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Home safety education and provision of safety equipment for injury prevention.
Cochrane Database of Systematic Reviews 2012, Issue 9. Art. No.: CD005014.
DOI: 10.1002/14651858.CD005014.pub3.

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[Intervention Review]

Home safety education and provision of safety equipment for injury prevention

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Editorial group: Cochrane Injuries Group.
Publication status and date: Edited (no change to conclusions), published in Issue 10, 2014.

Citation: Kendrick D, Young B, Mason-Jones AJ, Ilyas N, Achana FA, Cooper NJ, Hubbard SJ, Sutton AJ, Smith S, Wynn P, Mulvaney CA, Watson MC, Coupland C. Home safety education and provision of safety equipment for injury prevention. *Cochrane Database of Systematic Reviews* 2012, Issue 9. Art. No.: CD005014. DOI: 10.1002/14651858.CD005014.pub3.

ABSTRACT

Background

In industrialised countries injuries (including burns, poisoning or drowning) are the leading cause of childhood death and steep social gradients exist in child injury mortality and morbidity. The majority of injuries in pre-school children occur at home but there is little meta-analytic evidence that child home safety interventions reduce injury rates or improve a range of safety practices, and little evidence on their effect by social group.

Objectives

We evaluated the effectiveness of home safety education, with or without the provision of low cost, discounted or free equipment (hereafter referred to as home safety interventions), in reducing child injury rates or increasing home safety practices and whether the effect varied by social group.

Search methods

We searched the Cochrane Central Register of Controlled Trials (CENTRAL) (2009, Issue 2) in *The Cochrane Library*, MEDLINE (Ovid), EMBASE (Ovid), PsycINFO (Ovid), ISI Web of Science: Science Citation Index Expanded (SCI-EXPANDED), ISI Web of Science: Social Sciences Citation Index (SSCI), ISI Web of Science: Conference Proceedings Citation Index- Science (CPCI-S), CINAHL (EBSCO) and DARE (2009, Issue 2) in *The Cochrane Library*. We also searched websites and conference proceedings and searched the bibliographies of relevant studies and previously published reviews. We contacted authors of included studies as well as relevant organisations. The most recent search for trials was May 2009.

Selection criteria

Randomised controlled trials (RCTs), non-randomised controlled trials and controlled before and after (CBA) studies where home safety education with or without the provision of safety equipment was provided to those aged 19 years and under, and which reported injury, safety practices or possession of safety equipment.

Data collection and analysis

Two authors independently assessed study quality and extracted data. We attempted to obtain individual participant level data (IPD) for all included studies and summary data and IPD were simultaneously combined in meta-regressions by social and demographic variables.

Pooled incidence rate ratios (IRR) were calculated for injuries which occurred during the studies, and pooled odds ratios were calculated for the uptake of safety equipment or safety practices, with 95% confidence intervals.

Main results

Ninety-eight studies, involving 2,605,044 people, are included in this review. Fifty-four studies involving 812,705 people were comparable enough to be included in at least one meta-analysis. Thirty-five (65%) studies were RCTs. Nineteen (35%) of the studies included in the meta-analysis provided IPD.

There was a lack of evidence that home safety interventions reduced rates of thermal injuries or poisoning. There was some evidence that interventions may reduce injury rates after adjusting CBA studies for baseline injury rates (IRR 0.89, 95% CI 0.78 to 1.01). Greater reductions in injury rates were found for interventions delivered in the home (IRR 0.75, 95% CI 0.62 to 0.91), and for those interventions not providing safety equipment (IRR 0.78, 95% CI 0.66 to 0.92).

Home safety interventions were effective in increasing the proportion of families with safe hot tap water temperatures (OR 1.41, 95% CI 1.07 to 1.86), functional smoke alarms (OR 1.81, 95% CI 1.30 to 2.52), a fire escape plan (OR 2.01, 95% CI 1.45 to 2.77), storing medicines (OR 1.53, 95% CI 1.27 to 1.84) and cleaning products (OR 1.55, 95% CI 1.22 to 1.96) out of reach, having syrup of ipecac (OR 3.34, 95% CI 1.50 to 7.44) or poison control centre numbers accessible (OR 3.30, 95% CI 1.70 to 6.39), having fitted stair gates (OR 1.61, 95% CI 1.19 to 2.17), and having socket covers on unused sockets (OR 2.69, 95% CI 1.46 to 4.96).

Interventions providing free, low cost or discounted safety equipment appeared to be more effective in improving some safety practices than those interventions not doing so. There was no consistent evidence that interventions were less effective in families whose children were at greater risk of injury.

Authors' conclusions

Home safety interventions most commonly provided as one-to-one, face-to-face education, especially with the provision of safety equipment, are effective in increasing a range of safety practices. There is some evidence that such interventions may reduce injury rates, particularly where interventions are provided at home. Conflicting findings regarding interventions providing safety equipment on safety practices and injury outcomes are likely to be explained by two large studies; one clinic-based study provided equipment but did not reduce injury rates and one school-based study did not provide equipment but did demonstrate a significant reduction in injury rates. There was no consistent evidence that home safety education, with or without the provision of safety equipment, was less effective in those participants at greater risk of injury. Further studies are still required to confirm these findings with respect to injury rates.

PLAIN LANGUAGE SUMMARY

Home safety education and providing safety equipment for injury prevention

Injuries are the leading cause of childhood death in industrialised countries. People living in disadvantaged circumstances are at greater risk of injury than those who are more advantaged. This review examined whether home safety education and providing safety equipment reduced injuries and increased safety behaviours and safety equipment use. It also looked at whether home safety education was more or less effective in disadvantaged families. The review authors found 98 studies involving 2,605,044 participants which reported many different safety behaviours, but relatively few studies included information on injuries.

The authors found that home safety interventions provided in the home may reduce injury rates, but more research is needed to confirm this finding. The results often varied between studies but, overall, families who received home safety interventions were more likely to have a safe hot tap water temperature, a working smoke alarm, a fire escape plan, fitted stair gates, socket covers on unused sockets, syrup of ipecac, poison control centre numbers accessible, and to store medicines and cleaning products out of reach of children. The authors found that home safety education was equally effective in the families whose children were at greater risk of injury.

BACKGROUND

Every day more than 2000 children and teenagers die from unintentional injuries (WHO 2008). In industrialised countries injuries are the leading cause of child death, accounting for 40% of all child deaths between the ages of one to 14 years (Unicef 2001). The relative contribution of home, road traffic, leisure and other injuries varies by age and by country (WHO 2008). In the UK, for children under the age of five years, the majority of fatal and non-fatal injuries occur in the home (Morrison 1999; ONS 2009). For older children, most fatal injuries occur as a result of a road traffic injury (ONS 2009), but injuries occurring at home account for 40% of medically attended injuries in five to nine year olds and 25% in 10 to 14 year olds (Morrison 1999).

Children's risk of injury is varied by a range of factors. These include age, gender, socioeconomic disadvantage, family type and size, maternal age, maternal educational level, ethnic group and neighbourhood of residence. The risk of home injury is greater amongst younger children than older children (Morrison 1999; ONS 2009; Roberts 1998), with the relationship between injury risk and age varying with the mechanism of injury (Roberts 1998). Boys have consistently been found to be at higher risk of injury than girls, with an increasing differential risk with increasing age (ONS 2009; Roberts 1998).

The burden of childhood injuries is greatest in low income countries and, within each country, injuries disproportionately affect children from low income families (WHO 2008). There are steep social gradients in injury mortality and morbidity for a range of injury mechanisms (Edwards 2006; Hippisley-Cox 2002; Lyons 2003; Roberts 1996a; Roberts 1997). Other proxy indicators of disadvantage such as housing tenure (Alwash 1998; Kendrick 2005b), parental unemployment (Alwash 1998; Pomerantz 2001), income levels (Pomerantz 2001) and overcrowding (Alwash 1998) have also been found to be associated with child injury. Some work examining the effect of neighbourhood of residence has found a small but significant effect of living in a deprived neighbourhood that is independent of the characteristics of people living within neighbourhoods (Cubbin 2000b; Haynes 2003; Reading 1999; Reimers 2005).

The majority of studies examining the relationship between maternal age and child injury risk have found a greater risk of injury in children from families with younger rather than older mothers (Alwash 1998; Bijur 1988a; Reading 1999; Scholer 1999; Wicklund 1984). Children from single parent and step parent families have consistently been shown to be at higher risk of injury than those from two (natural) parent families (O'Connor 2000; Overpeck 1997; Reading 1999; Wadsworth 1983). Those children in larger families, especially where there are more older and fewer younger siblings, have been found to be at greater risk (Bijur 1988b; Reading 1999) as have those in families with lower levels of (usually maternal) education (Pomerantz 2001; Scholer 1999; Wicklund 1984). There are conflicting findings regarding the relationship between ethnicity and child injury rates. In the UK, the Health Survey for England (Erens 2001) and an ecological study of fracture clinic attendances and hospital admissions for child injury (Tobin 2002) found lower injury rates amongst South Asian groups, whilst a recent literature review of road traffic accident involvement of children from ethnic minorities suggests that Asian children may experience a higher risk of child pedestrian injury than their non-Asian counterparts (DETR 2001). Conflicting findings have also emerged from US studies (Cubbin 2000a; Overpeck 1997; Pomerantz 2001).

Over recent years a series of systematic reviews have been undertaken examining the effect of interventions to reduce unintentional injuries amongst children, many of which report interventions aimed at reducing home injuries (DiGuiseppi 2000; DiGuiseppi 2001; Dowswell 1996; Elkan 2000; HIPRC 2005b; HIPRC 2005c; HIPRC 2005d; HIPRC 2005e; HIPRC 2005f; Kendrick 1994; Klassen 2000; Nilsen 2004; Pearson 2009; Pless 1993; Popay 1993; Roberts 1996b; Speller 1995; Spinks 2004; Spinks 2005; Ta 2006; Towner 1993; Towner 1996; Towner 2001; Towner 2002; Turner 2004; Turner 2011; Warda 1999). These have concluded that home safety education and the provision of safety equipment can be effective in increasing some, but not all, safety practices, including safety equipment possession, but that there is a paucity of evidence relating to the effect of such interventions in reducing injury rates. Evidence from observational studies demonstrates that families of children attending hospital following a baby walker related stairway fall were significantly less likely to own a stair gate than community controls (Elkington 1999); families of children attending hospital following a poisoning incident were significantly less likely to store poisonous substances safely than families of children attending hospital for reasons other than poisoning (Azizi 1994); and families of children attending accident and emergency (A&E) departments following a burn or scald were less likely to be safe for a range of practices related to burn and scald prevention than families of children attending A&E without a burn or scald (Petridou 1998). In addition, several observational studies have reported a lower risk of death in homes with smoke alarms than without (DiGuiseppi 1998; Marshall 1998; Runyan 1992). Few meta-analyses have been undertaken in this area (DiGuiseppi 2000; DiGuiseppi 2001; Elkan 2000; Roberts 1996b). Two of these examined the effect of multi-faceted home visiting programmes aimed at improving a range of maternal and child health outcomes, and both found that such programmes reduced childhood injuries (Elkan 2000; Roberts 1996b). The third examined the effect of interventions to increase smoke alarm ownership and found a non-significant effect of counselling and educational interventions on owning an alarm or having a functional alarm. However, they did find a significant effect of interventions delivered during child health surveillance on either alarm ownership or having a functional alarm (DiGuiseppi 2001). The fourth examined the effect of interventions delivered in a clinical setting to increase smoke alarm ownership, promote a safe hot tap water temperature and to 'child proof' the home (DiGuiseppi 2000) and found interventions delivered in a clinical setting were effective in promoting a safe hot tap water temperature and in increasing smoke alarm ownership. In addition, intervention group families were 1.8 times more likely to store cleaning agents safely (95% CI or P value not reported). Only two of the studies included in this review reported injury outcomes and neither found that the intervention resulted in a significant reduction in injury occurrence. The review concluded that clinical counselling had little effect on most home safety practices designed to child proof the home and that the evidence about the impact of counselling on childhood injuries is limited. There is, therefore, a lack of evidence quantifying the effect of home safety education on a range of home safety practices and on childhood injury rates.

Concern has been expressed that educational interventions may either not address inequalities in childhood injury or may actually

widen existing inequalities (Kendrick 2000; Towner 2005; van Weeghal 1997). This may occur either through inequalities in access to, uptake of, or differential effectiveness of interventions between social groups. Two systematic reviews specifically addressing social deprivation and childhood injury (Dowswell 2002; Mackay 1999) concluded that very few studies examined the impact of interventions in different social groups. A third review addressing inequalities in child injury by age, gender, social and economic factors, culture and ethnicity, place and specific vulnerable groups (Towner 2005) concluded that few intervention studies have explicitly addressed inequalities, and even fewer have attempted to take account of inequalities in the design and to report on the effect of the intervention in relation to these inequalities. This lack of evidence makes it difficult for policy makers and those designing and delivering interventions to know how best to design and deliver home safety interventions to increase home safety, reduce childhood injuries and address inequalities in child injury rates (Dowswell 2002).

Why it is important to do this review

At present none of the systematic reviews or the small number of meta-analyses that have been published in the field of childhood home injury prevention have examined the effectiveness of such interventions by social group. As few injury prevention studies are large enough to have sufficient power for a subgroup analysis to adequately address this question, this is an ideal research question to be addressed through meta-analysis. Furthermore, as meta-regression analyses using summary data have limited power, it is also an ideal topic to be addressed by meta-analyses combining IPD and summary data from published studies.

OBJECTIVES

The objectives of the review were to:

1. evaluate the effectiveness of home safety education, with or without the provision of low cost, discounted or free equipment (hereafter referred to as home safety interventions), in reducing child injury rates or increasing practices aimed at preventing childhood injuries in the home;
2. evaluate the effect of home safety interventions by social group.

METHODS

Criteria for considering studies for this review

Types of studies

Individually and cluster randomised controlled trials (RCTs), non-randomised controlled trials and controlled before and after (CBA) studies (studies with a concurrent control group which have data collected on outcome measures at baseline and follow-up) were included.

Types of participants

Children and young people (aged 19 years and under) and their families.

For objective 2, studies were required to either report data on socio-economic characteristics or have unpublished data on socio-economic characteristics available for the review. The socio-economic and demographic characteristics of interest were those previously found to be associated with an increased risk of childhood injury, which were explored in the 2007 version of this review. These included child age, gender, ethnic group, family type (single or two parent), housing tenure and parental unemployment.

Types of interventions

Home safety interventions provided by health or social care professionals, school teachers, lay workers, voluntary or other organisations to individual children or families, or groups of children or families, whose aim is to reduce home injuries or increase home safety practices or use of home safety equipment. Interventions offered in healthcare settings (primary care and secondary care, for example primary care practices, clinics, out-patient departments, accident and emergency departments, hospital wards), schools and the homes of children and families were included. Interventions involving the provision of free, low cost or discounted safety equipment were included. Community-based trials with multi-faceted interventions were only eligible for inclusion if they included individual home safety interventions or group education.

We excluded multi-faceted home visiting programmes aimed at improving a range of maternal and child health outcomes which reported injury outcomes but not possession and use of safety equipment or safety practices, as these are the subject of a Cochrane review currently undergoing revision (Bennett 2008). Those programmes reporting possession and use of safety equipment or safety practices were included. We excluded interventions aimed at improving safety behaviours which were not specific to the home environment, such as preventing insect or animal bites and promoting swimming safety in non-domestic pools. We excluded studies promoting weapon safety and those aimed at reducing arson as our focus was on unintentional injury. We also excluded CBA studies where the control area contained the intervention area (for example, studies which compared injury rates in one area with those for the whole country). In our 2007 published review we included studies aimed at preventing chronic lead poisoning, however there has since been a Cochrane review evaluating household interventions aimed at preventing chronic lead poisoning (Yeoh 2008). We have, therefore, excluded these studies from the update and removed those that were included in our 2007 published review.

Types of outcome measures

The outcome measures we assessed were as follows.

Primary outcomes

- Self reported or medically attended injury in children and young people aged 0 to 19 years.

Secondary outcomes

- Possession and use of home safety equipment (stair gates, fireguards, smoke alarms, window locks, electrical socket covers, non-slip bath mats, fire extinguishers, ipecac syrup, poison centre control number stickers).
- Safety practices (storage of medicines, sharp objects, cleaning products, poisons and matches or lighters; use of baby walkers; safe hot water temperature; keeping hot foods or liquids, small objects and plants out of the reach of children; not leaving children alone in the bath, not leaving children alone on a high

surface; checking smoke alarm batteries, having or practising a fire escape plan).

Search methods for identification of studies

Searches were not restricted by date, language or publication status.

Electronic searches

A search strategy was devised to identify randomised and non-randomised studies (as defined above) using terms to identify injuries, safety equipment, practices and behaviours in the target population. We searched the following electronic databases:

- Cochrane Central Register of Controlled Trials (CENTRAL) (2009, Issue 2) in *The Cochrane Library*;
- MEDLINE (Ovid) (1950 to May 2009);
- EMBASE (Ovid) (1980 to May 2009);
- PsycINFO (Ovid) (1806 to May (week 3) 2009);
- ISI Web of Science: Science Citation Index Expanded (SCI-EXPANDED) (1970 to May 2009);
- ISI Web of Science: Social Sciences Citation Index (SSCI) (1970 to May 2009);
- ISI Web of Science: Conference Proceedings Citation Index-Science (CPCI-S) (1990 to May 2009);
- CINAHL (EBSCO) (1982 to May 2009);
- Database of Abstracts and Reviews of Effectiveness (DARE) (2009, Issue 2) in *The Cochrane Library*;
- NHS Economic Evaluation Database and the Health Technology Assessment Database (2009, Issue 2) in *The Cochrane Library*.

For the original review, all databases were searched from inception to July 2004.

Search strategies are reported in full in Appendix 1.

Searching other resources

We searched the following websites for published and unpublished research to June 2009:

- Injury Prevention Research Centers at the Centers for Disease Control (USA);
- Health Development Agency (UK) (up to March 2005);
- National Institute for Health and Clinical Excellence (UK);
- Children's Safety Network (USA);
- International Society for Child and Adolescent Injury Prevention (International);
- Child Accident Prevention Trust (UK);
- Injury Control Resource Information Network (USA);
- National Injury Surveillance Unit (Australia);
- SafetyLit (USA);
- The National Research Register (UK) (up to September 2007);
- UKCRN Clinical Research Portfolio;
- The *meta*Register of controlled trials;
- Index to theses.

We also handsearched the following sources to June 2009.

- Abstracts from the 1st to 9th World conferences on injury prevention and control.
- The journal "Injury Prevention" (to March 2009).
- Reference lists of articles included in the review and of published systematic reviews.

We attempted to contact all authors of studies included in the review and asked for details of unpublished research for versions of this review through June 2004. In addition, for the previous version of this review (June 2004) we surveyed all Sure Start and Home Start schemes and Fire and Rescue Services in the UK, the Royal Society for the Prevention of Accidents, National Children's Homes and the Community Practitioners and Health Visitors Association (CPHVA) to ascertain if they had undertaken or participated in any evaluations of home safety programmes. These surveys were not repeated for the latest update.

Data collection and analysis

Selection of studies

Two authors (shared between DK, JS, CC, MW, AM-J, CM, NI) independently scanned titles and abstracts to identify articles to retrieve in full. If an article appeared to be eligible based on the title but an abstract was unavailable, articles were retrieved in full. If there was disagreement between authors, a third author (DK or CM) reviewed the abstract and the article was retrieved in full if they considered it may fulfil the inclusion criteria. For studies where a review author was also an author of a study, other authors decided on inclusion of that study.

Data extraction and management

We attempted to obtain individual participant level data (IPD) for all eligible studies. If IPD were obtained, datasets were formatted across studies by recoding and labelling variables to ensure uniformity. Study authors who were unable or unwilling to provide IPD were asked to supply outcome data grouped by socio-economic characteristics. If authors did not provide IPD or grouped outcome data, review authors (DK, JS, NI, PW) independently extracted data from published articles onto standard data extraction forms. We calculated numerators and denominators if study authors did not report this information and if we had the appropriate data. In these cases the odds ratios and confidence intervals we report may vary slightly from those in the published reports, due to rounding.

Data extraction was compared between authors for the first 53 articles. As there was a high level of agreement between authors (*see* results), data extraction on subsequent articles for the 2007 version of this review was undertaken by one author (DK) and by two authors (shared between DK, NI, PW) for the update of the review. Any discrepancies were identified and investigated by referral back to the original article by a senior member of the research team with prior experience of data extraction for systematic reviews and by consensus forming discussions. Following data extraction, multiple publications relating to the same study were identified to ensure results pertaining to the same individuals were not included more than once in analyses for each outcome.

Assessment of risk of bias in included studies

Two of a team of six authors (AM-J, CM, SS, DK, NI, PW) independently assessed quality. If information regarding

study quality was not available from publications or required clarification, we contacted study authors. For RCTs, allocation concealment, blinding of outcome assessment and completeness of follow-up (80% or more in both treatment arms) were used as markers of trial quality.

Quality of randomisation was considered to be adequate when study authors mentioned the use of sealed opaque envelopes, automated computerised randomisation programmes, minimisation programmes or independent researchers using a computer generated list of random numbers. It was considered to be inadequate where randomisation was based on coin tossing or drawing from packs of cards. If insufficient data were provided to judge the adequacy of randomisation, it was categorised as unclear. Outcome assessment was considered to be blinded if authors stated this, and where it was not stated it was categorised as unclear. Outcomes assessed from self completed questionnaires were categorised as not blinded. The percentage follow-up in each arm was calculated from the number allocated and the number with follow-up data presented in each paper. This was frequently not reported for CBA studies, in which outcome assessment was often based on an injury surveillance system. In such cases, studies were categorised as having more than 80% follow-up in each arm. Blinding of outcome assessment and the percentage of participants followed up was only recorded for those outcomes of relevance to this review.

For non-randomised studies blinding of outcome assessment, completeness of follow-up (80% or more in both treatment arms) and assessment of the distribution of confounders (baseline socio-demographic or economic characteristics, safety practices or injury rates) were used as markers of quality. Studies were considered to be balanced in terms of confounders if the prevalence of these did not differ by more than 10% between the treatment arms. If studies reported that intervention and control groups were matched on various characteristics but did not provide data to judge the adequacy of this matching, the balance of confounders was categorised as unclear.

Kappa coefficients were calculated for the first 41 studies reviewed by both authors in the 2007 version of this review. Twenty of these studies were RCTs and 21 were non-randomised studies. As a high level of agreement was not reached for all quality markers (*see* results) two authors extracted data on study quality for all included studies for the 2007 version and the update of the review. Disagreement between authors was resolved by referral back to the original article by a senior member of the research team with prior experience of quality assessment and by consensus forming discussion.

We examined the influence of individual aspects of study quality on effect sizes in a sensitivity analysis.

Measures of treatment effect

Combining treatment effects

Meta-analyses were undertaken where three or more studies reported the same outcome. Where studies had three or more arms, data from each arm included in the meta-analyses is described in the table 'Characteristics of included studies'. Where studies reported outcomes only for all ages combined (that is children and adults) they were not included in the meta-analysis and their results are presented in the table of included studies.

For outcomes measured as rates, pooled incidence rate ratios (IRR) were estimated using summary data and random-effects models. Effect sizes and standard errors were estimated from summary data from each study using Poisson regression in Stata (version 10) and meta-analysis of effect sizes and standard errors was undertaken using the generic inverse variance option in Review Manager (version 5.1). If studies involved cluster randomisation, the number of events and the number of person years were adjusted for clustering using the variance inflation factor calculated using the formula given by Donner and Klar (Donner 2000). For studies for which we had IPD we calculated the coefficient of variation using the method described by Hayes and Bennett (Hayes 1999). For studies for which we did not have IPD we used a coefficient of variation of 0.25 (Hayes 1999). For CBA studies, we also estimated follow-up injury rates adjusted for baseline rates using Poisson regression with a time by treatment arm interaction term. This represented the ratio of:

(Intervention arm follow-up injury rate/Intervention arm baseline injury rate)/(Control arm follow-up rate/Control arm baseline injury rate).

The regression coefficient (and the standard error) for this ratio of rates was used as the effect size (and the standard error) in the meta-analysis adjusted for baseline injury rates.

For binary outcome measures, pooled odds ratios (OR) were estimated in a random-effects model meta-analysis using summary published data and if we had IPD, this was used to calculate appropriate summary data for those studies. If there was a zero in the 2 x 2 table for any study, 0.5 was added to each cell of that table before the meta-analysis was performed. Studies with cluster allocation were adjusted for clustering by dividing the number of participants with and without an outcome by the design effect, calculated based on the intra-class correlation coefficient (ICC) obtained from a range of sources (Kendrick 2006). For studies for which we had IPD we calculated the ICC from the IPD using one-way analysis of variance. For studies that did not report an ICC for a particular outcome, but which had a similar allocation level to studies for which we had IPD, we used the ICC calculated from the IPD. If we calculated ICCs from more than one study for an outcome we used the midpoint of the range of ICCs. If we did not have IPD from which to calculate an ICC for an appropriate level of allocation we used the midpoint of a range of published ICCs (Adams 2004; DiGuiseppi 2002; Ukoumunne 1999). If these were available for injury outcomes at an appropriate allocation level we chose them in preference to those for other health related outcomes. The adjusted numbers of participants were included in the meta-analysis as integers for analyses undertaken using Review Manager and as non-integers for the analyses undertaken using Stata (version 10). The primary analyses for which forest plots are provided were undertaken using Review Manager (version 5.1). Analyses for outcomes using non-integers, subgroup analyses and sensitivity analyses were undertaken using Stata (version 10). Effect sizes and confidence intervals, but not forest plots, are included in this review for these analyses.

Estimating the effect of interventions by social variables

Meta-regression was undertaken to examine the effect of interventions by social group. Five covariates, previously shown to be associated with risk of injury (see introduction) were chosen as explanatory variables for the meta-regression: child age

(continuous), gender (binary), ethnic group (binary), single parent family (binary), residing in rented accommodation (binary) and at least one parent not in paid employment (binary).

The effect of covariates was assessed using IPD and study summary level data simultaneously, to minimise bias by including data from as many studies as possible and to maximise power for the meta-regression (Lambert 2002). We developed a novel model which we used for this analysis, comprising five components (Sutton 2008).

Component 1

Logistic model to estimate effect sizes from non-clustered studies for which IPD were available (Turner 2000) including a term for the interaction between treatment group and the binary covariate. If studies had small subgroup numbers precluding the estimation of effects by subgroups they were included in the analyses as summary data (*see* component 3).

Component 2

Random intercepts logistic model with participant at level one and cluster at level two for clustered studies for which IPD were available including a term for the interaction between treatment group and the binary covariate. If studies had small subgroup numbers precluding the estimation of effects by subgroups they were included in the analyses as summary data (*see* component 4).

Component 3

Random-effects model meta-regression of summary data from non-clustered studies (Smith 1995) including a term for the covariate, expressed as the proportion of the study population with the covariate of interest.

Component 4

Random-effects model meta-regression of summary data from clustered studies where no adjustment for clustering had been made, including a term for the covariate, expressed as the proportion of the study population with the covariate of interest. Effect sizes were adjusted for clustering by inflating the variance by the design effect. A normal distribution, truncated at zero, was placed across likely values for the ICC. The mean ICC was obtained as described above and the standard deviation (SD) was equivalent to the difference between the maximum ICC for that outcome and the mean ICC divided by two. In such a distribution the mean ± 2 SD would encompass ICC values ranging from zero to the maximum ICC for that outcome.

Component 5

Meta-analysis combining effect sizes from components 1 to 4. In the event that not all of the first four components of the model were required for a particular outcome, they were dropped accordingly. Due to possible ecological bias (where study-level and patient-level analyses give different results and the study-level analysis is assumed to be biased), for analyses with sufficient IPD data available, we tested for potential ecological bias by splitting the variability between studies and within studies (in order to produce event-risk estimates from the meta-analysis more specific to individuals) (Riley 2008). Where the difference in the estimation of the treatment covariate interaction from both sources of variation was not statistically significantly different (at the 5% level) from each other, then the combined estimate is reported. Where it was significant, both estimates are noted.

The analysis strategy varied slightly to accommodate smaller amounts of data by reducing the complexity of the synthesis models, following the below criteria.

- Five or more studies with at least one having IPD available: random-effects model for simultaneously analysing IPD and summary-level data, investigating splitting variance between and within studies.
- Four studies with at least two having IPD available or five or more summary data only studies: random-effects model for simultaneously analysing IPD and summary-level data fireguards.
- One IPD and two to four summary data only studies; two IPD and one summary data only studies; three IPD and no summary data only studies: fixed-effect model for simultaneously analysing IPD and summary-level data.
- If only summary data were available, meta-regression was undertaken only when five or more studies provided summary data.

In this model the IPD components estimate odds ratios comparing the treatment effect amongst those with and without the covariate of interest, whilst summary data components estimate regression coefficients for the change in treatment effect for a one unit change in the proportion of participants with the covariate of interest. In the summary data models a proportion of zero for the covariate estimates the treatment effect amongst those without the covariate of interest and a proportion of one will estimate the effect amongst those with the covariate of interest. Hence IPD and summary data models are estimating the same relationship between treatment effect and covariates (a similar situation exists for the continuous data (Riley 2008)).

We had IPD for one CBA study (Petridou 1997). However, we were unable to adjust for baseline values of the outcome using the IPD due to zero values in some subgroups. We were also unable to estimate the ICC as the variation between clusters was completely confounded by treatment group. Where possible, we therefore adjusted for the baseline prevalence of safety practices using a logistic model incorporating the baseline values as a covariate, unadjusted for clustering, and the regression coefficient and standard error were included in component 4 of the model and adjusted for clustering as described above.

