 (25^{th} and 75^{th} centiles for both groups were 1.0; U=52 900, Z = -0.166, p=0.87)
Length of H stay for the first admission for injury did not differ between groups (for both groups, median length of stay and 25^{th} and 75^{th} centiles were 1 day; U=325, Z= -1.34, p=0.18).

Other relevant outcomes
Secondary outcomes show no difference in unsafe practices between groups (U=42 060; Z= -1.12, p=0.26).
Intervention group more confidence in dealing with choking incidents (15.1% (55/364) not very confident vs 24.7% (91/368), chi-sq=10.86, 2 df, p=0.004)
Intervention group more likely to know correct action for bleach ingestion (59.3% (216/364) vs 48.9% (180/368) chi-sq = 7.75, 1df, p=0.005)
No difference seen on other injury scenarios.
No differences between the groups in scores for perceptions of risk of injury or risk of hazards (U=55 340, Z=-0.24, p=0.81 and U=52 911, Z=-1.15, p=0.25).

Attrition details:
Indicate the number lost to follow-up and whether the proportion lost to follow-up differed by group (i.e. intervention v control).

Study details	Population and setting	Method of allocation to intervention/control	Outcomes, subgroups and methods of analysis	Notes
Authors Kendrick et al **Year (of publication)** 2009 (extended analysis of inequalities data from study originally reported in Watson et al, 2005) **Aim of study** To assess the effectiveness of safety advice and safety equipment in reducing unintentional injuries for families with children aged under 5 and living in deprived areas. **Study design** RCT	**<u>Source area/s</u>** **Country** UK (Nottingham) **Setting** Participants' homes or health clinics. **Location** Urban. **<u>Population demographics</u>** **Age** See Watson et al (2005) evidence table. **% Female** See Watson et al (2005) evidence table. **Ethnicity** See Watson et al (2005) evidence table. **Other socioeconomic variables** See Watson et al (2005) evidence table. **Study year** 2000-2002 **Eligible population:** See Watson et al (2005) evidence table.	**Method of allocation** See Watson et al (2005) evidence table. **<u>Intervention/s description</u>** **Type of intervention** Safety counselling + supply & installation of safety equipment. **Other components of scheme/intervention?** None. **Intervention delivered:** See Watson et al (2005) evidence table. **<u>Control/comparison/s description</u>** See Watson et al (2005) evidence table. **<u>Sample sizes</u>** See Watson et al (2005) evidence table. **Baseline comparisons** See Watson et al (2005) evidence table. **Study sufficiently powered?** See Watson et al (2005)	**<u>Outcomes</u>** See Watson et al (2005) evidence table. **How is the data for each outcome collected?** See Watson et al (2005) evidence table. **Other relevant outcomes** None. **Did the study collect data on and report resource use and/or costs** (of compared interventions)? No. **Timing of data collection** 12-months post-intervention/ **Method of analysis** Logistic regression analyses comparing trial arms, including a term for the interaction between trail arm and each social variable. Random effects model used to take account of any clustering by health visitor. Significance level of 0.05 used for all analyses. Sensitivity analysis undertaken to adjust analyses of stair gate use by whether al children in the family were aged <36 months or not (stair gates are only recommended for use up to this age). No adjustments made for baseline differences as these were negligible	**Limitations identified by author** None in addition to those identified in the Watson et al (2005) evidence table. **Limitations identified by review team** None in addition to those identified by the authors. **Evidence gaps and/or recommendations for future research** Disparities in rates of fitting and using stair gates requires further exploration. Authors suggest the following reasons are plausible, but require empirical investigation: - differences in perceptions (e.g. of risk, self-efficacy, or of the inconvenience of stair gates) - understanding of child development - supervisory practices - beliefs about the 'learning values' of injuries - the role of safety equipment in relation to other strategies for promoting child safety - acceptability of an intervention that involved (usually male) workers fitting the safety equipment in the home - variability in provision of interpreting services may have limited access to the intervention at times **Source of funding** See Watson et al (2005) evidence table. **Did the study collect data on and report information about barriers and facilitators to/of effectiveness?** No. **Observations from the Discussion section**

Study details	Population and setting	Method of allocation to intervention/control	Outcomes, subgroups and methods of analysis	Notes
Internal validity score [++, + or -] ++ **External validity score** [++, + or -] ++	**Selected population:** See Watson et al (2005) evidence table. **Excluded population/s:** See Watson et al (2005) evidence table.	evidence table.	across a wide range of socio-economic and behavioural characteristics. **Were there any subgroups for which outcomes were reported?** Yes – 'subgroups' are the focus of the analysis presented in the paper. **If so, which subgroups were outcomes reported for?** Ethnic group Maternal age at birth of first child Housing tenure Family type Receipt of means-tested benefits **Were the subgroup analyses prespecified?** No.,	**regarding barriers & facilitators** Not applicable.

Outcomes

Possession of fitted and always used stair gates at baseline and 1-year follow-up:

Socio-economic characteristics	**All participants at baseline**		**Control group at 1-year follow-up**		**Intervention group at 1 year f-up**		***P* value**
	Fitted and used stair gate	**OR (95% CI)**	**Fitted and used stair gate**	**OR (95% CI)**	**Fitted and used stair gate**	**OR (95% CI)**	
Ethnic group							
White	1301/2705 (48.1%)	Reference group	269/571 (47.1%)	Reference group	332/590 (56.3%)	Reference group	0.50
Other	133/463 (28.7%)	0.48 (0.38, 0.60)	31/92 (33.7%)	0.57 (0.36, 0.91)	43/90 (47.8%)	0.71 (0.46, 1.11)	
Maternal age at birth of 1st child							
>=20 years	1092/2297 (47.5%)	Reference group	240/494 (48.6%)	Reference group	285/516 (55.2%)	Reference group	0.06
<=19 years	269/707 (38.1%)	0.71 (0.59, 0.85)	54/140 (38.6%)	0.67 (0.46, 0.99)	78/135 (57.8%)	1.13 (0.77, 1.67)	
Housing tenure							

Study details	Population and setting	Method of allocation to intervention/control	Outcomes, subgroups and methods of analysis	Notes

Owner occupier	861/1745 (49.3%)	Reference group	196/395 (49.6%)	Reference group	222/407 (54.6%)	Reference group	0.006
Rented	588/1469 (40.0%)	0.72 (0.63, 0.84)	106/279 (38.0%)	0.62 (0.46, 0.85)	165/285 (57.9%)	1.15 (0.84, 1.56)	
Family type							
2-parent family	1123/2303 (48.8%)	Reference group	242/495 (48.9%)	Reference group	286/502 (57.0%)	Reference group	0.07
1-parent family	320/886 (36.1%)	0.62 (0.52, 0.73)	58/174 (33.3%)	0.52 (0.36, 0.75)	99/190 (52.1%)	0.82 (0.59, 1.15)	
Receipt of means-tested benefits							
Not receiving benefits	785/1548 (50.7%)	Reference group	162/335 (48.4%)	Reference group	189/350 (54.0%)	Reference group	0.04
Receiving benefits	606/1542 (39.3%)	0.67 (0.57, 0.77)	130/318 (40.9%)	0.74 (0.54, 1.01)	183/317 (57.7%)	1.16 (0.86, 1.58)	

P value for interaction term (*P* <0.05 means OR differs significantly between control and intervention groups)

Possession of functional smoke alarms at baseline and 1-year follow-up:

Socio-economic characteristics	**All participants at baseline**		**Control group at 1-year follow-up**		**Intervention group at 1 year f-up**		***P* value**
	Functional smoke alarm	**OR (95% CI)**	**Functional smoke alarm**	**OR (95% CI)**	**Functional smoke alarm**	**OR (95% CI)**	
Ethnic group							
White	2095/2618 (80.0%)	Reference group	504/589 (85.6%)	Reference group	562/611 (92.0%)	Reference group	0.73
Other	232/438 (53.0%)	0.33 (0.26, 0.42)	63/90 (70.0%)	0.39 (0.23, 0.66)	75/90 (83.3%)	0.45 (0.24, 0.85)	
Maternal age at birth of 1st child							
>=20 years	1752/2226 (78.7%)	Reference group	439/509 (86.3%)	Reference group	492/534 (92.1%)	Reference group	1.00
<=19 years	467/677 (69.0%)	0.64 (0.52, 0.78)	108/143 (75.5%)	0.49 (0.31, 0.78)	117/138 (84.8%)	0.49 (0.27, 0.86)	
Housing tenure							
Owner occupier	1393/1683 (82.8%)	Reference group	355/407 (87.2%)	Reference group	389/417 (93.3%)	Reference group	0.79
Rented	968/1417 (68.3%)	0.47 (0.39, 0.56)	223/284 (78.5%)	0.54 (0.35, 0.82)	257/295 (87.1%)	0.49 (0.29, 0.83)	

Study details	Population and setting	Method of allocation to intervention/control	Outcomes, subgroups and methods of analysis	Notes

Family type							
2-parent family	1758/2223 (79.1%)	Reference group	433/511 (84.7%)	Reference group	476/519 (91.7%)	Reference group	0.78
1-parent family	592/857 (69.1%)	0.60 (0.50, 0.73)	142/175 (81.1%)	0.77 (0.48, 1.22)	172/195 (88.2%)	0.69 (0.40, 1.19)	
Receipt of means-tested benefits							
Not receiving benefits	1251/1498 (83.5%)	Reference group	304/344 (88.4%)	Reference group	331/355 (93.2%)	Reference group	0.61
Receiving benefits	1031/1487 (69.3%)	0.48 (0.40, 0.58)	257/326 (78.8%)	0.47 (0.30, 0.72)	294/332 (88.6%)	0.56 (0.32, 0.96)	

P value for interaction term (*P* <0.05 means OR differs significantly between control and intervention groups)

Other relevant outcomes
None.

Attrition details:
See Watson et al (2005) evidence table.

Study details	Population and setting	Method of allocation to intervention/control	Outcomes, subgroups and methods of analysis	Notes

Study details	Population and setting	Method of allocation to intervention/control	Outcomes, subgroups and methods of analysis	Notes
Authors King et al **Year (of publication)** 2001 **Aim of study** To examine the effectiveness of a home visit program to improve home safety and decrease the frequency of injury in children. **Study design** RCT in the context of a case-control study **Internal validity score** [++, + or -] ++ **External validity score** [++, + or -] +	<u>**Source area/s**</u> **Country** Canada **Setting** 5 hospitals and 4 urban centres **Location** Urban <u>**Population demographics**</u> See below **Study year** 1994-1996 **Eligible population:** Children aged <8 presenting to the emergency dept. of each participating centre from Sept 1994-Oct 1996 were identified using ED logs and the Canadian Hospitals Injury Reporting and Prevention Program of the Health Protection Branch, Health Canada. **Selected population:** Children <8 years old, initially enrolled in a case-control study. They were eligible for the case-control study if they presented with 1 of the following injuries: tap water scald, burn from a household fire, poisoning or ingestion of	**Method of allocation** An RA contacted family within 3 days of ED visit to confirm eligibility and t arrange home visit within the week. An equal number of intervention and non-intervention id cards were placed in sealed envelopes, mixed in an opaque container, sequentially numbered as they were withdrawn, and distributed to aliquots at each site. Each home assigned to on of the 2 groups. <u>**Intervention/s description**</u> **Type of intervention** Home inspection by research assistants trained to make structured observations about specific safety hazards. These were reviewed and informed instruction about how to correct any existing deficiencies. A set of coupons for a national score of $10/item (to a max of $50). Detailed instruction about how to use the equipment and about targeted injury.	<u>**Outcomes**</u> Effects of the program on parental injury awareness and knowledge; the extent that families used home safety equipment; the rate of injury; cost-effectiveness of the intervention. **How is the data for each outcome collected?** Baseline information about home safety hazards collected by trained researcher using structured observations. Questionnaire administered at home by researcher to assess parental knowledge and awareness of injuries, children's past injury history. **Did the study collect data on and report resource use and/or costs** Yes – detail not extracted here **Timing of data collection** 1994-6. Baseline, FU 1 year later by blinded assessor. **Method of analysis** Participants characteristics compared using Wilcoxon	**Limitations identified by author** Baseline assessments suggested good awareness of injury risk and preventability in both groups, unaffected by the intervention and making it likely that enrolled families were already vigilant. Reporting biases possible for injury rates. Short visit time may have been to short to identify any real change that resulted in injury occurrence. **Limitations identified by review team** No objective measure of impact on injury. **Evidence gaps and/or recommendations for future research** Authors plan to contact participants to evaluate components of the intervention perceived as worthwhile or less beneficial. **Source of funding** National Health Research and development Program. Health and Welfare Canada **Did the study collect data on and report information about barriers and facilitators to/of effectiveness?** Yes **Observations from the Discussion section regarding barriers & facilitators** Authors suggest that observed lack of adoption may be related to aspects of the intervention requiring action on the part of the caregiver, with

Study details	Population and setting	Method of allocation to intervention/control	Outcomes, subgroups and methods of analysis	Notes
	a foreign object. Fracture, sprain, strain, cut or bruise from a fall from a height, head injury while riding a bicycle. 2 controls, matched for gender within 6 months of age, were selected for each target case. The first was selected with a non targeted injury (ie one occurring outside the home or a home injury not listed) the 2nd control was chosen form the patients with a medical illness presenting at the same ED. Consent for the RCT was ob trained after the baseline visit to assess home safety and parental knowledge. **Excluded population/s:** Those not meeting the inclusion criteria.	**Other components of scheme/intervention?** Provision of an information package on injury prevention. FU calls at 4 and 8 months. **Intervention delivered:** – When/where At home, within 1 week of the ED visit. – Scale Structured observations about home safety and questionnaire administered. Timing not reported – Intensity 2 visits of < 1hr. FU phone call 4-8 months after initial visit. – By whom Research assistant – How often Twice – baseline and one year later, plus the 2 phone calls and 1 letter reminding families about how the importance of maintaining preventative behaviours. **<u>Control/comparison/s description</u>** Received a general pamphlet about home safety. The observation about	rank sum test for ordinal and interval data and chi-sq test for categorical variables. Drop outs and completers compared for differences in baseline characteristics. Injury knowledge and awareness compared using analysis of variance (including intervention, centre, and their interaction) with the dependent variable at 1 yr expressed as % of baseline score. Least square estimates of intervention effect were derived from the fitted models. Standard residual diagnostics were used for model goodness of fit. Likelihood of adopting a given prevention strategy compared using the desired outcomes of a reduction in potential hazards in various home areas targeted by the intervention. Each outcome was calculated separately, taking into account its baseline hazard rate, intervention, centre, mechanism of injury, age, and gender using logistic regression models.	passive and active changes required. Passive activities (not requiring repeated action) are easier to adopt than active ones. Parental vigilance and responsibility demanded by more active measures are notoriously difficult to motivate. Easily installed devices (lowering hot water temperature) more likely to be used than more difficult ones (monitoring small object accessibility). Successful home visit programs are characterised by the establishment of a strong therapeutic relationship developed over frequent visits to address underlying factors associated with maternal and child health outcomes.

Study details	Population and setting	Method of allocation to intervention/control	Outcomes, subgroups and methods of analysis	Notes
		hazards was undertaken, but only the presence of a non-functioning smoke alarm was fed back to participants. FU phone call at 4-8 months. FU home visit 1yr after initial visit made by investigator blind to allocation. **<u>Sample sizes</u>** Consort diagram provided: 1172 randomised. 601 Intervention group, 535 4-month FU, 510 8-month FU, 482 1yr visit. 571 control group, 505 4-month FU, 498 8-month FU, 469 1yr visit. **Total n=** 1172 **Intervention n=** 601 **Control n=** 571 **Baseline comparisons** No baseline differences between arms. **Study sufficiently powered?** 375 participants in each group required to observe a 10% difference in the adoption of home safety behaviours, assuming 80% power to detect a difference (P<=0.005).	Odds ratios (95% CI) of intervention effects derived from fitted models. Standard residual diagnostics used to check goodness of fit. Rates of injury-prone hazards derived in the control group to aid interpretation of ORs of intervention effect estimates. Extent to which intervention decreased injury physician visits evaluated by comparing injury frequency between intervention groups using chi-sq test and ratio or injury/person yr derived assuming Poisson distribution for the number of injuries. **Were there any subgroups for which outcomes were reported?** No **If so, which subgroups were outcomes reported for?** NA **Were the subgroup analyses prespecified?** NA	

Selected baseline characteristics

	All N= 1172 n (%)	Intervention N=601	Control N=571	p-value
Male	696 (59)	352 (59)	344 (60)	0.56
Child's age	2 (1st, 3rd quartiles -1, 3)	2 (1st, 3rd quartiles -1, 3)	2 (1st, 3rd quartiles -1, 4)	0.79
ED presentation*				
Home injury	387 (33)	193 (32)	194 (34)	
Choking/ asphyxiation	36	22	14	
Poisoning	52	22	29	
Burns/scalds	80	39	41	
Falls	219	109	110	
Other injuries	389 (33)	206 (34)	183 (32)	
Illnesses	391 (34)	202 (34)	189 (34)	0.60
Socioeconomic status				
Parents age (average of both)	33 (30, 37)	33 (30, 36)	33 (30, 37)	0.09 (RG note I assume this is a typo - should be 0.90?
Age mother had 1st child – median (1st and 3rd quartiles))	27 (22, 30)	27 (23, 30)	27 (22, 30)	0.90
Parents minimum education (both parents)	13 (12, 16)	13 (12, 16)	13 (12, 16)	0.72

*Patients without a clear case-control status (n=5) were randomised and included in the analysis using ITT principle.

Outcomes

Baseline and FU injury knowledge and awareness

	Baseline					**Change at FU***		**Intervention effect^**	
	All N= 1172	**Intervention N=601**	**Control N=571**	**p-value**	**Completers only n= 951**	**Intervention n=469**	**Control N=469**	**Mean % diff (95% CI)**	**P value (change at FU)"**
Injury knowledge n (%)									
Correctly identify as the leading cause of death in children <8yrs	748 (73)	381 (73)	365 (73)	0.92					
Injury awareness –VAS 0-10 – higher no. = better awareness median (1st 3rd quartiles)									

How often do you think injuries to children require hospital admission?	6 (5, 7)	6 (5, 7)	6 (4, 7)	0.65		13.6 (6.4, 20.8)	15.2 (7.7, 22.6)	-1.6 (-11.6, 8.5)	0.76
How preventable do you think most childhood injuries are?	7 (6, 8)	7 (6, 8)	8 (7, 8)	0.63		7.3 (0.9, 13.7)	7.0 (0.6, 13.5)	0.3 (-8.5, 9.0)	0.95
How serious do you think most injuries are?	5 (5, 7)	5 (5, 7)	5 (5, 7)	0.73		11.6 (6.9, 16.4)	9.8 (5.0, 14.5)	1.9 (-4.7, 8.4)	0.58
How much control do you think you have to decrease the risk of your child having an injury?	7 (6, 8)	7 (6, 8)	7 (6, 8)	0.40		3.1 (-1.6, 7.7)	-2.1 (-6.8, 2.6)	5.1 (-1.3, 11.5)	0.12
Injury history n (%)									
Have any of your children seen a doctor because of an injury in the year before the current incidence?	136 (12)	67 (13)	69 (14)	0.48					

* Least square estimates and CI derived form analysis of variance with intervention, institution as independent predictors, there was no interaction between intervention and institution in any of presented outcomes.
^ Least squares estimates and CI of difference between groups.
"F-test of no intervention effect from the analysis of variance.

Description of injury prevention behaviours and estimate of treatment effect

Question description	Hazard rate of control group (%)	Treatment effects (intervention vs control) OR (95% CI)	P value
No small objects within child's reach in the living room	19.7	1.02 (0.88, 1.18)	0.40
No matches and lighter within child's reach in living room	13.3	1.03 (0.85, 1.25)	0.40
No windows easily beyond 6 inches in living room	50.7	1.08 (0.93, 1.250	0.15
All household cleaning supplies stored beyond child's reach in kitchen	55.6	1.04 (0.89, 1.22)	0.30
Child resistant caps on bottles in the kitchen cupboards	49.6	0.99 (0.84, 1.16)	0.44
Hot water tap does not exceed 54^{o}C	46.5	1.31 (1.14, 1.50)	<0.001
Smoke detectors on some or all levels	94.0	1.45 (0.94, 2.22)	0.05
All or some smoke detectors fully functional	84.0	1.01 (0.79, 1.30)	0.46
Fire extinguisher	49.5	0.81 (0.67, 0.97)	0.01
Gates at top and/or bottom of stairs	35.5	0.89 (0.71, 1.13)	0.17
Observed a baby walker	7.1	0.83 (0.49, 1.43)	0.25
Bedroom windows can not be opened beyond 6 inches	60.7	1.06 (0.92, 1.22)	0.22
No small objects within child's reach in bedroom	16.7	0.98 (0.83, 1.16)	0.42

Bathroom cleaning supplies securely stored	55.6	0.90 (0.81, 1.19)	0.11
All or some bottles in bathroom cupboards have child resistant caps	74.0	0.98 (0.81, 1.19)	0.42
Children wearing bike helmet some or all of the time	94.4	0.65 (0.31, 1.37)	0.13

For each desirable outcome, a logistic regression model was used with the following predictors: corresponding desirable outcome at baseline, intervention, ER presentation, (ie targeted home injuries, non-targeted home injuries, other illnesses), age (>=2) and gender. OR (CI, p) corresponding to no intervention effect were derived from fitted model. (RG note – not all questions asked appear to have been reported**)**

Outcomes from FU interview

Phone FU	**At 4 months**		**At 8 months**		**At 12 months**		
	Interv.	**Cont.**	**Interv.**	**Cont.**	**Interv.**	**Cont.**	**Rate ratio (95% CI)***
Since the previous visit, have any of your children seen a dr because of an injury? N (%)	38 (7) N=535	56 (1) N=505 P=0.05^	47 (9) N=510	54 (11) N=498 P=0.14^	24 (7) N=359	30 (9) N=343 P=0.34^	0.75 (0.58, 0.96)
Since your previous visits have you made any change in your home to make it safer? N (%)	322 (62) N=519		112 (23) N=492				

*Ratio of rate of injury per person-yr
^ Comparison of injury frequency between intervention groups at each time interval using chi-sq test.

Other relevant outcomes
62% of intervention `group reported home safety modifications at 4 months FU and 23% at 8 months.
Cost data not extracted.

Attrition details:
Consort diagram provided: 1172 randomised.
601 Intervention group, 535 4-month FU, 510 8-month FU, 482 1yr visit.
571 control group, 505 4-month FU, 498 8-month FU, 469 1yr visit.
19% lost to attrition. Drop outs were significantly younger parents, had younger age at first child, fewer years parental education than those who competed the trial (p<0.001). Also were less likely to identify injury as the leading cause of death (p=0.04). No diff between intervention (n=118) and control (n=103) intervention dropouts.

Study details	Population and setting	Method of allocation to intervention/control	Outcomes, subgroups and methods of analysis	Notes
Authors King et al **Year (of publication)** 2005 (follow-up of King et al 2001) **Aim of study** To assess the long-term effect of a home safety visit on the rate of home injury **Study design** RCT **Internal validity score** [++, + or -] ++ **External validity score** [++, + or -] +	**Source area/s** **Country** Canada **Setting** 5 paediatric teaching hospitals in 4 urban centres **Location** Urban **Population demographics** **Age** See King et al (2001) evidence table **% Female** See King et al (2001) evidence table **Ethnicity** Not reported **Other socioeconomic variables** See King et al (2001) evidence table **Study year** 1994-1996 (36 month follow-up of study) **Eligible population:** See King et al (2001) evidence table	**Method of allocation** See King et al (2001) evidence table **Intervention/s description** **Type of intervention** See King et al (2001) evidence table **Other components of scheme/intervention?** See King et al (2001) evidence table **Intervention delivered:** See King et al (2001) evidence table **Control/comparison/s description** See King et al (2001) evidence table **Sample sizes** **Total n=** 1172 **Intervention n=** 601 **Control n=** 571 **Baseline comparisons** See King et al (2001) evidence table	**Outcomes** Safety knowledge and practices Injuries (self-reported) **How is the data for each outcome collected?** Structured telephone interview using the following questions: 1) Since the last home visit, have any of your children gone to the emergency department because of an injury? 2) Since the last home visit, have you made any changes to make your home safer? 3) Which of the following had the greatest impact on your knowledge and practices?: participation in this study, media, advice from family or friends, family doctor, or other sources. 4) How much did each of the following items change your knowledge, beliefs or practices around the prevention of home injuries? (safety equipment discount coupons, home visits, pamphlets, phone calls) 5) On a scale of 1 to 10: a) How preventable do you think most children's injuries are? b) How much control do you think you have to decrease the risk of your child having an accident? **Other relevant outcomes** None	**Limitations identified by author** Self-report of injuries subject to recall bias. Interviewers were blinded to arm allocation, but participants had been made aware of their allocation upon the completion of the original trial. High attrition rate (34%), despite at least 5 attempts being made to contact each participant. **Limitations identified by review team** Telephone interview not validated. Reliance on self-reported changes in behaviour and perceived usefulness of different intervention components is subject to social desirability bias on part of participants. **Evidence gaps and/or recommendations for future research** Suggest evaluation programmes where >1 home visit is made. **Source of funding** National Health Research and Development Programme, Health and Welfare Canada **Did the study collect data on and report information about barriers and facilitators to/of effectiveness?** No. **Observations from the Discussion section regarding barriers & facilitators** Participants were more willing to follow through

Study details	Population and setting	Method of allocation to intervention/control	Outcomes, subgroups and methods of analysis	Notes
	Selected population: See King et al (2001) evidence table **Excluded population/s:** See King et al (2001) evidence table	**Study sufficiently powered?** Not reported.	**Did the study collect data on and report resource use and/or costs** Not reported **Timing of data collection** 36 months post-intervention **Method of analysis** Wilcoxon rank sum test used to test for differences between trial arms for ordinal or interval scale variables, and Pearson's χ^2 test for categorical variables. Frequency of injuries requiring a physician visit compared between groups using Pearson's χ^2 test; ratio of injury per person year derived assuming a Poisson distribution for the number of injuries. ITT not conducted. See King et al (2001) evidence table for details of baseline differences. **Were there any subgroups for which outcomes were reported?** Not applicable. **If so, which subgroups were outcomes reported for?** Not applicable. **Were the subgroup analyses prespecified?** Not applicable.	suggestions for more passive measures (e.g. lower hot water temperature, installation of smoke alarm).

Study details	Population and setting	Method of allocation to intervention/control	Outcomes, subgroups and methods of analysis	Notes

Outcomes

Impact on parents' knowledge and practices (scale range of 1-10, higher value corresponds to greater awareness – median values (1st and 3rd quartiles)):

	Intervention group	**Control group**	**p value**
How preventable do you think most children's injuries are?	8 (7,8)	8 (7,8)	0.177
How much control do you think you have to decrease the risk of your child having an accident?	8 (7,9)	8 (7,9)	0.917

Impact on parents' knowledge and practices: Response to question – Which of the following had the greatest impact on your knowledge and practices around the prevention of home injuries?

	Intervention group (n=400)	**Control group** (n=370)
Participation in the study	91 (23%)	74 (20%)
Media sources	136 (34%)	116 (31%)
Advice from family and friends	61 (15%)	65 (18%)
Family doctor	12 (3%)	13 (4%)
Other	100 (25%)	102 (28%)

Intervention vs. control: $\chi^2 = 2.36$ (4 df), p=0.67

Impact on parents' knowledge and practices: Response to question – How much did the <u>provision of discount coupons</u> change your knowledge, beliefs or practices around the prevention of home injuries?

	Intervention group (n=376)	**Control group** (n=369)
Not at all	227 (60%)	Not applicable
A little bit	75 (20%)	Not applicable
Somewhat	47 (13%)	Not applicable
A lot	27 (7%)	Not applicable

Impact on parents' knowledge and practices: Response to question – How much did the <u>home visits</u> change your knowledge, beliefs or practices around the prevention of home injuries?

	Intervention group (n=398)	**Control group** (n=369)
Not at all	53 (13%)	83 (23%)
A little bit	96 (24%)	114 (31%)
Somewhat	140 (35%)	106 (29%)
A lot	109 (27%)	66 (18%)

Intervention vs. control: $\chi^2 = 22.4$ (3 df), p=0.0001

Study details	Population and setting	Method of allocation to intervention/control	Outcomes, subgroups and methods of analysis	Notes

Impact on parents' knowledge and practices: Response to question – How much did the pamphlets change your knowledge, beliefs or practices around the prevention of home injuries?

	Intervention group (n=393)	**Control group** (n=361)
Not at all	95 (24%)	119 (33%)
A little bit	111 (28.2%)	121 (34%)
Somewhat	120 (31%)	84 (23%)
A lot	67 (17%)	37 (10%)

Intervention vs. control: $\chi^2 = 16.8$ (3 df), p=0.001

Impact on occurrence of injuries:

	Intervention group at 12 months(n=359) (home visit)	**Control group at 12 months**(n=343) (home visit)	**Intervention group at 36 months** (n=403) (survey)	**Control group at 36 months** (n=371) (survey)
Number of injuries since last follow-up that resulted in a child seeing a doctor	26	34	143	165

12-36 month rate ratio (rate of injury per person year) 0.80 (95% CI 0.64, 1.00)

Other relevant outcomes
Not applicable.

Attrition details:
At 36 month follow-up, 33% of intervention group and 36% of control group lost to follow-up.
Participants not completing the follow-up study were significantly different (Pearson's χ^2 test, p<0.001) with regard to median parent age, age mother had first child, and parent educational level, but these median differences were small in real-terms (1-2 years). All other socioeconomic characteristics were comparable.

Study details	Population and setting	Method of allocation to intervention/control	Outcomes, subgroups and methods of analysis	Notes
Authors Klitzman et al **Year (of publication)** 2005 **Aim of study** To complete a pilot study of a programme designed to address a range of home safety hazards (fire, lead based paint, mould, vermin) in pre-1940 properties. **Study design** BA **Internal validity score** [++, + or -] + **External validity score** [++, + or -] -	**Source area/s** **Country** USA (Brooklyn, New York) **Setting** Participants' homes **Location** Urban **Population demographics** **Age** Not reported. **% Female** Not reported. **Ethnicity** Not reported. **Other socioeconomic variables** All residences were located in a 'low-income' community. **Study year** 2001-2003 **Eligible population:** Not reported. **Selected population:** Sample strategy and definition of boundaries of sample area are not defined, but it is	**Method of allocation** Not applicable. **Intervention/s description** **Type of intervention** Home risk assessment + supply & installation of safety equipment (window guard, smoke alarm, fire extinguisher) **Other components of scheme/intervention?** Part of a wider programme that assessed and addressed for mould, vermin, and lead based paint hazards. **Intervention delivered:** Community residents who were to conduct the home risk assessments underwent an 'intensive' 2-week training session on residential hazards, health effects, remediation measures, and data collection. Home risk assessments (1-2 hours) were conducted using a tool adapted from previous instruments (e.g. New York City Fire	**Outcomes** Presence of installed safety equipment. **How is the data for each outcome collected?** Observation by trained assessor. **Other relevant outcomes** None. **Did the study collect data on and report resource use and/or costs** Yes, but only total costs – a significant proportion of these are likely to consist of the costs of the environmental components of the programme that addressed lead paint, mould, and vermin remediation. **Timing of data collection** 5 months post-intervention. **Method of analysis** McNemar test. **Were there any subgroups for which outcomes were reported?** No. **If so, which subgroups were outcomes reported for?** Not applicable. **Were the subgroup analyses prespecified?** Not applicable.	**Limitations identified by author** 'Funding constraints' prohibited a study design that included a control group. Only approximately two-thirds of the participants attended formal training sessions during the course of the programme. **Limitations identified by review team** Sampling strategy not reported. No baseline data presented to allow assessment of representativeness of sample. Presence (alone) of installed safety equipment at 5-month follow-up is a limited form of assessing outcomes as it does no test whether it is still functioning or family's ability/willingness to act in a safety-conscious manner. **Evidence gaps and/or recommendations for future research** Studies to 'determine which interventions, in what combinations, and at what intervals work best to maintain hazard reductions in the long-term'. Comparison of various approaches to education, e.g. individual and group, professional and peer-led. **Source of funding** US Department of Housing and Urban Development. New York City Council Speakers' Fund for Public Health Research. **Did the study collect data on and report**

Study details	Population and setting	Method of allocation to intervention/control	Outcomes, subgroups and methods of analysis	Notes
	reported that residences were included if: a) they were privately owned b) they were part of a 'multiple-dwelling structure' (i.e. >=3) c) both an adult tenant and building owner agreed to participate d) a child aged <11 years resided or spent at least 20 hours/week at the residence e) the residence was free of major structural defects f) there was no history of a child occupant with lead poisoning Participation rate not reported. **Excluded population/s:** Not reported.	Department) and information recorded in the areas of: 1) fire, electrical and fall hazards 2) maintenance history of the building and residence 3) interior and exterior underlying conditions that might contribute to household hazards 4) conditions directly associated with hazards Smoke alarms, fire extinguishers, fire safety plans, and window guards were installed either by contractors or project staff. **Control/comparison/s description** Not applicable. **Sample sizes** **Total n=** 70 **Intervention n=** 70 **Control n=** n/a **Baseline comparisons** Not applicable. **Study sufficiently powered?** Not applicable.		**information about barriers and facilitators to/of effectiveness?** No. **Observations from the Discussion section regarding barriers & facilitators** Not applicable.