All analyses were undertaken using a Bayesian Markov Chain Monte Carlo approach as implemented in the WinBUGS software (version 1.4.1) unless otherwise stated. All prior distributions were specified as vague unless otherwise stated.

Three studies provided IPD but were not included in the meta-analyses. One reported outcomes that were reported by fewer than three studies (Schwebel 2009). Two had control groups that were not comparable to other studies included in the meta-analysis (Kolko 2001; Rowland 2002) and, in addition, one also reported outcomes measured using a tool that differed from those of other studies reporting similar outcomes (Kolko 2001). One further study provided IPD on outcomes but not on social variables so was included in the meta-analyses but was only included as summary data in the meta-regressions (Swart 2008).

Unit of analysis issues

Outcome measures used in the analysis were as follows.

1. Injury rates for all injury mechanisms combined and for specific injury mechanisms.
2. Possession and use of home safety equipment (stair gates, fireguards, smoke alarms, window locks, electrical socket covers, non-slip bath mats, fire extinguishers, ipecac syrup, poison centre control number stickers).
3. Safety practices (storage of medicines, sharp objects, cleaning products, poisons and matches or lighters; use of baby walkers; safe hot water temperature; keeping hot foods or liquids, small objects and plants out of the reach of children; not leaving children alone in the bath, not leaving children alone on a high surface; checking smoke alarm batteries, having or practising a fire escape plan).

Although studies reported a wide range of outcomes (see table 'Characteristics of included studies'), we restricted our analyses to injuries and to the most commonly and consistently reported safety practices in an attempt to limit the problems associated with multiple significance testing. The injury and safety practices outcomes used in the meta-analyses are described in the table of included studies. Three injury outcomes were used in the meta-analyses, poisonings, thermal injuries and all injuries, all of which were reported as rates. All safety practices used in the meta-analyses were dichotomous.

Dealing with missing data

All cases with missing values were excluded from all analyses.

Assessment of heterogeneity

Heterogeneity between effect sizes of studies included in the review was described using forest plots, Chi^2 (χ^2) tests and the I^2 statistic. We explored potential explanations for heterogeneity in two ways. Firstly we used meta-regression to examine the effect of interventions by a range of demographic and social variables, using IPD and study summary level data simultaneously as described below. Other potential sources of heterogeneity were explored using subgroup analyses based on a priori explanations, which were whether the intervention included the provision of safety equipment, follow-up period (up to and including three months and four or more months), whether the intervention was delivered in a clinical setting or in the home or community, use of a randomised or non-randomised design, and study quality (allocation concealment, blinding of outcome assessment and at least 80% follow-up in each treatment arm).

Assessment of reporting biases

In investigating publication and related biases for binary outcomes we followed the approach recommended in recent guidelines (Sterne 2011). Briefly, we only considered outcomes with 10 or more studies and produced contour enhanced funnel plots (Peters 2008) for examination. Given that there was heterogeneity for many outcomes we conducted the arcsine test proposed by Rucker (Rucker 2008) for funnel plot asymmetry. In order to investigate the impact of publication bias, a regression adjustment (the Egger-D-Var variant) was used as described by Moreno et al (Moreno 2009) for the outcomes we were concerned about. For meta-analyses of injury rates where there were 10 or more studies we assessed publication bias using Egger's test.

Sensitivity analysis

The individual contribution of each study to the pooled result was assessed graphically and sensitivity analyses were undertaken to assess the effect of removing each study from each analysis. The robustness of the findings with respect to study quality was assessed by comparing treatment effects between randomised and non-randomised studies and between RCTs with and without each of the three quality markers using subgroup analyses.

RESULTS

Description of studies

Results of the search

Twelve thousand eight hundred and ninety-seven records were found from searching bibliographic databases and 221 from other sources. In addition, for the original review we surveyed 443 Sure Start schemes, 198 (45%) of which replied; 356 Home Start schemes, of which 125 (35%) replied; 60 Fire and Rescue Services, of which 50 (83%) replied; eight Head Offices in the English Regions of the National Children's Homes charity, none of which replied; and the Head Offices for Wales, Scotland, Northern Ireland and England for the Royal Society for the Prevention of Accidents, one of which replied (25%). These surveys did not identify any studies meeting our inclusion criteria that had not already been identified from another source. The surveys were therefore not repeated for the update of the review.

Three hundred and sixty-five articles (2.8%) from the 13,118 records were retrieved for more detailed evaluation.

Data were extracted by two authors on study design, participants, interventions, outcomes, subgroup analyses, adjustments for clustering and whether the author needed to be contacted for the first 53 studies identified for inclusion; 1386 of 1424 (97.3%) of these data items for the 53 studies were identical. Kappa coefficients for agreement on whether the study met the inclusion criteria in terms of study design ($\kappa = 1.00$), participants ($\kappa = 1.00$), interventions ($\kappa = 0.85$), outcomes ($\kappa = 0.84$) and overall whether the study met the inclusion criteria were high ($\kappa = 1.00$).

The PRISMA flow diagram shows the process of study identification and selection (Figure 1).

Figure 1. Study flow diagram.

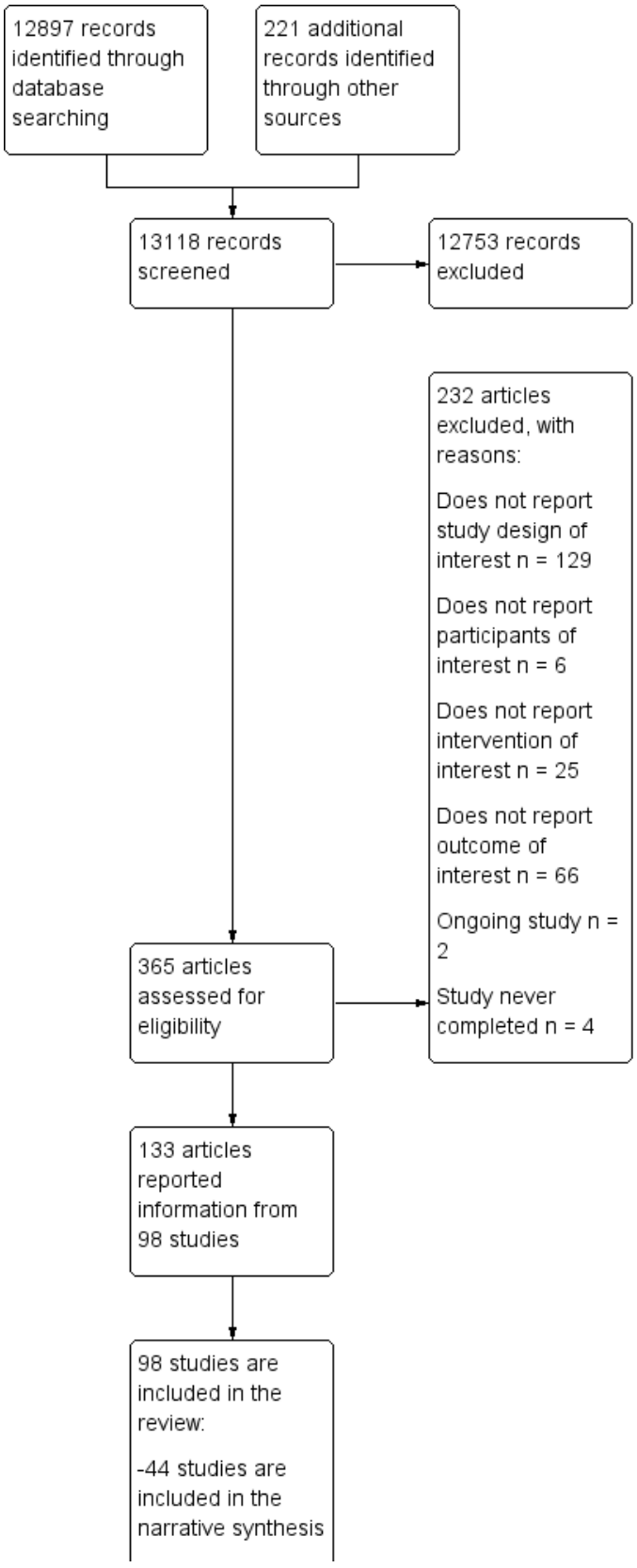


Figure 1. (Continued)

narrative synthesis

-54 studies are included in the meta-analyses of which 19 provided IPD

Studies included in meta-analysis by outcome:

Medically attended or self-reported injury n = 15 (number providing IPD n = 3)

Safety practices relating to prevention of:

- Thermal injuries n = 39 (number providing IPD n =18)
- Poisoning n = 27 (number providing IPD n = 16)
- Falls n = 16 (number providing IPD n = 14)
- Electrocution n = 9 (number providing IPD n = 7)
- Lacerations and bruises n = 7 (number providing IPD n = 5)
- Suffocation n = 6 (number

Figure 1. (Continued)

Included studies

Ninety-eight studies were included in the review. Fifty-six (57%) were RCTs, 11 (11%) were non-RCTs, 30 (31%) were CBAs and the design of one (1%) study was insufficiently described to distinguish between a non-RCT and a CBA. Fifty-four (55%) studies were included in at least one meta-analysis (35 RCTs, 6 non-RCTs and 13 CBAs) and 44 (45%) were summarised narratively. IPD were provided to us for 22 studies and data from 19 studies were included in at least one meta-analysis. The most commonly reported outcomes related to thermal injuries, poisoning and falls.

Forty-nine (50%) studies were from the USA, 14 from the UK (14%), six from Australia (6%), four (4%) each from Canada, South Africa and Sweden, three (4%) each from France and New Zealand, two (3%) each from Denmark and China, and one (1%) each from Singapore, Norway, Greece, Hong Kong, Israel, Italy and Mexico. Forty-one (42%) provided interventions to families with children aged less than five years. Forty-one (42%) provided low cost, discounted or free safety equipment and four (4%) provided information on financial help available for obtaining equipment or referral to centres where parents could obtain low cost equipment. Thirty-six studies (36%) provided the intervention specifically to a disadvantaged population.

Twenty-four studies reported outcomes related to the prevention of a range of medically attended or self reported injuries. Fifteen of these studies were included in the meta-analyses, seven of which were RCTs, one was a non-RCT and seven were CBAs. IPD were obtained from three studies.

Sixty-four studies reported a range of outcomes related to thermal injury prevention. Thirty-nine of these studies were included in at least one of the meta-analyses of thermal injury prevention outcomes, 29 of which were RCTs, four were non-RCTs and six were CBAs. IPD were obtained from 18 studies.

Forty-five studies reported a range of outcomes related to poisoning prevention. Twenty-seven of these studies were included in at least one of the meta-analyses of poisoning prevention outcomes; 22 were RCTs, three were non-RCTs and two were CBAs. IPD were obtained from 16 studies.

Twenty-five studies reported a range of outcomes related to falls prevention. Sixteen of these studies were included in the meta-analyses, 12 of which were RCTs, three were non-RCTs and one was a CBA. IPD were obtained from 14 studies.

Sixteen studies reported a range of outcomes related to electrical injury prevention. Nine of these studies were included in the meta-analyses, seven of which were RCTs and two were non-RCTs. IPD were obtained from seven studies.

Twelve studies reported a range of outcomes related to the prevention of lacerations and bruising. Seven of these studies were included in the meta-analyses, six of which were RCTs and one was a non-RCT. IPD were obtained from five studies.

Twelve studies reported a range of outcomes related to the prevention of suffocation. Six of these studies were included in the meta-analyses, all of which were RCTs. IPD were obtained from three studies.

Nine studies reported a range of outcomes related to the prevention of drowning. Five of these studies were included in the meta-analyses, three of which were RCTs and two were non-RCTs. IPD were obtained from four studies.

Nineteen studies reported home hazard scores or safety scores, none of which were included in a meta-analysis.

Table 1 shows the demographic and socio-economic variables reported by studies included in at least one of the meta-regression analyses. If authors provided IPD, we have calculated the frequencies of these variables rather than using the published frequencies. The IPD datasets provided by some authors included all study participants regardless of whether follow-up data were available for them, whilst others provided datasets containing only those participants for whom follow-up data were available. Similarly, some authors report baseline data on all participants whilst others report baseline data only on those for whom follow-up data were available. Consequently, the frequencies we report may differ from those reported by the authors in some cases. Twenty-nine studies which were included in our meta-analyses included data on child age. The mean or median age ranged from 0 to 13 years. Seventeen of the studies included in the meta-analyses reported child gender. The percentage of males ranged from 46% to 63% across these studies. Fifteen studies reported the percentage of families residing in rented accommodation; this ranged from 13% to 100%. Twenty-seven studies reported the percentage of single parent families; this ranged from 0% to 87%. Twenty-nine studies reported the percentage of participants from a black or minority ethnic group; this ranged from 1% to 96%. Sixteen studies reported the percentage of families with at least one parent unemployed; this ranged from 11% to 81%.

Excluded studies

The Characteristics of excluded studies table gives the reason for exclusion of each excluded study.

Risk of bias in included studies

Our assessment of the risk of bias is given in the table 'Characteristics of included studies'. Of the 56 RCTs, 19 (34%) had adequate randomisation or allocation concealment, 18 (32%) had blinded outcome assessment, and 30 (54%) had follow-up on at least 80% of participants in each treatment arm. Of the 11 non-RCTs, none had blinded outcome assessment, six (55%) had follow-up on at least 80% of participants in each treatment arm, and four (36%) were considered to be balanced in terms of confounders.

Of the 30 CBAs, none had blinded outcome assessment, 18 (60%) had follow-up on at least 80% of participants in each treatment arm, and eight (27%) were considered to be balanced in terms of confounders.

Twenty-three (41%) of the RCTs, five (45%) of the non-RCTs and 29 (97%) of the CBAs had a clustered design. The allocation level for clustered RCTs ranged from paediatricians to general practices and electoral wards, but also included several trials where allocation was based on time periods. The allocation level for the clustered non-RCTs included one study allocated at the general physician (GP) practice level, but the remaining studies were allocated based on time periods. The allocation level for the clustered CBAs was generally larger, ranging from child health clinics to cities, islands, municipalities and counties. For the CBAs, where authors have described how the intervention and control communities were allocated this has been included in the comments section of the table.

Fifty-four (55%) of the studies were included in at least one of the meta-analyses. Thirty-five (65%) of these were RCTs, six (11%) were non-RCTs and 13 (24%) were CBAs. Nineteen (35%) of the studies included in the meta-analysis provided IPD. In addition, a further three studies provided IPD which were not included in the meta-analyses (Kolko 2001; Rowland 2002; Schwebel 2009). The first two studies had control groups that were not comparable to other studies included in the meta-analysis and the outcomes measured in the third study were reported by fewer than three studies. None of the study authors provided us with unpublished subgroup analyses.

Effects of interventions

Different measures of effect are reported in this section, as follows.

- Pooled incidence rate ratios (IRR) were calculated for injuries occurring during the study period. An effect size less than 1.0 means the intervention was beneficial.
- Pooled odds ratios (OR) were calculated for protective outcomes, such as the uptake of safety equipment or safe practices. An effect size more than 1.0 means the intervention was beneficial.
- For both measures, if the range of the 95% confidence interval (CI) falls on both sides of 1.0 then, statistically, the intervention has not been shown to work with certainty.

Medically attended and self reported injuries

Fifteen studies reporting medically attended or self reported injury were included in the meta-analyses. The study by Kendrick was adjusted for clustering using a coefficient of variation of 0.30, calculated from the IPD. The study by Watson was not adjusted for clustering as the coefficient of variation calculated from the IPD was zero. The studies by Bentzen 1997; Carman 2006; Gittelman 2007; Guyer 1989; Lindqvist 1998a; Svanstrom 1995 and Yorkston 2007 were adjusted using a coefficient of variation of 0.25 as described above. After adjusting for clustering the effective combined sample size was 12,039 person years in the intervention arm and 12,367 person years in the control arm. Studies had very varied follow-up time periods, ranging from six months (Sangvai 2007) to eight years (Svanstrom 1995).

In community injury prevention programmes, which were usually CBA studies, the intervention community or communities were often chosen because of their high injury rates. Five of the seven CBAs included in the meta-analyses had considerably higher injury rates in the intervention than control arms at baseline (Carman 2006; Gittelman 2007; Guyer 1989; Lindqvist 1998a; Yorkston 2007). In view of this, we undertook analyses both adjusting and not adjusting CBA study follow-up injury rates for baseline injury rates. Studies also reported outcomes at multiple follow-up time periods. We chose the time period most consistent with that for other studies included in the meta-analysis.

One study reported injury rates for 'potentially preventable injuries', that is those that could plausibly be prevented by the equipment provided as part of the intervention, and rates for all injuries (that is including those that were not plausibly preventable by the equipment provided in the trial) (Phelan 2010). We therefore undertook analyses including all injuries with a sensitivity analysis including only the potentially preventable injuries from the study by Phelan 2010.

Analyses unadjusted for baseline injury rates in controlled before and after (CBA) studies

Analysis 1.1. The pooled incidence rate ratio (IRR) was calculated.

Home safety interventions did not appear to be associated with a reduction in injury rates (IRR 0.93, 95% CI 0.83 to 1.05) and there was significant heterogeneity between effect sizes. Heterogeneity may be partly explained by the provision of safety equipment, with interventions providing equipment possibly being less effective (IRR 0.94, 95% CI 0.81 to 1.09) than those not providing equipment (IRR 0.85, 95% CI 0.72 to 0.99), with no significant heterogeneity between effect sizes in either subgroup. This difference may result from a single large school-based study that did not provide equipment and which demonstrated a significant reduction in injury rates (Zhao 2005). Studies with non-blinded outcome assessment also appeared to have a greater effect (IRR 0.76, 95% CI 0.64 to 0.90) than those with blinded outcome assessment (IRR 0.95, 95% CI 0.73 to 1.22), but significant heterogeneity remained in the latter subgroup analysis. Heterogeneity may also be partly explained by the setting in which the intervention was delivered, with possible evidence of a greater effect in those delivered in the home (clinical setting IRR 1.07, 95% CI 0.99 to 1.17; home IRR 0.83, 95% CI 0.68 to 1.01; community IRR 1.03, 95% CI 0.69 to 1.54). Heterogeneity did not appear to be explained by study design (RCTs IRR 0.87, 95% CI 0.71 to 1.07; other designs IRR 1.04, 95% CI 0.87 to 1.24), adequate allocation concealment (adequate concealment IRR 0.88, 95% CI 0.70 to 1.11; inadequate or unclear concealment IRR 0.87, 95% CI 0.55 to 1.37) or follow-up of at least 80% of participants in each treatment arm (at least 80% follow-up IRR 0.84, 95% CI 0.64 to 1.09; less than 80% follow-up IRR 0.95, 95% CI 0.67 to 1.31). All analyses were robust to using only 'preventable' injuries from the study by Phelan 2010, except the finding of a significant effect in non-blinded studies (IRR all injuries OR 0.76, 95% CI 0.64 to 0.90; preventable injuries only OR 0.71, 95% CI 0.47 to 1.07). Sensitivity analyses also indicated that findings were robust to excluding all studies in turn except Watson 2005, which resulted in a significant reduction in injury risk (IRR 0.86, 95% CI 0.77 to 0.96).

Analyses adjusted for baseline injury rates in controlled before and after (CBA) studies

Analysis 1.2. The pooled incidence rate ratio (IRR) was calculated.

There was some evidence that home safety interventions may be associated with a reduction in injury rates (IRR 0.89, 95% CI 0.78 to 1.01) but there was significant heterogeneity between effect sizes. Heterogeneity may be partly explained by the setting in which the intervention was delivered with a significant effect found for interventions delivered in the home (IRR 0.75, 95% CI 0.62 to 0.91) compared to those delivered in clinical settings (IRR 1.07, 95% CI 0.99 to 1.17) or within the community (IRR 0.77, 95% CI 0.52 to 1.16), and no significant heterogeneity between effect sizes in any of these subgroup analyses. Interventions not providing equipment appeared to have a significant effect (IRR 0.78, 95% CI 0.66 to 0.92) whilst those providing equipment did not (IRR 0.92, 95% CI 0.79 to 1.08), with no significant heterogeneity between effect sizes in either subgroup analysis. Again, this difference may result from a single large school-based study which did not provide equipment and which demonstrated a significant reduction in injury rates (Zhao 2005). Studies with non-blinded outcome assessment may appear to be more effective (IRR 0.76, 95% CI 0.64 to 0.90) than those with blinded outcome assessment (IRR 0.95, 95% CI 0.73 to 1.22), but significant heterogeneity remained in the latter subgroup analysis. Heterogeneity did not appear to be explained by study design (RCTs IRR 0.89, 95% CI 0.76 to 1.06; other designs IRR 0.80, 95% CI 0.55 to 1.15). Restricting analyses to RCTs with adequate allocation concealment, blinded outcome assessment and follow-up of at least 80% of participants in each arm excluded all CBAs and consequently resulted in the same subset of studies as for the analyses unadjusted for baseline rates presented above (that is adequate allocation concealment IRR 0.88, 95% CI 0.70 to 1.11; inadequate or unclear concealment IRR 0.87, 95% CI 0.55 to 1.37; blinded outcome assessment IRR 0.95, 95% CI 0.73 to 1.22; non-blinded outcome assessment IRR 0.76, 95% CI 0.64 to 0.90; at least 80% follow-up IRR 0.84, 95% CI 0.64 to 1.09; less than 80% follow-up IRR 0.95, 95% CI 0.67 to 1.31). All analyses were robust to using only 'preventable' injuries from the study by Phelan 2010. Sensitivity analyses also indicated that findings were robust to excluding all studies in turn except Watson 2005, which resulted in a significant reduction in injury risk (IRR 0.82, 95% CI 0.74 to 0.92).

Data not included in the meta-analysis

Nine studies reporting injury outcomes were not included in the meta-analyses (Coggan 2000; Mackay 2002; Moller 1996; Ohn 2005; Ozanne-Smith 2002; Ponce De Leon 2007; Rey 1993; Schelp 1987; Schlesinger 1966). Two of these reported significantly lower injury rates in the intervention group as compared to the control group (Coggan 2000; Moller 1996); neither however presented numerators and denominators. One study reported a significantly lower injury rate in the intervention group as compared to the control group for one subgroup only (domestic accidents) (Rey 1993). One study reported a significant reduction in hospital admission rate (compared to the rate for the rest of Sweden) in one of the five intervention areas (Lidkoping), a significant increase in one of the five intervention areas (Skovde) and no significant difference in three other intervention areas (Ponce De Leon 2007). Four studies did not find a significant difference in injury rates between intervention and control groups (Mackay 2002; Ohn 2005; Ozanne-Smith 2002; Schlesinger 1966). One study (Schelp 1987) reported a significant reduction in injury rate post-intervention compared to pre-intervention but only presented this data for the intervention community.

Thermal injury prevention

Sixty-four studies reported thermal injury prevention outcomes, 39 (61%) of which had at least one outcome included in at least one meta-analysis.

Thermal injuries

Analysis 2.1. The pooled incidence rate ratio (IRR) was calculated.

Only four studies reporting thermal injury rates (Kendrick 1999; Watson 2005; Ytterstad 1998; Zhao 2005) were included in the meta-analysis. The study by Watson 2005 was adjusted for clustering using a coefficient of variation of 0.98 calculated from the IPD. The study by Kendrick was not adjusted for clustering as the coefficient of variation calculated from the IPD was zero. The study by Ytterstad 1998 was adjusted using a coefficient of variation of 0.25 as described above. The combined number of person years was 9758 and 12,924 in the intervention and control arms respectively. There was a lack of evidence that home safety interventions with or without the provision of safety equipment reduced thermal injuries (IRR 0.85, 95% CI 0.51 to 1.42) and there was significant heterogeneity between effect sizes. Adjusting the post-intervention thermal injury rates for baseline rates for the study by Ytterstad 1998 had little impact on the results (IRR 0.94, 95% CI 0.59 to 1.49).

Safe hot tap water temperature

Analysis 4.1. The pooled odds ratio (OR) was calculated.

Sixteen studies reporting safe hot tap water temperatures were included in the meta-analysis (Babul 2007; Barone 1988; Georgieff 2004; Gielen 2002; Katcher 1989; Kelly 1987; Kendrick 1999; Kendrick 2010; King 2001; Nansel 2002; Nansel 2008; Phelan 2010; Sangvai 2007; Thomas 1984; Waller 1993; Williams 1988). These studies used varying definitions of a safe hot tap water temperature; less than 49 °C (Georgieff 2004; Gielen 2002; Nansel 2002; Nansel 2008; Sangvai 2007), less than 52 °C (Kelly 1987), less than or equal to 54 °C (Katcher 1989; Kendrick 1999; King 2001; Phelan 2010; Thomas 1984) and less than 60 °C (Waller 1993). Safe hot water was not defined in three studies (Babul 2007; Barone 1988; Williams 1988). Hot water temperatures were tested by observers in nine studies (Georgieff 2004; Gielen 2002; Kelly 1987; Kendrick 2010; King 2001; Phelan 2010; Sangvai 2007; Thomas 1984; Waller 1993) and were self reported in five (Babul 2007; Katcher 1989; Kendrick 1999; Nansel 2002; Nansel 2008) although one of the latter validated self reported temperatures by testing a sample of homes (Katcher 1989). Five were adjusted for clustering (Barone 1988; Georgieff 2004; Gielen 2002; Kendrick 1999; Williams 1988) and adjusted numerators and denominators were rounded to the nearest integer. The study by Georgieff was adjusted using an ICC of 0.00012 (DiGuiseppi 2002) and the studies by Kendrick, Gielen, Barone and Williams were adjusted using an ICC of 0.00159, which was calculated from IPD from the study by Kendrick (Kendrick 1999).

Families in the home safety interventions arms were more likely to have a safe hot tap water temperature than control group families (OR 1.41, 95% CI 1.07 to 1.86) and repeating the analyses using non-integers for the numerators and denominators for cluster randomised studies produced identical results.

There was significant heterogeneity between effect sizes, which was not explained by the provision of thermometers for water

temperature testing or the provision of thermostatic mixer valves as excluding studies providing either resulted in a similar effect size (OR 1.32, 95% CI 0.97 to 1.81) and significant heterogeneity between effect sizes remained. Some of the heterogeneity may be explained by study setting, with a significant effect seen only amongst those studies providing interventions in the home (OR 1.58, 95% CI 1.12 to 2.22) compared to those in clinical settings (OR 1.31, 95% CI 0.78 to 2.20). Some of the heterogeneity may also be explained by follow-up period, with a significant effect seen only in studies with follow-up of four or more months (OR 1.49, 95% CI 1.16 to 1.85) compared to those with follow-up periods of three months or less (OR 1.40, 95% CI 0.57 to 3.46). Significant heterogeneity remained in the subgroup analyses by study setting and follow-up period. Similar effect sizes were found when analyses were restricted to randomised studies (OR 1.58, 95% CI 1.14 to 2.20), those with adequate allocation concealment (OR 1.67, 95% CI 1.14 to 2.51), blinded outcome assessment (OR 1.33, 95% CI 1.04 to 1.69) and follow-up of at least 80% participants in each arm (OR 1.62, 95% CI 1.04 to 2.53). Significant heterogeneity remained in the subgroup analyses for randomised studies and those with adequate allocation concealment and those with follow-up of at least 80% of participants in each arm. Sensitivity analyses excluding each study in turn indicated that findings were robust to excluding any one study.

Functioning smoke alarms

Analysis 4.2. The pooled odds ratio (OR) was calculated.

Seventeen studies reporting possession of a functioning smoke alarm were included in the meta-analysis (Barone 1988; Bulzachelli 2009; Clamp 1998; DiGuiseppi 2002; Gielen 2002; Gielen 2007; Hendrickson 2002; Johnston 2000; Kendrick 1999; King 2001; Matthews 1988; Miller 1982; Mock 2003; Phelan 2010; Sangvai 2007; Sznajder 2003; Watson 2005). Five were adjusted for clustering (Barone 1988; Gielen 2002; Johnston 2000; Kendrick 1999; Miller 1982) and adjusted numerators and denominators were rounded to the nearest integer. All studies were adjusted using an ICC of 0.033, calculated from IPD from the study by Kendrick 1999. The study by DiGuiseppi 2002 was not adjusted for clustering as the ICC calculated from the IPD provided from that study was extremely small ($P < 0.00001$).

Families in the home safety interventions arm were significantly more likely to possess a functioning smoke alarm than control group families (OR 1.81, 95% CI 1.30 to 2.52). Repeating the analyses using non-integers for the numerators and denominators for cluster randomised studies produced an effect size of 1.83 (95% CI 1.28 to 2.50). Effect sizes varied significantly between studies and this heterogeneity may be partly explained by provision of smoke alarms, with a larger effect size in studies providing smoke alarms (OR 2.49, 95% CI 1.53 to 4.06) than those not providing alarms (OR 1.12, 95% CI 0.87 to 1.45), although significant heterogeneity still existed between effect sizes for studies providing smoke alarms. It may also be partly explained by the setting in which the intervention was delivered, with those in clinical settings (OR 1.56, 95% CI 1.14 to 2.13) possibly having a smaller effect size than those delivered in the home or community (OR 2.92, 95% CI 1.08 to 7.91), but significant heterogeneity remained in the analysis for interventions delivered in the home or community. Larger effect sizes were also seen in studies with follow-up periods of three months or less (OR 2.66, 95% CI 1.27 to 5.89) than in those with longer follow-up periods (OR 1.47, 95% CI 1.04 to 2.09), however significant heterogeneity was found between effect sizes in both subgroup analyses. Similar effect sizes were found when analyses were restricted to randomised studies (OR 2.25, 95% CI 1.43 to 3.55), those with adequate allocation concealment (OR 2.24, 95% CI 1.38 to 3.64) and those with follow-up on at least 80% of participants in both arms (OR 3.13, 95% CI 1.49 to 6.58). Only three studies had blinded outcome assessment and the effect size may be smaller in these studies (OR 1.57, 95% CI 0.54 to 4.55) than in those without blinded outcome assessment (OR 2.64, 95% CI 1.55 to 4.51). However, care must be taken in interpreting this finding due to the small number of studies involved. Significant heterogeneity was found between treatment effects amongst randomised studies and amongst those randomised studies with and without adequate allocation concealment, with and without blinded outcome assessment, and with follow-up on at least 80% of participants in both arms. Sensitivity analyses indicated that the findings were robust to the exclusion of any one study.