Study details	Population and setting	Method of allocation to intervention/control	Outcomes, subgroups and methods of analysis	Notes

Outcomes
Presence of home safety equipment:

	No. at baseline	No. at follow-up	% change	McNemar test (*S*)	Probability (*S*)
Missing window guard	46	5	-67%	23.44	<0.0001
Missing smoke detector	39	1	-85%	31.11	<0.0001
Missing fire extinguisher	50	0	-88%	44.00	<0.0001
Electrical hazard	18	3	-83%	9.80	0.0017

Other relevant outcomes
None.

Attrition details:
No participants lost to follow-up.

Study details	Population and setting	Method of allocation to intervention/control	Outcomes, subgroups and methods of analysis	Notes
Authors Mallonee et al **Year (of publication)** 1996 **Aim of study** To evaluate the effectiveness of a smoke alarm giveaway programme in reducing residential fire-related morbidity and mortality in a high-risk population. **Study design** CBA **Internal validity score** [++, + or -] + **External validity score** -	**<u>Source area/s</u>** **Country** USA (Oklahoma City) **Setting** Participants' homes **Location** Urban **<u>Population demographics</u>** **Age** Not reported. **% Female** Not reported. **Ethnicity** Not reported. **Other socioeconomic variables** Intervention took place in an area of Oklahoma City described as having a fire-related injury rate over four times that of other areas in the city. This area had a distinctive pattern of fire causation compared with the rest of the city: % of fires by different causes in intervention area (% in remainder of Oklahoma City): 'Fire play' i.e. fires started by	**Method of allocation** Not applicable. **<u>Intervention/s description</u>** **Type of intervention** Free supply of smoke alarms. **Other components of scheme/intervention?** None. **Intervention delivered:** Free smoke alarms - advertised through canvassing (including the use of a fire engine sounding its siren and announcing the giveaway over a loudspeaker), flyers in public places, mailed flyers, and hand- delivered flyers, but smoke alarms had to be collected from local fire stations (although a number were also distributed door-to-door and some (9%) were installed). **<u>Control/comparison/s description</u>** Not applicable.	**<u>Outcomes</u>** Fire-related injuries (probably from 'State records', as fire-related injuries were a reportable condition, but source not explicitly stated). Installation and functioning of smoke alarms (observed). **How is the data for each outcome collected?** See above. **Other relevant outcomes** None. **Did the study collect data on and report resource use and/or costs** (of compared interventions)? No. **Timing of data collection** 3, 12, 16, 32, and 48 months post-intervention. **Method of analysis** No statistical analysis conducted – descriptive data only reported. **Were there any subgroups for which outcomes were reported?** No. **If so, which subgroups were outcomes reported for?** Not applicable.	**Limitations identified by author** Analysis is not adjusted for the significant decrease in the number of fires occurring in the intervention area – therefore cannot attribute decreases in fire-related injuries to the intervention. Unavailability of data relating to confounders, e.g. prevalence of contributory factors to fires such as rates of smoking and alcohol consumption – although authors note that it is 'unlikely' that any changes in these factors would have significantly impacted upon results. Some of the decreases in fire-related injuries may have been as a result of regression to the mean (selection of high-risk area of city for intervention may have meant that baseline incidence was simply higher by chance) – although authors note that high incidence existed for 3 years prior to the intervention and the decrease in incidence persisted for 48 months post-intervention. **Limitations identified by review team** Although all participants were resident in the area identified as high-risk, no baseline socio-economic characteristics are provided. **Evidence gaps and/or recommendations for future research** None. **Source of funding** Centers for Disease Control & Prevention.

Study details	Population and setting	Method of allocation to intervention/control	Outcomes, subgroups and methods of analysis	Notes
	children playing with fire – 47% (8%) Cigarettes – 17% (11%) Flammable liquids – 13% Heating device – 10% Other – 13% Data not presented, but reported that intervention area had 'a lower median household income, lower property values, and a poorer quality of housing' (p.28) than the remainder of the city. **Study year** 1990 **Eligible population:** Convenience sample – recruited by various methods, e.g. flyers, canvassing in the street using a fire engine. **Selected population:** Convenience sample – characteristics not reported. **Excluded population/s:** None.	**Sample sizes** **Total n=** 9291 **Intervention n=** 9291 **Control n=** Not applicable **Baseline comparisons** Not applicable. **Study sufficiently powered?** Not applicable.	**Were the subgroup analyses prespecified?** Not applicable.	**Did the study collect data on and report information about barriers and facilitators to/of effectiveness?** No. **Observations from the Discussion section regarding barriers & facilitators** Not applicable.

Study details	Population and setting	Method of allocation to intervention/control	Outcomes, subgroups and methods of analysis	Notes

Outcomes
Fire-related injury rates pre- and post- intervention:

	Intervention area				Remainder of city			
	No. of fatal injuries/ Total injuries	**No. of fires**	**Annualised injury rate/ 100 000 population**	**Injury rate/ 100 residential fires**	**No. of fatal injuries/ Total injuries**	**No. of fires**	**Annualised injury rate/ 100 000 population**	**Injury rate/ 100 residential fires**
Pre-intervention								
Sept. 1987 – Dec. 1988	11/16	326	16.4	4.9	13/21	906	4.2	2.3
Jan. 1989 – Apr. 1990	5/14	272	14.3	5.1	5/15	942	3.0	1.6
Total (Sept. 1987 – Apr. 1990)	16/30	598	15.3	5.0	18/36	1848	3.6	1.9
Post-intervention								
May 1990 – Aug. 1991	0/3	237	3.1	1.3	5/15	858	3.0	1.7
Sept. 1991 – Dec. 1992	1/1	183	1.0	0.5	9/20	674	4.0	3.0
Jan. 1993 – Apr. 1994	2/5	249	5.1	2.0	10/23	747	4.6	3.1
Total (May 1990 – Apr. 1994)	3/9	669	3.1	1.3	24/58	2279	3.9	2.5
Incidence-density ratio (95% CI)			0.2 (0.1, 0.4)				1.1 (0.7, 1.7)	

(Incidence-density ratio compares the number of cases occurring per person-months at risk in each group pre- and post- the intervention.)

Study details	Population and setting	Method of allocation to intervention/control	Outcomes, subgroups and methods of analysis	Notes

Functional status of smoke alarms post-intervention (random sample of homes participating in the intervention):

Smoke alarm status	**3 months post-intervention (n=875)**	**12 months post-intervention (n=5617)**	**48 months post-intervention (n=749)**
Alarm properly installed and functioning (95% CI)	61 % (58-64)	51% (50-52)	45% (41-49)
Alarm not installed	20%	6%	4%
Alarm improperly installed	4%	2%	1%
Alarm or battery not functioning	2%	5%	7%
Batteries removed from alarm	2%	10%	19%
Occupant no longer had the alarm	7%	14%	9%
Alarm removed from house when occupant moved	4%	11%	15%

Other relevant outcomes
None.

Attrition details:
Not applicable.

Study details	Population and setting	Method of allocation to intervention/control	Outcomes, subgroups and methods of analysis	Notes
Authors Metchikian et al **Year (of publication)** 1999 **Aim of study** To evaluate the home safety component of 'Project SafeCare'. **Study design** BA **Internal validity score** [++, + or -] - **External validity score** [++, + or -] -	**<u>Source area/s</u>** **Country** USA **Setting** Participants' homes **Location** Urban **<u>Population demographics</u>** **Age** Age range of parents from 27-41 years. **% Female** 100% **Ethnicity** Not reported. **Other socioeconomic variables** Characteristics of the 3 participants: - Mother A – age 27, reported for neglect when overdosed on heroin whilst children were sleeping; children returned to mother when agreed to enter drug treatment programme. Suffered 'mild' physical and emotional abuse by father as a child. Never employed. Completed 10th grade in high	**Method of allocation** Not applicable. **<u>Intervention/s description</u>** **Type of intervention** Home risk assessment and supply of safety equipment. **Other components of scheme/intervention?** Home safety component was part of 'Project SafeCare' programme. This programme provides services to families who have been referred from the child protective service or a local hospital because they have been reported for abuse or neglect of a child aged <5 years or are young, at-risk mothers **Intervention delivered:** Trained research assistants conducted a home risk assessment using the Home Accident Prevention Inventory-Revised (HAPI-R). This tool categorises hazards as follows:	**<u>Outcomes</u>** Changes in knowledge and behaviour. **How is the data for each outcome collected?** Number of hazards in the home, as assessed using HAPI-R. Inter-observer reliability rating averaged 99%. **Other relevant outcomes** None. **Did the study collect data on and report resource use and/or costs** Not reported. **Timing of data collection** 4-6 months post-intervention. **Method of analysis** Descriptive statistics (number of hazards in the home). **Were there any subgroups for which outcomes were reported?** No. **If so, which subgroups were outcomes reported for?** Not applicable. **Were the subgroup analyses prespecified?** Not applicable.	**Limitations identified by author** Participants knew when visits would take place and therefore may have prepared their homes in advance. **Limitations identified by review team** No rationale given for purposive sample. Whilst the details of individual participants (made possible by the small sample size) *might* give insight into how or why the intervention was/was not effective, the study does not explore the relationship between participant characteristics and these potential explanatory factors. Loss of 1/3 participants to follow-up. Authors comment that the impressive findings are 'remarkable' given the conservative nature of the HAPI-R assessment tool , but fail to consider how observation bias may have impacted upon findings. **Evidence gaps and/or recommendations for future research** None. **Source of funding** Not stated. **Did the study collect data on and report information about barriers and facilitators to/of effectiveness?** No.

Study details	Population and setting	Method of allocation to intervention/control	Outcomes, subgroups and methods of analysis	Notes
	school. - Mother B – age 41, ‘appeared to have a developmental delay’, although no formal diagnosis. Reported for neglect during period of homelessness. Assessed as needing to improve parenting skills. Physically and emotionally abused by step-father as a child. Unemployed, but had previously worked as a salesperson and factory worker. - Mother C – age 25, married, reported for neglect when her child suffered a burn on her leg. Employed as a secretary. Completed 11th grade in high school. **Study year** Not reported. **Eligible population:** Not reported. **Selected population:** Not reported. **Excluded population/s:** Not reported.	1) poisoning by solids and liquids 2) fire and electrical hazards 3) suffocation by mechanical objects 4) ingestible small objects 5) sharp objects 6) firearms 7) falling hazards 8) drowning hazards Assessments and training of the parents was conducted on between 7 and 9 occasions over the course of 9 months to 1 year. Training consisted of discussing appropriate strategies for making hazards inaccessible: a) putting items out of reach b) using safety latches c) locking up hazardous items Appropriate safety items (cupboard latches, cupboard slide lock, electrical outlet blanks) were also provided free-of-charge to parents. Parents were also encouraged to identify other hazards and to identify how they could be		**Observations from the Discussion section regarding barriers & facilitators** Not applicable.

Study details	Population and setting	Method of allocation to intervention/control	Outcomes, subgroups and methods of analysis	Notes
		made safe. On subsequent visits where the home risk assessment was completed, feedback was given to the parents regarding how they had addressed safety hazards. **<u>Control/comparison/s description</u>** Not applicable. **<u>Sample sizes</u>** **Total n=** 3 **Intervention n=** n/a **Control n=** n/a **Baseline comparisons** Not applicable. **Study sufficiently powered?** Not applicable.		

Outcomes
Number of hazards in the home (*NOTE:* data extracted by eye from line graphs; mean number of hazards calculated for each timeframe):

	Baseline	Training	Follow-up
Mother A			
Bathroom	30	5	3
Kitchen	27	11	1.5
Living room	10	6	6
Bedroom	4	2	0
Mother B			
Bathroom #1	121	10	2
Kitchen	44	4	1
Bathroom #2	16	0	0

Study details	Population and setting	Method of allocation to intervention/control	Outcomes, subgroups and methods of analysis	Notes

Parent's bedroom	13	0	0
Child's bedroom	3	0	0
Living room	2	0	0

Other relevant outcomes
None.

Attrition details:
1 participant (33%) could not be followed-up as they moved away from the state.

Study details	Population and setting	Method of allocation to intervention/control	Outcomes, subgroups and methods of analysis	Notes
Authors Paul et al **Year (of publication)** 1994 **Aim of study** To evaluate the effectiveness of a 'low-cost' home risk assessment strategy aimed at reducing home safety hazards. **Study design** RCT **Internal validity score** [++, + or -] - External validity score [++, + or -] -	**Source area/s** **Country** Australia. **Setting** Participants' homes. **Location** (urban, rural) Rural. **Population demographics** **Age** No further breakdown given, but all children were in the age range of 1-2½ years. **% Female** Not stated. **Ethnicity** Not stated. **Other socioeconomic variables** No. of children in household: Intervention: >1 child 24 (60%) 1 child 16 (40%) Control: >1 child 47 (81%) 1 child 11 (19%) χ^2=3.625 (df 1), p=0.057	**Method of allocation** Participants were 'randomly allocated to the intervention or control group' – no further details provided. **Intervention/s description** **Type of intervention** Home risk assessment. **Other components of scheme/intervention?** None. **Intervention delivered:** 'Safe Place Project': Home risk assessments were conducted, following a one-hour small group training session, by volunteers from a local Rotary club, staff members from the local community health centre, or paid interviewers (volunteers conducted 52% of the workload). The assessment was made using a safety education booklet (which participants could keep)	**Outcomes** The home environment was observed visually for hazards defined as follows: Exterior of house: - >=3 steps without an adequate non-climbable barrier - balcony or verandah of >600mm high without an adequate non-climbable barrier - high windows which open >100mm - roof areas a child could gain access to - climbable or inadequate gates - pools without adequate non-climbable fencing - dangerous gardens - dangerous wall areas Interior of house: - no earth leakage circuit breaker or electrical outlet covers - stove without stove guard - hot water taps without thermostatic mixing valves or spring-loaded safety taps - benchtops with unprotected sharp edges - kettle without curly cord - no lockable cupboard for storage of poisons in the kitchen, bathroom and laundry - no syrup of ipecac - heaters or fire without fixed fire guard - glass doors or panels not containing safety glass or safety film - glass doors or panels not marked at child eye-level - >=3 steps/stairs without an adequate	**Limitations identified by author** Small sample size. Control and intervention groups may have differed significantly at baseline with regard to the number of safety hazards (pre-test home safety checklist was not conducted for control group due to risk of intervention effect). Low consent rates. High attrition, due to "practical difficulties in implementing the safety checks" (p.248). Control group may have differed significantly from intervention group with regard to the experience of parents (control group contained more parents with more than one child). Delivering the intervention satisfactorily was difficult due to resource constraints. Home safety equipment could not be provided at a reduced cost as originally intended. **Limitations identified by review team** Despite comprehensive definitions of what should be counted as a 'hazard', a randomised check of 20% of the home risk assessments found a significantly limited inter-rater agreement on the classification of hazards in the home – 29/63 (46%) of the items were *deleted* from the analysis due to a kappa score <0.4 or where agreement was <70%.

Study details	Population and setting	Method of allocation to intervention/control	Outcomes, subgroups and methods of analysis	Notes
	Marital status: Intervention: Married 35 (87.5%) Other 5 (12.5%) Control: Married 56 (97%) Other 2 (3%) p=0.263 (Fisher's exact test) Education of Parent 1: Intervention: <High school certificate 12 (30%) High school certificate 10 (25.5%) Trade certificate 5 (13%) Tertiary degree or diploma 13 (32.5%) Education of Parent 1: Control: <High school certificate 23 (40%) High school certificate 13 (22%) Trade certificate 9 (16%) Tertiary degree or diploma 13 (22%) χ^2=1.774 (df 3), p=0.627 Education of Parent 2: Intervention:	that allowed each potential type of hazard to marked as present/not present; this was followed by a list of action points and contact details of local outlets where safety equipment could be purchased. **<u>Control/comparison/s description</u>** No home risk assessment. **<u>Sample sizes</u>** **Total n=** 198 **Intervention n=** 94 **Control n=** 104 **Baseline comparisons** 'Baseline' demographic characteristics of intervention and control groups showed no statistically significant difference (using χ^2 test), *but* this analysis was conducted only on those participants where follow-up was successful (not the c. 44-49% of participants lost to follow-up). **Study sufficiently powered?** Not reported.	non-climbable barrier - toys with parts that could burn, entrap, smother or be inhaled by a child - cot with bars <50mm or >85mm apart - high chair without harness Knowledge of safety precautions for various household areas. **How is the data for each outcome collected?** Home risk assessment using safety education booklet. Safety knowledge questionnaire (unvalidated). **Other relevant outcomes** None. **Did the study collect data on and report resource use and/or costs** No. **Timing of data collection** 5-9 months post-intervention. **Method of analysis** ITT not conducted. Analysis not adjusted for baseline differences. **Were there any subgroups for which outcomes were reported?** None. **If so, which subgroups were outcomes reported for?**	High attrition rates. **Evidence gaps and/or recommendations for future research** None. **Source of funding** University of Newcastle Research Management Committee **Did the study collect data on and report information about barriers and facilitators to/of effectiveness?** No. **Observations from the Discussion section regarding barriers & facilitators** None.