Seventeen studies reported smoke alarm ownership (Barone 1988; Clamp 1998; Davis 1987; DiGuiseppi 2002; Gielen 2007; Guyer 1989; Hendrickson 2002; Jenkins 1996; Kelly 1987; Kendrick 2007; King 2001; Matthews 1988; McDonald 2005; Nansel 2002; Nansel 2008; Posner 2004; Thomas 1984), 10 of which did not also report possession of a functional smoke alarm (Davis 1987; Guyer 1989; Jenkins 1996; Kelly 1987; Kendrick 2007; McDonald 2005; Nansel 2002; Nansel 2008; Posner 2004; Thomas 1984). Meta-analysis of these 17 studies indicated that there was some evidence to suggest that intervention group families may be slightly more likely to have a smoke alarm (OR 1.17, 95% CI 0.97 to 1.42) and no significant heterogeneity was found between effect sizes.

Use of fire guards

Analysis 4.3. The pooled odds ratio (OR) was calculated.

Four studies reporting use of fire guards were included in the meta-analysis (Clamp 1998; Kendrick 1999; Kendrick 2005b; Watson 2005). Two studies (Clamp 1998; Watson 2005) reported whether fire guards were fitted and always used; one study reported whether fire guards were used on some or all fires (Kendrick 2005b); and one whether fire guards were used on all fires (Kendrick 1999). If studies reported that fire guards were not required because families did not have any gas, electric, open or other fires these families were included as having fire guards as they were considered safe in terms of the risk of a thermal injury from such a source. Two studies (Kendrick 1999; Kendrick 2005b) were adjusted for clustering and adjusted numerators and denominators were rounded to the nearest integer. Both studies were adjusted for clustering using ICCs calculated from IPD from each respective study. An ICC of 0.01893 was used for Kendrick 1999 and 0.01119 for Kendrick 2005b.

There was some evidence that home safety interventions were effective in increasing the use of fire guards (OR 1.40, 95% CI 1.00 to 1.95). Repeating the analyses using non-integers for the numerators and denominators for cluster randomised studies produced an effect size of 1.39 (95% CI 1.00 to 1.94). Effect sizes were significantly heterogeneous. All four studies provided fire guards and all provided interventions in clinical settings. A larger effect size was seen in the one study with a follow-up period of three months or less (OR 3.60, 95% CI 1.89 to 6.84) than in those with longer follow-up periods (OR 1.17, 95% CI 1.00 to 1.36); there was no significant heterogeneity between effect sizes for

those studies with longer follow-up periods. However, care must be taken in interpreting this finding due to the small number of studies involved. Restricting analyses to randomised studies, those with adequate allocation concealment, and with follow-up on more than 80% of participants in both treatment arms did not alter the conclusions drawn from the main analysis. Only one randomised study had blinded outcome assessment. Sensitivity analyses excluding each study in turn indicated that the results were robust to the exclusion of any one study.

Keeping hot drinks or food out of reach of children

Analysis 4.4. The pooled odds ratio (OR) was calculated.

Six studies reporting keeping hot drinks or food out of the reach of children (Babul 2007; Hendrickson 2002; Kendrick 1999; Nansel 2002; Nansel 2008; Posner 2004) were included in the meta-analysis. The definitions of keeping hot food or drinks out of reach varied from never placing hot food or drinks on tablecloths or on edges of counters (Posner 2004), never holding a child whilst cooking or holding a hot liquid (Nansel 2002; Nansel 2008), never drinking hot drinks whilst holding a child (Kendrick 1999), hot liquids and hot foods placed out of a child's reach (Babul 2007), and hot food or drinks not observed to be accessible to a child on a home visit (Hendrickson 2002). The study by Kendrick was adjusted for clustering using an ICC of 0.01609 calculated from the IPD from that study and adjusted numerators and denominators were rounded to the nearest integer.

Families in the home safety interventions arms were not significantly more likely to keep hot drinks out of reach of children than control group families (OR 0.95, 95% CI 0.61 to 1.48) and there was no evidence of heterogeneity between effect sizes. Sensitivity analyses excluding each study in turn indicated that the findings were robust to the exclusion of any one study.

Storage of matches

Analysis 4.5. The pooled odds ratio (OR) was calculated.

Six studies reporting storage of matches out of the reach of children were included in the meta-analysis (Dershewitz 1977; Hendrickson 2002; Kelly 1987; Kendrick 1999; King 2001; Sznajder 2003). Five studies reported matches and lighters observed as out of reach of children on a home visit (Dershewitz 1977; Hendrickson 2002; Kelly 1987; King 2001; Sznajder 2003) and the sixth used self reported always keeping matches out of reach (Kendrick 1999). The ICC calculated from the IPD for the only clustered study (Kendrick 1999) was extremely small ($P < 0.00001$), hence the data from this study were not adjusted for clustering.

There was a lack of evidence that home safety interventions were effective in increasing the safe storage of matches (OR 1.03, 95% CI 0.63 to 1.68). There was no significant heterogeneity between effect sizes. Sensitivity analyses excluding each study in turn indicated that the findings were robust to the exclusion of any one study.

Possession of a fire extinguisher

Analysis 4.6. The pooled odds ratio (OR) was calculated.

Five studies reporting possession of a fire extinguisher were included in the meta-analysis (Babul 2007; Hendrickson 2002; King 2001; Petridou 1997; Sznajder 2003). This was defined as an easily accessible extinguisher that was in working order (Sznajder 2003), a fire extinguisher present (Hendrickson 2002; King 2001) and a functional fire extinguisher present (Babul 2007; Petridou 1997). The study by Petridou 1997 was adjusted for clustering using an ICC of 0.0024 (estimated as the midpoint of a range of ICCs published for health outcomes at the level of health authority, local authority or town (Kendrick 2006)) and the adjusted numerator and denominator were rounded to the nearest integer.

There was a lack of evidence that home safety interventions were effective in increasing possession of a fire extinguisher (OR 0.90, 95% CI 0.53 to 1.51). Repeating the analyses using non-integers for the numerators and denominators for cluster randomised studies produced an effect size of 0.91 (95% CI 0.54 to 1.51). There was significant heterogeneity between treatment effects. The heterogeneity may be partly explained by the provision of fire extinguishers as studies not providing extinguishers had a smaller effect (OR 0.77, 95% CI 0.63 to 0.95) than the one study (Hendrickson 2002) that did provide extinguishers (OR 4.67, 95% CI 1.78 to 12.25). However, care must be taken in interpreting this finding due to the small number of studies involved. Sensitivity analyses including only randomised studies, those with adequate allocation concealment, and with follow-up on more than 80% of participants in both treatment arms did not alter the conclusions drawn from the main analysis. Only one randomised study had blinded outcome assessment. Sensitivity analyses excluding each study in turn indicated that results were robust to the exclusion of any one study.

Having a fire escape plan

Analysis 4.7. The pooled odds ratio (OR) was calculated.

Four studies reporting having or practising a fire escape plan were included in the meta-analysis (Campbell 2001; Hwang 2006; Petridou 1997; Posner 2004). The study by Petridou 1997 was adjusted for clustering using an ICC of 0.0024 (estimated as the midpoint of a range of ICCs published for health outcomes at the level of health authority, local authority or town (Kendrick 2006)) and the adjusted numerator and denominator were rounded to the nearest integer. Home safety interventions were effective in increasing the proportion of families with a fire escape plan (OR 2.01, 95% CI 1.45 to 2.77) and there was no significant heterogeneity between effect sizes. Identical results were found when analyses were repeated using non-integers for numerators and denominators for clustered studies. Sensitivity analyses excluding each study in turn indicated that the findings were robust to the exclusion of any one study.

Checking or changing smoke alarm batteries in the last six months

Analysis 4.8. The pooled odds ratio (OR) was calculated.

Four studies reporting checking or changing smoke alarm batteries in the last six months were included in the meta-analysis (McDonald 2005; Nansel 2002; Nansel 2008; Posner 2004). There was no evidence that home safety interventions were effective in increasing the proportion of families who had checked or changed smoke alarm batteries in the preceding six months (OR 1.15, 95% CI 0.63 to 2.08) and there was no significant heterogeneity between effect sizes. Sensitivity analyses excluding each study in turn indicated that the findings were robust to the exclusion of any one study.

Effect of covariates on thermal injury prevention practices

The effects of the interventions by child age, gender and social group are shown in Table 2. There was no evidence that interventions varied in effect by child age, gender or any of the social variables.

Studies not included in the meta-analyses for thermal injury prevention

Twenty-five studies were not included in any meta-analyses and, in addition, 14 of the 39 studies included in the meta-analyses reported other outcomes for which meta-analyses were not undertaken. Two of the studies reported medically attended thermal injuries (Guyer 1989; McLoughlin 1982) and neither found a reduction in injury rates amongst intervention communities. Two studies reported fire related injuries and found a significant reduction in fire related injuries in the intervention area but not in the control area (Mallonee 1996; Schwarz 1993); a third study reported fire related injuries in all age groups and did not find a significant reduction in injuries in the intervention group (DiGuiseppi 2002).

Four studies reported testing hot tap water temperature (Katcher 1989; Mock 2003; Posner 2004; Shapiro 1987); three of which found a significantly higher proportion of the intervention group had tested their hot tap water temperature (Katcher 1989; Posner 2004; Shapiro 1987). Two studies reported possession of fitted fire guards (Coggan 2000; Paul 1994); one of which reported a significant effect favouring the intervention group (Coggan 2000). Three studies reported fire setting or match play incidents (Adler 1994; Franklin 2002; Kolko 2001); two of which (Franklin 2002; Kolko 2001) reported significant reductions in the incidence of fire setting or match play behaviour favouring the intervention groups. Two studies reported turning pan handles away from the edge of stoves (Nansel 2008; Posner 2004); neither of which found a significant difference between treatment groups.

The remainder of the outcomes were each reported by only one study and significant differences were reported between treatment groups only for 12 studies. Posner 2004 reported significantly more intervention group families had spout covers for the bath and used a hot water thermometer; Katcher 1989 reported that significantly more intervention group families had tested their hot water temperature; Colver 1982 reported that significantly more intervention group families made safety changes to their homes; Garcia 1996 reported that the intervention group parents showed a significant improvement in safety behaviour; Kendrick 2007 reported that significantly more intervention group children never used matches; Hwang 2006 reported that significantly more intervention arm families had identified a meeting place outside the house in case of fire; Chan 2004 reported that intervention group parents were significantly more likely to test the temperature of micro-waved food and to 'child proof' boilers and rice cookers; and Blake 1993 reported that significantly more intervention group parents bought and installed smoke alarms.

Harvey 2004 reported that installing alarms resulted in a higher proportion of households having functional alarms than giving vouchers for free alarms. Rowland 2002 reported that smoke alarms with ionisation sensors were more likely to be working than those with optical sensors, and those with lithium batteries were more likely to be working than those with zinc batteries; Mueller 2008 reported that significantly more families who had photoelectric alarms installed had functioning alarms than those who had ionisation alarms, at both nine and 15 months; and Yang 2008 reported that families who had lithium battery smoke alarms were more likely to have functioning alarms than those with zinc battery alarms, and that photoelectric alarms resulted in significantly fewer false alarms than ionising alarms.

Poisoning prevention

Forty-five studies reported poisoning prevention outcomes, 27 (60%) of which had at least one outcome included in at least one meta-analysis.

Poisonings

Analysis 3.1. The pooled incidence rate ratio (IRR) was calculated.

Only four studies reporting poisoning rates (Fergusson 1982; Kendrick 1999; Watson 2005; Zhao 2005) were included in the meta-analysis. The studies by Kendrick 1999 and Watson 2005 were not adjusted for clustering as the coefficients of variation calculated from the IPD data were zero. The study by Fergusson 1982 was adjusted for clustering using a coefficient of variation of 0.25 as described above. The combined number of person years was 9206 and 8791 in the intervention and control arms respectively. There was a lack of evidence that home safety interventions with or without the provision of safety equipment reduced the rate of poisoning (IRR 0.93, 95% CI 0.65 to 1.32) and there was no significant heterogeneity between effect sizes.

Storage of medicines

Analysis 5.1. The pooled odds ratio (OR) was calculated.

Thirteen studies reporting storage of medicines either in locked cupboards, drawers or cabinets; stored at or above adult waist level or as being inaccessible to a child were included in the meta-analysis (Babul 2007; Clamp 1998; Dershewitz 1977; Gielen 2007; Kelly 1987; McDonald 2005; Nansel 2002; Nansel 2008; Posner 2004; Schwarz 1993; Swart 2008; Sznajder 2003; Watson 2005). The study by Schwarz 1993 was adjusted for clustering using an ICC of 0.00012 (midpoint of a range of ICCs for injury at ward level (Kendrick 2006)) and that by Swart 2008 was adjusted using an ICC of 0.218 which was calculated from the IPD provided by the authors.

Families in the home safety interventions arms were significantly more likely to store medicines safely than control group families (OR 1.53, 95% CI 1.27 to 1.84). Repeating the analyses using non-integers for the numerators and denominators for cluster randomised studies produced an identical result. There was was no significant heterogeneity between effect sizes. Findings were robust to excluding each study in turn.

Storage of cleaning products

Analysis 5.2. The pooled odds ratio (OR) was calculated.

Fifteen studies reporting safe storage of cleaning products, defined as for safe storage of medicines, were included in the meta-analysis (Clamp 1998; Dershewitz 1977; Gielen 2007; Hendrickson 2002; Kelly 1987; Kendrick 1999; King 2001; McDonald 2005; Nansel 2002; Nansel 2008; Posner 2004; Swart 2008; Sznajder 2003; Watson 2005; Woolf 1992). The ICC for safe storage of cleaning products calculated from IPD for the study by Kendrick 1999 was extremely small ($P < 0.00001$), so this study was analysed unadjusted for

clustering. The study by Swart 2008 was adjusted for clustering using an ICC of 0.359 calculated from the IPD provided by the authors.

Families in the home safety interventions arms were significantly more likely to store cleaning products safely than control group families (OR 1.55, 95% CI 1.22 to 1.96) but effect sizes varied significantly between studies. The heterogeneity may be partly explained by providing cupboard, drawer or cabinet locks, as opposed to providing education only, by study setting and follow-up period. The effect appeared to be greater amongst studies providing locks (OR 1.87, 95% CI 1.28 to 2.72) than those providing education only (OR 1.13, 95% CI 0.92 to 1.40), although significant heterogeneity remained between effect sizes amongst studies which provided locks. Interventions delivered in clinical settings appeared to have a smaller effect (OR 1.29, 95% CI 1.10 to 1.51) than those delivered at home (OR 2.14, 95% CI 1.06 to 4.32), but the effect sizes were significantly heterogeneous amongst the latter subgroup. Heterogeneity may also be partly explained by the follow-up period, with larger effect sizes seen in studies with follow-up periods of three months or less (OR 1.88, 95% CI 1.33 to 2.66) than in those with longer follow-up periods (OR 1.15, 95% CI 0.99 to 1.34); however, significant heterogeneity was found between effect sizes in those studies with shorter follow-up periods.

Restricting the analyses to randomised studies made little difference to the findings in terms of effect size or heterogeneity (OR 1.68, 95% CI 1.26 to 2.22). Heterogeneity was partly explained by trial quality. There was some evidence that effect sizes were smaller and less heterogeneous in RCTs with adequate allocation concealment than in those without (adequate allocation concealment OR 1.21, 95% CI 1.04 to 1.40; inadequate or unclear allocation concealment OR 3.00, 95% CI 1.42 to 6.32), with significant heterogeneity in the latter subgroup. Effect sizes were similar in studies with and without blinding of outcome assessment (with blinded outcome assessment OR 1.71, 95% CI 1.10 to 2.67; without blinded outcome assessment OR 1.76, 95% CI 1.11 to 2.81), with significant heterogeneity in both subgroups. Both studies with (OR 1.77, 95% CI 1.15 to 2.71) and without (OR 1.45, 95% CI 1.03 to 2.04) follow-up on at least 80% of participants demonstrated effects of a similar magnitude, with significant heterogeneity amongst studies with at least 80% follow-up in both arms. Sensitivity analyses excluding each study in turn indicated that the findings were robust to the exclusion of any one study.

Possession of syrup of ipecac

Analysis 5.3. The pooled odds ratio (OR) was calculated.

Ten studies reporting possession of syrup of ipecac were included in the meta-analysis (Gielen 2002; Johnston 2000; Kelly 1987; Kelly 2003; McDonald 2005; Nansel 2002; Petridou 1997; Schwarz 1993; Woolf 1987; Woolf 1992). Five were adjusted for clustering (Gielen 2002; Johnston 2000; Kelly 2003; Petridou 1997; Schwarz 1993) and adjusted numerators and denominators were rounded to the nearest integer. The study by Petridou 1997 was adjusted for clustering using an ICC of 0.0024 (estimated as midpoint of a range of ICCs published for health outcomes at the level of health authority, local authority or town). The studies by Gielen 2002; Johnston 2000 and Kelly 2003 were adjusted for clustering using an ICC of 0.0094 (midpoint of a range of ICCs calculated from IPD and from published injury outcomes at general practice, clinic, health professional level) and the study by Schwarz 1993 was adjusted for clustering using an ICC of 0.00012 (midpoint of a range of ICCs for injury at ward level) (Kendrick 2006).

Families in the home safety interventions arms were significantly more likely to possess syrup of ipecac than control group families (OR 3.34, 95% CI 1.50 to 7.44). Repeating the analyses using non-integers for the numerators and denominators for cluster randomised studies produced an effect size OR of 3.34 (95% CI 1.50 to 7.41). Effect sizes varied significantly between studies. The heterogeneity may be partly explained by whether syrup of ipecac was provided or not, the setting in which the intervention was delivered, follow-up period and study design. The effect size appeared to be larger in studies providing syrup of ipecac (OR 10.41, 95% CI 2.40 to 45.09) than those not providing it (OR 1.77, 95% CI 1.08 to 2.91), although significant heterogeneity remained between effect sizes for studies in both subgroups. There was some evidence that the effect size may be larger where the intervention is delivered at home (OR 5.45, 95% CI 1.22 to 24.32) as opposed to in a clinical setting (OR 2.02, 95% CI 1.08 to 3.75), although significant heterogeneity remained between effect sizes for studies in both subgroups. Smaller treatment effects were seen in studies with follow-up periods of three months or less (OR 2.47, 95% CI 1.00 to 6.08) than in those with longer follow-up periods (OR 4.38, 95% CI 1.36 to 14.31); however, significant heterogeneity was found between effect sizes in those studies with shorter follow-up periods.

The effect size was much smaller amongst randomised (OR 2.25, 95% CI 1.26 to 3.99) than non-randomised studies (OR 17.90, 95% CI 8.28 to 38.72), but there were similar effect sizes for RCTs with and without each of the quality criteria (effect sizes ranged from OR 1.60 to 3.46) and significant heterogeneity existed in five of the six subgroup analyses. Sensitivity analyses excluding each study in turn indicated that the findings were robust to the exclusion of any one study.

Poison control centre number accessible

Analysis 5.4. The pooled odds ratio (OR) was calculated.

Nine studies reporting having the poison control centre number accessible were included in the meta-analysis (Hendrickson 2002; Kelly 2003; Nansel 2002; Nansel 2008; Petridou 1997; Phelan 2010; Posner 2004; Woolf 1987; Woolf 1992). One of these reported having the poison control centre number or the national emergency number (911) accessible (Hendrickson 2002). Two studies (Kelly 2003; Petridou 1997) were adjusted for clustering and adjusted numerators and denominators were rounded to the nearest integer. The study by Petridou 1997 was adjusted for clustering using an ICC of 0.0024 (estimated as midpoint of a range of ICCs published for health outcomes at the level of health authority, local authority or town) and the study by Kelly 2003 adjusted for clustering using an ICC of 0.0094 (midpoint of a range of ICCs calculated from IPD and from published injury outcomes at general practice, clinic, health professional level) (Kendrick 2006).

Families in the home safety interventions arm were significantly more likely to have the poison control centre number accessible (OR 3.30, 95% CI 1.70 to 6.39). Repeating the analyses using non-integers for the numerators and denominators for cluster randomised studies produced an effect size OR of 3.31 (95% CI 1.70 to 6.43). The effect sizes varied significantly between studies. This heterogeneity may be partly explained by the provision of

poison control centre stickers or the setting in which the education was delivered. Studies providing poison control centre stickers (OR 4.44, 95% CI 2.08 to 9.49) may have larger effect sizes to those not providing stickers (OR 2.66, 95% CI 0.93 to 7.67); effect sizes in both groups were heterogeneous. Education delivered in a clinical setting (OR 2.10, 95% CI 0.85 to 5.15) may have a smaller effect than that delivered at home (OR 5.99, 95% CI 2.08 to 17.26), but significant heterogeneity between effect sizes remained in both subgroups. Treatment effects appeared similar amongst studies with shorter (three months or less) (OR 3.54, 95% CI 1.36 to 9.22) and longer (four months or more) follow-up periods (OR 2.98, 95% CI 1.09 to 8.09); however, significant heterogeneity was found between effect sizes in those studies with shorter follow-up periods.

Restricting the analysis to RCTs slightly increased the effect size (OR 4.78, 95% CI 2.53 to 9.02) but made little difference to the degree of heterogeneity. There was evidence that the heterogeneity may be partly explained by trial quality and that effect sizes may be smaller in RCTs with adequate allocation concealment than in those without (adequate allocation concealment OR 2.52, 95% CI 0.92 to 8.69; inadequate or unclear allocation concealment OR 7.02, 95% CI 3.18 to 15.50), with significant heterogeneity amongst both subgroups. The effect size may be smaller amongst studies with blinded outcome assessment (OR 4.10, 95% CI 2.10 to 7.99) than amongst those without (OR 6.78, 95% CI 1.39 to 33.10) but significant heterogeneity remained in both subgroups. The effect size appeared to be larger in RCTs with follow-up (OR 6.57, 95% CI 3.02 to 14.30) than without (OR 2.33, 95% CI 1.47 to 3.69) follow-up of at least 80% of participants, although there was significant heterogeneity between effect sizes for RCTs in the former subgroup. Sensitivity analyses excluding each study in turn indicated that the findings were robust to the exclusion of any one study.

Storage of poisons out of reach

Analysis 5.5. The pooled odds ratio (OR) was calculated.

Five studies reporting storing poisons out of reach were included in the meta-analysis (Bulzachelli 2009; Gielen 2002; Gielen 2007; Phelan 2010; Sangvai 2007). The study by Gielen 2002 was adjusted for clustering using an ICC of 0.0094 (midpoint of a range of ICCs calculated from IPD and from published injury outcomes at general practice, clinic, health professional level) (Kendrick 2006). Home safety interventions were not effective in increasing safe storage of poisons (OR 2.07, 95% CI 0.94 to 4.66) and there was significant heterogeneity between effect sizes. Repeating the analyses using non-integers for the numerators and denominators for cluster randomised studies produced an effect size OR of 2.08 (95% CI 0.92 to 4.68). The heterogeneity may be partly explained by providing cupboard, drawer or cabinet locks, as opposed to providing education only, by study setting and follow-up period. Effect sizes may be larger in studies providing locks (OR 4.07, 95% CI 0.73 to 22.80) compared to those providing education only (OR 1.44, 95% CI 0.90 to 2.30); in those provided in the home or community (OR 2.66, 95% CI 0.22 to 31.67) than in a clinical setting (OR 1.84, 95 CI 0.75 to 4.52); and in those with longer (four months or more) (OR 3.93, 95% CI 0.64 to 23.94) rather than short (three months or less) follow-up periods (OR 1.52, 95% CI 1.10 to 2.11). Significant heterogeneity remained in all subgroup analyses except for studies providing education only and those with shorter follow-up periods. Restricting analyses to RCTs made little difference to the effect size (OR 2.69, 95% CI 0.96 to 7.57) or degree of heterogeneity. Heterogeneity may also be partly explained by study quality. Comparisons between RCTs with an without adequate allocation concelament or blinded outcome assessment were not possible as three of the four RCTs had adequate allocation concealment and three had unblinded outcome assessment. Effect sizes may be larger in studies with follow-up of at least 80% of participants in each arm (OR 3.36, 95% CI 0.58 to 19.34) than without (OR 2.58, 95% CI 0.22 to 30.36). Signficant heterogeneity remained in all subgroup analyses. Sensitivity analyses excluding each study in turn indicated that findings became significant when the study by Gielen 2002 was excluded (OR 2.73, 95% CI 1.01 to 7.37).

Storage of plants out of reach

Analysis 5.6. The pooled odds ratio (OR) was calculated.

Three studies reporting storing plants out of reach (Babul 2007), plants not being accessible (Posner 2004), or not having any toxic plants in the home (Sznajder 2003) were included in the meta-analysis. There was a lack of evidence that home safety education was effective in promoting safe storage of plants (OR 1.18, 95% CI 0.40 to 3.48) and there was no significant heterogeneity between effect sizes. Findings were robust to excluding each study in turn.

Effect of covariates on poisoning prevention outcomes

Table 3 shows the effect of the interventions by child age, gender and social group. Interventions to promote storage of poisons out of reach were significantly more effective in families with younger rather than older children. Families with employed parents were significantly more likely to possess syrup of ipecac than those with at least one parent not in paid employment. There was no evidence that interventions varied in effect with gender or the other social variables.

Studies not included in the meta-analyses for poisoning prevention outcomes

Eighteen studies were not included in any of the meta-analyses and, in addition, 10 of the 27 studies included in the meta-analyses also reported other outcomes for which meta-analyses were not undertaken.

Seven studies reported poisonings (Guyer 1989; Krug 1994; Lindqvist 1998a; Scherz 1968; Steele 1985a; Steele 1985b; Woolf 1992); one of which found a significant reduction in kerosene ingestion in the intervention area as compared to the control area (Krug 1994), and a second reported a reduction in the proportion of aspirin poisonings occurring in the intervention area post-intervention as compared to pre-intervention but did not present denominators or a P value (Scherz 1968). The remaining five studies reported no significant difference in poisoning rates between the intervention and control groups.

Six studies reported possession of syrup of ipecac (Dawson 1989; Lacoutre 1978; LeBailly 1990; Paul 1994; Steele 1985a; Wissow 1989). Four found significant effects, three favouring the intervention group (Lacoutre 1978; LeBailly 1990; Paul 1994) and one favouring the control group (Wissow 1989). Four studies reported use of child resistant containers (CRCs) for storing medicines (Schwarz 1993), cleaning products (King 2001) or paraffin (Schwebel 2009; Swart 2008), with two finding no significant difference (King 2001; Schwebel 2009), one finding significantly more intervention group families storing paraffin

in a CRC (Swart 2008), and one finding greater use of CRCs for medicines amongst control group families with borderline statistical significance (P = 0.08) (Schwarz 1993). Two studies reported possession of a carbon monoxide detector (Phelan 2010; Posner 2004) with one finding significantly more intervention group families possessed a detector (Phelan 2010).

The remaining outcomes were each reported by one study only. Six studies found a significant effect. Johnston 2000 found that the intervention group were significantly more likely to have removed poisons from their home than the control group; Schwebel 2009 found significantly more intervention group families stored paraffin away from food and were significantly less likely to store paraffin in drinks containers; Swart 2008 found that significantly more intervention group families stored beauty products safely and stored paraffin in properly labelled, tightly closed non-glass containers; Paul 1994 found the intervention group was significantly more likely to have a lockable cabinet for storage of poisons in the kitchen post-intervention compared to pre-intervention; Steele 1985b found that the intervention group showed significantly more hazard reducing behaviour than the control group; and Garcia 1996 found that intervention group students showed a significant improvement in poison safety behaviour.

Falls prevention

Twenty-five studies reported falls prevention outcomes, 16 (64%) of which had at least one outcome included in at least one meta-analysis.

Fitted stair gates

Analysis 6.1. The pooled odds ratio (OR) was calculated.

Twelve studies reporting possessing a fitted stair gate were included in the meta-analysis (Clamp 1998; Gielen 2002; Kendrick 1999; Kendrick 2005; King 2001; McDonald 2005; Nansel 2002; Nansel 2008; Phelan 2010; Posner 2004; Sznajder 2003; Watson 2005). Two studies reported whether stair gates were fitted and always used (Clamp 1998; Watson 2005), two reported whether stair gates or closed doors were used to prevent access to some or all stairways (Gielen 2002; McDonald 2005), and the remainder reported having at least one fitted stair gate. If studies reported that stair gates were not required because families did not have any stairs these families were included as having stair gates as they were considered safe in terms of the risk of a stairway fall. Three studies were adjusted for clustering (Gielen 2002; Kendrick 1999; Kendrick 2005) and adjusted numerators and denominators were rounded to the nearest integer. The studies by Kendrick were adjusted for clustering using ICCs of 0.0092 (Kendrick 2005) and 0.0065 (Kendrick 1999), both of which were calculated from the IPD. The study by Gielen 2002 was adjusted for clustering using an ICC of 0.0079 (midpoint of a range of ICCs calculated from IPD from studies by Kendrick 2005).