Study details	Population and setting	Method of allocation to intervention/control	Outcomes, subgroups and methods of analysis	Notes
	<High school certificate 10 (29%) High school certificate 4 (11%) Trade certificate 14 (40%) Tertiary degree or diploma 7 (20%) Education of Parent 2: Control: <High school certificate 16 (28%) High school certificate 11 (19%) Trade certificate 21 (37%) Tertiary degree or diploma 9 (16%) χ^2=1.104 (df 3), p=0.776 Home tenure: Intervention: Rented 3 (8%) Owned 36 (92%) Control: Rented 12 (20%) Owned 47 (80%) χ^2=2.003 (df 1), p=0.157 **Study year** Not reported. **Eligible population:** Parents of all children born in a local rural hospital between 10		Not applicable. **Were the subgroup analyses prespecified?** Not applicable.	

Study details	Population and setting	Method of allocation to intervention/control	Outcomes, subgroups and methods of analysis	Notes
	months and 2 years previously. **Selected population:** Attempts were made to contact all eligible parents (n=615 identified) – of these, only 350 could be contacted, of which 205 (59%) agreed to participate. However, due to 'difficulties' in arranging house checks (volunteer non-availability, difficulties in arranging appointment times, families moving house), only 76% (n=72) in the intervention arm received the intervention. **Excluded population/s:** None.			

Outcomes
Note: Table 2 (hazards present in >20% of homes, outcome data for total sample) *not* extracted as data is meaningless without baseline hazard data or comparison between intervention and control arms.

Authors present pre-post intervention outcomes for *selected* hazards (i.e. those where statistical significance):

Pre-test to post-test differences in the intervention group (McNemar's Test of Symmetry):
Roof areas with child access (χ^2=4, df=1, p<0.05)
No lockable cupboard in kitchen or bathroom (χ^2=4.0, df=1, p<0.05)
Toys with heat sources (χ^2=4, df=1, p<0.05)
Toys able to trap the head or neck (χ^2=4, df=1, p<0.05)

Post-test differences between intervention and control group (Yates Chi-Square test):
Use of bench-top corners (χ^2=40.695, df=1, p<0.001)
Syrup of ipecac (χ^2=6.936, df=1, p<0.01)

Pre-test to post-test differences in the intervention group home hazard score (signed rank sum test used as data not normally distributed):

Study details	Population and setting	Method of allocation to intervention/control	Outcomes, subgroups and methods of analysis	Notes

S=147, p<0.05; pre-test mean score=11.41, SD=3.11; post-test mean score=9.39, SD=2.30)

Post-test differences between intervention and control group home hazard score (Wilcoxon's rank sum test):
Intervention mean score=9.39, SD=2.30; control mean score=9.91, SD=2.7647 – no significant difference)

Percentage of respondents able to name >=2 safety precautions for each household feature at post-test:

Household feature	Intervention group (n=40)	Control group (n=58)
Steps/stairs	22 (55%)	22 (38%)
Verandah/balcony	16 (40%)	14 (24%)
Yard/garden	28 (70%)	20 (34%)
Power points	8 (20%)	17 (29%)
Stove	12 (30%)	13 (22%)
Hot water taps	13 (33%)	9 (16%)
Kitchen	15 (38%)	14 (24%)
Bathroom	21 (53%)	12 (21%)
Heater/fire	5 (13%)	5 (9%)
Poisonous substances	16 (40%)	13 (22%)
Toys	17 (43%)	11 (19%)
Glass doors	16 (40%)	5 (9%)
Pool/pond	18 (45%)	17 (29%)

Paper reports (p.247) "a trend towards an increase in knowledge score for the intervention group (S=-88, p=0.06)" and "intervention group's post-test knowledge score to be significantly higher than the control's (S=2515, z=3.6972, p=0.0005)

Other relevant outcomes
Not applicable.

Attrition details:
Intervention n=54 (57%), Control n=46 (44%) lost to follow-up

Study details	Population and setting	Method of allocation to intervention/control	Outcomes, subgroups and methods of analysis	Notes
Authors Posner et al **Year (of publication)** 2004 **Aim of study** To assess the effectiveness of an emergency department-based home safety intervention on caregivers' behaviours and practices related to home safety **Study design** RCT **Internal validity score** [++, + or -] ++ **External validity score** [++, + or -] ++	**Source area/s** **Country** USA **Setting** Emergency department **Location** Urban **Population demographics** **Age** Of caregivers (years) – mean (SD): Intervention: 27.6 (6.4) Control: 30.7 (8.8) Of injured children (years) – mean (SD): Intervention: 2.4 (1.4) Control: 2.0 (1.3) **% Female** Of caregivers n (% in trial arm): Intervention: Mother 41 (84%) Father 7 (14%) Grandparent 0 (0%) Other 1 (2%) Of caregivers n (% in trial arm): Control: Mother 40 (85%) Father 5 (11%) Grandparent 1 (2%)	**Method of allocation** Describe how the selected individuals/clusters were allocated to receive either intervention or control. How was confounding minimised? Allocation arm contained in numbered, opaque envelopes that had been pre-randomised in computer-generated blocks of 10 (allocation sequence unknown to staff who enrolled and assigned participants). **Intervention/s description** **Type of intervention** Enhanced emergency department discharge care ('comprehensive home safety counselling') + safety tips leaflet + free home safety kit (cupboard latches, drawer latches, electrical outlet covers, tub spout covers, nonslip bath decals, bathwater thermometer, small parts tester (choking tube), poison control telephone number stickers, literature	**Did the study collect data on and report resource use and/or costs** Only the approximate retail value of the safety kit (US$32) **Timing of data collection** Median length of follow-up time = 68 days (range: 39-146) **Method of analysis** ITT reported. Caregivers lost to follow-up did not differ significantly from those successfully contacted (group assignment p=.91; pre-test overall safety score p<.28; caregiver age p<.47; caregiver relationship p<.42; child age p<.15; injury mechanism p<.11) **Were there any subgroups for which outcomes were reported?** None **If so, which subgroups were outcomes reported for?** Not applicable **Were the subgroup analyses prespecified?** Not applicable	**Limitations identified by author** Potential for reporting bias due to questionnaire relying upon self-reporting of safety practices (i.e. potential exists for overestimation of the intervention's effectiveness). Intermediate outcomes reported (i.e. changes in knowledge) rather than home injury events. **Limitations identified by review team** None in addition to those identified by authors. **Evidence gaps and/or recommendations for future research** Final outcome of interest (injuries incurred in the home) should be measured rather than intermediate outcomes. **Source of funding** Robert Wood Johnson Foundation. **Did the study collect data on and report information about barriers and facilitators to/of effectiveness?** No. **Observations from the Discussion section regarding barriers & facilitators** Not applicable.

Study details	Population and setting	Method of allocation to intervention/control	Outcomes, subgroups and methods of analysis	Notes
	Other 1 (2%) Of children n (% in trial arm): Intervention: Female 21 (43%) Control: Female 26 (55%) **Ethnicity** Of children n (% in trial arm): Intervention: Black 39 (80%) Hispanic 0 (0%) White 6 (12%) Other 4 (8%) Of children n (% in trial arm): Control: Black 34 (72%) Hispanic 1 (2%) White 8 (17%) Other 4 (8%) **Other socioeconomic variables** Educational attainment of caregivers n (% in trial arm): Intervention: <High school 4 (8%) High school 15 (31%) >High school 18 (37%) No response 12 (24%) Educational attainment of caregivers n (% in trial arm):	related to fire and window safety). **Other components of scheme/intervention?** None **Intervention delivered:** Comprehensive safety counselling delivered by trained lay personnel. Safety discharge advice described as 'comprehensive' (i.e. covering all child safety risks, not just those that caused the injury) and followed a scripted review of the safety leaflet. **<u>Control/comparison/s description</u>** Usual emergency department discharge care (verbal safety information) + safety tips leaflet. **<u>Sample sizes</u>** **Total n=** 136 **Intervention n=** 69 **Control n=** 67 **Baseline comparisons** No formal test upon baseline demographic		

Study details	Population and setting	Method of allocation to intervention/control	Outcomes, subgroups and methods of analysis	Notes
	Control: <High school 1 (2%) High school 14 (30%) >High school 26 (55%) No response 6 (13%) Home ownership of caregivers n (% in trial arm): Intervention: Rent 23 (47%) Own 20 (41%) Home ownership of caregivers n (% in trial arm): Control: Rent 25 (53%) Own 21 (45%) **Study year** 2001 **Eligible population:** Caregivers of children aged <5 years who presented to a paediatric emergency department for treatment of unintentional injuries sustained in the home. **Selected population:** Attendees who had sustained injuries by one of the following mechanisms: falls, burns/fires, cuts/piercings/, poisoning, foreign body aspiration/ ingestion, near-drownings. 86%	data reported. Visual analysis of demographic data does not indicate major baseline differences. Pre-intervention safety scores (derived from validated questionnaire administered by trained study personnel) on a range of safety behaviours was not significantly different between intervention and control: Safety device use <.42 Poison <.37 Falls <.08 Drowning <.10 Cuts <.67 Burns <.79 Aspiration <.78 Fires <.24 Overall safety score <.70 **Study sufficiently powered?** Yes. Calculated on basis of overall safety score (standard deviation) of 59.1 (13.6), a 2-tailed hypothesis test, α=.05, correlations in range 0.1 to 0.6, a 10% difference in safety score could be		

Study details	Population and setting	Method of allocation to intervention/control	Outcomes, subgroups and methods of analysis	Notes
	agreed to participate. **Excluded population/s:** Non-English speaking caregivers. Children who incurred injuries outside of the home. Children with intentional injuries. Children incurring fatal injuries. Children who incurred injuries within a house that was not their primary residence. Children who incurred injuries but who did not live within an urban area. Injuries occurring where the primary caregiver was absent.	detected by enrolling between 14 and 33 participants per group with a power of 80%.		

Outcomes
Assessed using a validated questionnaire administered using trained study personnel.

Type of injury-prevention knowledge	Post-test score (% (SD)): Control group	Post-test score (% (SD)): Intervention group	p-value
Device use	44.3 (22.3)	65.4 (20.5)	<.001
Poisoning	64.9 (19.8)	74.4 (19.5)	<.02
Falls	57.4 (28.3)	58.9 (25.5)	<.79
Drownings	92.9 (16.2)	95.9 (13.4)	<.33
Cuts	66.4 (22.5)	81.0 (18.2)	<.001
Burns	68.4 (17.4)	76.0 (14.9)	<.03
Aspiration	52.7 (22.5)	59.7 (21.1)	<.12
Fires	80.6 (11.5)	81.7 (9.2)	<.61
Overall safety score	66.8 (11.1)	73.3 (8.4)	<.002

Other relevant outcomes
None

Attrition details:
Intervention: 19 (28%) lost to follow-up; Control: 17 lost to follow-up, 2 excluded (found to not meet inclusion criteria) (28%)

Study details	Population and setting	Method of allocation to intervention/control	Outcomes, subgroups and methods of analysis	Notes
Authors Sangvai et al **Year (of publication)** 2007 **Aim of study** To evaluate the effectiveness of a Chronic Care Model approach to injury prevention in primary care settings (providing decision support and clinical information systems, and redesigning the health care delivery system with the aim of facilitating health promoting family behaviours).	**<u>Source area/s</u>** **Country** USA **Setting** Private and academic family practices Practice 1: Private, rural Practice 2: Private, urban Practice 3: Academic, urban **Location** (urban, rural) Both urban and rural Practice 1: Private, rural Practice 2: Private, urban Practice 3: Academic, urban **<u>Population demographics</u>** **Age** Children aged 0-5 **% Female** Not reported **Ethnicity** Practice 1: White 94% African American 2% Other 4% Practice 2: White 60% African American 34%	**Method of allocation** Randomised allocation sequence contained in sequentially numbered envelopes. **<u>Intervention/s description</u>** **Type of intervention** Education + supply of safety kit only **Other components of scheme/intervention?** Counselling regarding use of car safety seats & safe storage of guns (outcomes not extracted in this table) **Intervention delivered:** Counselling (10-15 minutes) regarding the use of smoke detectors, safe storage of hazardous household materials, and setting of safe hot water tap temperature delivered by family practice medical staff, based upon a computerised 6-question assessment of parent's home safety knowledge. A research health assistant	**<u>Outcomes</u>** Outcomes for the 3 practices are presented separately by the authors as there are significant differences between with regard to participants' insurance status, ethnic group, maternal education and dwelling type. **How is the data for each outcome collected?** Authors intended to assess safety behaviour by observation (by research assistant blinded to arm allocation) during home visits, but only 27 participants (8%) agreed to this assessment of outcomes. **Other relevant outcomes** Not applicable **Did the study collect data on and report resource use and/or costs** No **Timing of data collection** Approximately 6 months post-intervention. **Method of analysis** No adjustments made for confounding variables. Presentation of analyses unclear, e.g. comparing intervention vs. control for some outcomes, but practice vs. practice for others. ITT analysis conducted for outcomes	**Limitations identified by author** Low recruitment rate. Potential for social-desirability bias in self-report. Potential home visit significantly discouraged participation in the study, although it is not clear why this was such a strong disincentive to participation. **Limitations identified by review team** Recruitment fell substantially short of stated 'study feasibility' sample size; n=319 (stated required n=1200 for adequate statistical power) and home visits (to observe outcomes) n=27 (stated required n=420). Reasons for substantial differences in successful recruitment to study within the different practices (e.g. Practice 1: 86%, Practice 2: 36% declined to participate) remain unacknowledged and unexplained. No details provided regarding the distribution of various items within the safety kits (according to need) between the three practices (and therefore to communities with differing socio-economic characteristics). Majority of outcomes compared by practice rather than by intervention vs. control groups – no rationale given, but possibly due to extremely low rate of agreement of participants to assessment of outcomes by home visit.

Study details	Population and setting	Method of allocation to intervention/control	Outcomes, subgroups and methods of analysis	Notes
Study design RCT **Internal validity score** [++, + or -] - **External validity score** [++, + or -] -	Other 6% Practice 3: White 14% African American 81% Other 5% **Other socioeconomic variables** (where available) Medical insurance: Practice 1: Private 63% Public 37% Practice 2: Private 64% Public 36% Practice 3: Private 11% Public 89% Maternal education: Practice 1: <High school 43% High school + any college 28% >College graduate 28% Unknown 0% Practice 2: <High school 25% High school + any college 28% >College graduate 45% Unknown 2% Practice 3:	also delivered generic safety counselling. A free, tailored safety equipment pack comprising (as indicated) smoke alarm, cupboard locks, and/or water temperature information cards was provided **<u>Control/comparison/s description</u>** 'Standard physician counselling' **<u>Sample sizes</u>** **Total n=** 319 **Intervention n=** 160 **Control n=** 159 **Baseline comparisons** Sociodemographic characteristics of participants are presented by family practice, but not by intervention/control group – so cannot assess if important baseline differences in this regard. **Study sufficiently powered?** No. Authors report that sample size of 1200 would be necessary to detect 40%	observed at home visit, but this is only a very small (8%) sub-set of the sample due to attrition. **Were there any subgroups for which outcomes were reported?** No **If so, which subgroups were outcomes reported for?** Not applicable. **Were the subgroup analyses prespecified?** Not applicable.	Self-reporting of home safety behaviours during telephone call not elicited using validated survey instrument. **Evidence gaps and/or recommendations for future research** None identified. **Source of funding** Agency for Health Care Research & Quality **Did the study collect data on and report information about barriers and facilitators to/of effectiveness?** Yes. **Observations from the Discussion section regarding barriers & facilitators** Authors hypothesise that possibility of home visits taking place discouraged many potential participants from taking part.