Families in the home safety interventions arms were significantly more likely to have a fitted stair gate than control group families (OR 1.61, 95% CI 1.19 to 2.17). Repeating analyses using non-integers for numerators and denominators for clustered studies produced similar results (OR 1.61, 95% CI 1.18 to 2.18). There was significant heterogeneity between effect sizes. This heterogeneity may be partly explained by the provision of stair gates, with possibly larger effect sizes amongst studies providing (OR 2.05, 95% CI 1.08 to 3.89) than not providing gates (OR 1.26, 95% CI 0.96 to 1.64); but significant heterogeneity remained amongst studies providing gates. Studies providing the intervention in the home may also have larger effect sizes (OR 1.95, 95% CI 0.57 to 6.65) than those providing the intervention in a clinical setting (OR 1.30, 95% CI 1.19 to 1.60), but again significant heterogeneity was found amongst studies providing the intervention at home. Study design and adequate allocation concealment had little impact on findings (RCTs only OR 1.68, 95% CI 1.16 to 2.42; adequate allocation concealment OR 1.72, 95% CI 1.17 to 2.55, with significant heterogeneity in both analyses). Only two studies had blinded outcome assessment, and effect sizes were smaller amongst those studies (OR 0.92, 95% CI 0.71 to 1.18) than amongst studies without blinded outcome assessment (OR 1.97, 95% CI 1.28 to 3.04, with significant heterogeneity amongst effect sizes). Effect sizes were similar amongst studies with follow-up on at least 80% of participants in each arm (OR 1.89, 95% CI 0.98 to 3.63, with significant heterogeneity amongst effect sizes) and those without (OR 1.46, 95% CI 1.20 to 1.76), and amongst those with shorter (three months or less) follow-up periods (OR 1.78, 95% CI 1.22 to 2.60) and longer (four months or more) follow-up periods (OR 1.52, 95% CI 1.00 to 2.31, with significant heterogeneity amongst effect sizes). Sensitivity analyses indicated findings were robust to excluding each study.

Possession and use of baby walker

Analysis 6.2. The pooled odds ratio (OR) was calculated.

Nine studies reporting baby walker possession (Kendrick 2005; King 2001; Nansel 2002; Nansel 2008; Phelan 2010) or use (Babul 2007; Posner 2004; Sznajder 2003; Tan 2004) were included in the meta-analysis. It was considered appropriate to combine these two outcomes as a strong relationship between walker ownership and use was found in the one study that reported both outcomes for which we had IPD (Kendrick 2005). This study found that 94% of those owning a walker used it and 96% of those who used a walker owned one. The study by Kendrick 2005 was adjusted for clustering using an ICC of 0.0529 calculated from the IPD from that study and adjusted numerators and denominators were rounded to the nearest integer.

Families in the home safety interventions arms were less likely to have or use a walker than control group families (OR 1.57, 95% CI 1.18 to 2.09). Identical results were found when analyses were repeated using non-integers for numerators and denominators for clustered studies. There was significant heterogeneity between effect sizes. This heterogeneity may be partly explained by the setting in which the intervention was delivered and the follow-up period. Education delivered in clinical settings may be more effective in reducing walker possession and use (OR 0.46, 95% CI 0.37 to 0.59) than that delivered at home (OR 0.84, 95% CI 0.59 to 1.18), and the effect may be greater with follow-up periods of four months or more (OR 0.58, 95% CI 0.43 to 0.79, with significant heterogeneity between effect sizes) compared to shorter follow-up periods (OR 0.82, 95% CI 0.43 to 1.57).

Restricting analyses to randomised studies (OR 0.71, 95% CI 0.55 to 0.93) and those with adequate allocation concealment (OR 0.71, 95% CI 0.55 to 0.93) had little impact on the findings. There was some evidence that effects may be greater amongst studies without blinded outcome assessment (OR 0.69, 95% CI 0.50 to 0.96) than amongst the two studies with blinded assessment (OR 0.87, 95%

CI 0.53 to 1.43) but this should be interpreted with caution due to small numbers of studies with blinded outcome assessment. Effect sizes were similar amongst those with follow-up (OR 0.75, 95% CI 0.53 to 1.05) and without (OR 0.66, 95% CI 0.41 to 1.07) follow-up on at least 80% of participants in each arm. Sensitivity analyses found that findings were robust to excluding each study in turn.

Possession of window locks or screens or windows with limited opening

Analysis 6.3. The pooled odds ratio (OR) was calculated.

Six studies reporting possession of window locks (Clamp 1998; Kendrick 1999; Watson 2005), screens (Hendrickson 2002), windows with opening limited to no more than six inches (King 2001) or working window guards, locks or restricted openings of less than 10 cm (Phelan 2010) were included in the meta-analysis. The ICC for window locks calculated from the IPD for the study by Kendrick was extremely small (P < 0.00001) hence this study was not adjusted for clustering.

Families in the home safety interventions arms were not significantly more likely to possess window locks than control group families (OR 1.17, 95% CI 0.87 to 1.57) and effect sizes varied significantly between studies. Effect sizes were similar in studies providing window locks (OR 1.21, 95% CI 0.67 to 2.11, with significant heterogeneity between effect sizes) and those not providing locks (OR 1.24, 95% CI 0.71 to 2.18), and those delivered in clinical settings (OR 1.18, 95% CI 0.62 to 2.25, with significant heterogeneity between effect sizes) and those delivered at home (OR 1.12, 95% CI 0.87 to 1.45). The heterogeneity may be partly explained by follow-up period, with a larger effect found in studies with follow-up periods of three months or less (OR 2.52, 95% CI 1.15 to 5.52) than in those with longer follow-up periods (OR 1.06, 95% CI 0.81 to 1.39). There was some evidence that interventions may be effective amongst RCTs (OR 1.26, 95% CI 1.00 to 1.59) including those with non-blinded outcome assessment (OR 1.43, 95% CI 1.05 to 1.96). Effects were not significant for RCTs with adequate allocation concealment (OR 1.22, 95% CI 0.96 to 1.55) and those with follow-up on at least 80% of participants (OR 1.53, 95% CI 0.87 to 2.68). Sensitivity analyses excluding each study in turn indicated that findings were robust to the exclusion of any one study.

Possession of non-slip bath mats or decals

Analysis 6.4. The pooled odds ratio (OR) was calculated.

Three studies reporting possession of non-slip bath mats (Petridou 1997; Phelan 2010; Sznajder 2003) and one reporting possession of non-slip bath decals (Posner 2004) were included in the meta-analysis. The study by Petridou was adjusted for clustering using an ICC of 0.0024 (estimated as the midpoint of a range of ICCs published for health outcomes at the level of health authority, local authority or town) (Kendrick 2006) and adjusted numerators and denominators were rounded to the nearest integer.

Intervention arm families were not significantly more likely to have non-slip bath mats or decals (OR 1.10, 95% CI 0.68 to 1.79). Repeating the analyses using non-integers for the numerators and denominators for cluster randomised studies produced similar findings (OR 1.10, 95% CI 0.68 to 1.78). There was no significant heterogeneity between effect sizes. Sensitivity analyses excluding each study in turn indicated that findings were robust to the exclusion of any one study.

Does not leave child alone on high surface

Analysis 6.5. The pooled odds ratio (OR) was calculated.

Three studies reported never leaving a child alone on a high surface (Babul 2007; Nansel 2008; Posner 2004). Intervention arm families were not significantly more likely to never have left a child alone on a high surface (OR 0.84, 95% CI 0.58 to 1.20) and there was no significant heterogeneity amongst effect sizes. Sensitivity analyses excluding each study in turn indicated that findings were robust to the exclusion of any one study.

Effect of covariates on falls prevention practices

Table 4 shows the effect of the interventions by child age, gender and social group. There was no evidence that the interventions varied in effect with child age, ethnic group or parental unemployment. Interventions were significantly more effective in increasing stair gate possession amongst families living in non-owner occupied accommodation and in increasing window lock possession amongst families with male children. Analyses were not possible for baby walkers and high surfaces for child age due to the outcomes not being relevant to older children.

Data not included in the meta-analysis

Nine studies were not included in any of the meta-analyses and, in addition, seven of the 16 studies included in the meta-analyses also reported other outcomes for which meta-analyses were not undertaken.

Three studies reported the safety of balconies (Paul 1994; Petridou 1997; Sznajder 2003), none of which found a significant effect. Three reported use or acquisition of a stair gate (Coggan 2000; Emond 2002; Wissow 1989), two of which reported a significant effect favouring the intervention group (Coggan 2000; Emond 2002). Two reported having handrails on indoor or outdoor stairs (Hendrickson 2002; Paul 1994); having carpets or rugs fixed to floors (Kendrick 1999; Sznajder 2003); high chair safety (Paul 1994; Sznajder 2003); and limiting window opening widths (King 2001; Paul 1994), none of which demonstrated a significant effect. The remainder of the outcomes were reported by one study only. Chan 2004 demonstrated a significant effect favouring the intervention group for child proofing window frames and for avoiding staggered furniture layout and Paul 1994 demonstrated a significant effect favouring the intervention group for reducing accessibility of roof areas. One reporting outdoor stair safety (Petridou 1997) and one reporting the number of safety changes made to the home (Colver 1982) reported significant effects favouring the intervention group. No significant effects were demonstrated for any other outcomes.

Electrical injury prevention

Use of socket covers

Analysis 7.1. The pooled odds ratio (OR) was calculated.

Nine studies reported the use of socket covers (Clamp 1998; Dershewitz 1977; Hendrickson 2002; Kelly 1987; Kendrick 1999; Nansel 2008; Phelan 2010; Posner 2004; Sznajder 2003). This was defined as use of socket covers (Dershewitz 1977), use of socket covers on all unused outlets (Clamp 1998; Nansel 2008), often or always using socket covers on unused outlets (Kendrick 1999; Posner 2004), using socket covers on unused outlets (Kelly 1987; Sznajder 2003), or not having uncovered electrical outlets visible

(Phelan 2010) or accessible to children (Hendrickson 2002). The ICC for using socket covers calculated from IPD for the study by Kendrick 1999 was extremely small (P < 0.00001) so this study was analysed unadjusted for clustering.

Families in the home safety interventions arms were significantly more likely to use socket covers than those not receiving home safety interventions (OR 2.69, 95% CI 1.46 to 4.96), and effect sizes varied significantly between studies. The heterogeneity was partly explained by the provision of socket covers, with studies providing covers appearing to have a greater effect (OR 3.54, 95% CI 1.45 to 8.64) than those not providing covers (OR 1.76, 95% CI 1.02 to 3.03), and RCTs appearing to have a greater effect (OR 3.68, 95% CI 1.47 to 9.20) than other designs (OR 1.39, 95% CI 1.06 to 1.83); but significant heterogeneity remained between effect sizes for studies providing locks and for RCTs. Interventions provided at home (OR 5.45, 95% CI 0.49 to 60.69) may have larger effect sizes than those provided in clinical settings (OR 2.01, 95% CI 1.18 to 3.40), but significant heterogeneity remained in both subgroup analyses. Studies with shorter follow-up periods (three months or less) appeared to have a greater effect (OR 4.06, 95% CI 1.59 to 10.32) than those with longer follow-up periods (four months or more) (OR 1.33, 95% CI 1.01 to 1.76), with significant heterogeneity in the former subgroup analysis. Effect sizes were similar in studies with (OR 3.53, 95% CI 1.35 to 9.19) and without adequate allocation concealment (OR 3.97, 95% CI 0.68 to 23.26). The same subset of studies had follow-up on at least 80% of participants in each arm and non-blinded outcome assessment, and effect sizes appeared larger in these studies (OR 5.44, 95% CI 1.39 to 21.24) than in those with lower levels of follow-up and blinded outcome assessment (OR 1.76, 95% CI 0.72 to 4.34); with significant heterogeneity between effect sizes in the former group of studies. Sensitivity analyses excluding each study in turn indicated that findings were robust to the exclusion of any one study.

Effect of covariates on use of socket covers

Table 5 shows the effect of the interventions by child age, gender and social group. There was no evidence that the effect of interventions to increase use of socket covers varied by child age, gender or any of the social variables.

Data not included in the meta-analysis

Seven studies reported a range of outcomes not included in the meta-analysis. Three reported use of socket covers (Emond 2002; LeBailly 1990; Wissow 1989), with two studies (Emond 2002; LeBailly 1990) reporting that the intervention group was significantly more likely to have socket covers than the control group. Two reported use of circuit breakers (Paul 1994; Petridou 1997), with one study reporting a significant effect favouring the intervention group (Petridou 1997). The remaining outcomes were reported by one study only. Chan 2004 found intervention group parents were more likely to report child proofing electrical heating devices; but no effect of the intervention was found for the other outcomes reported by the other studies.

Prevention of lacerations and bruising

Storage of sharp objects

Analysis 8.1. The pooled odds ratio (OR) was calculated.

Seven studies reporting storage of sharp objects were included in the meta-analysis. This was defined as storage of sharp objects at or above adult eye level or in locked cupboards or drawers (Clamp 1998; Watson 2005), storage of sharp objects in locked cupboards or drawers (Posner 2004), always stores sharp objects out of reach (Kendrick 1999), unsafe storage of sharp objects (Phelan 2010), or knives not accessible (Kelly 1987) or stored out of reach (Dershewitz 1977). The study by Kendrick 1999 was adjusted for clustering using an ICC of 0.0094, calculated from the IPD from that study, and adjusted numerators and denominators were rounded to the nearest integer.

Families in the home safety interventions arms were not significantly more likely to store sharp objects safely than those in the control arms (OR 1.54, 95% CI 0.90 to 2.64). Identical results were found when analyses were repeated using non-integers for numerators and denominators for clustered studies. There was significant heterogeneity between effect sizes. Six of the seven studies provided locks, six were also RCTs and six provided the intervention in clinical settings, so exploration of differential effects by the provision of locks, study design and setting was not possible. Studies with a longer follow-up period (four or more months) (OR 1.85, 95% CI 0.86 to 3.96) may possibly have a slightly larger effect size than those with shorter follow-up periods (three months or less) (OR 1.22, 95% CI 0.41 to 3.62), but significant heterogeneity remained in both subgroup analyses. RCTs with adequate allocation concealment (OR 2.27, 95% CI 0.88 to 5.87) may have a larger effect size than those without (OR 0.89, 95% CI 0.55 to 1.45), with significant heterogeneity in the former subgroup analysis. Those with non-blinded outcome assessment (OR 3.47, 95% CI 1.09 to 11.11) appeared to have a larger effect size than those with blinded assessment (OR 0.80, 95% CI 0.53 to 1.22), with significant heterogeneity in the former subgroup analysis. Those with follow-up on at least 80% of participants in each arm had a larger effect size (OR 5.86, 95% CI 2.06 to 16.64) than those without (OR 1.02, 95% CI 0.69 to 1.50), again with significant heterogeneity in the former subgroup analysis. Sensitivity analyses excluding each study in turn indicated that findings were robust to the exclusion of any one study.

Effect of covariates on storage of sharp objects

Table 6 shows the effect of the interventions by child age, gender and social group. There was no evidence that the effect of interventions to increase safe storage of sharp objects varied by child age, gender, ethnic group, housing tenure or parental unemployment. The effect of interventions by family type differed according to whether the variance within and between studies was modelled jointly or separately. Modelling the variance jointly indicated there was no significant difference in the intervention effect between single and two parent families. However, when the variance within and between studies was modelled separately, interventions appeared to be more effective in two parent families in the between variance model (OR single parent family 0.003, 95% CI 1.4×10^{-5} to 0.18; OR two parent family 9.78, 95% CI 0.22 to 80.38), interaction term 2.3×10^{-4} (95% CI 5.4×10^{-6} to 0.01) than in the within variance model (OR single parent family 12.76, 95% CI 0.28 to 1045; OR two parent family 9.78, 95% CI 0.22 to 80.38), interaction term 1.30 (95% CI 0.84 to 2.00); difference between the within study variance and between study variance models 8.66 (95% CI 4.90 to 12.38). Caution should be exercised in interpreting these findings due to the small number of studies in these analyses (four IPD studies and two summary data only studies).

Data not included in the meta-analysis

Eight studies included a range of outcomes not included in the meta-analysis. Three studies reported protecting sharp corners or edges of benchtops (Kelly 1987; Paul 1994; Sznajder 2003); two of which found a significant effect favouring the intervention group (Paul 1994; Sznajder 2003). One study reported storage of pins and needles out of reach (Dershewitz 1977) and one reported storage of sharp objects out of reach (Wissow 1989); neither demonstrated a significant effect. One study reported five outcomes related to lawn mower safety and found significant effects favouring the intervention group for not leaving the motor running and making children stay indoors whilst the lawn was being mowed (Mayer 1998). One study reported use of devices to prevent doors closing completely and found a significant effect favouring the intervention group (Clamp 1998). One study reported laceration injury rates pre- and post-intervention for intervention and control areas (Bentzen 1997). Both pre- and post-intervention rates varied greatly between areas, with exceedingly low rates in the control area at both timepoints; so it may not be reasonable to compare injury rates between areas. Other outcomes were reported by one study only and none found any significant effects.

Suffocation prevention

Keeping small objects out of reach of children

Analysis 9.1. The pooled odds ratio (OR) was calculated.

Six studies reporting keeping small objects out of reach of children were included in the meta-analysis. They defined out of reach as no small objects within a child's reach in the living room (King 2001), small objects usually (Sznajder 2003) or always (Babul 2007) kept out of a child's reach, coins out of reach (Dershewitz 1977), small items not accessible (Hendrickson 2002), and objects smaller than a ping-pong ball visible on surfaces less than one metre from the floor (Phelan 2010).

There was a lack of evidence that home safety interventions were effective in encouraging parents to keep small objects out of reach of children (OR 0.79, 95% CI 0.36 to 1.77), with significant heterogeneity between effect sizes. All included studies were RCTs and all but one delivered the intervention at home, hence differential effects by study design and setting were not possible. Effect sizes were similar amongst studies with shorter (three months or less) (OR 1.05, 95% CI 0.41 to 2.69) and with longer follow-up periods (four months or more) (OR 0.60, 95% CI 0.16 to 2.30), with significant heterogeneity amongst both subgroup analyses. Effect sizes were also similar amongst RCTs with (OR 0.70, 95% CI 0.24 to 2.07) and without (OR 1.10, 95% CI 0.21 to 5.81) adequate allocation concealment, with significant heterogeneity in the former subgroup analysis, and amongst those with (OR 0.76, 95% CI 0.39 to 1.47) and without (OR 0.87, 95% CI 0.19 to 4.00) blinded outcome assessment, with significant heterogeneity between effect sizes in both subgroup analyses. Effect sizes appeared larger in studies with follow-up on at least 80% of participants in each arm (OR 1.29, 95% CI 0.90 to 1.85) than those without (OR 0.25, 95% CI 0.06 to 1.05), but there was significant heterogeneity between effect sizes in the latter subgroup analysis. Sensitivity analyses excluding each study in turn indicated that findings were robust to the exclusion of any one study.

Effect of covariates on storage of small objects

Table 7 shows the effect of the interventions by child age, gender and social group. The interventions were significantly more effective amongst families with older rather than younger children and were more effective amongst families where at least one parent was not in paid employment rather than families in which both parents were in paid employment. Interventions did not differ in effect by gender or family type.

Data not included in the meta-analysis

Nine studies reported outcomes not included in the meta-analyses (Babul 2007; Campbell 2001; Dershewitz 1977; Hendrickson 2002; Kendrick 1999; Paul 1994; Pless 2007; Posner 2004; Zhang 2003). Only one study found any significant effects of home safety interventions, which were for preventing children from eating nuts and using a small parts tester (Posner 2004).

Drowning prevention

Never leaving child alone in the bath

Analysis 10.1. The pooled odds ratio (OR) was calculated.

Five studies reporting never leaving a child alone in the bath (Babul 2007; Kendrick 1999; Nansel 2002; Nansel 2008; Posner 2004) were included in the meta-analysis. The study by Kendrick was adjusted for clustering using an ICC of 0.0082, calculated from the IPD from that study, and adjusted numerators and denominators were rounded to the nearest integer.

There was a lack of evidence that home safety interventions were effective in preventing children being left alone in the bath (OR 1.21, 95% CI 0.85 to 1.72), with no significant heterogeneity amongst effect sizes. Repeating the analyses using non-integers for the numerators and denominators for cluster randomised studies produced a similar effect size (OR 1.22, 95% CI 0.85 to 1.75). Sensitivity analyses excluding each study in turn indicated that findings became significant when the study by Kendrick was excluded (OR 1.89, 95% CI 1.08 to 3.32).

Effect of covariates on never leaving child alone in the bath

Table 8 shows the effect of the interventions by child age, gender and social group. The effect of interventions did not differ by child age, gender or any of the social variables.

Data not included in the meta-analysis

Six studies reported a range of outcomes not included in the meta-analysis. Five studies reported domestic swimming pool fencing (Babul 2007; Coggan 2000; Girasek 2010; Nansel 2002; Paul 1994); one of which found the intervention group were significantly more likely to acquire pool fencing (Coggan 2000). One study reported never leaving a child alone in the area of a paddling or swimming pool and never leaving a paddling pool full of water after use (Nansel 2002), and did not find significant effects for either of these outcomes. Finally one study found no significant difference in drowning mortality rates (Zhang 2003).

Home hazard or safety scores

Nineteen studies reported a range of home hazard scores or safety scores with little consistency in the tools used to measure hazards or safety, which precluded meta-analyses for these outcomes.

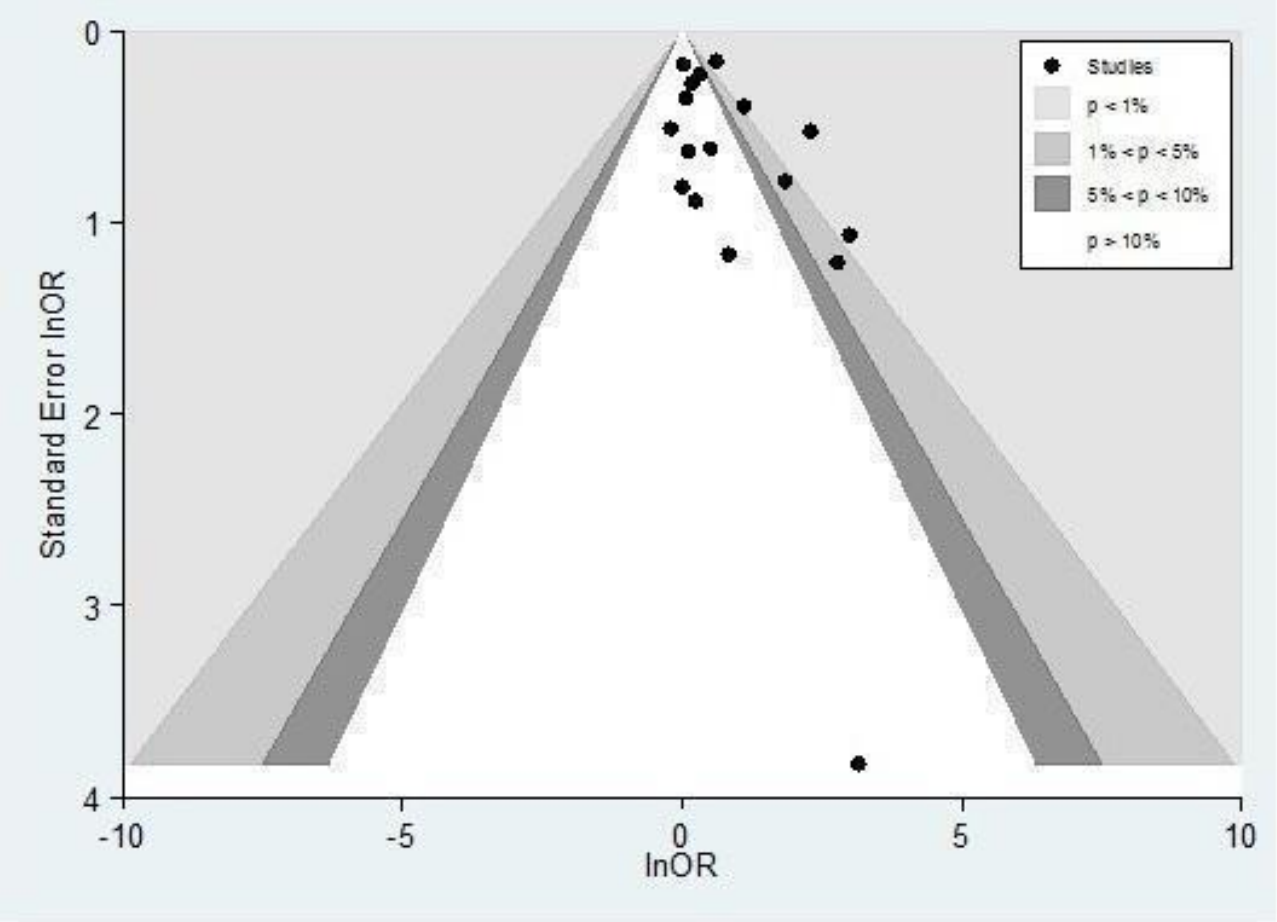
Data not included in the meta-analysis

Nine of the studies reporting home hazard or home safety scores reported significantly safer scores amongst intervention group families (Kelly 1987; Llewellyn 2003; Nansel 2002; Odendaal 2008; Olds 1994; Phelan 2010; Posner 2004; Schwebel 2009; Swart 2008). Seven studies found no significant difference between scores for the intervention and control groups (Dershewitz 1977; Gielen 2002; Guyer 1989; Paul 1994; Petridou 1997; Vineis 1994; Wissow 1989). One study reported only pre-post changes in the score in intervention and control arms separately, stratified by child age and deprivation, type (advice versus use of equipment) and location (household, recreation and transport) of preventive activity (Mock 2003). They found significant improvements in scores in the intervention group but not the control group within most strata. One study reported the number of families making safety changes to their homes and reported a significantly greater number of intervention group families making safety changes than control group families (Colver 1982). The final study did not report the results for the overall score (Chan 2004) but did report significant improvements for some components of the score.

Assessment of publication bias

Only three safety practices outcomes had 10 or more studies and publication bias assessment was restricted to these. Specifically, the following P values for tests of asymmetry were obtained: ownership of a functioning smoke alarm (P = 0.063), ownership of syrup of ipecac (P = 0.761), and safe hot water temperature (P = 0.251). Hence, while no test attained a significant result at the 5% level, the P value for ownership of a functioning smoke alarm was low, indicating some concern publication biases may be present. A contour enhanced funnel plot for functioning smoke alarms is presented in Figure 2. Our interpretation of this is somewhat inconclusive, but the possibility of studies with non-significant findings in the white region to the left of the data being missing is evident, and this would be consistent with publication bias mechanisms. Application of the regression bias adjustment method to this outcome resulted in a diminished OR of 1.44 (95% CI 1.07 to 1.92) compared to an OR of 1.79 (95% CI 1.28 to 2.50) without adjustment.

Figure 2. Contour enhanced funnel plot for possession of a functioning smoke alarm



Publication bias was also assessed for medically attended or self reported injuries, as more than 10 studies were included in these analyses. There was some evidence of asymmetry for the analyses adjusted for baseline injury rates (P = 0.082 for analysis including all injuries from Phelan 2010 and P = 0.06 for analysis including only preventable injuries from Phelan 2010). However, contour enhanced funnel plots do not show a pattern of studies consistent with publication bias based on statistical significance (Figure 3 and Figure 4). There was no evidence of publication bias in the analyses unadjusted for baseline injury rates (P = 0.495 for analysis including

all injuries from Phelan 2010 and P = 0.366 for analyses including only preventable injuries from Phelan 2010).

Figure 3. Contour enhanced funnel plot for medically attended or self reported injuries adjusted for baseline injury rates (including all injuries from Phelen 2010)

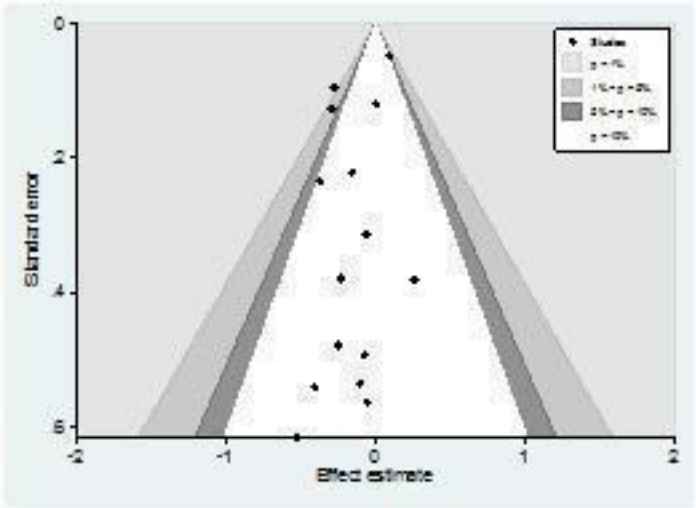
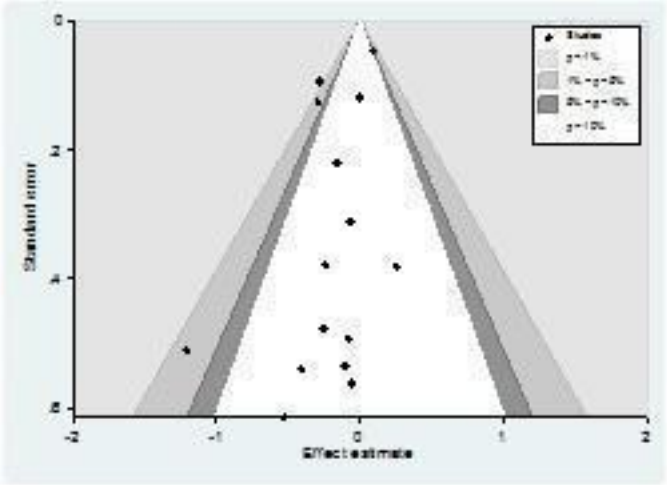


Figure 4. Contour enhanced funnel plot for medically attended or self reported injuries adjusted for baseline injury rates (including only preventable injuries from Phelen 2010)



DISCUSSION

Summary of main results

There was a lack of evidence that home safety interventions were effective in reducing rates of thermal injuries or poisonings. There was some evidence that home safety interventions may be effective in reducing rates of all injuries combined, especially when follow-up injury rates from CBA studies were adjusted for baseline injury rates.

Home safety interventions were effective in increasing a wide range of safety practices including having a safe hot tap water temperature, a functional smoke alarm, having or practising a fire escape plan, storing medicines and cleaning products out of reach, having syrup of ipecac and the poison control centre number accessible, having a fitted stair gate, not using a baby walker and using socket covers on unused sockets. There was some evidence that home safety interventions were effective in increasing use of fire guards. Effect sizes appeared to be larger for interventions that provided safety equipment than for those that provided education alone for having a functional smoke alarm, storing cleaning products out of reach, having syrup of ipecac, having the poison control number accessible, having a fitted stair gate and using socket covers on unused sockets. All of the studies reporting fire guard use included in the meta-analyses provided fire guards. Effect sizes also appeared greater where interventions were

delivered in the home as opposed to in clinical settings for having a safe hot water temperature, having a functional smoke alarm, storing cleaners out of reach, having syrup of ipecac and the poison control centre number accessible, having a fitted stair gate and socket covers. The effect of home safety interventions appeared to diminish with time, with greater effects demonstrated for having a functional smoke alarm, storing cleaning products out of reach, having window locks and socket covers over a shorter (three months or less) than a longer time period. However, significant effects were found for follow-up periods of four months or more for having a safe hot tap water temperature, a functional smoke alarm, a fitted fire guard, syrup of ipecac, having the poison control centre number accessible, having a fitted stair gate, not using a baby walker and using socket covers on unused sockets.

Overall, there was a lack of evidence that home safety interventions were effective in increasing possession of non-slip bath mats and decals or fire extinguishers, or in preventing children being left alone on high surfaces or in the bath, keeping hot food and drinks out of reach, checking smoke alarm batteries, or storing matches, sharp objects, small objects, poisons or plants out of reach. The number of studies and participants were small (≤ six studies and ≤ 1000 participants per arm) for eight of these outcomes. There was also a lack of evidence of the effect of home safety interventions on having window locks and screens or windows with limited opening, but subgroup analyses suggested that the interventions may be effective in the shorter, but not the longer term.

Overall, there was no consistent evidence that home safety interventions were less effective amongst children at greater risk of injury. There was evidence of differential effectiveness in only seven of 96 (7%) meta-regression analyses. This is encouraging as it suggests that home safety interventions should not widen existing inequalities in child home injury rates.

Overall completeness and applicability of evidence

This is the largest and most comprehensive published systematic review and meta-analysis assessing the effect of home safety education, with or without the provision of safety equipment, to date. It remains the only published review in the field of child home injury prevention to obtain individual participant data (IPD) and to use this in a series of meta-analyses and meta-regressions to quantify the effect of interventions by age, gender and social group.

More then 90% of our included studies were from higher income countries, predominantly from the USA, UK and Australia. This limits the generalisability of our findings to low and middle income countries, where housing conditions, family characteristics, living arrangements and cultural practices may be very different from those in the higher income countries.

It is likely that some outcome reporting bias has occurred in the studies included in our review. Almost half of the studies included in our review were not included in any of the meta-analyses. They were excluded for a variety of reasons, most commonly because the reported outcomes were dissimilar from those reported in other studies. Studies were also excluded from the meta-analyses where they failed to report numerators and denominators for outcomes in both treatment arms and we were unable to obtain these from contact with authors. Six of those not reporting numerators and denominators for outcomes in both treatment arms were conference abstracts without subsequent publication of the data (Blake 1993; Chan 2004; Gaffney 1996a; Garcia 1996; Mackay 2002; Moller 1996) and 12 were undertaken more than 10 years ago, so the likelihood of obtaining IPD or unpublished analyses from these studies was small. In general, the effects reported by studies not included in our meta-analyses appeared to be consistent with the findings from the meta-analyses. Our use of IPD has minimised outcome reporting bias in other ways because we were able to report outcomes (for example specific safety practices or use of items of safety equipment) and include data in meta-analyses from studies that had previously only published composite outcome measures such as safety scores or hazard scores.

Despite the large number of studies included in our review, relatively few reported specific injury outcomes (for example thermal injuries and poisonings) and even fewer reported numerators and denominators for injury outcomes could be used in our meta-analyses. Bearing in mind the low incidence of such injuries, it is likely that our analyses were underpowered to detect anything but very (and possibly implausibly) large treatment effects.

There was some evidence that home safety interventions may be effective in reducing rates of all injuries combined, especially when follow-up injury rates from CBA studies were adjusted for baseline injury rates. Interventions provided at home as opposed to in clinical settings or in the community significantly reduced the risk of injury when analyses were adjusted for baseline injury rates and had a similar but non-significant effect when analyses were not adjusted for baseline injury rates. Interventions which did not provide home safety equipment significantly reduced the risk of injury regardless of adjustment for baseline injury rates, whilst those that provided equipment did not. This finding is probably explained by two large studies, one school-based study which did not provide equipment and which demonstrated a significant reduction in injury rates (Zhao 2005) and a second clinic-based study which provided equipment and did not find a reduction in injury rates (Watson 2005). Sensitivity analyses indicated that exclusion of this latter study resulted in home safety interventions being associated with a significant reduction in injury risk, regardless of adjustment for baseline injury rates.

Most studies reported relatively short-term outcomes (less than one year), few studies reported repeated measures of outcomes over time or long-term outcomes. Overall, it appeared that effect sizes may diminish over time, hence we cannot assume that our findings would be maintained over longer time periods. Few studies for the less commonly reported outcomes also reported child age, gender or social variables. This will have limited the power of our meta-regression analyses to detect differential treatment effects for some demographic and social variables for some outcomes.

Our findings in relation to a safe hot tap water temperature must be considered in the context of current recommendations about the temperature that can be considered to be 'safe'. Few studies used 46 °C as the definition of 'safe' hot water, but this is the temperature currently recommended by the Child Accident Prevention Trust (CAPT 2004). It is therefore possible that home safety interventions, although effective in reducing hot tap water temperatures, may not be effective in reducing temperatures sufficiently to reduce the incidence of scalding.

The size of the review and the number of outcomes for which we have undertaken meta-analyses inevitably resulted in estimating

many 95% confidence (and credible) intervals. It is therefore possible that a small number of the 'significant' effects may have arisen by chance, and our findings must be interpreted with this in mind. However, this cannot explain the consistency of our findings relating to the positive effect of home safety interventions on many safety practices or the lack of significant differences in treatment effect for most outcomes for child age, gender and social group.

Quality of the evidence

Unlike many meta-analyses, we included non-randomised and controlled before and after (CBA) studies. Although these comprised only one quarter of the studies included in the meta-analyses, their inclusion increased the power of our analyses. For the majority of outcomes findings were robust to study design, with similar effect sizes found amongst RCTs and other designs (non-RCTs and CBAs). For three outcomes effect sizes appeared to be larger in RCTs than other designs (having the poison control number accessible, having window locks and having socket covers), and for one study the effect size appeared to be smaller in RCTs (having syrup of ipecac). In addition, study design did not appear to be important in explaining heterogeneity in effect sizes for most analyses.

The quality of the included studies was mixed and varied by study design. Of the RCTs only one third had adequate randomisation, allocation concealment or blinded outcome assessment, and half had follow-up on at least 80% of participants in each treatment arm. None of the non-RCTs had blinded outcome assessment, just over half had follow-up on at least 80% of participants in each treatment arm, and only one third were considered to be balanced in terms of confounders. None of the CBA studies had blinded outcome assessment, three fifths had follow-up on at least 80% of participants in each treatment arm, and one quarter were considered to be balanced in terms of confounders. There was some evidence that effect sizes varied with study quality. Effect sizes appeared to be smaller for eight outcomes amongst studies with blinded outcome assessment (having functional smoke alarms, stair gates, window locks, socket covers and the poison control number accessible; not having a baby walker; storing sharp objects out of reach and injuries). For five studies effect sizes appeared larger amongst studies with follow-up on at least 80% of participants in each arm (having the poison control centre number accessible and socket covers, storing poisons out of reach, keeping small objects and sharp objects out of reach). Effect sizes were larger for two outcomes in studies with adequate allocation concealment (storing poisons out of reach and keeping sharp objects out of reach) and smaller for two outcomes in studies without adequate allocation concealment (storing cleaning products out of reach and having the poison control centre number accessible). Significant heterogeneity remained in many of these subgroup analyses. Care should be taken in interpreting these findings due to small numbers of studies in many subgroup analyses and multiple significance testing. The majority of analyses were robust to excluding each study in turn, indicating that findings were not dependent on single highly influential studies.

Significant heterogeneity was found amongst effect sizes for many of our meta-analyses. The most common potential explanations for this were the setting in which the intervention was delivered, the provision of safety equipment, and blinding of outcome assessment. Greater effect sizes tended to be found amongst interventions delivered at home or in the community as opposed to in clinical settings (with the exception of interventions to reduce baby walker use). In terms of safety equipment provision, greater effect sizes tended to be found when safety equipment was provided (with the exception of studies reporting injuries as an outcome). Studies with blinded assessment for some outcomes tended to have smaller effect sizes than those with non-blinded outcome assessment. Other factors less commonly explaining heterogeneity included follow-up period, study design and other aspects of study quality. However, significant heterogeneity of effect sizes often remained within subgroup analyses, suggesting other factors may also be important potential explanations for differences in effect sizes between studies. We also found a wide variation in study populations in terms of child age, ethnic group, family type, housing tenure and parental unemployment. Our meta-regression analyses suggest that differential effectiveness of interventions by child gender, age or social variables may explain some of the heterogeneity in effect sizes for ipecac possession, safe storage of poisons, use of stair gates and window locks, and safe storage of small and sharp objects. The problems of multiple significance testing and inadequate power in subgroup analyses must be borne in mind when interpreting these subgroup analyses.

Potential biases in the review process

We undertook comprehensive searches of both the published and unpublished literature to identify studies, but it is possible that our searches may have failed to identify some potentially eligible studies. We found evidence of a possible publication bias for one outcome only, that of possession of a functional smoke alarm. However, when adjusted for possible bias, the effect size was diminished but still statistically significant. Our use of pairs of independent researchers to select studies for inclusion, extract data and assess study quality should have minimised the potential for bias in the review process.

Agreements and disagreements with other studies or reviews

Our findings build on those of the two reviews by DiGuiseppi and colleagues (DiGuiseppi 2000; DiGuiseppi 2001) and are more positive than either of these reviews, both in terms of the effect of home safety interventions on safety practices and on injuries. The first review and meta-analysis (DiGuiseppi 2000) found that interventions in a clinical setting were effective in promoting a safe hot tap water temperature, in increasing smoke alarm ownership and in increasing safe storage of cleaning products. Only two studies reported injury outcomes and neither found a significant reduction in injury occurrence. The review concluded that clinical counselling had little effect on most home safety practices designed to child proof the home and that the evidence about the impact of counselling on childhood injuries was limited. The second review (DiGuiseppi 2001) found interventions were effective in increasing functional smoke alarm ownership only in clinical settings and with a smaller effect size than that found in our review. Our findings are likely to be more positive as we have examined a wider range of outcomes, included a larger number of studies and obtained and used IPD, which allowed for analysis of previously unpublished data. In addition, some RCTs (King 2001; Watson 2005; Zhao 2005) and CBAs (Bentzen 1997; Yorkston 2007) had large sample sizes and some studies demonstrated very positive effects for some outcomes (Johnston 2000; Hendrickson 2002; Posner 2004; Sznajder 2003), including for injury rates (King 2001; Phelan 2010; Zhao 2005). Our meta-analyses also suggest there is some

evidence to support the finding of a reduction in injury rates in these studies, particularly for home-based interventions; although further studies are needed to clarify the role of safety equipment provision.

In terms of examining the effect of home safety interventions by child age, gender and social group, there is little work with which to compare our findings. Our findings appear to confirm subgroup analyses from individual studies that interventions are not less effective in higher risk groups. Several studies have reported some subgroup analyses examining whether the treatment effect varied by a range of factors, with most finding no evidence of differential effectiveness by child or family factors (Kendrick 2005; Mock 2003; Vineis 1994; Watson 2005). Clamp 1998 reported that the effect of general practitioner safety advice plus access to low cost safety equipment appeared to be at least as, if not more, effective in families receiving means tested benefits than in those not receiving benefits. However, this was based on comparing effect sizes amongst families receiving and not receiving benefits and not on testing for an interaction between treatment arm and receipt of benefits. Sznajder 2003 assessed whether the effect of home delivery of an injury prevention kit varied by family type, educational level and family size. They found that the intervention appeared to be more effective amongst single parent families and those with low levels of education, but less effective amongst families with two or more children. This appeared to be based on comparisons of effect sizes between subgroups of families as opposed to tests of the hypothesis that there was no interaction between treatment arm and the subgroup variables. Olds 1994 examined the effect of a home visiting programme on hazardous exposures within the home amongst a subgroup of low-income unmarried teenage mothers. They found a significant effect of the intervention in reducing hazardous exposures in the whole sample at both 34 and 46 months follow-up and a significant effect amongst low-income unmarried teenage mothers at 46 months only.

AUTHORS' CONCLUSIONS

Implications for practice

Our evidence that home safety education and the provision of safety equipment is effective in increasing a range of safety practices, and possibly also in reducing child injury rates, suggests that child health and social care providers should provide home safety interventions including education and access to free, low cost or discounted safety equipment as part of their child health and well-being programmes. It is important that practitioners provide interventions that are as similar as possible to those we included in our meta-analyses otherwise they may not achieve similar effects. For example, most of the studies included in our meta-analyses were based on one-to-one, face-to-face education delivered either at home or in a clinical setting, so our findings cannot necessarily be extrapolated to different methods of delivery in different settings.

Home safety education and modifying the home environment by the provision of safety equipment can only ever be one part of a strategy to reduce home injuries in children. Other engineering approaches are also important components of such a strategy, for example the design of products or components of the structure of the house to increase safety, especially as these often provide passive protection (Pless 1993; Towner 2001). Strategies also need to encompass enforcement approaches such as the use of standards, regulations and legislation as these have also been found to be effective in reducing child injury rates (Erdmann 1991; Sibert 1977).

Implications for research

Our findings suggest that home safety education, especially with the provision of safety equipment, is effective in increasing a range of safety practices and it may also reduce injury rates. Further evidence is needed in relation to this latter outcome, in particular to the role of the provision of safety equipment and the effects of home-based interventions as opposed to those delivered in other settings. There are two possible options for addressing the question of whether home safety interventions are effective in reducing child injury rates. The first, and most preferable, is that further large trials or multiple smaller trials that are sufficiently clinically homogenous to combine in future meta-analyses are undertaken measuring injury outcomes. The second, but less preferable option, is that a series of methodologically rigorous observational studies that measure and adjust appropriately for a wide range of potential confounding factors are undertaken. The first option would provide the strongest evidence but at a much greater cost over a longer time period. The second would provide evidence at a lesser cost over a shorter time period, but the quality of the evidence could be limited, especially by selection bias, recall bias and confounding.

Multi-faceted home visiting programmes aimed at improving a range of maternal and child health outcomes have been found to be effective in reducing child injury rates (Elkan 2000; Roberts 1996b). Most of these programmes did not provide home safety interventions similar to that provided in the studies included in our review. It would therefore be useful to assess whether adding a home safety education and equipment component to a multi-faceted home visiting programme further reduces child injury rates.

The importance of ensuring that interventions do not widen existing inequalities in child injuries suggests that future studies should consider this possibility in their design, analysis and in the reporting of their findings. As we were unable to demonstrate differential effects for many outcomes for most demographic and social variables, some of which may have been due to a lack of power, these relationships can be re-examined if future studies measure and report these variables. Standardisation of methods of measuring social variables would be helpful as this would maximise the number of studies whose data could be included in such meta-analyses.

In relation to outcome measurement, one recent RCT (Phelan 2010) demonstrating a significant reduction in injury rates, defined injury outcomes in terms of whether they were potentially preventable by safety equipment provided as part of the intervention, and future studies should consider using such outcomes. The studies included in our review used a wide range of tools, some of which were validated, to measure a wide range of safety practices. Use of existing validated tools in future studies would maximise the potential for future meta-analyses. Furthermore, we found that standardising IPD datasets across studies required a large amount of time, and the use of standard measures would make this task considerably easier and less time consuming. As the power of meta-regression analysis is considerably greater in analyses containing IPD than in those using only summary data for participant level covariates (Lambert 2002), it is also important that the community

of injury researchers is willing to share their IPD for such future research.

The model we developed for examining the effect of interventions by demographic and social variables was restricted to binary and continuous outcome measures, which comprised most of the outcomes included in our review. Whilst our model is not immediately generalisable to rate outcomes, future work may develop such models which may be useful in fields other than injury prevention.

ACKNOWLEDGEMENTS

We would like to thank Jayne Simpson for selecting studies for inclusion, extracting data and contributing to drafting the report for the original review.

We would like to thank the following authors for providing the IPD (*) and unpublished data (§) which were used in the analyses presented in this report:

M Bulzachelli *§, P Dawson §, C DiGuiesppi *§, K Georgieff §, A Gielen *§, D Girasek §, S Hendrickson *§, D Kendrick *§ (plus provided IPD on behalf of M Clamp), D Kolko *§, R McClure § (on behalf of E Yorkston), E McDonald *, T Nansel *§, T Ohn §, E Petridou *§, K Phelen*§, J Posner *§, I Roberts *§ (on behalf of D Rowland), D Schwebel *§, L Swart *§, M Sznajder *, N Tan *§, E Wald § (on behalf of S Sangvai), M Watson*§, B Ytterstad §

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* Indicates the major publication for the study

CHARACTERISTICS OF STUDIES

Characteristics of included studies *[ordered by study ID]*

Adler 1994

Methods	RCT

Adler 1994 *(Continued)*

Participants	Children aged 5-16 years with a history of firesetting/fireplay
Interventions	I_1 = educational material, 2 home visits by fire fighters to provide education, behaviour modification, parental instruction in use of negative consequences in the event of firesetting, plotting events leading up to an incident and discussing alternative ways of responding to incidents in future I_2 = same as I_1 plus offer of psychiatric referral C_1 = fire safety educational material C_2 = fire safety educational material plus offer of psychiatric referral
Outcomes	Outcomes measured over 12 months: Rate of fire setting Number of children setting fires causing or threatening to cause property damage - data not reported separately for treatment arms No significant difference between experimental and control groups in rate of fire setting or seriousness of fire setting No P values reported
Notes	Blinding - n Outcomes 80% - n Balance - n/a

Risk of bias

Bias	Authors' judgement	Support for judgement
Allocation concealment (selection bias)	Low risk	Adequate

Babul 2007

Methods	RCT
Participants	Parents of new born infants at a general hospital serving mainly urban or suburban communities
Interventions	I_1= Home visit + home safety inspection + free safety kit (smoke alarm, coupon for 50% discounted stair gate, corner cushions, cabinet locks, blind cord windups, water temperature card, door stoppers, socket covers, poison control centre sticker + safety brochure + home safety checklist for parents) I_2 = free safety kit (as above) C = usual care
Outcomes	Outcomes measured at 12 months of age: Medically attended injuries Safe hot water temperature (temperature not specified) Possession of fire extinguisher Hot drinks/food out of reach Safe storage of medicines Plants out of reach Use of baby walker

Babul 2007 *(Continued)*

	Left child alone on high surface Hall and stairways adequately lit I_1=169/171, I_2=161/162, C=144/146; I_1 vs C OR 1.17 (0.08 to 16.37), I_2 vs C OR 2.24 (0.11 to 132.72) Hall and stairways not cluttered I_1=160/169, I_2=152/162, C=135/144; I_1 vs C OR 1.19 (0.40 to 3.47), I_2 vs C OR 1.01 (0.35 to 2.87) Small objects kept out of reach Blind cords not accessible to child I_1=150/171, I_2=145/161, C=125/146; I_1 vs C OR 1.20 (0.59 to 2.43), I_2 vs C OR 1.53 (0.72 to 3.26) Never left child alone in bath Pools fully fenced I_1 =112/172, I_2 = 105/161, C = 104/144; I_1 vs C OR 0.72 (0.43 to 1.19); I_2 vs C OR 0.72 (0.43 to 1.21)
Notes	I_1 and I_2 arms combined for meta-analyses Blinding - n Outcomes 80% - n Balance - n/a

Risk of bias

Bias	Authors' judgement	Support for judgement
Allocation concealment (selection bias)	Low risk	Adequate

Barone 1988

Methods	RCT (C) Allocation at level of parenting classes
Participants	5 parenting classes (108 parents of toddlers)
Interventions	I = slides, handouts on burn prevention, bath water thermometer, hot water gauge, usual safety education C = usual safety education
Outcomes	Outcomes measured over 6 months: Possession of smoke alarm Functional smoke alarm Safe hot water temperature
Notes	Blinding - n Outcomes 80% - n Balance - n/a

Risk of bias

Bias	Authors' judgement	Support for judgement

Barone 1988 *(Continued)*

Allocation concealment (selection bias)	High risk	Inadequate

Baudier 1988

Methods	RCT (C) Allocation at level of groups of schools
Participants	Infant school children
Interventions	I = teaching kit for use by teachers of infant classes, take home booklet, stickers, exhibitions, parents meetings C = none of above
Outcomes	Outcomes measured during subsequent school term: Safe storage of poisons
Notes	Blinding - u Outcomes 80% - n Balance - u

Risk of bias

Bias	**Authors' judgement**	**Support for judgement**
Allocation concealment (selection bias)	Unclear risk	Not used

Bentzen 1997

Methods	CBA (C) Allocation at level of municipality
Participants	Population of children aged 0-15 years in 2 municipalities, Odense (intervention) and Randers (control)
Interventions	I = community injury prevention programme including advice in well child clinics and group based health programmes, pamphlets, puppet theatre, posters, exhibitions C = no community injury prevention programme
Outcomes	Outcomes measured over 4 years: Medically attended injuries (ED attendances) Incidence of cut injuries - I = 468/10000 boys; 343/10000 girls at baseline and 361/10000 boys; 280/10000 girls at follow-up C = 7.7/10000 boys; 5.8/10000 girls at baseline and 54.9/10000 boys; 40.9/10000 girls at follow-up No P values reported
Notes	Blinding - u Outcomes 80% - y Balance - y

Risk of bias

Bentzen 1997 *(Continued)*

Bias	Authors' judgement	Support for judgement
Allocation concealment (selection bias)	Unclear risk	Not applicable - non-randomised study

Blake 1993

Methods	Non-RCT/CBA
Participants	Parents in two inner city health clinics
Interventions	I = educational video C = no video
Outcomes	Period over which outcomes measured not reported. Functional smoke alarm. Significant increase in purchase and installation of smoke alarms in intervention group No figures or P values reported
Notes	Blinding - u Outcomes 80% - n Balance - u Allocation of participants not described

Risk of bias

Bias	Authors' judgement	Support for judgement
Allocation concealment (selection bias)	Unclear risk	Not applicable - non-randomised study

Bulzachelli 2009

Methods	Non-RCT Randomised to I_1 or I_2 arms on days when mobile child safety centre present (Monday, Wednesday, Friday) and allocated to control arm when mobile child safety centre not present (Tuesday, Thursday)
Participants	Parents of children aged 1 month to seven years attending a well-child clinic in low-income urban communities
Interventions	I_1= prescribed visit to mobile child safety centre I_2 = optional visit to mobile child safety centre C = told about purpose of mobile safety centre & given more information on request but not referred to centre
Outcomes	Outcomes measured at 2 to 4 weeks: Functional smoke alarm Safe storage of poisons

Bulzachelli 2009 *(Continued)*

Notes	I_1 and I_2 arms combined for meta-analyses Blinding - n Outcomes 80% - n Balance - n Control arm participants had higher baseline educational and income levels than intervention arm participants.

Risk of bias

Bias	Authors' judgement	Support for judgement
Allocation concealment (selection bias)	Unclear risk	Not applicable - non-randomised study

Campbell 2001

Methods	RCT (C) Allocation at level of schools
Participants	Hispanic migrant youths, aged 11-16 years, low income
Interventions	I = 8 sessions of multimedia first aid and home safety training presented by bilingual and bicultural college students C = 8 sessions of multimedia tobacco and alcohol prevention education presented by bilingual and bicultural college students
Outcomes	Outcomes measured over 12 months: Possession of fire extinguisher (No figures or P value reported) Practiced fire escape plan Safe storage of medicines (No figures or P value reported) Safe storage of cleaning products (No figures or P value reported) Removal of small objects (No figures or P value reported) No significant difference in total number of home safety changes made (No figures or P value reported)
Notes	Blinding - y Outcomes 80% - n Balance - n/a

Risk of bias

Bias	Authors' judgement	Support for judgement
Allocation concealment (selection bias)	Unclear risk	Unclear

Carman 2006

Methods	CBA (C) Allocation at level of electoral wards

Carman 2006 *(Continued)*

Participants	Children under 5 years in deprived electoral wards
Interventions	I = home visit by injury prevention project workers + safety education + free equipment (bath mat, harness and reins, cupboard locks, corner cushions, multi-purpose lock, socket covers) + low cost fitted equipment (stair gates, fireguards, smoke alarm, kitchen cupboard locks, glass safety film) + population wide injury prevention talks to community groups and safety events across locality + follow-up of families whose children had attended the Emergency Department C = Population wide injury prevention talks to community groups and safety events across locality + follow-up of families whose children had attended the Emergency Department
Outcomes	Outcomes measured over 2 years: Medically attended injuries (ED attendance)
Notes	Blinding - u Outcomes 80% - y Balance - no Intervention areas had higher baseline ED attendance rates than control areas

Risk of bias

Bias	Authors' judgement	Support for judgement
Allocation concealment (selection bias)	Unclear risk	Not applicable - non-randomised study

Chan 2004

Methods	RCT
Participants	Families in two districts of Hong Kong with children under 3 years admitted to hospital with an unintentional injury
Interventions	I = 4 quarterly home visits and monthly telephone follow-ups focusing on practical solutions to potential for injury, from lay home visitors and standard educational material on injury prevention C = standard educational material on injury prevention
Outcomes	Period over which outcomes measured not reported. Tested temperature of microwaved food Child proofed boiler and rice cookers, window frames and electrical heating devices Household rearrangement to avoid staggering furniture layout Home hazards assessed on a 51 item household environment checklist Significantly more intervention group families tested temperature of microwaved food (P = 0.05) and child proofed boilers and rice cookers (P = 0.05), window frames (P < 0.01) and electrical heating devices (P = 0.05) and rearranged furniture to avoid staggering layout (P < 0.01) No figures reported for any of the above outcomes No figures or P value reported for overall hazard score
Notes	Blinding - u Outcomes 80% - u Balance - u

Risk of bias

Chan 2004 *(Continued)*

Bias	Authors' judgement	Support for judgement
Allocation concealment (selection bias)	Unclear risk	Unclear

Clamp 1998

Methods	RCT
Participants	Families with children < 5 years registered at one GP surgery
Interventions	I = general practitioner safety advice, leaflets & low cost safety equipment (smoke alarms, window locks, cupboard and drawer catches, socket covers, door slam devices, fire guards, stair gates) C = usual care
Outcomes	Outcomes measured at 6 weeks: Functional smoke alarm Possession of smoke alarm Fitted fire guard Safe storage of medicines Safe storage of cleaning products Use of stair gate Use of window locks Use of socket covers Sharp objects stored out of reach Use of door slam devices I = 50/82 C = 14/82 OR 7.59 (3.67 to 15.69)
Notes	Blinding - n Outcomes 80% - y Balance - n/a

Risk of bias

Bias	Authors' judgement	Support for judgement
Allocation concealment (selection bias)	Low risk	Adequate

Coggan 2000

Methods	CBA (C) Allocation at level of communities
Participants	Population of two communities, Waitakere (intervention) and a control community matched on demographic variables, new housing developments, road safety and safer community coordinator positions
Interventions	I = community based injury prevention programme focusing on child safety including multi-agency collaboration, education & training, advocacy and action for hazard reduction C = no community based injury prevention program
Outcomes	Outcomes measured over 2 years:

Coggan 2000 *(Continued)*

	Injury outcomes ascertained from injury surveillance system. Hospital admission rates for injury - Significant reduction in injury hospitalisation rates during intervention and post intervention phase in intervention as compared to control community P < 0.05. Figures not reported. Fitted fire guard - Intervention community significantly more likely to have a fitted fire guard P = 0.0002. No figures reported. Acquisition of stair gate - Intervention group significantly more likely to acquire a stair gate P < 0.0001. No figures reported. Acquisition of appropriate fencing for swimming pools - Intervention group more likely to acquire pool fencing, P = 0.0001. No figures reported.
Notes	Blinding - u Outcomes 80% - y Balance - n Intervention community had higher child injury rates at baseline than control community

Risk of bias

Bias	Authors' judgement	Support for judgement
Allocation concealment (selection bias)	Unclear risk	Not applicable - non-randomised study