Study details	Population and setting	Method of allocation to intervention/control	Outcomes, subgroups and methods of analysis	Notes
	<High school 52% High school + any college 38% >College graduate 10% Unknown 1% Dwelling type: Practice 1: Single home 72% Duplex/attached 4% Apartment 16% Mobile home 7% Practice 2: Single home 65% Duplex/attached 11% Apartment 24% Mobile home 0% Practice 3: Single home 31% Duplex/attached 24% Apartment 45% Mobile home 0% **Study year** December 2002 – January 2004 **Eligible population:** Parents attending ‘usual care’ child health clinic at the family practices. **Selected population:** Convenience sample of parents with children aged 0-5 years.	reduction (at 95% CI) in noncompliant home safety behaviour – only a sample of 319 was attained.		

Study details	Population and setting	Method of allocation to intervention/control	Outcomes, subgroups and methods of analysis	Notes
	34% agreed to participate. Authors note that 'disinterest', 'no time', and 'did not want home visit' were reasons given for non-participation, but unclear as to what bias to sample this may have resulted in. **Excluded population/s:** Not reported.			

Outcomes
Safety behaviours assessed at home visit (NOTE: only 8% of participants agreed to these visits taking place), intervention vs. control: (Fisher exact test)
Smoke alarms present and functioning p=.015 (16/17 households in the intervention group and 5/10 households in the control group).
Safe storage of hazardous household substances p=.015
No other significant differences noted.

Other relevant outcomes
Outcomes *by family practice* (self-report during telephone call) (no statistically significant differences between practices):

	Practice 1 (n=67 (%))	**Practice 2** (n=147 (%))	**Practice 3** (n=105 (%))
Installation and use of smoke alarms	66 (99)	131 (89)	102 (97)
Water temperature <=120 degrees farenheit	66 (99)	113 (77)	61 (58)
Unknown	0	15 (10)	40 (38)

Attrition details:
Not stated – whilst 20 phone calls could not be completed as the line had been disconnected, no details given regarding the practices or trial arms to which these participants were allocated. Note that results are presented as if *all* participants had been successfully contacted.

Study details	Population and setting	Method of allocation to intervention/control	Outcomes, subgroups and methods of analysis	Notes
Authors Schwarz et al **Year (of publication)** 1993 **Aim of study** To evaluate the impact of the 'Safe Block Project' on home hazards and injury prevention knowledge in a poor urban African-American community. **Study design** CBA **Internal validity score** [++, + or -] + **External validity score** +	**<u>Source area/s</u>** **Country** USA **Setting** Participants' homes. **Location** Urban. **<u>Population demographics</u>** **Age** Not reported. **% Female** Not reported. **Ethnicity** 97% African American. **Other socioeconomic variables** Median yearly income $11810 **Study year** 1989 **Eligible population:** The 9 census tracts with the highest injury rates in the target community were allocated to intervention and control arms. **Selected population:** All households within the	**Method of allocation** Non-randomised. Allocation of community areas conducted purposively so that baseline injury rates, income, and population characteristics were similar in both trial arms (no formal analysis conducted). **<u>Intervention/s description</u>** **Type of intervention** Home risk assessment + education + supply & installation of safety equipment **Other components of scheme/intervention?** As homicides were the main cause of mortality in the target communities (and were a source of concern to participants), discussion also took place regarding injuries resulting from violence. Home safety educational events also took place (in addition to within participants' homes) at	**<u>Outcomes</u>** Presence of hazards. Presence of installed safety equipment. Safety knowledge. **How is the data for each outcome collected?** Standardised questionnaire completed on a random sample of participants by Department of Public Health personnel (observation/ interview with participants) **Other relevant outcomes** Presence of hazards posed by lack of home maintenance, e.g. frayed electrical cords, tripping hazards, storage of kerosene. **Did the study collect data on and report resource use and/or costs** No. **Timing of data collection** 12 months post-intervention. **Method of analysis** χ^2 analysis conducted to assess differences between intervention and control arms. Logistic regression used to control for age distribution differences (i.e. children <5 years and adults >65 years) ITT analysis not conducted.	**Limitations identified by author** More comprehensive and formal baseline home risk assessment would have provided more data for analysis of the effectiveness of the intervention. Non-random arm allocation – however, note that this method was used with good reason on basis of feedback from community leaders (contamination between neighbours in contiguous homes or blocks would have been highly probable if these had been the basis for random allocation). Potential for contamination from concurrent city-wide safety programmes, e.g. fire department provision of free smoke alarms. Study design did not allow disaggregation of effects of home-based interventions carried out by safety inspectors and the block-wide educational initiatives facilitated by community liaison personnel. **Limitations identified by review team** Recruitment used upon potential participants being at home at the time that recruitment was taking place. Personnel completing follow-up were not blinded to arm allocation. No analysis conducted of characteristics of participants lost to follow-up.

Study details	Population and setting	Method of allocation to intervention/control	Outcomes, subgroups and methods of analysis	Notes
	census tracts concerned. **Excluded population/s:** Not reported.	block and community meetings. **Intervention delivered:** 'Safe Block Project' Trained community-based outreach workers used an inspection checklist to conduct a risk assessment in every room within the participant's house and supplied a comprehensive safety pack (bathwater thermometer, nightlight, syrup of ipecac, telephone sticker with emergency contact numbers, and poster (& fridge magnet) with emergency contact numbers and information on presenting burns, poisonings, falls, and domestic violence). Smoke alarms were installed by the community workers and home hazards and how to address them were discussed with participants. Community liaison workers also endeavoured to cultivate a network of community-based representatives who	**Were there any subgroups for which outcomes were reported?** No. **If so, which subgroups were outcomes reported for?** Not applicable. **Were the subgroup analyses prespecified?** Not applicable.	Missed opportunity to conduct and document more in-depth home risk assessments for analysis of the effectiveness of the programme. **Evidence gaps and/or recommendations for future research** None. **Source of funding** Not reported. **Did the study collect data on and report information about barriers and facilitators to/of effectiveness?** No. **Observations from the Discussion section regarding barriers & facilitators** Not applicable.

Study details	Population and setting	Method of allocation to intervention/control	Outcomes, subgroups and methods of analysis	Notes
		would continue to be involved with home safety education **<u>Control/comparison/s description</u>** No intervention. **<u>Sample sizes</u>** **Total n=** 2722 **Intervention n=** 1250 **Control n=** 1472 **Baseline comparisons** No formal analysis conducted, but intervention and control arms were purposively allocated so that baseline injury rates, income, and population characteristics were similar. **Study sufficiently powered?** Not reported.		

Outcomes
Hazards in the home that required minimal effort to correct:

	Intervention group (%)	**Control group (%)**	***p***	**Adjusted odds ratio (95% CI)**
No syrup of ipecac for children aged <5 years	29.0	90.2	<.001	0.04 (0.02, 0.07)
No smoke alarm	4.0	23.0	<.001	0.14 (0.09, 0.20)
Hot water temperature >125°F	36.8	26.8	<.001	1.73 (1.39, 2.15)
Inadequate lighting on stairs	17.9	19.9	.41	0.90 (0.69, 1.16)

Study details	Population and setting	Method of allocation to intervention/control	Outcomes, subgroups and methods of analysis	Notes

Hazard in the home that required moderate effort to correct:

	Intervention group (%)	Control group (%)	*p*	Adjusted odds ratio (95% CI)
No fire escape plan	68.7	84.9	<.001	0.30 (0.24, 0.38)
Medications within reach (where children aged <5 y)	48.4	64.4	<.001	0.48 (0.33, 0.71)
Medications without childproof caps (where children aged <5 y)	26.2	16.3	.08	1.53 (0.95, 2.46)
Medications either within reach or without childproof caps (where children aged <5 y)	24.8	15.4	.08	1.54 (0.95, 2.50)

Other relevant outcomes
None.

Attrition details:
Approximately 40% of the sample were randomly selected for follow-up; of these, 28% of both the intervention and control arms were lost to follow-up.

Study details	Population and setting	Method of allocation to intervention/control	Outcomes, subgroups and methods of analysis	Notes
Authors Sznajder et al **Year (of publication)** 2003 **Aim of study** To evaluate the effectiveness of home delivery of an injury prevention kit. **Study design** RCT **Internal validity score** [++, + or -] + **External validity score** [++, + or -] -	**<u>Source area/s</u>** **Country** France **Setting** Participants' homes **Location** Urban (near Paris) **<u>Population demographics</u>** **Age** Mean age of children in years (SD): Intervention 3.9 (4.4) Control 4.5 (4.2) Mean age of respondent (parent) in years (SD): Intervention 32.4 (5.1) Control 32.3 (5.9) **% Female** Not reported. **Ethnicity** Not reported. **Other socioeconomic variables** Family type: Intervention: One parent 14.3% Two parents 83.7%	**Method of allocation** Allocation was 'randomised' (no further details provided) **<u>Intervention/s description</u>** **Type of intervention** Safety counselling + safety pamphlets + safety kit (cupboard and drawer latches, door handle covers, table protection corners, electric outlet covers, non-skid bath mat, smoke alarm, phone sticker with contact number of poison control centre) **Other components of scheme/intervention?** None **Intervention delivered:** Intervention delivered in the participants' home on a single occasion by a health professional (doctor, nurse, or auxiliary nurse) when the child reached the age of 6-9 months. No details reported regarding length	**<u>Outcomes</u>** Self-reported changes in home safety behaviour (unvalidated questionnaire). **How is the data for each outcome collected?** Observation. Questionnaire. **Other relevant outcomes** None. **Did the study collect data on and report resource use and/or costs** No. **Timing of data collection** 6-8 weeks following delivery of intervention and baseline safety behaviour questionnaire. **Method of analysis** Student's *t* test. Analysis not adjusted as baseline characteristics were comparable. **Were there any subgroups for which outcomes were reported?** Yes. **If so, which subgroups were outcomes reported for?** Single parent families. Parents with <university education.	**Limitations identified by author** Although study recruitment through Mother & Child Protection Services was proposed to target lower socio-economic populations, approximately 50-75% of participants were higher socio-economic status (in terms of educational level, salaried employment and low rates of unemployment). **Limitations identified by review team** Maximum follow-up time of 8 weeks – insufficient to evaluate long-term behaviour change. Rationale for conducting observation of *and* questionnaire on safety behaviours not given – is this because there was insufficient confidence in the validity of the observations? (if this is the case, why is a more fine-grained analysis made of the observational findings (and greater weight given to them in the presentation and discussion) whilst the analysis of questionnaire responses is made on a sum of all the responses?) Inclusion criteria unclear and used upon non-randomised sample of research participants by Mother & Child Protection Services. No calculation of statistical power of study. Sub-group analyses not pre-specified. **Evidence gaps and/or recommendations for future research** Evaluation of effectiveness of the intervention on injury outcomes (rather than surrogate variables).

Study details	Population and setting	Method of allocation to intervention/control	Outcomes, subgroups and methods of analysis	Notes
	Reconstituted 0% Unknown 2.0% Control: One parent 12.0% Two parents 80.0% Reconstituted 8.0% Unknown 0% Dwelling type: Intervention: House 6.1% Block of flats 91.8% Temporary 2.0% Unknown 0% Control: House 6.0% Block of flats 92.0% Temporary 0% Unknown 2.0% Educational level of parents: Intervention: Primary school 8.2% Secondary school 22.4% Grammar school 14.3% University 49.0% Unknown 6.1% Control: Primary school 4.0% Secondary school 24.0% Grammar school 16.0% University 54.0% Unknown 2.0%	of counselling provided. **Control/comparison/s description** Safety counselling + safety pamphlets **Sample sizes** **Total n=** 99 **Intervention n=** 49 **Control n=** 50 **Baseline comparisons** Using Student's t test, no statistically significant (i.e. no p value <5%) differences in baseline socio-economic characteristics of intervention and control groups. **Study sufficiently powered?** Not reported.	**Were the subgroup analyses prespecified?** No.	Evaluation of cost-effectiveness of the intervention. **Source of funding** For example, government (eg NHS), voluntary/charity, pharmaceutical company etc and the role of funding organisations. **Did the study collect data on and report information about barriers and facilitators to/of effectiveness?** No. **Observations from the Discussion section regarding barriers & facilitators** No.

Study details	Population and setting	Method of allocation to intervention/control	Outcomes, subgroups and methods of analysis	Notes
	Employment: Intervention: Salaried post 63.3% Independent 0% Training 2.0% Unemployed 4.0% Homemaker 30.7% Control: Salaried post 58.0% Independent 2.0% Training 0% Unemployed 2.0% Homemaker 32.0% Mean number of children in household (SD): Intervention 1.7 (0.8) Control 1.9 (1.0) Primipara: Intervention 49% Control 42% **Study year** October 2000 – April 2001 **Eligible population:** Families selected by Mother & Child Protection Services; this service's usual criteria for involvement are primipara, medical, psychological, and/or socioeconomic difficulties. No formal comparison of			

Study details	Population and setting	Method of allocation to intervention/control	Outcomes, subgroups and methods of analysis	Notes
	characteristics of sample population conducted; visual analysis suggests that the sample population contained less unemployed parents, with smaller family sizes and who were more likely to be resident in a flat than the population of the towns concerned as a whole. **Selected population:** 100 families with newborns were 'selected' by Mother & Child Protection Services (inclusion criteria not stated) and randomised to intervention and control arms. Whether or not potential participants declined to participate is not reported. **Excluded population/s:** Exclusion criteria not reported.			

Outcomes

Number of high risk cases observed at baseline and follow-up (6-8 weeks):

Observed home safety behaviours relating to:	Intervention: Follow-up/Baseline	Intervention: % improvement	Control: Follow-up/Baseline	Control: % improvement	p value
Falls	65/144	45.1%	41/133	30.8%	<0.02
Fires	53/161	32.9%	24/163	14.7%	<0.001
Poisoning	76/116	65.5%	46/98	46.9%	<0.01
Suffocation	27/49	55.1%	11/50	22.0%	<0.001
Wounds	23/48	47.9%	25/55	45.5%	0.95

Number of self-reported improvements in home safety behaviours at baseline and follow-up (6-8 weeks):

Study details	Population and setting	Method of allocation to intervention/control	Outcomes, subgroups and methods of analysis	Notes

Question	**Intervention: No. of households where safety change made/ No. of high risk situations observed at initial visit**	**Control: No. of households where safety change made/ No. of high risk situations observed at initial visit**
How many smoke detectors have been installed efficiently?	26/46	5/49
Do you use electrical outlet covers?	16/25	11/24
Are medicines stored in locked or out-of-reach locations?	13/15	8/13
Is alcohol stored in locked or out-of-reach locations?	10/18	2/16
Are beauty products (bath oil, shampoos, aftershave lotions) stored in locked or out-of-reach locations?	21/32	13/25
Are cleaning products (dishwashing detergent, bleach, oven cleaner) stored in locked or out-of-reach locations?	20/28	17/26
Are home maintenance products (weedkillers, insecticides, kerosene) stored in locked or out-of-reach locations?	10/14	6/17
Are sharp-pointed table corners covered with protection devices?	25/30	13/27
Do you have non-skid strips or a non-skid mat in your bathtub?	11/28	19/31
Total	152/236 (64.4%)	94/228 (41.2%)

Number of self-reported improvements between intervention and control was significantly different (p<0.01)

Single-parent families, use of safety devices provided in the kit, intervention vs. control: 90.0% vs. 44.4% (p<0.007)
Parents with <less university education, use of safety devices provided in the kit, intervention vs. control: 61.5% vs. 36.5% (p<0.01)

Other relevant outcomes
None.

Attrition details:
One family in intervention arm lost to follow-up (reason not stated).