Colver 1982

Methods	RCT (C) Allocation at level of clinics, day nurseries and nursery classes
Participants	Families with children < 5 years attending child health clinics, day nurseries, nursery classes and a toddler group in deprived area
Interventions	I = encouraged to watch TV safety campaign + home visit + advice on benefits to obtain safety equipment and local availability of safety equipment C = encouraged to watch TV safety campaign
Outcomes	Outcomes measured at 3 months: Safety changes made to home including cooker guards, fire guards and keeping matches out of reach - Intervention group were more likely to report making safety changes to the home I = 22/37 C = 4/43, OR 14.30 (4.22 to 48.46) A physical hazard score comprising nine hazards in the home - No figures or P values reported
Notes	Blinding - u Outcomes 80% - n Balance - n/a

Risk of bias

Bias	Authors' judgement	Support for judgement
Allocation concealment (selection bias)	Unclear risk	Unclear

Davis 1987

Methods	RCT (C) Allocation at level of school class
Participants	41 grade 4-6 classes
Interventions	I = six 1 hour fire safety lessons with workbook, demonstrations, teacher training, materials and take home materials for parents C = usual lessons
Outcomes	Outcomes measured immediately after last fire safety lesson: Possession of smoke alarm
Notes	Blinding - n Outcomes 80% - y Balance - n/a

Risk of bias

Bias	Authors' judgement	Support for judgement
Allocation concealment (selection bias)	Unclear risk	Unclear

Dawson 1989

Methods	RCT
Participants	Women aged 16 years and under attending maternity clinic, 20-26 weeks pregnant, English speaking
Interventions	I_1 = home visits to provide emotional support, advice on child care including safety advice, practical help e.g. with housing, finding legal advice, transport to clinics; encouragement and transportation to use community resources I_2 = I_1 plus 2 weekly parent groups C_1 = usual care C_2 = usual care (selected post randomised enrolment)
Outcomes	Outcomes measured at 12 months: Poison centre phone number accessible - I_1+ I_2 = 37/54 C_1+ C_2 = 20/33 OR 1.41 (0.57 to 3.49) Possession of ipecac I_1+ I_2 = 28/54 C_1+ C_2 = 17/33 OR 1.01 (0.43 to 2.41)
Notes	Blinding - u Outcomes 80% - n Balance - n/a

Risk of bias

Bias	Authors' judgement	Support for judgement
Allocation concealment (selection bias)	Unclear risk	Unclear

Dershewitz 1977

Methods	RCT
Participants	Mothers of children attending a medical clinic enrolled in pre paid medical plan
Interventions	I = safety advice + safety booklet + free safety equipment provided by researcher C = free safety equipment provided by researcher
Outcomes	Outcomes measured at 2 months: Safe storage of prescription medicines Safe storage of cleaning products Use of socket covers Sharp objects (knives) stored out of reach Small objects (coins) out of reach Safe storage of non-prescription medicines I = 1/101 C = 3/104 OR 0.34 (0.03 to 3.29) Use of cupboard locks (not specified for cupboards containing poisonous substances) I = 34/101 C = 32/104 OR 1.14 (0.64 to 2.05) Removal of pins and needles I = 33/101 C = 31/104 OR 1.14 (0.63 to 2.06) Household hazard scale comprising eleven potential hazards - Total hazard score I = 53.2, C = 52.99, P = NS, P value not given
Notes	Blinding - y Outcomes 80% - n Balance - n/a

Risk of bias

Bias	Authors' judgement	Support for judgement
Allocation concealment (selection bias)	Unclear risk	Unclear

DiGuiseppi 2002

Methods	RCT (C) Allocation at level of electoral wards
Participants	Households in council rented accommodation
Interventions	I = free smoke alarm, and offer of free fitting, reminder to change batteries C = no smoke alarm
Outcomes	Outcomes measured at 18 months: Fire related injuries: Rate ratio (RR) 1.3 (0.9,1.8), adjusted for baseline rates RR 1.3 (0.9,1.9) Hospitalisations and deaths: RR 1.3 (0.7,2.4), adjusted for baseline rates RR 1.3 (0.7,2.3) Preventable injuries*:

DiGuiseppi 2002 *(Continued)*

	RR 1.1 (0.8,1.7), adjusted for baseline rates RR 1.2 (0.8,1.8) Preventable hospitalisations and deaths: RR 1.0 (0.5,1.9), adjusted for baseline rates RR 1.0 (0.5,2.0) Attended fires: RR 1.0 (0.9,1.2), adjusted for baseline rates RR 1.1 (0.96,1.3) *Preventable = independently judged by 2 researchers blinded to treatment arm to be potentially preventable had a working smoke alarm been present. Functional smoke alarms
Notes	Blinding - y Outcomes 80% - y(i) n(sp) Balance - n/a

Risk of bias

Bias	Authors' judgement	Support for judgement
Allocation concealment (selection bias)	Low risk	Adequate

Emond 2002

Methods	CBA (C) Allocation at level of health visitor base
Participants	First time mothers from socio-economically deprived areas
Interventions	I = first parent health visitor scheme (a programme of regular home visits to help, support and advise mothers) C = conventional health visiting
Outcomes	Outcomes measured at 2 years: Use of stair gate - intervention group significantly more likely to use stair gates. No figures or p values reported Use of socket covers - Intervention group more likely to use socket covers. No figures or p values reported
Notes	Blinding - n Outcomes 80% - u Balance - n Intervention area chosen because of deprivation level. At baseline the intervention arm had higher proportion of black and Asian mothers, lower maternal educational level and less advantaged in terms of housing status than control arm.

Risk of bias

Bias	Authors' judgement	Support for judgement
Allocation concealment (selection bias)	Unclear risk	Not applicable - non-randomised study

Fergusson 1982

Methods	Non-randomised controlled trial (C) Allocation at level of 2 month time periods and within time periods sequentially by date of birth
Participants	Families of children aged 2-3 years participating in the Christchurch Child Development Study
Interventions	I = "Mr Yuk" stickers for poisonous substances + list of substances to which sticker should be attached + educational leaflet provided by researcher C = none of the above
Outcomes	Outcomes measured at 12 months: Medically attended poisonings Mean number of poisons within child's reach I = 14.80, C = 17.70, P > 0.05 Poisoning hazards score I = 79.96, C = 78.29, P > 0.05.
Notes	Blinding - u Outcomes 80% - y Balance - y

Risk of bias

Bias	Authors' judgement	Support for judgement
Allocation concealment (selection bias)	Unclear risk	Not applicable - non-randomised study

Franklin 2002

Methods	CBA
Participants	Children and young people, aged 4-17 years, referred from the county court system, fire departments, schools and parents with fire setting incident
Interventions	I = trauma burn outreach prevention program (TBOPP) - a 1 day multidisciplinary program with interactive content focusing on the impact of fire setting behaviour including a peer counselling approach C = No TBOPP
Outcomes	Outcomes measured between 8 months and 2.5 years: Firesetting behaviour Recidivism rate - I = 1/132 C = 37/102, OR 0.01 (0.002 to 0.1)
Notes	Blinding - u Outcomes 80% - u Balance - n Control arm were children who were not referred to the prevention programme Control arm were marginally younger and less likely to have a history of arson

Risk of bias

Bias	Authors' judgement	Support for judgement
Allocation concealment (selection bias)	Unclear risk	Not applicable - non-randomised study

Gaffney 1996a

Methods	CBA (C) Allocation level not reported
Participants	Populations of unspecified control and intervention areas
Interventions	I = multi-faceted campaign to reduce risk factors and the rate of hot water scalds in children aged 0-4 years C = no campaign
Outcomes	Outcomes measured at 3 months and 2.5 years: Awareness and use of scald limiting products - no changes in awareness or use of scald limiting products. No figures or P values reported
Notes	Blinding - u Outcomes 80% - u Balance - u

Risk of bias

Bias	Authors' judgement	Support for judgement
Allocation concealment (selection bias)	Unclear risk	Not applicable - non-randomised study

Garcia 1996

Methods	CBA (C) Allocation at level of schools
Participants	4th grade elementary school children and their parents
Interventions	I = safety fair at schools which included interactive safety stations on poisons, fires and home injuries. C = no safety fairs
Outcomes	Period over which outcomes measured not reported: Fire safety behaviours - intervention school parents showed significant improvement in safety behaviour. No figures or P values reported Poison safety - Intervention school students showed a significant improvement in poison safety. No figures or P values reported
Notes	Blinding - u Outcomes 80% - u Balance - u

Risk of bias

Bias	Authors' judgement	Support for judgement
Allocation concealment (selection bias)	Unclear risk	Not applicable - non-randomised study

Georgieff 2004

Methods	CBA (C) Allocated at level of electoral ward.
Participants	Children < 3 years from 5 deprived wards
Interventions	I_1= awareness raising campaign including leaflets, a logo, a radio advert campaign, a bus advertising campaign, burns and scalds road shows, free bath water thermometers and hot tap water temperature testing by researchers $I_2 = I_1$ + free thermostatic mixer valve for baths C = none of the above
Outcomes	Period over which outcomes measured not reported: Safe hot tap water temperature < 49 degrees Celsius Mean temperature after intervention (degrees Celsius) I (1) = 52, I (2) = 55, C = 58 No p values reported
Notes	I_2 and C arms used for meta-analyses Blinding - u Outcomes 80% - n Balance - n Intervention group had higher percentage of single parents

Risk of bias

Bias	Authors' judgement	Support for judgement
Allocation concealment (selection bias)	Unclear risk	Not applicable - non-randomised study

Gielen 2002

Methods	RCT (C) Allocation at level of paediatricians
Participants	1st and 2nd year paediatric residents and their patient-parent dyads Low income population of parents of children aged 0-6 months
Interventions	I = safety counselling by paediatricians + referral to child safety centre + home visit C = safety counselling by paediatricians + referral to child safety centre
Outcomes	Outcomes measured over 12 months: Safe hot water temperature Functional smoke alarm Possession of ipecac Safe storage of poisons No toxic plants in the home Use of stair gate Safety score comprising the number of observed safety practices within the home - zero safety practices I = 4/45 C = 2/40 OR 1.85 (0.32 to 10.71), 1 safety practice I = 22/46 C = 22/43 OR 0.88 (0.38 to 2.01),

Gielen 2002 *(Continued)*

	2 safety practices I = 14/46 C = 13/43 OR 1.01 (0.41 to 2.49), ≥3 safety practices I = 6/46 C = 6/43 OR 0.93 (0.27 to 3.12)
Notes	Blinding - u Outcomes 80% - u Balance - n/a

Risk of bias

Bias	Authors' judgement	Support for judgement
Allocation concealment (selection bias)	Unclear risk	Unclear

Gielen 2007

Methods	RCT
Participants	Parents of children aged 4-66 months attending an urban paediatric ED
Interventions	I = personalised report containing tailored, stage-based messages based on the precaution adoption process model C = report on other child health topics
Outcomes	Outcomes measured at 2-4 weeks: Possession of smoke alarm Functional smoke alarm Safe storage of medicines Safe storage of cleaning products Safe storage of poisons
Notes	Blinding - n Outcomes 80% - y Balance - n/a

Risk of bias

Bias	Authors' judgement	Support for judgement
Allocation concealment (selection bias)	Low risk	Adequate

Girasek 2010

Methods	RCT (C) Allocated at level of pre-natal class
Participants	Pregnant pool owners

Girasek 2010 *(Continued)*

Interventions	I_1 = viewing a video tape describing toddler drowning risks and recommended pool precautions I_2 = viewing a videotape as above but including a mother describing how she lost her son to drowning C = standard care - no videotape
Outcomes	Installation of isolation pool fencing $I_1 + I_2$ = 10/62 C=2/30 OR 2.69 (0.61 to 11.85) Had first aid training $I_1 + I_2$ = 33/69 C=9/32 OR 2.33 (1.01 to 5.56)
Notes	Blinding - y Outcomes 80% - y Balance - n/a

Risk of bias

Bias	Authors' judgement	Support for judgement
Allocation concealment (selection bias)	Low risk	Adequate

Gittelman 2007

Methods	CBA (C) Allocation at level of communities
Participants	Children aged 0-18 years in an intervention community and in 3 control communities
Interventions	I = Injury Free Coalition for Kids community injury prevention programme including after-school programmes, summer educational classes for children, education at school and community fairs, free home safety kits (contents not specified). C = no community injury prevention programme
Outcomes	Outcomes measured over 5 years: Medically attended injuries (deaths, hospital admissions and ED attendances)
Notes	Blinding - n Outcomes 80% - y Balance - n Intervention communities had higher baseline injury rates than control communities

Risk of bias

Bias	Authors' judgement	Support for judgement
Allocation concealment (selection bias)	Unclear risk	Not applicable - non-randomised study

Guyer 1989

Methods	CBA (C) Allocation at level of cities and towns
Participants	Population of 14 cities and towns in Massachusetts
Interventions	I = Community injury prevention programme including injury counselling by paediatricians to parents of young children, school and community burn prevention education, home safety inspections + community wide promotion of poison centre service C = no community injury prevention programme
Outcomes	Outcomes measured over 22 months: Rate of medically attended poisonings - poisoning rate I = 36.14/10,000 person years C = 92.71/10,000 person years, OR 0.95 (0.57 to 1.58) (adjusted for socio-economic group) Rate of medically attended fall injuries - I = 175.02/10,000 person years C = 262.44/10,000 person years OR 0.78 (0.61 to 1.00) (adjusted for socio-economic group) Medically attended thermal injuries - I = 59.68/10000 person years C = 106.03/10000 person years OR 1.26 (0.84 to 1.90) (adjusted for socio-economic group) Possession of smoke alarm Preventive behaviour score comprising behaviours for preventing poisonings (14 items), burns (12 items), falls (6 items) - Mean score: Burns: I = 49.2, C = 46.8 Falls I = 30.3, C = 30.7 Poisoning I =34.3, C = 30.5. P values not reported
Notes	Blinding - u Outcomes 80% - y Balance - n Control communities had higher baseline injury rates, a greater proportion of Hispanic residents and lower household income than intervention communities

Risk of bias

Bias	Authors' judgement	Support for judgement
Allocation concealment (selection bias)	Unclear risk	Not applicable - non-randomised study

Harvey 2004

Methods	RCT (C)
Participants	Households without smoke alarms in areas with a high prevalence of residential fire deaths, a low prevalence of functional smoke alarms, a composition of primarily low-income residents, and/or high proportion of rented housing
Interventions	I_1 = smoke alarm installation I_2 = vouchers for free smoke alarm
Outcomes	Outcomes measured at 6 to 12 months: Functional smoke alarm. I_1=1421/1583, I_2=997/1545; OR 4.82 (3.96 to 5.88) Analyses not adjusted for clustering

Harvey 2004 *(Continued)*

Notes	Blinding - n Outcomes 80% - n Balance -n/a

Risk of bias

Bias	Authors' judgement	Support for judgement
Allocation concealment (selection bias)	Unclear risk	Unclear

Hendrickson 2002

Methods	RCT
Participants	Mothers with children aged 1-4 years, predominantly Mexican/Mexican American
Interventions	I = safety counselling from researchers, plus identification of home hazards + safety education + provision of safety equipment (door knob covers, smoke detectors or new batteries if smoke alarm already in situ, fire extinguisher, cabinet latches and outlet covers) C = none of the above
Outcomes	Outcomes measured at 6 weeks: Functional smoke alarm Possession of a fire extinguisher Matches stored out of reach Hot drinks out of reach Safe storage of cleaning products Poison control centre number accessible Use of window locks Use of socket covers Small objects kept out of reach Floors not in need of repair I = 31/38, C = 28/40, OR 1.90 (0.66 to 5.50) Stairs not in need of repair I = 5/38, C = 1/40, OR 5.91 (0.66 to 53.15) Hand rail on stairs I = 5/38, C = 2/40, OR 2.88 (0.52 to 15.84)
Notes	Blinding - n Outcomes 80% - y Balance - n/a

Risk of bias

Bias	Authors' judgement	Support for judgement
Allocation concealment (selection bias)	High risk	Inadequate

Hwang 2006

Methods	CBA
Participants	3rd and 4th grade students in 2 elementary schools in an urban, poor community
Interventions	I = visit during school hours from fire department personnel who installed a free 10 year lithium smoke alarm on each level of the residence. Provided a fire escape plan verbally and on a dry erase board placed on the refrigerator. C = usual care
Outcomes	Outcomes measured at 4 weeks: Has a fire escape plan Has identified a meeting place outside the home in case of fire. OR 1.9 (1.0 to 3.8) Possession of smoke alarm. No significant difference between groups. Lighting of matches or lighters. No significant difference between groups. Child cooking on stove. No significant difference between groups. Possession of fire extinguisher. No significant difference between groups. Figures and p values not reported for the latter four outcomes.
Notes	Blinding - n Outcomes 80% - u Balance - y

Risk of bias

Bias	Authors' judgement	Support for judgement
Allocation concealment (selection bias)	Unclear risk	Not applicable - non-randomised study

Jenkins 1996

Methods	RCT
Participants	Families with children aged 0-17 years admitted to a pediatric burns unit
Interventions	I = education about burn care and prevention using specially designed booklet pre discharge from nurses, physiotherapists or occupational therapists C = routine discharge teaching without booklet
Outcomes	Outcomes measured at first out-patient appointment post-discharge: Possession of smoke alarm
Notes	Blinding - y Outcomes 80% - y Balance - n/a

Risk of bias

Jenkins 1996 *(Continued)*

Bias	Authors' judgement	Support for judgement
Allocation concealment (selection bias)	Low risk	Adequate

Johnston 2000

Methods	RCT (C) Allocation at level of pre school enrichment programme centres
Participants	Families of children aged 4-5 years enrolled in Head Start program provided to socio-economically disadvantaged children
Interventions	I = home safety inspections + educational material + provision of ipecac, smoke alarms and batteries provided by educational paraprofessionals C = home safety inspection + written information only
Outcomes	Outcomes measured at 3 months: Functional smoke alarm Possession of ipecac Removed poisons from home I = 61/202 C = 20/135 OR 2.48 (1.42 to 4.36) Disposed of unused medicine I = 18/202 C = 16/134 OR 0.72 (0.35 to 1.47)
Notes	Blinding - n Outcomes 80% - y Balance - n/a

Risk of bias

Bias	Authors' judgement	Support for judgement
Allocation concealment (selection bias)	High risk	Inadequate

Katcher 1989

Methods	RCT (C) Allocated at level of half day of clinic visit
Participants	Consecutive paediatric clinic clients randomised to two groups
Interventions	I = counselling by paediatrician plus tap water thermometer and tap water safety literature C = counselling and tap water safety literature
Outcomes	Outcomes measured at 1 month: Safe hot water temperature < 54.4 degrees Celsius Tested hot water temperature I = 122/263, C = 55/239, OR 2.89 (1.97 to 4.26)
Notes	Blinding - u Outcomes 80% - n Balance - n/a

Katcher 1989 *(Continued)*

Risk of bias

Bias	Authors' judgement	Support for judgement
Allocation concealment (selection bias)	Unclear risk	Unclear

Kelly 1987

Methods	RCT
Participants	Parents of 6 month old children attending primary care centre for well child care
Interventions	I = 3 part safety course at well child care visits C = routine safety education
Outcomes	Outcomes measured at 2 weeks; Medically attended injuries (ED attendance, physician attendance or admission to hospital) Safe hot water temperature < 52 degrees Celsius Possession of smoke alarm Matches stored out of reach Safe storage of medicines Safe storage of cleaning products Possession of ipecac Uncovered electrical outlets Sharp objects stored out of reach No sharp corners on furniture I = 46/55 C = 42/54 OR 1.46 (0.56 to 3.81) A hazard score comprising 9 possible hazards observed on home visit - Mean hazard score I = 2.4, C = 3.0, P<0.02
Notes	Blinding - y Outcomes 80% - n Balance - n/a

Risk of bias

Bias	Authors' judgement	Support for judgement
Allocation concealment (selection bias)	Unclear risk	Unclear

Kelly 2003

Methods	RCT (C) Allocation at level of well child care class
Participants	Parents of children aged 15 months to 6 years attending Women, Infant and Children clinics
Interventions	I = videotape + poison control centre pamphlet + poison control centre stickers C = usual care
Outcomes	Outcomes measured at 2 weeks:

Kelly 2003 *(Continued)*

	Possession of ipecac Poison centre number accessible
Notes	Blinding - y Outcomes 80% - y Balance - n/a

Risk of bias

Bias	Authors' judgement	Support for judgement
Allocation concealment (selection bias)	Unclear risk	Unclear

Kendrick 1999

Methods	Non-randomised controlled trial (C) Allocated at level of GP practice. Randomised practices to intervention group and matched control group practices on deprivation score
Participants	Children aged 3 to 12 months registered at 36 GP practices
Interventions	I = health visitor safety advice at child health surveillance, low cost equipment (stair gates, fire guards, cupboard and drawer locks, smoke alarms), home safety checks and first aid training C = usual care
Outcomes	Outcomes measured at 25 months: Medically attended thermal injuries Medically attended poisonings Medically attended injuries (primary care attendance, ED attendance, hospital admission or death) Stores hot iron out of reach I = 353/364, C = 358/366, OR 0.72 (0.28 to 1.80) Functional smoke alarm Fitted fire guard Safe hot water temperature < 54 degrees Celsius Hot drinks out of reach Stores matches out of reach Safe storage of cleaning products Use of stair gates Use of window locks Use of socket covers Sharp objects stored out of reach Never left child alone in bath Rugs fixed to floor I = 88/187, C = 64/169, OR 1.46 (0.96 to 2.23) Does not have toys small enough to fit in child's mouth I = 201/358, C = 216/365, OR 0.88 (0.66 to 1.19) Always checks toys with removable small parts I = 179/363, C = 179/365, OR 1.01 (0.76 to 1.35)
Notes	Blinding - n Outcomes 80% - y(i) n(sp) Balance - y

Risk of bias

Bias	Authors' judgement	Support for judgement

Kendrick 1999 *(Continued)*

Allocation concealment (selection bias)	Unclear risk	Not applicable - non-randomised study

Kendrick 2005

Methods	RCT (C) Allocation at level of general practices
Participants	Women of at least 28 weeks gestation registered at participating general practices
Interventions	I = midwife and health visitor advice to discourage walker use, information cards, fridge magnets, checklists for use in child health surveillance visit at 3 to 4 months. Encouraging use of stair gates and fire guards amongst walker users C = usual care
Outcomes	Outcomes measured when child 9 months of age: Fitted fire guard Use of baby walker Use of stair gate
Notes	Blinding - n Outcomes 80% - y Balance - n/a

Risk of bias

Bias	**Authors' judgement**	**Support for judgement**
Allocation concealment (selection bias)	Low risk	Adequate

Kendrick 2007

Methods	RCT (C) Allocation at level of schools
Participants	Children aged 7-10 years in state funded primary schools
Interventions	I = teachers were trained by Fire Service Personnel to deliver teaching on falls; poisoning; and fire and burns. Fire Service personnel provided free teaching resources, including Risk Watch folders and “Risky Boxes” which included background information, lesson plans and activities for pupils C = usual care
Outcomes	Outcomes measured at 4 months: Possession of smoke alarm Child never cooks without adult present I=117/163 C=141/184, 0.90 (0.45 to 1.82) Child never uses matches I=137/165 C=139/186, 1.84 (1.06 to 3.20) Child never gets medicines without asking adult. I=107/123 C=164/187, 0.69 (0.30 to 1.59)

Kendrick 2007 *(Continued)*

	Child never plays on stairs. I=41/76 C=106/186, 0.80 (0.43 to 1.48)
Notes	Blinding - y Outcomes 80% - y Balance - n/a

Risk of bias

Bias	Authors' judgement	Support for judgement
Allocation concealment (selection bias)	Low risk	Adequate

Kendrick 2010

Methods	RCT
Participants	Households with children < 5 years in social housing in disadvantaged communities
Interventions	I = Thermostatic mixer valve fitted by qualified plumber and educational leaflets prior to and at the time of fitting. C = usual care
Outcomes	Outcomes measured at 3 and 12 months: Safe water temperature
Notes	Blinding - y Outcomes 80% - n Balance - n/a

Risk of bias

Bias	Authors' judgement	Support for judgement
Allocation concealment (selection bias)	Low risk	Adequate

King 2001

Methods	RCT
Participants	Children < 8 years attending A&E for injury or medical complaint
Interventions	I = home safety inspection + information on correcting any deficiencies, discount vouchers for safety equipment, demonstrations of use of safety devices + information on preventing specific injuries provided by researcher C = home safety inspection & safety pamphlet.
Outcomes	Outcomes measured at 12 (safety practices) and 36 (medically attended injuries) months: Self reported medically attended injuries (injury requiring attention by doctor) Stores matches or lighters out of reach

King 2001 *(Continued)*

	Safe hot tap water not exceeding 54 degrees Celsius Functional smoke alarm Possession of a fire extinguisher Safe storage of cleaning products Use of stair gate Use of baby walker Small objects kept out of reach CRCs on cleaning products in kitchen I = 238/482, C = 233/469, OR 0.98 (0.77 to 1.27) Safe storage of bathroom cleaning products I = 255/482 C = 261/469 OR 0.90 (0.69 to 1.16) CRC's on bathroom cleaning products I = 355/482, C = 347/469, OR 0.98 (0.74 to 1.31) No windows opened easily beyond 6 inches in the living room I = 254/482, C = 238/469, OR 1.08 (0.84 to 1.39) No windows opened easily beyond 6 inches in the bedroom I = 299/482, C = 285/469, OR 1.05 (0.81 to 1.37)
Notes	Blinding - y Outcomes 80% - y Balance - n/a

Risk of bias

Bias	Authors' judgement	Support for judgement
Allocation concealment (selection bias)	Low risk	Adequate

Kolko 2001

Methods	Non-randomised controlled trial Participants only randomised to I_1 and I_2 arms. C arm families were those scheduled to have a home visit from a fire fighter prior to the study, those living too far from the clinic where CBT and FSE were provided and 2 families who would not agree to randomisation.
Participants	Boys referred for services by the City of Pittsburgh bureau of fire
Interventions	I_1 = CBT (cognitive behavioural therapy) - designed to encourage behaviours other than fire setting I_2 = FSE (fire safety education) - instruction in fire safety skills, prevention practices, fire protection and evacuation C = HVF (home visit by firefighter) providing information about the danger of fires, the function of fire-fighters and asking children to promise not to get involved in unsanctioned fire play
Outcomes	Outcomes measured at 13 weeks and 1 year: Any fire setting incident: At 13 weeks I_1 = 3/17 I_2 = 2/14 C = 4/14 I_1 vs C OR 0.54 (0.10 to 2.94) I_2 vs C OR 0.42 (0.06 to 2.77) At 1 year I_1 = 4/17 I_2 = 2/13 C = 7/14 I_1 vs C OR 0.31 (0.13 to 1.43) I_2 vs C OR 0.18 (0.03 to 1.14) Any match play incident At 13 weeks I_1 = 6/17 I_2 = 3/14 C = 4/14

Kolko 2001 *(Continued)*

	I_1 vs C OR 1.36 (0.30 to 6.28) I_2 vs C OR 0.68 (0.12 to 3.83) At 1 year I_1 = 6/17 I_2 = 1/14 C = 8/14 I_1 vs C OR 0.41 (0.10 to 1.75) I_2 vs C OR 0.06 (0.01 to 0.57)
Notes	Blinding - n Outcomes 80% - y Balance - n I_1 arm had higher, and I_2 arm had lower frequency of child reported fire setting and match play incidents at baseline than control arm.