Study details	Population and setting	Method of allocation to intervention/control	Outcomes, subgroups and methods of analysis	Notes
Authors Watson et al **Year (of publication)** 2005 **Aim of study** To assess the effectiveness of safety advice and safety equipment in reducing unintentional injuries for families with children aged under 5 and living in deprived areas. **Study design** RCT **Internal validity score** [++, + or -] ++ **External validity score** ++	**<u>Source area/s</u>** **Country** UK (Nottingham) **Setting** Participants' homes or health clinics. **Location** Urban. **<u>Population demographics</u>** **Age** Age of youngest child (years): Intervention: 0 – 27.1% 1 – 24.2% 2 – 19.8% 3 – 16.7% 4 – 12.0% Control: 0 – 25.9% 1 – 24.5% 2 – 21.0% 3 – 16.0% 4 – 12.6% No. of children <16 years: Intervention: 1 – 38.5% 2 – 36.9% 3 – 17.0% >=4 – 7.6%	**Method of allocation** After baseline questionnaires had been returned, participants were stratified by Health Visitor and randomised (using computer generated schedule) to trial arms. **<u>Intervention/s description</u>** **Type of intervention** Safety counselling + supply & installation of safety equipment. **Other components of scheme/intervention?** None. **Intervention delivered:** Health Visitor provided standardised safety counselling (20 minutes), but which was individualised to be specific to the ages of children within the family. Safety equipment (stair gates, fire guards, smoke alarms, cupboard locks, window locks - as appropriate) was supplied and installed free-of-	**<u>Outcomes</u>** Medically-attended injuries, rates of attendance in primary and secondary care, and hospital admission for unintentional injuries (all sourced from primary and secondary care records). Installation and use of safety equipment in the home (validated questionnaire). Safety behaviour in the home (validated questionnaire). **How is the data for each outcome collected?** See above. **Other relevant outcomes** None. **Did the study collect data on and report resource use and/or costs** No. **Timing of data collection** At 12 and 24 months post-intervention. **Method of analysis** Prespecified analysis plan, intention to treat. Multilevel logistic regression used to compare trial arms. Significance assessed using Wald tests. Interactions between intervention and family income and child age were	**Limitations identified by author** Low initial participation rate (35% of the families who were eligible to take part). Participants may have been those families who were more motivated to address home safety issues (risk of overestimation of intervention's effectiveness). **Limitations identified by review team** Assessment of safety behaviour outcomes, despite use of validated questionnaire, has risk of social desirability bias in responses as is self-report. **Evidence gaps and/or recommendations for future research** Investigation of unexplained findings in the study: 1) Higher rate of attendance in primary care for minor injuries in the intervention arm – possibility that involvement in the study changed parents' consulting behaviour. 2) Possibility of risk compensation in the intervention arm. **Source of funding** NHS Executive, Trent. One researcher was funded by a Department of Health Public Health Career Scientist Award, and another researcher by a Department of Health Primary Care Researcher Development Award. **Did the study collect data on and report information about barriers and facilitators**

Study details	Population and setting	Method of allocation to intervention/control	Outcomes, subgroups and methods of analysis	Notes
	Control: 1 – 40.3% 2 – 34.1% 3 – 17.5% >=4 – 8.2% **% Female** Not reported. **Ethnicity** Non-white: Intervention – 14.1% Control – 15.2% **Other socioeconomic variables** Receipt of means tested benefits: Intervention – 50.0% Control – 50.1% No car: Intervention – 30.5% Control – 31.3% Lives in rented accommodation: Intervention – 45.8% Control – 45.9% Overcrowding (>1 person/room) Intervention – 11.1% Control – 11.8% Single parent family: Intervention – 27.4% Control – 28.4%	charge (for families in receipt of benefits; others received free delivery only). **Control/comparison/s description** 'Usual care', i.e. no access to the research documentation or safety equipment supply & installation scheme. **Sample sizes** **Total n=** 3428 families (3995 children aged <5) **Intervention n=** 1711 families (1974 children aged <5, plus 323 new births during study) **Control n=** 1717 families (2021 children aged <5, plus 336 new births during study) **Baseline comparisons** Intervention and control groups well-balanced at baseline over a wide range of socio-economic and safety behaviour characteristics. **Study sufficiently powered?** Follow-up included	examined. Models checked by examining residual plots and assessing for overdispersion. No adjustments made for baseline differences as these were negligible across a wide range of socio-economic and behavioural characteristics. **Were there any subgroups for which outcomes were reported?** No. **If so, which subgroups were outcomes reported for?** Not applicable. **Were the subgroup analyses prespecified?** Not applicable.	**to/of effectiveness?** No. **Observations from the Discussion section regarding barriers & facilitators** None.

Study details	Population and setting	Method of allocation to intervention/control	Outcomes, subgroups and methods of analysis	Notes
	Teenage mother: Intervention – 24.1% Control – 23.2% Resides in a deprived area (Townsend score >0): Intervention – 70.9% Control – 70.7% One parent unemployed: Intervention – 36.2% Control – 36.0% Both parents unemployed: Intervention – 33.1% Control – 34.2% Child in family already had medically attended injury: Intervention – 12.9% Control – 13.2% Fitted and always used fireguard: Intervention – 45.9% Control – 46.7% Fitted and used stair gate: Intervention – 44.5% Control – 45.4% Fitted and working smoke alarm Intervention – 76.9% Control – 75.5%	sufficient numbers to satisfy the calculated 3400 sample that would give 80% power to detect at the 5% significance level a relative reduction of 10% in medically attended injuries between treatment arms. (Calculation assumed that 50% of control families would have at least one child having >=1 medically attended injuries over the 2 year follow-up period and allowed for 10% loss to follow-up).		

Study details	Population and setting	Method of allocation to intervention/control	Outcomes, subgroups and methods of analysis	Notes
	Fitted window locks: Intervention – 63.0% Control – 61.8% Medicines safely stored in kitchen: Intervention – 87.5% Control – 88.3% Cleaning products safely stored in kitchen: Intervention – 50.6% Control – 51.8% Sharp objects safely stored in kitchen: Intervention – 36.6% Control – 38.7% Cleaning products safely stored in bathroom: Intervention – 66.2% Control – 69.2% Sharp objects safely stored in bathroom: Intervention – 87.5% Control – 87.7% **Study year** 2000-2002 **Eligible population:** Families with >=1 children aged <5 years who were on the caseload of Health Visitors			

Study details	Population and setting	Method of allocation to intervention/control	Outcomes, subgroups and methods of analysis	Notes
	within the 47 participating practices. **Selected population:** Families with >=1 children aged <5 years. 35% of the families approached agreed to participate. **Excluded population/s:** Families where >=1 children were on the Child Protection Register. Families where a child had experienced a fatal unintentional injury.			

Outcomes
Injury outcomes at the level of the family or child at 24-months follow-up:

	Intervention arm				**Control arm**				**Effect size**	
Injury outcomes	**No. (%)**	**Denomina tor**	**Rate/1000 person years**	**Person years**	**No. (%)**	**Denomina tor**	**Rate/1000 person years**	**Person years**	**Odds ratio (95% CI)**	**Incidence rate ratio (95% CI)**
At family level:										
Child in family had medically attended injury	593 (40.5%)	1463	-	-	574 (37.5%)	1532	-	-	1.14 (0.98, 1.50)	-
Phoned NHS Direct after an injury	77 (10.0%)	769	-	-	67 (9.3%)	719	-	-	1.08 (0.76, 1.52)	-
Attended walk-in centre after	29 (3.8%)	767	-	-	28 (3.9%)	712	-	-	0.94 (0.53, 1.60)	-

Study details	Population and setting	Method of allocation to intervention/control	Outcomes, subgroups and methods of analysis	Notes

an injury									
At child level:									
Primary care attendance	220	-	61.2	3595.1	172	-	44.2	3887.7		1.37 (1.11, 1.70)
Secondary care attendance	685	-	175.9	3895.0	743	-	174.1	4267.8	-	1.02 (0.90, 1.13)
Hospital admission	54	-	13.9	3895.0	58	-	13.6	4267.8	-	1.02 (0.70, 1.48)
Abbreviated injury scale >=2	57 (12.1%)	472	-	-	49 (10.8%)	456	-	-	1.14 (0.76, 1.71)	-
Minor injury severity score >=2	215 (45%)	478	-	-	206 (45.3%)	455	-	-	0.98 (0.75, 1.27)	-

Prevalence of safety practices at 12 and 24 months follow-up (number of families):

	12 months follow-up			**24 months follow-up**		
Safety practices	**Intervention (n=771)**	**Control (n=744)**	**Odds ratio (95% CI)**	**Intervention (n=803)**	**Control (n=754)**	**Odds ratio (95% CI)**
Fitted and always used fire guard	414 (54.3%)	374 (50.9%)	1.14 (0.93, 1.40)	328 (42.1%)	299 (40.0%)	1.09 (0.88, 1.33)
Fitted and used stair gate	408 (55.0%)	328 (45.7%)	1.46 (1.19, 1.80)	239 (30.1%)	240 (31.9%)	0.92 (0.74, 1.14)
Fitted and working smoke alarm	692 (90.6%)	619 (84.0%)	1.83 (1.33, 2.52)	728 (91.5%)	648 (86.5%)	1.67 (1.21, 2.32)
Fitted window locks	550 (71.7%)	493 (66.5%)	1.28 (1.02, 1.59)	577 (72.4%)	525 (72.0%)	1.12 (0.90, 1.40)
Safe storage						
Medicines in kitchen	712 (93.4%)	683 (92.6%)	1.15 (0.76, 1.73)	765 (95.5%)	701 (93.2%)	1.55 (1.00, 2.40)
Cleaning products	496 (65.5%)	428 (58.6%)	1.34 (1.09, 1.66)	442 (55.3%)	365 (48.5%)	1.31 (1.07, 1.60)

Study details	Population and setting	Method of allocation to intervention/control	Outcomes, subgroups and methods of analysis	Notes

in kitchen						
Sharp objects in kitchen	346 (45.4%)	279 (38.2%)	1.34 (1.09, 1.65)	296 (36.9%)	262 (34.8%)	1.10 (0.91, 1.32)
Cleaning products in bathroom	493 (70.4%)	463 (68.5%)	1.09 (0.87, 1.38)	497 (63.1%)	459 (61.7%)	1.06 (0.86, 1.31)
Sharp objects in bathroom	545 (81.2%)	505 (78.3%)	1.20 (0.92, 1.57)	568 (73.2%)	548 (75.1%)	0.91 (0.72, 1.14)

Other relevant outcomes
None.

Attrition details:
As primary care records were used for injury outcomes, 0% attrition in both arms for these outcomes.

For other outcomes (assessed using questionnaire - note: smaller sample size of 1000 in each trial arm):
At 12 months:
Intervention group 8% lost to follow-up (e.g. refused to take part, moved out of area), control group 4% lost to follow-up.
At 24-months:
Intervention group 18% lost to follow-up, control group 24% lost to follow-up.

Study details	Population and setting	Method of allocation to intervention/control	Outcomes, subgroups and methods of analysis	Notes
Authors Woolf et al **Year (of publication)** 1992 **Aim of study** To evaluate the effectiveness of a poison-centre initiated mailed intervention on improving the preventive practices of families whose pre-school child had recently experienced a poisoning incident. **Study design** RCT **Internal validity score** [++, + or -] +	**Source area/s** **Country** USA **Setting** Parents' home (intervention pack sent by mail) **Location** (urban, rural) State of Massachusetts is both urban and rural – no breakdown given of residential location of research participants. **Population demographics** **Age** Parents of children aged <=5 100% **% Female** Not reported. **Ethnicity** % White: Intervention 87% Control 93% **Other socioeconomic variables** Maternal age in years (mean (SD)): Intervention 30.0 (5.5) Control 30.2 (5.7) Paternal age in years (mean	**Method of allocation** Randomised according to the day of the week on which the family was recruited. **Intervention/s description** **Type of intervention** Supply only (home safety information pamphlets, slide lock for kitchen cupboards, syrup of ipecac discount coupon, and 2 stickers with telephone number of poison centre mailed to home address of family in intervention arm). **Other components of scheme/intervention?** None. **Intervention delivered:** Single mailing to participants' homes. **Control/comparison/s description** No mailing. **Sample sizes** **Total n=** 336 **Intervention n=** 169	**Outcomes** Use of cupboard lock. Self-reported changes in safety-related behaviour. **How is the data for each outcome collected?** Structured (but unvalidated) interview conducted by phone. **Other relevant outcomes** Use of telephone sticker with number of poison control centre. Home storage of syrup of ipecac. (Data collected using structured (but unvalidated) interview conducted by phone). **Did the study collect data on and report resource use and/or costs** (of compared interventions)? No. **Timing of data collection** 3 months post-intervention. **Method of analysis** ITT analysis not conducted. Authors judged there to be no significant baseline differences, therefore no adjustments considered necessary. **Were there any subgroups for which outcomes were reported?**	**Limitations identified by author** Sampled only those families who already had the resources to contact a poison control centre. Sample limited to those families who had access to a telephone. Sample predominantly white, well-educated, and of a high socio-economic status with good health care. Cupboard lock in safety pack was not suitable for all types of cupboard (non-compliance may have been due to unsuitability of lock rather than lack of desire to make a change in behaviour). Outcomes were self-reported rather than observed. Short follow-up period (3 months) meant that effectiveness of intervention in reducing repeat poisonings in toddlers could not be assessed. **Limitations identified by review team** ITT analysis not conducted, although attrition in each arm (c.10%) was not high given the public environment in which the study was conducted. Outcome data collected using structured (but unvalidated) questionnaire administered by phone, therefore risk of response bias due to social desirability. 3-month follow-up insufficient to evaluate long-term behaviour change.

Study details	Population and setting	Method of allocation to intervention/control	Outcomes, subgroups and methods of analysis	Notes
External validity score [++, + or -] +	(SD)): Intervention 32.6 (6.1) Control 32.1 (6.1) Maternal education in years (mean (SD)): Intervention 13.4 (2.1) Control 13.7 (2.1) Paternal education in years (mean (SD)): Intervention 13.8 (2.2) Control 13.8 (2.1) % of children with a regular physician: Intervention 98% Control 99% % who had received ipecac from a physician: Intervention 8% Control 14% % who had received advice about poisonings: Intervention 37% Control 37% % of children who had experienced a subsequent poisoning within prior 3 months: Intervention 3% Control 5%	**Control n=** 167 **Baseline comparisons** No formal analysis conducted, but visual inspection of baseline characteristics shows no significant differences between intervention and control groups. **Study sufficiently powered?** Yes. Sample size of 150 in each trial arm calculated to have a 95% probability (2-tailed) of detecting a 20% between-group difference.	No. **If so, which subgroups were outcomes reported for?** Not applicable. **Were the subgroup analyses prespecified?** Not applicable.	**Evidence gaps and/or recommendations for future research** None. **Source of funding** Milton Fund (Harvard Medical School). Dyson Foundation. **Did the study collect data on and report information about barriers and facilitators to/of effectiveness?** No. **Observations from the Discussion section regarding barriers & facilitators** Not applicable.

Study details	Population and setting	Method of allocation to intervention/control	Outcomes, subgroups and methods of analysis	Notes
	Study year Not reported. **Eligible population:** All children aged <=5 years for whom a phone call had been made (within the 17-day period of recruitment) to the Massachusetts poison control centre with regard to an acute poisoning episode. **Selected population:** Families (33% of the eligible population) who did not have ipecac syrup in the home one week after the poisoning event. Note that 56% of the eligible population *did* have ipecac syrup in the home by this point without any further intervention. 11% declined to participate. **Excluded population/s:** Children for whom calls were made from emergency departments or physician's offices, where identification was not given. Families that could not be contacted by phone after 5 calls.			

Study details	Population and setting	Method of allocation to intervention/control	Outcomes, subgroups and methods of analysis	Notes

Outcomes
Use of home safety equipment:

	Intervention (%)	Control (%)	X^2	p
Cupboard lock	59	40	10.80	.001

Self-reported compliance with suggestions about poisoning prevention practices in the home:

	Intervention (%)	Control (%)	p
Have your children under the age of 5 years had a blood test for lead in the last year?	45	54	Not significant
Have you recently gone through the house to throw out old medicines and household products?	63	68	Not significant
Have you had a conversation with the child's grandparents about poisoning prevention measures they could take?	32	27	Not significant
Have you checked your houseplants and disposed of poisonous ones?	15	19	Not significant
Do all of your medicines at home have child-resistant caps?	70	58	Not significant

Other relevant outcomes

	Intervention (%)	Control (%)	X^2	p
Telephone sticker use	78	39	60.92	<.0001
Home storage of ipecac	57	52	0.57	Not significant

Attrition details:
Intervention n=19 (11%), Control n=16 (10%) – those lost to follow-up could not be contacted by phone

Appendix 6 Quality assessment of included economic evaluations

Quality assessment of included economic evaluations (using CHEC criteria list)

Criteria	Ginnelly et al. 2005	Haddix et al. 2001	King et al. 2001
Type of economic evaluation (*reminder - not a CHEC question*)	CEA	CEA	CEA
Is the study population (sites/areas) clearly described?	Yes	Yes	Yes
Are competing alternatives clearly described?	Yes	Yes	Yes
Is a well-defined research question posed in answerable form?	Yes	Yes	Yes
Is the economic study design appropriate to the stated objective?	Yes	Yes	Yes
Is the chosen time horizon appropriate to include relevant costs and consequences? (time horizon in years shown)	No (2)	Yes (life)	No (1)
Is the actual perspective chosen appropriate?	Yes	Yes	Yes[c]
Are all important and relevant costs for each alternative identified?	Yes	Yes	Not clear
Are all resources measured appropriately in physical units?	Mostly[a]	No	Not clear
Are resources valued appropriately?	Yes	NR	Yes, but[d]
Are all important and relevant outcomes for each alternative identified?	Yes	Yes	Yes
Are all outcomes measured appropriately in physical units?	Yes/No[b]	Yes	Yes
Are outcomes valued appropriately?	NA	NA	NA
Is an incremental analysis of costs and outcomes performed?	Yes	Yes	Yes
Are all future costs and outcomes discounted appropriately?	NA	Yes (costs)	NA
Are all important variables, whose values are uncertain, appropriately subjected to sensitivity analysis?	PSA only	Very few	No
Do the conclusions follow from the data reported?	Yes	Yes	Yes
Does the study discuss the generalisability of the results to other settings and patient/client groups (other places/roads)?	Very limited	Very limited	None
Does the article indicate that there is no potential conflict of interest of study researcher(s) and funder(s)?	No	No	No
Are ethical and distributional issues discussed appropriately?	Some	No	No
OVERALL STUDY QUALITY RATING	+	+	-

NB. The 'CHEC' list for assessing quality of health economic evaluations (Evers et al. 2005) incorporates all but one of the widely used critical appraisal questions recommended by Drummond et al (1997).