Risk of bias

Bias	Authors' judgement	Support for judgement
Allocation concealment (selection bias)	Unclear risk	Not applicable - non-randomised study

Krug 1994

Methods	CBA (C) Allocated at level of district
Participants	Populations of 2 districts, Gelukspan (intervention) and Lehurutshe (control), Western Transvaal, South Africa
Interventions	I = provision of child resistant kerosene container to households with small children C = no child resistant kerosene container provided
Outcomes	Outcomes measured at 14 months: Medically attended kerosene poisonings - Mean (SD) incidence of kerosene poisoning after CRC distribution. I = 4.54 (3.46), C = 9.8 (5.63), P = 0.015
Notes	Blinding - u Outcomes 80% - u Balance - y

Risk of bias

Bias	Authors' judgement	Support for judgement
Allocation concealment (selection bias)	Unclear risk	Not applicable - non-randomised study

Lacoutre 1978

Methods	CBA (C) Allocation at level of towns

Lacoutre 1978 *(Continued)*

Participants	School children aged 6-14 years in Wilmington (intervention) and Scituate (control), Massachusetts
Interventions	I = community poison prevention education programme, directed at school children C = no community poison prevention education programme
Outcomes	Period over which outcomes measured not reported. Possession of ipecac - reports change in percentage of families having ipecac but does not report baseline prevalence. Significantly more intervention group families had ipecac than control group families, $P < 0.05$.
Notes	Blinding - n Outcomes 80% - u Balance - y

Risk of bias

Bias	Authors' judgement	Support for judgement
Allocation concealment (selection bias)	Unclear risk	Not applicable - non-randomised study

LeBailly 1990

Methods	Non-randomised controlled trial Sequential allocation to treatment group
Participants	Families attending 2 paediatric group practices, 1 in urban area, other in suburban area
Interventions	I_1 = well child visit + safety equipment I_2 = well child visit + safety equipment + safety counselling by physician I_3 = well child visit + safety counselling by physician C = well child visit
Outcomes	Outcomes measured at 9 months: Possession of fire extinguishers Functional smoke alarm - Intervention groups (counselling and equipment and equipment only) had significantly greater use of fire extinguishers and smoke alarms. No figures or P values reported. Possession of ipecac - Significantly more intervention group families (counselling and equipment and equipment only) possessed ipecac. No figures or P values reported. Use of outlet covers - Intervention groups (counselling and equipment and equipment only) had significantly greater use of socket covers. No figures or P values reported.
Notes	Blinding - u Outcomes 80% - n Balance - u

Risk of bias

Bias	Authors' judgement	Support for judgement
Allocation concealment (selection bias)	Unclear risk	Not applicable - non-randomised study

Lindqvist 1998a

Methods	CBA (C) Allocated at level of municipalities.
Participants	Populations of 2 communities, Motala (intervention), Mjolby (control)
Interventions	I = community injury prevention programme including multi-agency collaboration, mass media campaigns, nurses provided age specific safety information in compulsory annual health visits. Video on hazards distributed to all families with children < 6 years, safety products and environmental modifications displayed at public places C = no community injury prevention programme
Outcomes	Outcomes measured over 5-6 years: Medically attended injuries (health centre attendance, ED attendance, hospital admission and deaths) for home injuries. Medically attended poisonings - I = 29/8566 pre intervention and 17/8315 post intervention. Not reported for control area. RR post intervention to pre intervention, in intervention area: 0.60 (0.33 to 1.10)
Notes	Blinding - u Outcomes 80% - y Balance - y

Risk of bias

Bias	Authors' judgement	Support for judgement
Allocation concealment (selection bias)	Unclear risk	Not applicable - non-randomised study

Llewellyn 2003

Methods	RCT
Participants	Parents with intellectual disability who were the primary carers of children < 5 years
Interventions	I_1= weekly home visits covering a different topic each week e.g. fire, electrical safety. I_2= lesson books received by mail covering the same topics as I_1 but without face to face contact C_1 = current community services C_2 = current community services
Outcomes	Outcomes measured over 3 months: Mean (SD) hazard score comprising precautions taken to deal with 114 possible dangers in and around the home 1st post programme assessment: I_1 = 60.35 (21.94) versus I_2 = 48.73 (10.77) versus C_1 = 53.3 (12.88), P < 0.001 2nd post programme assessment: I_2 = 88.09 (34.92) versus C_1 = 57.5 (11.48), P < 0.001
Notes	Blinding - y Outcomes 80% - n Balance - n/a

Llewellyn 2003 *(Continued)*

	C_2 initially randomly allocated but reallocated to C_1 to ensure completed program in study period

Risk of bias

Bias	Authors' judgement	Support for judgement
Allocation concealment (selection bias)	Unclear risk	Unclear

Mackay 2002

Methods	RCT (C) Allocation at level of schools
Participants	Elementary school children attending 12 schools
Interventions	I = Risk Watch safety curriculum delivered by teachers for one year C = usual curriculum
Outcomes	Outcomes measured over 12 months: Parental reported medically attended injuries and near misses - No significant difference in medically attended injuries or near misses. No figures or P values reported
Notes	Blinding - u Outcomes 80% - u Balance - n/a

Risk of bias

Bias	Authors' judgement	Support for judgement
Allocation concealment (selection bias)	Unclear risk	Unclear

Mallonee 1996

Methods	CBA (C) Allocation at level of geographical areas of a city
Participants	Population of a 24 square mile area of Oklahoma City (intervention) and population of the rest of Oklahoma (control)
Interventions	I = distribution of smoke alarms door to door by volunteers and community agencies to homes without a smoke alarm C = no smoke alarm distribution
Outcomes	Outcomes measured over 4 years: Fire-related injury rates - Injury rate decreased 81% in the intervention area but only 7% in the control area. Only 2 children under 5 years of age were injured in the intervention area in the 6 years post intervention (denominator not reported). Numerator and denominator for child injury rate not reported for control area.

Mallonee 1996 *(Continued)*

Notes	Blinding - n Outcomes 80% - y Balance - n Area with highest fire injury rate chosen for intervention and rest of city chosen as control area. Lower household income in intervention area, lower property values and more fires started by children in the intervention area

Risk of bias

Bias	Authors' judgement	Support for judgement
Allocation concealment (selection bias)	Unclear risk	Not applicable - non-randomised study

Matthews 1988

Methods	Non-randomised controlled trial 18 mothers allocated using random numbers, 8 by alternation
Participants	26 mothers of toddlers recruited from clinics, day care centres
Interventions	I = home safety inspection, video, handouts, modelling re: safety and managing dangerous child behaviour, hot water thermometers, choke tube C = home visit with video, handouts, modelling on language simulation
Outcomes	Outcomes measured over 2 weeks: Possession of smoke alarm Functional smoke alarm
Notes	Blinding - u Outcomes 80% - y Balance - u

Risk of bias

Bias	Authors' judgement	Support for judgement
Allocation concealment (selection bias)	Unclear risk	Not applicable - non-randomised study

Mayer 1998

Methods	RCT
Participants	Parents of children attending an orthopaedic outpatient clinic, with at least one child aged 0-9 years
Interventions	I = 20 minute video about lawnmower injuries and safety shown in orthopaedic clinic & educational leaflet C = no video
Outcomes	Outcomes measured over 7 weeks:

Mayer 1998 *(Continued)*

	Not leaving mower running I = 22/30, C = 17/35, OR 2.91 (1.02 to 8.29) Making children stay indoors I = 19/30, C = 12/32, OR 2.88 (1.03 to 8.07) Tell children to leave yard I = 25/29, C = 25/33, OR 2.00 (0.53 to 7.50) Never leave child in yard I = 19/29, C = 15/34, OR 2.41 (0.87 to 6.69) Removal of debris prior to mowing I = 29/30, C = 29/34, OR 5.00 (0.55 to 45.48)
Notes	Blinding - n Outcomes 80% - n Balance - n/a

Risk of bias

Bias	Authors' judgement	Support for judgement
Allocation concealment (selection bias)	Unclear risk	Unclear

McDonald 2005

Methods	RCT
Participants	Parents of children aged 6 weeks to 24 months, attending well child clinic
Interventions	I = tailored safety advice in well child clinic + feedback report to paediatrician to encourage safety counselling + information on safety equipment savings at child safety centre C = usual care
Outcomes	Outcomes measured over 1 month: Possession of smoke alarm Possession of ipecac Use of stair gate Safe storage of medicines Safe storage of cleaning products Has changed smoke alarm batteries in last 6 months
Notes	Blinding - u Outcomes 80% - n Balance - n/a

Risk of bias

Bias	Authors' judgement	Support for judgement
Allocation concealment (selection bias)	Low risk	Adequate

McLoughlin 1982

Methods	CBA (C) Allocation at level of communities.
Participants	Populations of Lynn, Quincy and Salem and Saugus (Intervention) and Holyoke and South Hadley (control), Massachusetts.

McLoughlin 1982 *(Continued)*

Interventions	I = mass media campaign and school and community intervention programs C = media campaign only
Outcomes	Outcomes measured over 8 months: Medically attended thermal injuries - no significant difference in thermal injury rates pre intervention to post intervention in children in the intervention community. No p values reported
Notes	Blinding - u Outcomes 80% - u Balance - u Injury outcomes ascertained from injury surveillance system, but hospitals involved did not cover all residents and did not include private practices

Risk of bias

Bias	Authors' judgement	Support for judgement
Allocation concealment (selection bias)	Unclear risk	Not applicable - non-randomised study

Miller 1982

Methods	Non-randomised controlled trial (C) Allocated at level of 2 week periods of clinic attendance and sequential allocation by date of attendance
Participants	Children attending for routine paediatrician healthcare
Interventions	I = pamphlet and a one minute educational message by paediatrician, plus low cost smoke detector C = usual care
Outcomes	Outcomes measured at 6 weeks Functional smoke alarm
Notes	Blinding - u Outcomes 80% - y Balance - y

Risk of bias

Bias	Authors' judgement	Support for judgement
Allocation concealment (selection bias)	Unclear risk	Not applicable - non-randomised study

Mock 2003

Methods	CBA (C) Allocated at level of clinics.
Participants	Upper socioeconomic stratum (SES) - two private clinics Middle stratum - two clinics charging low fees

Mock 2003 *(Continued)*

	Lower stratum - subsidised clinics
Interventions	I_1 (upper) - lectures and demonstrations lasting 6 hours. Use of audio visual material including The Injury Prevention Program (TIPP) I_2 (middle) - as above but some participants also received clinic-based counselling I_3 (lower) - half hour household visits by nurses and some audio visual materials also used C = standard injury prevention counselling
Outcomes	Outcomes measured at 6 months: Functional smoke alarm Tested hot water temperature I_1 = 0/25, C_1 = 2/29, I_2 = 0/18, C_2 = 0/36, I_3 = 1/27, C_3 = 0/15; ORs not calculable Score of preventive behaviours - Mean (SD) percent safe response scores: Upper SES I = 64.7 (12.9) pre, 72.8 (9.9) post, P < 0.001; C = 66.3 (12.8) pre, 63.9 (13.4) post, P = 0.12 Middle SES I = 60.2 (13.7) pre, 68.0 (11.5) post, P < 0.001; C = 54.3 (14.8) pre, 56.0 (15.5) post, P = 0.28 Lower SES I = 54.2 (14.9) pre, 61.8 (13.3) post, P < 0.001; C = 55.6 (16.2) pre, 59.7 (19.7) post, P = 0.09.
Notes	I_1, I_2 and I_3 arms combined for meta-analyses Blinding - n Outcomes 80% - n Balance - n Intervention arm had higher percentage of safe responses at baseline than control arm

Risk of bias

Bias	Authors' judgement	Support for judgement
Allocation concealment (selection bias)	Unclear risk	Not applicable - non-randomised study

Moller 1996

Methods	CBA (C) Allocation at level of communities.
Participants	Populations of 5 municipalities (number of intervention and control municipalities not specified)
Interventions	I = community injury prevention programme including multi-agency collaboration and utilizing injury data to target injury interventions C = no community injury prevention programme
Outcomes	Outcomes measured at 2 years: Medically attended injuries (not defined) - Significantly lower risk of home and play accidents amongst children aged 0-5 years in intervention group than control group. No figures or P values reported.
Notes	Blinding - u Outcomes 80% - y Balance - u

Risk of bias

Bias	Authors' judgement	Support for judgement

Moller 1996 *(Continued)*

Allocation concealment (selection bias)	Unclear risk	Not applicable - non-randomised study

Mueller 2008

Methods	RCT
Participants	Households with low to mid-level income
Interventions	I_1= Ionization smoke alarm installed + instructions given in maintenance + fire extinguisher provided I_2 = Photoelectric smoke alarm installed + instructions given in maintenance + fire extinguisher provided
Outcomes	Outcomes measured at 9 and 15 months: At 9 months: Functional smoke alarm. I_1=264/332, I_2=322/340; OR 0.22 (0.12 to 0.38) At 15 months: Functional smoke alarm. I_1=239/311, I_2=287/314; OR 0.31 (0.19 to 0.51)
Notes	Blinding - n Outcomes 80% - y Balance - n/a

Risk of bias

Bias	**Authors' judgement**	**Support for judgement**
Allocation concealment (selection bias)	Unclear risk	Unclear

Nansel 2002

Methods	RCT
Participants	Parents of children aged 6-20 months attending well child check
Interventions	I = computer generated tailored safety advice in well child clinic C = computer generated generic safety advice in well child clinic
Outcomes	Outcomes measured at 3 weeks: Safe hot water temperature <= 48.9 degrees Celsius Possession of smoke alarm Hot drinks/food out of reach Safe storage of medicines Safe storage of cleaning products Possession of ipecac Poison centre number accessible Use of stair gate Use of baby walker

Nansel 2002 *(Continued)*

	Never left child alone in bath Smoke alarm batteries checked or changed Use of socket covers Never left child alone in area of paddling pool I = 10/11, C = 15/16, OR 0.67 (0.04 to 11.94) Never left paddling pool full of water after use I = 11/11, C = 14/16, OR Not calculable Swimming pool has fence with locked gate I = 1/1, C = 2/2, OR Not calculable Never left child alone in pool area I = 1/1, C = 2/2, OR Not calculable Risk scores comprising injury risk behaviours for burns/fire, falls, poisoning, drowning - Decrease in mean (SD) risk score I = 4.68 (6.44), C = 1.54 (5.58), P = 0.003
Notes	Blinding - u Outcomes 80% - y Balance - n/a

Risk of bias

Bias	Authors' judgement	Support for judgement
Allocation concealment (selection bias)	Low risk	Adequate

Nansel 2008

Methods	Non-RCT Participants randomly allocated to I_1 and C arms and remainder allocated to I_2
Participants	Parents of children aged <= 4 years attending well child visits at 3 paediatric clinics with mainly low to middle income patients
Interventions	I_1 = tailored injury prevention education I_2 = tailored injury prevention education and provider tailored information C = general education
Outcomes	Outcomes measured at 1 month: Possession of smoke alarm Safe hot water temperature Hot drinks/food out of reach Safe storage of medicines Safe storage of cleaning products Poison centre number accessible Use of stair gates Use of baby walker Never leaves child alone on high surface Never left child alone in bath

Nansel 2008 *(Continued)*

	Turns pan handles away from edge of stove I_1=7/7, I_2=11/12, C=12/14, OR combining both I arms: 3.00 (0.14 to 186.62) Almost always keeps child away from stove or oven I_1=4/7, I_2=10/12, C=11/13, OR combining both I arms: 0.51 (0.04 to 3.98)
Notes	I_1 and I_2 arms combined for meta-analyses Blinding - n Outcomes 80% - n Balance - n Participants in I_2 arm were older, more likely to be Caucasian and had lower educational level than those in C arm.

Risk of bias

Bias	Authors' judgement	Support for judgement
Allocation concealment (selection bias)	Unclear risk	Not applicable - non-randomised study

Odendaal 2008

Methods	RCT
Participants	Households with children <10 years old living in low-income communities
Interventions	I = 4 home visits including safety education, home inspection and distribution of free safety devices with a demonstration of use (first aid kit, roll of insulation tape, safety nails, 2L plastic paraffin container and a bag and hook for safe storage. C = usual care
Outcomes	Outcomes measured at 1 week: Hazard scores for thermal injuries, poisoning and falls 88 item home safety checklist. Mean (SE) score, Mean difference: Total safety score. I=20.3 (0.89) C=23.9 (0.92), 3.6 (1.12 to 6.16) Electrical burns score. I=3.0 (2.70) C=3.9 (0.29), 0.9 (0.15 to 1.70) Paraffin burns score. I=2.6 (0.24) C=3.3 (0.23), 0.7 (0.04 to 1.37) Burns safety practices score. I=6.8 (0.19) C=7.1 (0.21), 0.3 (-0.31 to 0.80) Poisoning score. I=2.9 (0.23) C=4.0 (0.25), 1.1 (0.44 to 1.77) Falls score. I=5.0 (0.29) C=5.6 (0.30), 0.6 (-0.16 to 1.47)
Notes	Blinding - n Outcomes 80% - y Balance - n/a

Risk of bias

Odendaal 2008 *(Continued)*

Bias	Authors' judgement	Support for judgement
Allocation concealment (selection bias)	Unclear risk	Unclear

Ohn 2005

Methods	CBA (C) Allocation at level of "Sure-Start" areas
Participants	Children aged 0-4 years in 2 Sure Start areas, Foxhill & Parsons Cross (intervention) and Firth Park (control)
Interventions	I = free installation of home safety equipment (smoke alarms, fire guards and stair gates) C = no free installation of home safety equipment
Outcomes	Outcomes measured over 3 years: Medically attended injuries (ED attendances and hospital admissions) - No significant difference in the odds of an injury attendance being from the intervention area as opposed to the control area. No P value reported, OR 0.91 (0.82 to 1.02)
Notes	Blinding - n Outcomes 80% - y Balance - n Control arm more deprived

Risk of bias

Bias	Authors' judgement	Support for judgement
Allocation concealment (selection bias)	Unclear risk	Not applicable - non-randomised study

Olds 1994

Methods	RCT
Participants	Primiparous women registering before the 26th week of pregnancy from upstate New York, <19 years of age, single parents, or low socio-economic status
Interventions	I_1 = families were provided with a home nurse visitor during pregnancy in addition to screening and transportation services I_2 = as I_1 but the nurse continued to visit until the child was 2 years of age C_1 = screening for sensory and developmental problems C_2 = free transportation for regular prenatal and well child care clinics
Outcomes	Outcomes measured at 34 and 46 months: Safe storage of poisonous substances - no significant difference. No figures or P values reported Hazard score comprising exposure to hazards in the home At 34 months:

Olds 1994 *(Continued)*

	log incidence of hazardous exposures I_2 = -1.75, $C_1 + C_2$ = -1.04, P = 0.04 At 46 months: log incidence of hazardous exposures I_2 = -1.94, $C_1 + C_2$ = -0.83, P = 0.003
Notes	Blinding - y Outcomes 80% - y Balance - n/a

Risk of bias

Bias	Authors' judgement	Support for judgement
Allocation concealment (selection bias)	Unclear risk	Unclear

Ozanne-Smith 2002

Methods	CBA (C) Allocated at level of communities
Participants	Population of 2 communities, Shire of Bulla (intervention) and Shire of Melton (control)
Interventions	I = community injury prevention programme including multi-agency collaboration, promotion of child safety equipment, safety education for parents from healthcare staff, child safety courses, distribution of home safety package, exhibitions, use of mass media C = no community injury prevention programme
Outcomes	Outcomes measured over 4-5 years: Medically attended injuries (ED attendance, hospital admission or death) - No significant difference between the control and intervention community. Figures and P values not reported.
Notes	Blinding - u Outcomes 80% - y Balance - n Control community had higher injury rates at baseline

Risk of bias

Bias	Authors' judgement	Support for judgement
Allocation concealment (selection bias)	Unclear risk	Not applicable - non-randomised study

Paul 1994

Methods	RCT
Participants	Families with children aged 10 months to 2 years born at local rural hospital
Interventions	I = home safety check + tailored education booklet + local safety equipment retail outlets identified, mail order addresses provided or equipment ordered through research team and made available at local hospital

Paul 1994 *(Continued)*

	C = none of the above
Outcomes	Outcomes measured between 5 and 9 months: Possession of a cooker guard Thermostatic mixer valves in kitchen/bathroom/laundry Spring loaded safety taps in kitchen/bathroom/laundry Fitted fireguard No significant difference in any thermal injury outcomes. No figures or P values reported Lockable cabinet for storage of poisons in kitchen/bathroom/laundry - Intervention group more likely to have lockable cabinets post intervention than pre intervention, P < 0.05 Possession of ipecac - Intervention group more likely to have ipecac than control group, P < 0.01. Figures not reported. Roof areas child can gain access to Outside steps with no railings and non-climbable barrier Balcony without adequate non-climbable barrier High windows which open more than 10 cm Climbable fencing Interior steps without railings Non-climbable barriers High chair without harness Intervention group less likely to have accessible roof areas post intervention than pre intervention (P < 0.05). No significant difference in other falls injury outcomes. Figures and P values not reported. Use of earth leakage circuit breakers Safety shuttered power points - no significant difference in any electrical injury outcomes. Figures and P values not reported. Protected sharp edges - Intervention group less likely to have bench tops with sharp edges, P < 0.001. Figures and P values not reported. No toys with small parts - No significant difference between intervention and control groups. Figures and P values not reported Adequate pool fencing - no significant difference in any drowning injury outcomes. Figures and P values not reported Use of safety glass in glass doors - no significant difference. Figures and P value not reported Hazard score calculated based on a 24 item home hazard checklist - Mean (SD) hazard score: I = 9.39 (2.30), C = 9.91 (2.76), P = NS
Notes	Blinding - u Outcomes 80% - n Balance - n/a

Risk of bias

Bias	Authors' judgement	Support for judgement
Allocation concealment (selection bias)	Unclear risk	Unclear

Petridou 1997

Methods	CBA (C) Allocation at level of islands
Participants	Population of two Greek islands, Naxos (intervention) and Spetses (Control)
Interventions	I = community intervention including safety seminars for parents, workshops with teachers promoting school safety, courses with primary and secondary school children on safety and resuscitation, leaflets;

Petridou 1997 *(Continued)*

	plus focused intense intervention: lay home visitors, weekly visits to discuss home safety in households with children (<=18 years) or older people (>=65 years) C = none of the above
Outcomes	Outcomes measured over 20 months: Possession of a fire extinguisher Poison centre number accessible Possession of ipecac Slip resistant bathroom mat Has a fire escape plan Safe balconies I = 24/128, C = 36/131, OR 0.61 (0.34 to 1.10) Safe indoor stairs I = 104/128, C = 110/131, OR 0.83 (0.43 to 1.58) Safe outdoor stairs I = 32/128, C = 17/131, OR 2.24 (1.17 to 4.27) Has circuit breaker - Significant increase in the use of circuit breakers in intervention group from baseline. No difference in circuit breakers between intervention and control group I = 115/128, C = 120/131, OR 0.81 (0.35 to 1.88). Score comprising 28 home safety practices - Mean (SD) score I = 15.18 (2.62), C = 15.24 (2.17)
Notes	Blinding - n Outcomes 80% - y Balance - y

Risk of bias

Bias	Authors' judgement	Support for judgement
Allocation concealment (selection bias)	Unclear risk	Not applicable - non-randomised study

Phelan 2010

Methods	RCT
Participants	Pregnant women, aged 18 years and over, < 19 weeks gestation, attending pre-natal practices in Cincinnati, USA.
Interventions	I = home safety inspection, provision and fitting of free safety equipment when child is aged 3-6 months (stair gates, non-slip matting under rugs, window guards, repair of stair handrails, cupboard/drawer locks, door knob covers, storage bins, socket covers, smoke detectors, CO detectors, stove guards, stove locks) and safety advice handout. C = prior to child's birth family given targeted home repairs to control lead hazards (e.g. paint stabilization, water filters)
Outcomes	Outcomes measured at 12 and 24 months: Medically attended injuries (phone consultations, clinic or ED attendances) Modifiable medically attended injuries (phone consultations, clinic or ED attendances) Functional smoke alarm Safe storage of poisons Poison centre number accessible

Phelan 2010 *(Continued)*

	Use of baby walker Use of window locks Use of stair gate Non-slip bath mat Use of socket covers Sharp objects out of reach Small objects kept out of reach Possession of CO detector: At 12 months: I=118/139 C=64/138, OR 1.83 (1.22 to 2.74) At 24 months: I=89/120 C=56/119, OR 1.58 (1.01 to 2.45) Number and density of injury hazards. Not reported. Injury hazards were significantly reduced in intervention group but not in control group at 1 and 2 years (p<0.004).
Notes	Blinding - n Outcomes 80% - y Balance - n/a

Risk of bias

Bias	Authors' judgement	Support for judgement
Allocation concealment (selection bias)	Low risk	Adequate

Pless 2007

Methods	RCT
Participants	Parents attending 5 private paediatric practices
Interventions	I = product related posters pertaining to the dangers of venetian blinds and one to the risk of strangulation from clothing drawstrings C = no product related posters
Outcomes	Outcomes measured at 2 weeks: Taken recommended safety measures for clothing drawstrings. I=48/439 C=47/369, OR 0.84 (0.54 to 1.32) Taken recommended safety measures for blind cords. I=276/439 C=238/369, OR 0.93 (0.69 to 1.26) Not adjusted for clustering
Notes	Blinding - u Outcomes 80% - y

Pless 2007 *(Continued)*

	Balance - n/a

Risk of bias

Bias	Authors' judgement	Support for judgement
Allocation concealment (selection bias)	Unclear risk	Unclear

Ponce De Leon 2007

Methods	CBA (C)
Participants	Children aged 0-14 years living in 5 WHO Safe Communities (Lidkoping, Skovde, Tidaholm, Mariestad and Falkoping) and the remaining 10 municipalities in the same district (C_1) and the rest of Sweden (C_2)
Interventions	I = WHO Safe Communities injury prevention programme including multi-agency collaboration, safety education for parents from healthcare staff, training parents in child safety and first aid, exhibitions, posters, use of mass media C_1 = no community injury prevention programme C_2 = no community injury prevention programme
Outcomes	Outcomes measured over 16 years Medically attended injuries (hospital admissions) Significant reduction in hospital admission rate in one of the 5 intervention areas (Lidkoping). Significant increase in hospital admission rate in one of the 5 intervention areas (Skovde). No significant difference in other 3 intervention areas. Lidkoping: place*time interaction regression coefficient -0.562 (SE 0.097) p<0.01. Skovde: place*time interaction regression coefficient -0.249 (SE 0.067) p<0.01.
Notes	Blinding - u Outcomes 80% - y Balance - n Some intervention communities had higher injury rates at baseline than the rest of Sweden (C_2).

Risk of bias

Bias	Authors' judgement	Support for judgement
Allocation concealment (selection bias)	Unclear risk	Not applicable - non-randomised study

Posner 2004

Methods	RCT
Participants	Caregivers of children < 5 years attending ED for home injury

Posner 2004 *(Continued)*

Interventions	I = home safety counselling by trained lay personnel, home safety kit (cupboard and drawer locks, socket covers, bath tub spout covers, non-slip bath decals, bath water thermometer, poison control centre number stickers, free small parts tester) + home safety literature C = home safety literature
Outcomes	Outcomes measured over 10 weeks: Possession of smoke alarm Hot drinks/food out of reach Safe storage of medicines Safe storage of cleaning products Poison centre number accessible Plants not accessible Use of stair gate Use of baby walker Non-slip bath decals Never leaves child alone on high surface Use of socket covers Sharp objects stored out of reach Never left child alone in bath Time since last tested battery < 6 months Has a fire escape plan Use of water thermometer I = 43/49, C = 13/47, OR 18.74 (6.45 to 54.47) Has spout covers for bath taps I = 39/49, C = 18/47, OR 6.28 (2.53 to 15.61) Always uses fire guard for electric or kerosene space heater while sleeping I = 4/8, C = 2/3, OR 0.50 (0.03 to 7.99) Cooks on back burners of cooker I = 25/49, C = 16/47, OR 2.02 (0.89 to 4.60) Turns pan handles towards back of cooker I = 29/49, C = 23/47, OR 1.59 (0.71 to 3.59) Often heats kitchen by leaving oven door open I = 0/49, C = 0/47, OR Not calculable Never leaving burning candles in empty room I = 11/15, C = 17/23, OR 0.97 (0.22 to 4.24) No overloaded electrical sockets (>=3 items plugged into a socket) I = 23/48, C = 15/47, OR 1.96 (0.85 to 4.52) Never smoking in bed and method of disposing of ashes I = 6/9, C = 10/11, OR 0.20 (0.02 to 2.39) Never stores chemicals in drinks bottle I = 49/49, C = 46/47 OR not calculable Child exposed to lead paint I = 8/49, C = 2/47, OR 4.39 (0.88 to 21.88) Possession of CO detector I = 14/49, C = 11/47, OR 1.31 (0.52 to 3.27) Tested CO detector within 6 months I = 6/11, C = 9/11, OR 0.27 (0.04 to 1.85) Never places a carrier on a high surface I = 6/49 C = 6/47, OR 0.95 (0.28 to 3.20) Does not let child eat: Hot dogs I = 15/49, C = 14/47, OR 1.04 (0.43 to 2.49) Candy I = 25/49, C = 25/47, OR 0.92 (0.41 to 2.04) Carrots I = 31/49, C = 24/47, OR 1.65 (0.73 to 3.73) Nuts I = 38/49, C = 28/47, OR 2.34 (0.96 to 5.70) Grapes I = 11/49, C = 10/47, OR 1.07 (0.41 to 2.82) Uses small parts tester I = 27/49, C = 5/47, OR 10.31 (3.48 to 30.50) Eight category safety scores were calculated from responses to questions about safety practices. Fires (14 items) I = 81.7, C = 80.6, P < 0.61 Burns (12 items) I = 76, C = 68.4, P < 0.03 Poisoning (6 items) I = 74.4, C = 64.9, P < 0.02 Submersion (4 items) I = 95.9, C = 92.9, P < 0.33 Aspiration (6 items) I = 59.7, C = 52.7, P < 0.12 Cuts (6 items) I = 81.0, C = 66.4, P < 0.001 Falls (7 items) I = 58.9, C = 57.4, P < 0.79 Safety device use (9 items) I = 65.4, C = 44.3, P < 0.001

Posner 2004 *(Continued)*

Notes	Blinding - y Outcomes 80% - n Balance - n/a

Risk of bias

Bias	Authors' judgement	Support for judgement
Allocation concealment (selection bias)	Low risk	Adequate

Rey 1993

Methods	CBA (C) Allocation at level of towns
Participants	Population of two towns, Chambery (intervention) and Annecy (control)
Interventions	I = community injury prevention programme including safety education for children in schools, exhibitions, apartment demonstrating home hazards, school children presenting accident projects to members of the public, film show about safety and use of mass media C = no community injury prevention programme
Outcomes	Outcomes measured at 6 months: Medically attended injuries (physician attendance, clinic attendance, hospital attendance or admission). Significant reduction in domestic accidents requiring a medical consultation in intervention compared to control group, P < 0.02. No figures reported. Significant increase in accidents requiring urgent medical attention for children aged 6-10 years in intervention group comparing post to pre injury rates. No figures reported. No significant difference in hospitalisation rates between intervention and control groups. No figures or P value reported.
Notes	Blinding - u Outcomes 80% - y Balance - y

Risk of bias

Bias	Authors' judgement	Support for judgement
Allocation concealment (selection bias)	Unclear risk	Not applicable - non-randomised study

Rowland 2002

Methods	RCT
Participants	2145 households from a local authority housing estate
Interventions	I_1 = ionisation sensor with a zinc battery I_2 = ionisation sensor with a zinc battery and pause button I_3 = ionisation sensor with a lithium battery and pause button I_4 = optical sensor with a lithium battery

Rowland 2002 *(Continued)*

	I_5 = optical sensor with a zinc battery
Outcomes	Outcomes measured at 15 months: Functional smoke alarm - I_1 = 86/141, I_2 = 56/116, I_3 = 44/63, I_4 = 24/79, I_5 = 40/57
Notes	Blinding - n Outcomes 80% - y Balance - n/a