[a] Except resources like police presence at fires
[b] Combining both non-fatal and fatal injuries is not ideal, given how differently their avoidance would be relatively valued.
[c] Assuming that such home risk assessment programmes would be funded and provided by health services, and that external impacts on fire and police services are minimal relative to health service cost impacts.
[d] Costs for particular injury treatments were from either Hospital standard costs or Ontario Health Insurance Plan Schedule of Fees & Benefits; not usually regarded as good proxies for opportunity costs.

Appendix 7 Studies excluded at full text stage: Effectiveness review

Reference	Reason for exclusion
Adams LE, Purdue GF, Hunt JL. Tap-water scald burns. Awareness is not the problem. Journal of Burn Care & Rehabilitation 1991;12(1):91-95.	Not within review topic
Anemaet WK & Moffa-Trotter ME. Promoting safety and function through home assessments. Topics in Geriatric Rehabilitation 1999;15(1):26-55.	Not within review topic
Angst HB. Fire alarm system without alarm. Health Estate Journal 1993;47(6):2-3.	Not within review topic
Anon. Child accident prevention: home safety equipment loan schemes: plans and progress within one Environmental Health Department. London: Child Accident Prevention Trust - (28 Portland Place, London, W1N 4DE) 1991;():n. pag..	Inappropriate study design
Anon. From the Centers for Disease Control and Prevention. Deaths resulting from residential fires and the prevalence of smoke alarms--United States, 1991-1995. JAMA 1998;280(16):1395.	Not within review topic
Anon. Preventing burns and fires caused by high-powered light sources. Health Devices 2005;34(9):325-26.	Not within review topic
Ballesteros MF, Jackson ML, Martin MW. Working toward the elimination of residential fire deaths: the Centers for Disease Control and Prevention's Smoke Alarm Installation and Fire Safety Education (SAIFE) program. Journal of Burn Care & Rehabilitation 2005;26(5):434-39.	Inappropriate study design
Belsky J, Leyland A, Barnes J, Melhuish E, Belsky J, Leyland A, et al. Sure start in England. Lancet 2009;373(9661):381.	Not within review topic
Bennett C, Macdonald G, Dennis JA, Coren E, Patterson J, Astin M, Abbott J. Home-based support for disadvantaged adult mothers. Bennett Cathy , Macdonald Geraldine , Dennis Jane A, Coren Esther , Patterson Jacoby , Astin Margaret , Abbott Joanne Home based support for disadvantaged adult mothers Cochrane Database of Systematic Reviews : Reviews 2008 Issue 1 John Wiley & Sons , L 2008;():n. pag..	Inappropriate study design
Berfenstam R. Saving children's lives in Sweden through accident prevention. Health Matrix 1994;4(1):93-106.	Not within review topic
Borja S. Child Safe. URL: (accessed)	Inappropriate study design
Bruce B & McGrath P. Group interventions for the prevention of injuries in young children: a systematic review (Structured abstract). Injury Prevention 2005;11():143-47.	Not within review topic
Centers for Disease Control and Prevention (CDC). Deaths resulting from residential fires and the prevalence of smoke alarms--United States, 1991-1995. MMWR - Morbidity & Mortality Weekly Report 1998;47(38):803-06.	Inappropriate study design
Chevallier B & Sznajder M. Economic approach to a public health problem: child accidents in France (Brief record). Archives de Pediatrie 2000;7():457-60.	Excluded Economic study

Reference	Reason for exclusion
Children in Wales. Working Towards a Child Safety Strategy for Wales. ;():n. pag..	Inappropriate study design
Claudet I, Toubal K, Carnet C, Rekhroukh H, Zelmat B, Debuisson C, Cahuzac JP. When doors slam, fingers jam! (Brief record). Archives de Pediatrie 2007;14():958-63.	Not within review topic
Coggan C, Patterson P, Brewin M, Hooper R, Robinson E. Evaluation of the Waitakere Community Injury Prevention Project. Inj Prev 2000;6(2):130-34.	Not within review topic
Coggan C, Patterson P, Brewin M. Process evaluation report of the Waitakere community injury prevention project. Auckland: Injury Prevention Research Centre, 1998.	Not within review topic
Cohen LR, Runyan CW, Downs SM, Bowling JM. Pediatric injury prevention counseling priorities. Pediatrics 1997;99(5):704-10.	Not within review topic
Conners GP, Veenema TG, Kavanagh CA, Ricci J, Callahan CM. Still falling: a community-wide infant walker injury prevention initiative. Patient Education & Counseling 2002;46(3):169-73.	Not within review topic
Culp AM, Culp RE, Anderson JW, Carter S. Health and safety intervention with first-time mothers. Health Education Research 2007;22(2):285-94.	Not within review topic
Culp AM, Culp RE, Blankemeyer M, Passmark L. Parent education home visitation program: adolescent and nonadolescent mother comparison after six months of intervention. Infant Mental Health Journal 1998;19(2):111-23.	Not within review topic
Danseco ER, Miller TR, Spicer RS. Incidence and costs of 1987-1994 childhood injuries: demographic breakdowns (Brief record). Pediatrics 2000;105():E271-78.	Excluded Economic study
Dickinson H & Dickinson H. Evaluating sure start - by nigel malin and gillian morrow. Health & Social Care in the Community 2009;17(3):321.	Not within review topic
DiGuiseppi C & Higgins JPT. Systematic review of controlled trials of interventions to promote smoke alarms. Archives of Disease in Childhood 2000;82(5):341-48.	Systematic or non-systematic review - reviewed for references
DiGuiseppi C, Goss CW, Higgins JP. Interventions for promoting smoke alarm ownership and function. Cochrane Database of Systematic Reviews 2001;(2):CD002246-NaNaN.	Systematic or non-systematic review - reviewed for references
Dowswell T, Towner EM, Simpson G, Jarvis SN. Preventing childhood unintentional injuries - what works? A literature review (Structured abstract). Injury Prevention 1996;2():140-49.	Systematic or non-systematic review - reviewed for references
Duggan AK, McFarlane EC, Windham AM, Rohde CA, Salkever DS, Fuddy L, et al. Evaluation of Hawaii's Healthy Start Program. Future of Children 177 ;9(1):66-90.	Not within review topic

Reference	Reason for exclusion
Ehrlich A. Providing free smoke alarms did not reduce fire related injuries in a deprived multiethnic urban population. Evidence-Based Nursing 2003;6(4):105-06.	Inappropriate study design
Fallat ME & Rengers SJ. The effect of education and safety devices on scald burn prevention. J Trauma 1993;34(4):560-63.	Not within review topic
Fallat ME & Rengers SJ. The effect of education and safety devices on scald burn prevention. Journal of Trauma-Injury Infection & Critical Care 563 ;34(4):560-63.	Duplicate
Georgieff K & Maw C. Wakefield District Burns and Scalds Prevention Project. Health Development Unit. Wakefield Metropolitan District Council, 2004.	Inappropriate study design
Gielen AC, Wilson ME, Faden RR, Wissow L, Harvilchuck JD. In-home injury prevention practices for infants and toddlers: the role of parental beliefs, barriers, and housing quality. Health Education Quarterly 1995;22(1):85-95.	Inappropriate study design
Goldman KD & Schmalz KJ. The 'home ranger' rides again! Making home visits safer and more effective. Health Promotion Practice 2008;9(4):323-27.	Inappropriate study design
GRAY R. Project work on accident prevention. London (Mountford House, Tottenham Green East, London N15 4AN): Haringey Health Authority 1991;():n. pag..	Inappropriate study design
Hammond J & Varas R. Coordinated strategies in burn prevention programs: a case study. Journal of Burn Care & Rehabilitation 1990;11(4):376-78.	Inappropriate study design
Harker P & Moore L. Primary health care action to reduce child home accidents: a review. Health Education Journal 1996;55(3):322-31.	Systematic or non-systematic review - reviewed for references
Health Development Agency. Injuries in children aged 0-14 years and inequalities. 2005;():n. pag..	Systematic or non-systematic review - reviewed for references
Health Development Agency. Prevention and Reduction of Accidental Injury to Children and Older People - Evidence Briefing. 2003.	Systematic or non-systematic review - reviewed for references
Health Education Authority. Health Promotion in Childhood and Young Adolescence for the Prevention of Unintentional Injuries. 1996.	Systematic or non-systematic review - reviewed for references
Healthcare Commission and Audit Commission. Better safe than sorry: Preventing unintentional injury to children. Audit Commission,, 2007.	Inappropriate study design

Reference	Reason for exclusion
Hodnett ED & Roberts I. WITHDRAWN: Home-based social support for socially disadvantaged mothers.[update of Cochrane Database Syst Rev. 2000;(2):CD000107; PMID: 10796694]. Cochrane Database of Systematic Reviews 2007;(3):CD000107.	Publication withdrawn
Hooper R, Coggan CA, Adams B. Injury prevention attitudes and awareness in New Zealand. Injury Prevention 2003;9(1):42-47.	Inappropriate study design
Istre GR & Mallonee S. Smoke alarms and prevention of house-fire-related deaths and injuries. Western Journal of Medicine 2000;173(2):92-93.	Inappropriate study design
J.Nixon ASCT. Community based programs to prevent poisoning in children 0-15 years. Injury Prevention 2004;10():n. pag..	Not within review topic
Jones AR, Thompson CJ, Davis MK. Smoke alarm ownership and installation: a comparison of a rural and a suburban community in Georgia. Journal of Community Health 2001;26(5):307-29.	Inappropriate study design
Jordan EA, Duggan AK, Hardy JB. Injuries in Children of Adolescent Mothers - Home Safety Education Associated with Decreased Injury Risk. Pediatrics 1993;91(2):481-87.	Not within review topic
Kane P & Kane P. Sure start local programmes in England. Lancet 2008;372(9650):1610-12.	Not within review topic
Kendrick D & Marsh P. Inequalities in receipt of injury prevention in primary care. Health Education Journal 2000;59(2):150-56.	Inappropriate outcomes reported
Kendrick D, Barlow J, Hampshire A, Stewart-Brown S, Polnay L. Parenting interventions and the prevention of unintentional injuries in childhood: systematic review and meta-analysis. Child: Care, Health & Development 2008;34(5):682-95.	Systematic or non-systematic review - reviewed for references
Kendrick D, Coupland C, Mulvaney C, Simpson J, Smith SJ, Sutton A, et al. Home safety education and provision of safety equipment for injury prevention. Cochrane Database of Systematic Reviews 2007;(1):CD005014.	Systematic or non-systematic review - reviewed for references
Kendrick D, Hapgood R, Marsh P. Is it only 'safe' families who request home safety checks? International Journal of Health Promotion & Education 2000;38(4):134-38.	Inappropriate study design
Kendrick D, Smith S, Sutton A, Watson M, Coupland C, Mulvaney C, Mason-Jones A. Effect of education and safety equipment on poisoning-prevention practices and poisoning: systematic review, meta-analysis and meta-regression. Archives of Disease in Childhood 2008;93(7):599-608.	Systematic or non-systematic review - reviewed for references
Kendrick D, Stewart J, Coupland C, Hayes M, Hopkins N, McCabe D, et al. Randomised controlled trial of thermostatic mixer valves in reducing bath hot tap water temperature in families with young children in social housing: A protocol. Trials [Electronic Resource] 2008;9():14.	Inappropriate outcomes reported

Reference	Reason for exclusion
Kendrick D, Watson MC, Mulvaney CA, Smith SJ, Sutton AJ, Coupland CA, Mason-Jones AJ. Preventing childhood falls at home: meta-analysis and meta-regression. American Journal of Preventive Medicine 2008;35(4):370-79.	Systematic or non-systematic review - reviewed for references
Kendrick D. Accidents among children. British Journal of General Practice 1993;43(374):395.	Abstract only
Ker K & Ivers R. Cochrane corner: prevention of injuries at home. Injury Prevention 2007;13(2):141.	Inappropriate study design
Kerr KEA & Kerr KKKau. Prevention of injuries at home. [References]. Injury Prevention 141;13(2):Apr.	Inappropriate study design
Kitzman H, Olds DL, Henderson CR, Hanks C, Cole R, Tatelbaum R, et al. Of prenatal and infancy home visitation by nurses on pregnancy outcomes, childhood injuries, and repeated childbearing trial - A randomized controlled trial. Jama-Journal of the American Medical Association 1997;278(8):644-52.	Not within review topic
Kopjar B & Wickizer TM. Population-based study of unintentional injuries in the home (Brief record). American Journal of Epidemiology 1996;144():456-62.	Excluded Economic study
Kopjar B. Costs of health care for unintentional injury in Stavanger, Norway. European Journal of Public Health 1997;7(3):321-27.	Inappropriate study design
Lee J. How to limit liability on home health care equipment. Home safe. Health Facilities Management 1940;11(11):38.	Not within review topic
Licence K. Promoting and protecting the health of children and young people. Child: Care, Health & Development 2004;30(6):623-35.	Systematic or non-systematic review - reviewed for references
Logan S. Home visiting reduces the rates of childhood injuries. Child: Care, Health & Development 1997;23(1):101-02.	Inappropriate study design
Lyons R, Sander LV, Weightman AL. Modification of the home environment for the reduction of injuries. Cochrane database system review 2006;CD003600():n. pag..	Inappropriate study design
Macdonald G, Bennett C, Dennis J, Coren E, Patterson J, Astin M, Abbott J. Home-based support for disadvantaged teenage mothers.[update in Cochrane Database Syst Rev. 2008;(1):CD006723; PMID: 18254114]. Cochrane Database of Systematic Reviews 2007;(3):CD006723.	Publication withdrawn
Macdonald G, Bennett C, Dennis J, Coren E, Patterson J, Astin M, Abbott J. WITHDRAWN: Home-based support for disadvantaged teenage mothers.[update of Cochrane Database Syst Rev. 2007;(3):CD006723; PMID: 17636849]. Cochrane Database of Systematic Reviews 2008;(1):CD006723.	Publication withdrawn
MacKay M, Vincenten J, Brussoni M, Towner E. Child Safety Good Practice Guide : good investments in unintential child injury prevention and safety promotion. Amsterdam: European Child Safety Alliance, 2006.	Inappropriate study design
MacKellar A. Child safety and demonstration homes. Medical Journal of Australia 1991;154(9):575-76.	Not within review topic

Reference	Reason for exclusion
Malek M, Chang BH, Gallagher SS, Guyer B, Malek M, Chang BH, et al. The cost of medical care for injuries to children. Annals of Emergency Medicine 1991;20(9):997-1005.	Excluded Economic study
Mallonee S. Evaluating injury prevention programs: the Oklahoma City Smoke Alarm Project. Future of Children 2000;10(1):164-74.	Does not report any additional data to earlier study
Manganello JA & McKenzie LB. Home and child safety on reality television. Health Education Research 2009;24(1):49-53.	Inappropriate study design
Martin LA, Ariza AJ, Thomson JS, Binns HJ, Pediatric Practice Research Group. Seconds for care: evaluation of five health supervision visit topics using a new method. Journal of Pediatrics 711;153(5):706-11.	Not within review topic
McClure R, Nixon J, Spinks A, Turner C. Community-based programmes to prevent falls in children: a systematic review. J Paediatr Child Health 2005;41(9-10):465-70.	Systematic or non-systematic review - reviewed for references
McLoughlin E & McGuire A. The causes, cost, and prevention of childhood burn injuries. American Journal of Diseases of Children 1990;144(6):677-83.	Inappropriate study design
Melhuish E, Belsky J, Leyland AH, Barnes J. Effects of fully-established Sure Start Local Programmes on 3-year-old children and their families living in England: a quasi-experimental observational study. Lancet 2008;372(9650):1641-47.	Not within review topic
Mickalide A & Validzic A. Smoke alarm maintenance in low-income families. American Journal of Public Health; 89 (10) Oct 1999 1999;():5.	Inappropriate study design
Miller TR & Levy DT. Cost-outcome analysis in injury prevention and control: a primer on methods. Injury Prevention 1997;3():288-93.	Excluded Economic study
Miller TR, Romano EO, Spicer RS. The cost of childhood unintentional injuries and the value of prevention. Future of Children 2000;10(1):137-63.	Not within review topic
Morris B. Childhood injury prevention. American Family Physician 2010;45(5):2008.	Inappropriate study design
Morris D. Flying Start Child Home Safety Scheme. URL: (accessed)	Outcomes not disaggregated
Morrongiello BA & Morrongiello BA. Mothers' home-safety practices for preventing six types of childhood injuries: What do they do, and why? [References]. Journal of Pediatric Psychology ;29(4):Jun-297.	Not within review topic
Mulvaney C & Kendrick D. Engagement in safety practices to prevent home injuries in preschool children among white and non-white ethnic minority families. Injury Prevention 2004;10(6):375-78.	Not within review topic
Nansel TR, Weaver N, Donlin M, Jacobsen H, Kreuter MW, Simons-Morton B. Baby, be safe: the effect of tailored communications for pediatric injury prevention provided in a primary care setting. Patient Education and Counseling 2002;46(3):175-90.	Not within review topic

Reference	Reason for exclusion
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O'Brien R, Ruthazer R, Robiteau R, Lee J. Injury prevention for pregnant and parenting teens: A home visiting model. Journal of Adolescent Health 1999;24(2):106.	Abstract only
Odendaal W, van NA, Jordaan E, Seedat M. The impact of a home visitation programme on household hazards associated with unintentional childhood injuries: a randomised controlled trial. Accident Analysis & Prevention 2009;41(1):183-90.	Not set in an OECD country
Olds DL & Kitzman H. Can home visitation improve the health of women and children at environmental risk? Pediatrics 1990;86(1):108-16.	Inappropriate study design
Olds DL, Henderson CR, Kitzman H. Does prenatal and infancy nurse home visitation have enduring effects on qualities of parental caregiving and child health at 25 to 50 months of life? Pediatrics 1994;93(1):89-98.	Not within review topic
Olds DL, Henderson CR, Kitzman HJ, Eckenrode JJ, Cole RE, Tatelbaum RC. Prenatal and infancy home visitation by nurses: recent findings. Future of Children 190 ;9(1):44-65.	Not within review topic
Olds DL. Prenatal and infancy home visiting by nurses: from randomized trials to community replication. Prevention Science 2002;3(3):153-72.	Systematic or non-systematic review - reviewed for references
Olds DL. The nurse-family partnership: An evidence-based preventive intervention. Infant Mental Health Journal 2006;27(1):5-25.	Not within review topic
Ozanne-Smith J, Day L, Stathakis V, Sherrard J. Controlled evaluation of a community based injury prevention program in Australia. Injury Prevention 2002;8(1):18-22.	Outcomes not disaggregated
Ozanne-Smith Jea. Community based injury prevention evaluation report: Shire of Bulla Safe Living Program. Canberra: Monash University Accident Research Centre, 1994.	Not within review topic
Parmer JE, Corso PS, Ballesteros MF. A cost analysis of a smoke alarm installation and fire safety education program. Journal of Safety Research 2006;37(4):367-73.	Inappropriate study design
Parry C. Eastside Childsafe Project. URL: (accessed)	Inappropriate study design
Peden M, Oyegbite K, Ozanne-Smith J, Hyder A, Branche C, Rahman F, et al. World Report on Child Injury Prevention. WHO, 2008.	Inappropriate study design
Petridou E, Tolma E, Dessypris N, Trichopoulos D. A controlled evaluation of a community injury prevention project in two Greek islands. International Journal of Epidemiology 1997;26(1):173-79.	Not within review topic

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Pillai SB, Bethel CA, Besner GE, Caniano DA, Cooney DR. Fall injuries in the pediatric population: safer and most cost-effective management (Brief record). Journal of Trauma 2000;48():1048-50.	Excluded Economic study
Pirrallo RG & Cady CE. Lessons learned from an emergency medical services fire safety intervention. Prehospital Emergency Care 2004;8(2):171-74.	Inappropriate study design
Pratt LK, Runyan CW, Cohen LR, Margolis PA. Home visitors' beliefs and practices regarding childhood injury prevention. Public Health Nursing 1998;15(1):44-49.	Inappropriate study design
Pressley JC, Trieu L, Kendig T, Barlow B. National injury-related hospitalizations in children: public versus private expenditures across preventable injury mechanisms (Brief record). Journal of Trauma Injury Infection and Critical Care 2007;63():S10-19.	Excluded Economic study
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Rehmani R. Reduction of home injury hazards by home visiting program: A randomized controlled trial. Annals of Emergency Medicine 2005;46(3):S86.	Abstract only
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Roberts I, Kramer MS, Suissa S. Does home visiting prevent childhood injury? A systematic review of randomised controlled trials. BMJ 1996;312(7022):29-33.	Systematic or non-systematic review - reviewed for references
Roberts I. Home visiting and child injury - Reply. British Medical Journal 1996;313(7057):625.	Inappropriate study design
Rowland D, DiGuiseppi C, Roberts I, Curtis K, Roberts H, Ginnelly L, et al. Prevalence of working smoke alarms in local authority inner city housing: randomised controlled trial. BMJ 2002;325(7371):998-1001.	Not within review topic
Russell KM. Health beliefs and social influence in home safety practices of mothers with preschool children. IMAGE: Journal of Nursing Scholarship ;28(1):Spr-64.	Inappropriate study design
Saegert SC, Klitzman S, Freudenberg N, Cooperman-Mroczek J, Nassar S. Healthy housing: A structured review of published evaluations of US interventions to improve health by modifying housing in the United States, 1990-2001. American Journal of Public Health 2003;93(9):1471-77.	Systematic or non-systematic review - reviewed for references
Sandel M, Phelan K, Wright R, Hynes HP, Lanphear BP. The effects of housing interventions on child health. Pediatric Annals 2004;33(7):474-81.	Systematic or non-systematic review - reviewed for references

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Schnitzer PG. Prevention of unintentional childhood injuries.[summary for patients in Am Fam Physician. 2006 Dec 1;74(11):1870; PMID: 17168343]. American Family Physician 2006;74(11):1864-69.	Systematic or non-systematic review - reviewed for references
Sethi D, Towner E, Vincenten J, Segui-Gomez M, Racioppi F. European report on child injury prevention. WHO, 2008.	Not within review topic
Sherrard J, Ozanne-Smith J, Staines C. Prevention of unintentional injury to people with intellectual disability: a review of the evidence. Journal of Intellectual Disability Research 2004;48(Pt:7):7-45.	Not within review topic
Shults RA, Sacks JJ, Briske LA, Dickey PH, Kinde MR, Mallonee S, Douglas MR. Evaluation of three smoke detector promotion programs. American Journal of Preventive Medicine 1998;15(3):165-71.	Inappropriate study design
Sirois FME & Sirois FM. Procrastination and motivations for household safety behaviors: An expectancy-value theory perspective. [References]. Brown, Lois V (Ed) -326;(2007):Nova.	Not within review topic
Sowden A, Sheldon T, Pehl L, Long A. Preventing unintentional injuries in children and young adolescents. Effective Health Care 1996;2(5):1-16.	Systematic or non-systematic review - reviewed for references
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Stocchetti N. Risk prevention, avoidable deaths and mortality-morbidity reduction in head injury. European Journal of Emergency Medicine 2001;8(3):215-19.	Not within review topic
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Sullivan M, Cole B, Lie L, Twomey J. Reducing child hazards in the home. A joint venture in injury control. Journal of Burn Care & Rehabilitation 1990;11(2):175-79.	Inappropriate study design
Svanstrom L, Ekman R, Schelp L, Lindstrom A. The Lidkoping Accident Prevention Programme--a community approach to preventing childhood injuries in Sweden. Inj Prev 1995;1(3):169-72.	Not within review topic
Swart L, van NA, Seedat M, Jordaan E. Paraprofessional home visitation program to prevent childhood unintentional injuries in low-income communities: a cluster randomized controlled trial. Injury Prevention 2008;14(3):164-69.	Not set in an OECD country

Reference	Reason for exclusion
Sznajder M, Yacoubovitch J, Weill A, Chevallier B. Evaluation of the cost of injuries in the pediatric population (Brief record). Annales de Pediatrie 1999;46():352-61.	Excluded Economic study
Ta VM, Frattaroli S, Bergen G, Gielen AC. Evaluated community fire safety interventions in the United States: a review of current literature. Journal of Community Health 2006;31(3):176-97.	Systematic or non-systematic review - reviewed for references
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Thompson CJ, Jones AR, Davis MK, Caplan LS. Do smoke alarms still function a year after installation? A follow-up of the get-alarmed campaign. Journal of Community Health 2004;29(2):171-81.	Inappropriate study design
Thompson R, Edwards P, Jarvis S, Avery A, Towner E, Walsh S. Childhood accidents: is it time to prescribe safety equipment? Community Practitioner 1998;71(4):138-40.	Inappropriate study design
Timpka T, Nilsen P, Lindqvist K. The impact of home safety promotion on different social strata in a WHO safe community. Public Health 2006;120(5):427-33.	Outcomes not disaggregated
Towner E & Dowswell T. Community-based childhood injury prevention interventions: what works? Health Promotion International 2002;17(3):273-84.	Systematic or non-systematic review - reviewed for references
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Towner E. The prevention of childhood injury. 2003.	Inappropriate study design
Turner C, Spinks A, McClure R. Community-based interventions for the prevention of burns and scalds in children. Cochrane database systematic reviews 2005;CD004335():n. pag..	Systematic or non-systematic review - reviewed for references
Vauxhall Neighbourhood Council. Vauxhall Home Safety Initiative Final Report. 2004.	Inappropriate study design
Walker BL. The Effects of A Burn Prevention Program on Child-Care Providers. Fire Technology 1995;31(3):244-64.	Not within review topic
Waller AE, Clarke JA, Langley JD. An Evaluation of A Program to Reduce Home Hot Tap Water Temperatures. Australian Journal of Public Health 1993;17(2):116-23.	Not within review topic
Warda L, Tenenbein M, Moffatt ME. House fire injury prevention update. Part II. A review of the effectiveness of preventive interventions. Injury Prevention 1999;5(3):217-25.	Systematic or non-systematic review - reviewed for references

Reference	Reason for exclusion
Watson M, Woods A, Kendrick D. Injury prevention: working together on an RCT. Community Practitioner 2002;75(5):172-76.	Inappropriate outcomes reported
Webne SL & Kaplan BJ. Preventing tap water scalds: do consumers change their preset thermostats. American Journal of Public Health 1993;83(10):1469-70.	Inappropriate outcomes reported
Wiggins M, Oakley A, Roberts I, Turner H, Rajan L, Austerberry H, et al. The Social Support and Family Health Study: a randomised controlled trial and economic evaluation of two alternative forms of postnatal support for mothers living in disadvantaged inner-city areas. Health Technology Assessment 2004;8(32):1-+.	Not within review topic
Williams N, Evans R, Rogers A, Wright M. Final Evaluation of the Home Fire Risk Check Grant and Fire Prevention Grant Programmes - Fire Research 2/2009. URL: (accessed 09 March 1926)	Inappropriate study design
Yang J, Peek-Asa C, Jones MP, Nordstrom DL, Taylor C, Young TL, Zwerling C. Smoke alarms by type and battery life in rural households: a randomized controlled trial. American Journal of Preventive Medicine 2008;35(1):20-24.	Not within review topic
Ytterstad B & Sogaard AJ. The Harstad Injury Prevention Study: prevention of burns in small children by a community-based intervention. Burns 1995;21(4):259-66.	Not within review topic
Ytterstad B & Wasmuth HH. The Harstad Injury Prevention Study: evaluation of hospital-based injury recording and community-based intervention for traffic injury prevention. Accid Anal Prev 1995;27(1):111-23.	Not within review topic
Ytterstad B, Smith GS, Coggan CA. Harstad injury prevention study: prevention of burns in young children by community based intervention. Inj Prev 1998;4(3):176-80.	Not within review topic
Ytterstad B. The Harstad injury prevention study: hospital-based injury recording used for outcome evaluation of community-based prevention of bicyclist and pedestrian injury. Scand J Prim Health Care 1995;13(2):141-49.	Not within review topic
Zaloshnja E, Miller TR, Lawrence BA, Romano E. The costs of unintentional home injuries. American Journal of Preventive Medicine 2005;28(1):88-94.	Excluded Economic study

Appendix 8 Studies excluded at full text stage: Cost-effectiveness review

Reference	Reason for exclusion
Carman, J., Friedman, E., Lamb, D., & Lennon, K. 2006, "Evaluating the impact of a child injury prevention project", *Community Practitioner*, vol. 79, no. 6, pp. 188-192.	Cost-savings estimates shown, but insufficient information on methods given
Chevallier, B. & Sznajder, M. 2000, "Economic approach to a public health problem: child accidents in France", *Archives de Pediatrie.*, vol. 7, pp. 457-460.	Cost of illness study, France
Danesco, E. R., Miller, T. R., & Spicer, R. S. 2000, "Incidence and costs of 1987-1994 childhood injuries: demographic breakdown", *Pediatrics*, vol. 105, no. e27.	Cost of illness study, USA
Kopjar, B. 1997, "Costs of health care for unintentional injury in Stavanger, Norway", *European Journal of Public Health*, vol. 7, no. 3, pp. 321-327.	Cost of illness study, Norway
Kopjar, B. & Wickizer, T. M. 1996, "Population-based study of unintentional injuries in the home", *American Journal of Epidemiology*, vol. 144, pp. 456-462.	Cost of illness study, Norway
Malek, M., Chang, B. H., Gallagher, S. S., Guyer, B., Malek, M., Chang, B. H., Gallagher, S. S., & Guyer, B. 1991, "The cost of medical care for injuries to children", *Annals of Emergency Medicine*, vol. 20, no. 9, pp. 997-1005.	Cost of illness study, USA
McIntosh E, Barlow J, Davis H, & Stewart-Brown S. 2009, “Economic evaluation of an intensive home visiting programme for vulnerable families: a cost-effectiveness analysis of a public health intervention”, *Journal of Public Health*, Advance Access [doi: 10.1093/pubmed/fdp047] pp.1-11.	CEA of wrong intervention (home-visiting to prevent intentional injuries to children)
McLoughlin, E. & McGuire, A. 1990, "The causes, cost, and prevention of childhood burn injuries", *American Journal of Diseases of Children*, vol. 144, no. 6, pp. 677-683.	Cost of illness study, USA
Miller, T. R. & Levy, D. T. 1997, "Cost-outcome analysis in injury prevention and control: a primer on methods", *Injury Prevention*, vol. 3, pp. 288-293.	Systematic review of economic evaluations (NB. *none relevant to this review*)

Reference	Reason for exclusion
Miller, T. R., Romano, E. O., & Spicer, R. S. 2000, "The cost of childhood unintentional injuries and the value of prevention", *Future of Children*, vol. 10, no. 1, pp. 137-163.	Cost and burden of illness study & review of selected child safety measures, USA
Parmer, J. E., Corso, P. S., & Ballesteros, M. F. 2006, "A cost analysis of a smoke alarm installation and fire safety education program", *Journal of Safety Research*, vol. 37, no. 4, pp. 367-373.	Cost analysis, USA
Pillai, S. B., Bethel, C. A., Besner, G. E., Caniano, D. A., & Cooney, D. R. 2000, "Fall injuries in the pediatric population: safer and most cost-effective management", *Journal of Trauma*, vol. 48, pp. 1048-1050.	Cost analysis, USA
Pressley, J. C., Barlow, B., Kendig, T., & Paneth-Pollak, R. 2007, "Twenty-year trends in fatal injuries to very young children: The persistence of racial disparities", *Pediatrics*, vol. 119, no. 4, p. E875-E884.	Cost of illness study, USA
Sznajder, M., Yacoubovitch, J., Weill, A., & Chevallier, B. 1999, "Evaluation of the cost of injuries in the pediatric population", *Annales.de Pediatrie.*, vol. 46, pp. 352-361.	Cost of illness study, France
Zaloshnja, E., Miller, T. R., Lawrence, B. A., & Romano, E. 2005, "The costs of unintentional home injuries", *American Journal of Preventive Medicine*, vol. 28, no. 1, pp. 88-94.	Cost of illness study, USA

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