Risk of bias

Bias	Authors' judgement	Support for judgement
Allocation concealment (selection bias)	Low risk	Adequate

Sangvai 2007

Methods	RCT
Participants	Parents of children aged 0-5 years enrolled at 3 paediatric practices
Interventions	I = safety counselling from physician and researcher, free safety equipment (smoke detectors, gun locks, cabinet locks, and water temperature cards) and brief educational handout for parents. C = usual care
Outcomes	Outcomes measured at 6 months: Functional smoke alarm Safe hot water temperature Safe storage of poisons
Notes	Blinding - y Outcomes 80% - y for injury outcomes, n for safety practices Balance - n/a

Risk of bias

Bias	Authors' judgement	Support for judgement
Allocation concealment (selection bias)	Low risk	Adequate

Schelp 1987

Methods	CBA (C) Allocated at level of municipality
Participants	Population of two municipal districts, Falkoping (intervention) and Lidkoping (control)

Schelp 1987 *(Continued)*

Interventions	I = community injury prevention programme including multi-agency collaboration, use of mass media, exhibitions at child health centres, demonstrations of safety equipment, use of checklists in child health surveillance visits, increased local availability of child safety equipment, parent education C = no community injury prevention programme
Outcomes	Outcomes measured at 12 months: Medically attended injuries (clinic attendance, hospital attendance) occurring at home - incidence I = 48.6/1000 pre, 32.2/1000 post intervention, P < 0.001. Figures not presented for control area
Notes	Blinding - u Outcomes 80% - y Balance - n Control municipality had higher injury rates at baseline

Risk of bias

Bias	Authors' judgement	Support for judgement
Allocation concealment (selection bias)	Unclear risk	Not applicable - non-randomised study

Scherz 1968

Methods	CBA (C) Allocation at level of geographic area covering Army Post Exchanges
Participants	Families of army personnel
Interventions	I = free child resistant container attached to boxes of children's aspirin, sold at Post Exchanges C = children's aspirin sold at other sites without CRC attached
Outcomes	Outcomes measured over 6 months: Medically attended aspirin poisoning - proportion of all poisonings due to aspirin in intervention area pre = 27/38, post = 5/22. No P value reported.
Notes	Blinding - u Outcomes 80% - u Balance - u

Risk of bias

Bias	Authors' judgement	Support for judgement
Allocation concealment (selection bias)	Unclear risk	Not applicable - non-randomised study

Schlesinger 1966

Methods	CBA (C) Allocated at level of housing developments with 10 or more homes
Participants	Population of children aged < 7 years, in housing developments

Schlesinger 1966 *(Continued)*

Interventions	I = community injury prevention programme including neighbourhood discussion groups, monthly newsletter to families, speakers at group and club meetings, distribution of safety literature C = no community injury prevention
Outcomes	Outcomes measured over 24 months: Medically attended injuries (physician attendance, dentist attendance, hospital attendance) - No significant difference in the rate of accidents in the intervention and control groups. No figures or P values reported.
Notes	Blinding - u Outcomes 80% - y Balance - n Intervention areas had higher injury rates at baseline than control areas

Risk of bias

Bias	Authors' judgement	Support for judgement
Allocation concealment (selection bias)	Unclear risk	Not applicable - non-randomised study

Schwarz 1993

Methods	CBA (C) Allocation at census tract level
Participants	Population of 9 census tracts, predominantly low income, urban, African-American
Interventions	I = home inspection and modification + education in homes and at block and community meetings. Provision of ipecac, smoke alarms and batteries, bath water thermometers, night lights, emergency centre number sticker and fridge sticker with information on preventing injury C = none of above
Outcomes	Outcomes measured over 12 months: Fire-related injuries/1000 - I - Before: 1.83, During: 1.14, After: 0.86. Incidence change (after vs before): 0.5 (0.4 to 0.6) C - Before: 1.34, During: 2.68, After: 1.11. Incidence change (after vs before): 0.8 (0.6 to 1.1) Functional smoke alarms - I = 866/902, C = 816/1060, OR 7.19 (4.98 to 10.64) Possession of ipecac Safe storage of medicines Medicines not in CRCs - I = 66/250, C = 41/250, OR 1.83 (1.81 to 2.83) analyses not adjusted for clustering
Notes	Blinding - n Outcomes 80% - n Balance - y

Risk of bias

Bias	Authors' judgement	Support for judgement

Schwarz 1993 *(Continued)*

Allocation concealment (selection bias)	Unclear risk	Not applicable - non-randomised study

Schwebel 2009

Methods	RCT
Participants	Female heads of households in 2 low income housing districts
Interventions	I=kerosene safety intervention using a “train the trainers” model where trainers train local paraprofessionals to deliver education to communities, plus educational materials for paraprofessionals to distribute in communities on safe use of kerosene and kerosene powered appliances and treatment of kerosene related injuries. C=usual care
Outcomes	Outcomes measured at 4 weeks: Paraffin appliances on flat surfaces. I=92/95 C=102/108; OR 1.80 (0.44 to 7.42) Paraffin appliances on steady surfaces. I=89/96 C=99/107; OR 1.03 (0.36 to 2.95) Paraffin appliances on surfaces without tablecloths. I=24/95 C=31/108; OR 0.84 (0.45 to 1.57) Paraffin appliances out of reach. I=28/96 C=33/108; OR 0.94 (0.51 to 1.71) Flammable materials at least 1 metre away from all paraffin appliances. I=2/96 C=7/108; OR 0.31 (0.06 to 1.52) Dry sand available to extinguish flames. I=0/98 C=0/109; OR not calculable. Paraffin stored out of reach. I=16/92 C=32/109; OR 0.51 (0.26 to 1.00) Paraffin stored away from food. I=85/92 C=89/109; OR 2.73 (1.10 to 6.78) Paraffin stored in vessel marked “paraffin”. I=2/92 C=2/109; OR 1.19 (0.16 to 8.61) Paraffin stored in beverage container. I=68/92 C=103/109; OR 0.17 (0.06 to 0.42) Paraffin stored in vessel with CRC. I=0/92 C=3/109; OR not calculable Paraffin stored in covered container. I=55/92 C=95/109; OR 1.80 (0.44 to 7.42) Mean kerosene safety practices score (SD) score Baseline I=0.38 (0.09) C=0.41 (0.10) Follow-up I=0.49 (0.17) C=0.46 (0.13) Mean change from baseline I=0.10 (0.18) C=0.05 (0.16) p<0.05 Analyses not adjusted for clustering
Notes	Blinding - u Outcomes 80% - y Balance - n/a

Risk of bias

Schwebel 2009 *(Continued)*

Bias	Authors' judgement	Support for judgement
Allocation concealment (selection bias)	Unclear risk	Unclear

Shani 2003

Methods	RCT (C) Allocation at level of school classes
Participants	Bedouin schoolchildren aged 12-13 years
Interventions	I_1= school safety slide show on burn prevention I_2= school safety video show on burn prevention I_3= school safety slide and video show on burn prevention
Outcomes	Outcomes measured over 2 months: Burn related safety behaviour mean (SD) scores: I_1 = 3.56 (0.56), I_2 = 3.58 (0.51), I_3 = 3.45 (0.76) P > 0.05
Notes	Blinding - n Outcomes 80% - u Balance - n/a

Risk of bias

Bias	Authors' judgement	Support for judgement
Allocation concealment (selection bias)	Unclear risk	Unclear

Shapiro 1987

Methods	RCT
Participants	Women admitted to the maternity ward of 3 hospitals
Interventions	I = pamphlet about tap water scalds and thermometer for testing, plus a one minute educational message summarising pamphlet C = pamphlet and thermometer
Outcomes	Outcomes measured between 2 and 9 months: Tested hot water temperature I = 155/302 C = 88/302, OR 2.56 (1.83 to 3.59) Lowered hot water temperature Figures and P value not reported
Notes	Blinding - u Outcomes 80% - y Balance - n/a

Risk of bias

Bias	Authors' judgement	Support for judgement

Shapiro 1987 *(Continued)*

Allocation concealment (selection bias)	Unclear risk	Unclear

Steele 1985a

Methods	CBA (C) Allocated at level of cities
Participants	Populations of Escondido (intervention) and Chula Vista (control), California
Interventions	I = community poison prevention programme including mass media, training of healthcare personnel to provide poison prevention education to clients, safety fairs C = no community poison prevention programme
Outcomes	Outcomes measured over 12 months: Medically attended poisonings - no significant difference in post versus pre injury rates in intervention or control communities. Poison centre utilisation Possession of ipecac - no significant difference in poison centre utilisation or in possession of ipecac. No figures or P value reported.
Notes	Blinding - u Outcomes 80% - u Balance - u Unclear how intervention city chosen

Risk of bias

Bias	**Authors' judgement**	**Support for judgement**
Allocation concealment (selection bias)	Unclear risk	Not applicable - non-randomised study

Steele 1985b

Methods	RCT
Participants	Parents of children aged 6 months to 4 years attending well baby clinics, aged >= 18 years, English speaking with a telephone available
Interventions	I_1 = one-to-one poisoning education, with reinforcement by physician I_2 = I_1 + burns education I_3 = one-to-one burns education, with reinforcement by physician C = no education
Outcomes	Outcomes measured at 3, 6 and 12 months: Self reported poisoning - no significant differences for poison injury rates Poisoning prevention behaviours Poison centre utilisation - Intervention groups exhibited significantly more hazard reducing behaviour. No figures or P values reported

Steele 1985b *(Continued)*

Notes	Blinding - u Outcomes 80% - u Balance - n/a

Risk of bias

Bias	Authors' judgement	Support for judgement
Allocation concealment (selection bias)	Unclear risk	Unclear

Svanstrom 1995

Methods	CBA (C) Allocated at level of municipalities
Participants	Population of 5 municipalities; Lidkoping (intervention), 4 bordering municipalities (control)
Interventions	I = community injury prevention programme including multi-agency collaboration, safety education for parents from healthcare staff, training parents in child safety and first aid, exhibitions, posters, use of mass media C = no community injury prevention
Outcomes	Outcomes measured over 7 years: Medically attended injuries (hospital admissions)
Notes	Blinding - u Outcomes 80% - y Balance - n Intervention municipality had higher injury rates at baseline than control municipalities.

Risk of bias

Bias	Authors' judgement	Support for judgement
Allocation concealment (selection bias)	Unclear risk	Not applicable - non-randomised study

Swart 2008

Methods	RCT (C) Allocation at level of blocks of households
Participants	Households with children <= 10 years old living in low-income communities
Interventions	I = 4 home visits focusing on child development and the prevention of burns, poisoning and falls and providing safety education + free safety devices (child proof locks and paraffin container safety caps). C = usual care
Outcomes	Outcomes measured at 2 weeks: Paraffin stove used as heater. I = 28/189 C = 21/188; OR 1.65 (0.46 to 5.84)

Swart 2008 *(Continued)*

Paraffin stove filled whilst warm. I = 19/189 C = 18/188; OR 1.13 (0.44 to 2.89)

Paraffin heater < 30cm from flammable material. I = 8/189 C = 4/188; OR 2.02 (0.60 to 6.83)

Paraffin heater on unstable surface. I = 0/189 C = 2/188; OR not calculable

Paraffin cooker < 30cm from flammable material. I = 39/189 C = 22/188; OR 2.39 (0.53 to 10.82)

Paraffin cooker on unstable surface. I = 7/189 C = 5/188; OR 1.40 (0.44 to 4.49)

Paraffin lamp < 30cm from flammable material. I = 12/189 C = 17/188; OR 0.60 (0.13 to 2.82)

Paraffin lamp on unstable surface. I = 31/189 C = 45/188; OR 0.53 (0.19 to 1.45)

Paraffin appliances on when family sleeping. I = 79/189 C = 69/188; OR 2.03 (0.57 to 7.26)

Candles placed on unstable surface. I = 18/189 C = 12/188; OR 1.68 (0.38 to 7.51)

Candles used < 30cm from flammable material. I = 27/189 C = 45/188; OR 0.53 (0.08 to 3.50)

Tablecloth under candle, paraffin heater, stove or lamp. I = 34/189 C = 49/188, OR 0.75 (0.17 to 3.20)

Beauty products properly labelled in tightly closed non-glass containers. I = 185/189 C = 185/188; OR 0.75 (0.17 to 3.42)

Safe storage of beauty products. I = 172/189 C = 157/188; OR 2.13 (1.00 to 4.53)

Medicines properly labelled in tightly closed non-glass containers. I = 186/189 C = 187/188; OR 0.33 (0.03 to 3.23)

Safe storage of medicines.

Paraffin properly labelled in tightly closed non-glass containers. I = 173/189 C = 146/188; OR 5.02 (1.26 to 19.98)

Safe storage of paraffin. I = 123/189 C = 114/188; OR 1.47 (0.51 to 4.25)

Paraffin stored in CRC. I = 162/189 C = 128/188; OR 3.39 (1.28 to 9.02)

Cleaning products properly labelled in tightly closed non-glass containers. I = 184/189 C = 176/188; OR 6.04 (0.44 to 83.02)

Safe storage of cleaning products.

Cleaners stored on same shelf as food. I = 5/189 C = 5/188; OR 0.84 (0.17 to 4.14)

Alcohol properly labelled in tightly closed non-glass containers. I = 186/189 C = 185/188; OR 1.01 (0.20 to 5.07)

Safe storage of alcohol. I = 183/189 C = 178/188; OR 1.76 (0.48 to 6.50)

Rat poison properly labelled in tightly closed non-glass containers. I = 187/189 C = 186/188; OR 1.01 (0.14 to 7.25)

Safe storage of rat poison. I = 189/189 C = 185/188; OR not calculable.

90 item home safety checklist: Mean (SE) score, Mean difference:

Total safety score. I = 13.9 (0.53) C = 14.2 (0.54), -0.31 (-1.8 to 1.2)

Electrical burns score. I = 1.1 (0.14) C = 1.3 (0.14), -0.19 (-0.54 to 0.16)

Paraffin burns score. I = 3.2 (0.21) C = 3.2 (0.21), -0.03 (-0.64 to 0.57)

Burns safety practices score. I = 2.5 (0.12) C = 2.9 (0.12), -0.41 (-0.76 to -0.07)

Poisoning score. I = 1.9 (0.11) C = 2.4 (0.20), -0.45 (-1.01 to 0.11)

Swart 2008 *(Continued)*

	Falls score. I = 3.7 (0.24) C = 3.6 (0.24), 0.09 (-0.60 to 0.78)
Notes	Blinding - y Outcomes 80% - y Balance - n/a

Risk of bias

Bias	Authors' judgement	Support for judgement
Allocation concealment (selection bias)	Unclear risk	Unclear

Sznajder 2003

Methods	RCT
Participants	Socio-economically disadvantaged families, with medical or psychological difficulties which place them at high risk
Interventions	I = home safety counselling by health professionals, safety leaflets, free home safety kit (cupboard and drawer locks, door handle covers, furniture corner protectors, socket covers, non-slip bath mat, fitted smoke alarm, poison control centre number stickers) C = home safety counselling + safety leaflets
Outcomes	Outcomes measured over 2 months: Functional smoke alarm Possession of a fire extinguisher Stores matches out of reach Safe storage of medicines Safe storage of cleaning products No toxic plants in the home Use of stair gate Use of a baby walker Use of non-slip bath mats Use of socket covers Small objects kept out of reach Hot water system has adjustable thermostat I = 5/47, C = 5/50; OR 1.07 (0.29 to 3.97) High chair safe I = 28/47, C = 34/50; OR 0.69 (0.30 to 1.59) Risk of falling from a window or balcony I = 9/46, C = 17/49; OR 0.46 (0.18 to 1.17) Cables/leads lying around likely to cause falls I = 6/46 C = 12/48; OR 0.45 (0.15 to 1.32) Carpets fixed safely I = 7/48 C = 6/50; OR 1.25 (0.39 to 4.04) Use of furniture corner covers I = 30/35, C = 20/34; OR 4.20 (1.31 to 13.50) Food items that can cause choking out of reach I = 45/50; C = 45/50, OR 2.50 (0.46 to 13.56) Cords and chains for blinds out of reach I = 6/25, C = 11/31; OR 0.57 (0.18 to 1.86)
Notes	Blinding - n Outcomes 80% - y Balance - n/a

Risk of bias

Bias	Authors' judgement	Support for judgement

Sznajder 2003 *(Continued)*

Allocation concealment (selection bias)	Low risk	Adequate

Tan 2004

Methods	Non-randomised controlled trial (C) Allocation at level of week of clinic attendance and sequential allocation to treatment arm
Participants	Caregivers and infants aged 4-5 months attending three health clinics
Interventions	I = structured nurse counselling + leaflets aimed at discouraging walker use C_1 = no nurse counselling C_2 = no nurse counselling and no baseline data collection
Outcomes	Outcomes measured when child 9 months of age: Self reported walker injuries: Toppling over on flat ground I = 12/228, C_1+ C_2 = 19/480; OR 1.35 (0.64 to 2.83) From falling down steps I = 2/228, C_1+ C_2 = 6/480; OR 0.70 (0.14 to 3.49) Hospitalised due to walker injury I = 0/228; C_1+ C_2= 1/480, OR not calculable Use of baby walker
Notes	C_1 and C_2 arms combined for meta-analyses Blinding - u Outcomes 80% - y Balance - y

Risk of bias

Bias	Authors' judgement	Support for judgement
Allocation concealment (selection bias)	Unclear risk	Not applicable - non-randomised study

Thomas 1984

Methods	RCT
Participants	Parents attending well-baby classes
Interventions	I = standard information and literature plus a lecture on burn prevention provided by nurse practitioners, leaflets on protecting home against fire, adjusting hot water settings and cost of smoke alarms at local stores, plus $7 discount coupon for a smoke alarm. C = standard information and literature
Outcomes	Outcomes measured at 6 weeks: Safe hot water temperature Functional smoke alarm I = 28/29 C = not reported P > 0.05
Notes	Blinding - u Outcomes 80% - y

Thomas 1984 *(Continued)*

	Balance - n/a

Risk of bias

Bias	Authors' judgement	Support for judgement
Allocation concealment (selection bias)	High risk	Inadequate

Vineis 1994

Methods	Non-randomised controlled trial (C) Allocation at level of 2-3 week periods of clinic attendance and sequential allocation to treatment group
Participants	Parents of newborn babies
Interventions	I = 15 minutes counselling by nurse + distribution of 3 educational booklets - 1 on prevention of home injuries in childhood, 1 on smoking and one on passive smoking C = none of the above
Outcomes	Outcomes measured over 2 and 4 years: Risk of burns - no significant difference in preventive behaviours. No P values reported. Scores of risk of poisoning by (a) cleaning products and (b) medicines - no significant difference in preventive behaviours. No P values reported. Scores of risk of falls - no significant difference in preventive behaviours. No P values reported. Scores of risk of electric shock - no significant difference in preventive behaviours. No P values reported. Risk of home injury score comprising behaviours relating to burns, poisonings, falls and electrical injury - reports change from baseline in risk scores, but baseline scores not presented. No significant difference in risk scores between groups. No P values reported.
Notes	Blinding - n Outcomes 80% - n Balance - u

Risk of bias

Bias	Authors' judgement	Support for judgement
Allocation concealment (selection bias)	Unclear risk	Not applicable - non-randomised study

Waller 1993

Methods	RCT
Participants	A random sample of Dunedin area children taken from birth records
Interventions	I = free plumbing advice, home visit to measure tap water temperature, discuss dangers of hot water in the home and how to reduce tap water temperature provided by nurses C_1 = no home visit

Waller 1993 *(Continued)*

	C_2 = no home visit and no baseline data collection
Outcomes	Outcomes measured at 4 months: Safe hot water temperature < 60 degrees Celsius
Notes	C_1 and C_2 arms combined for meta-analyses Blinding - u Outcomes 80% - y Balance - n/a

Risk of bias

Bias	Authors' judgement	Support for judgement
Allocation concealment (selection bias)	Unclear risk	Unclear

Watson 2005

Methods	RCT
Participants	Families with children < 5 years on caseloads of health visitors in deprived areas
Interventions	I = health visitor safety consultation, free fitted safety equipment (stair gates, fire guards, cupboard and drawer locks, smoke alarms, window locks) C = usual care
Outcomes	Outcomes measured at 12 and 24 months: Medically attended thermal injuries Medically attended poisonings Medically attended injuries (primary care attendance, ED attendance, hospital admission or death) Functional smoke alarms Fitted fire guard Safe storage of medicines Safe storage of cleaning products Use of stair gate Use of window locks Sharp objects stored out of reach
Notes	Blinding - y(injuries) n(safety practices) Outcomes 80% - y(injuries) n(safety practices) Balance - n/a

Risk of bias

Bias	Authors' judgement	Support for judgement
Allocation concealment (selection bias)	Low risk	Adequate

Williams 1988

Methods	RCT (C) Allocation at level of prenatal classes
Participants	Pregnant women attending prenatal classes
Interventions	I = 1 hour lecture, handouts on burn prevention, usual safety education. C = usual safety education.
Outcomes	Outcomes measured at 1 month: Safe hot water temperature (not defined) Possession of smoke alarm Functional smoke alarm - no significant difference in alarm ownership between groups. Figures and P values not reported
Notes	Blinding - n Outcomes 80% - u Balance - n/a

Risk of bias

Bias	Authors' judgement	Support for judgement
Allocation concealment (selection bias)	Unclear risk	Unclear

Wissow 1989

Methods	RCT
Participants	Families with children < 6 years attending paediatric ED or clinic following injury
Interventions	I = home hazard inspection + education + free safety equipment provided at home C = free safety equipment provided at hospital
Outcomes	Period over which outcomes measured not reported. Possession of a fire extinguisher - no figures or P value reported Fire escape plan - no figures or P value reported Possession of ipecac - significantly more control group families had ipecac, P = 0.009. Poison centre number accessible - no figures or P value reported Testing for lead poisoning - no figures or P values reported Peeling paint - no figures or P values reported Possession of bathmat slip guard - no figures or P value reported Use of stair gates - no P values reported Use of socket covers - no figures or P values reported Sharp objects stored out of reach - no figures or P values reported Mean number of hazards present calculated based on a 50 item home hazard inventory - No significant difference in the mean number of hazards, P >0.05 No figures reported
Notes	Blinding - y Outcomes 80% - n Balance - n/a

Wissow 1989 *(Continued)*

Risk of bias

Bias	Authors' judgement	Support for judgement
Allocation concealment (selection bias)	Unclear risk	Unclear

Woolf 1987

Methods	RCT (C) Allocated at level of week of clinic visit
Participants	Families attending medical ED with children < 5 years Urban poor population
Interventions	I = counselling by medical staff on poisoning treatment methods, leaflet on poison prevention, poison control centre number sticker + ipecac C_1 = none of the above C_2 = none of the above and no baseline data collection
Outcomes	Outcomes measured over 6 months: Possession of ipecac Poison centre number accessible Storage of cleaning products, medicines, perfume - no figures or P values reported
Notes	C_1 and C_2 arms combined for meta-analyses Blinding - y Outcomes 80% - n Balance - n/a

Risk of bias

Bias	Authors' judgement	Support for judgement
Allocation concealment (selection bias)	Unclear risk	Unclear

Woolf 1992

Methods	RCT (C) Allocated at level of day of recruitment
Participants	Families of children less than or equal to 5 years with a poisoning who contacted the poison control centre and did not have ipecac
Interventions	I = mailed $1 coupon for ipecac, one cupboard lock, checklist for poison proofing the home, leaflets C = none of the above
Outcomes	Outcomes measured over 3 months: Self reported repeat poisoning - no significant difference. No figures or P value reported

Woolf 1992 *(Continued)*

	Possession of ipecac Poison centre number accessible Safe storage of cleaning products
Notes	Blinding - y Outcomes 80% - y Balance - n/a

Risk of bias

Bias	Authors' judgement	Support for judgement
Allocation concealment (selection bias)	Unclear risk	Unclear

Yang 2008

Methods	RCT
Participants	Rural households participating in a cohort study examining multiple health outcomes
Interventions	I_1 = installation of photoelectric smoke alarm with lithium battery I_2 = installation of photoelectric smoke alarm with carbon-zinc battery I_3 = installation of ionizing smoke alarm with lithium battery I_4 = installation of ionizing smoke alarm with carbon-zinc battery
Outcomes	Outcomes measured at 12 months: Number of photoelectric vs. ionising alarms: I_1+ 1_2=952/1018 I_3+ I_4=889/973; OR 1.30 (0.88 to 1.92) Number of alarms with lithium vs. carbon-zinc battery: I_1+ I_3=975/1030 I_2+ I_4=866/961; OR 1.91 (1.30 to 2.82) Number of false alarms photoelectric vs. ionising alarms: I_1+ 1_2=55/1018 I_3+ I_4=120/973; OR 0.41 (0.29 to 0.56) Number of false alarms with lithium vs. carbon-zinc battery: I_1+ I_3=91/1030 I_2+ I_4=84/961; OR 1.05 (0.78 to 1.42)
Notes	Blinding - n Outcomes 80% - y Balance - n/a

Risk of bias

Bias	Authors' judgement	Support for judgement
Allocation concealment (selection bias)	Unclear risk	Unclear

Yorkston 2007

Methods	CBA (C)
Participants	Children aged 0-4 years living in 2 intervention and 16 control communities
Interventions	I = WHO Safe Communities injury prevention programme C = no community injury prevention programme
Outcomes	Outcomes measured over 7 years which included 2 years post commencement of intervention: Medically attended injuries (hospital admissions) No significant reduction in logarithmically transformed injury rates. Reduction in logarithmically transformed injury rates of 0.09 per 10,000 children aged 0-4 years associated with intervention (95% CI -0.29 to 0.11) p=0.36. Adjusted for remoteness of area, marital status, indigenous population.
Notes	Blinding - u Outcomes 80% - y Balance - no Intervention communities had higher baseline injury rates than control communities

Risk of bias

Bias	Authors' judgement	Support for judgement
Allocation concealment (selection bias)	Unclear risk	Not applicable - non-randomised study

Ytterstad 1998

Methods	CBA (C) Allocated at level of cities
Participants	Children < 5 years in the city of Harstad (intervention) and Trondheim (control)
Interventions	I = promotion of cooker guards in electrical stores, mass media campaign to lower tap water thermostat to 55 degrees Celsius, health education, parental counselling and home assessment. C = none of the above
Outcomes	Outcomes measured over 10 years: Medically attended thermal injuries Thermal injury severity and mechanism - severity of stove and tap water scalds reduced in intervention area but figures only reported for intervention area. No P values reported.
Notes	Blinding - u Outcomes 80% - y Balance - n Control city had higher injury rates and educational level than intervention city at baseline

Risk of bias

Ytterstad 1998 *(Continued)*

Bias	Authors' judgement	Support for judgement
Allocation concealment (selection bias)	Unclear risk	Not applicable - non-randomised study

Zhang 2003

Methods	CBA (C) Allocation at level of counties
Participants	Children aged 0-4 years from 12 townships from 6 counties; 6 intervention and 6 control townships
Interventions	I = health education comprising booklet containing methods of preventing suffocation and drowning, education by paediatricians to prevent suffocation and teaching sessions on vaccination day C = usual care
Outcomes	Outcomes measured over 12 months: Mortality from suffocation I = 1/1414, C = 4/1447, OR 0.26 (0.03 to 2.30) Parents not swaddling babies - no figures or P values reported Mortality from drowning I = 3/8293 C = 5/7653, P > 0.05, OR 0.55 (0.13 to 2.32) Use of fencing round pools - No figures or P values reported
Notes	Blinding - n Outcomes 80% - n Balance - n Intervention areas had higher baseline injury rates than control areas

Risk of bias

Bias	Authors' judgement	Support for judgement
Allocation concealment (selection bias)	Unclear risk	Not applicable - non-randomised study

Zhao 2005

Methods	RCT
Participants	Children aged 7-13 years attending 4 primary schools
Interventions	I = safety education provided to parents and children C = usual care
Outcomes	Outcomes measured at 1 and 2 years: Self reported injuries (unclear if children reported multiple injuries) Self reported all injuries combined 1 year after intervention I=262/3172 C=234/2699; not significant (p value not given) Self reported all injuries combined 2 years after intervention I=211/3226 C=229/2654, χ^2 =9.26, p<0.01 Self reported falls 1 year after intervention I=90/3172 C=67/2699; not significant (p value not given)

Zhao 2005 *(Continued)*

	Self reported falls 2 years after intervention I=64/3226 C=75/2654, p<0.05 Self reported scalds/burns 1 year after intervention I=28/3172 C=25/2699; not significant (p value not given) Self reported scalds/burns 2 years after intervention I=10/3226 C=18/2654, p<0.05 Self reported poisoning 1 year after intervention I=6/3172 C=8/2669; not significant (p value not given) Self reported poisoning 2 years after intervention I=4/3226 C=11/2654, p<0.05 Self reported electrical injury 1 year after intervention I=11/3172 C=10/2699; not significant (p value not given) Self reported electrical injury 2 years after intervention I=2/3226 C=6/2654; not significant (p value not given) Self reported inhalation injury 1 year after intervention I=10/3172 C=9/2699; not significant (p value not given) Self reported inhalation injury 2 years after intervention I=8/3226 C=5/2654; not significant (p value not given) Self reported cuts 1 year after intervention I=12/3172 C=11/2699; not significant (p value not given) Self reported cuts 2 years after intervention I=20/3226 C=9/2654; not significant (p value not given) Self reported other injuries 1 year after intervention I=1/3172 C=6/2699; not significant (p value not given) Self reported other injuries 2 years after intervention I=5/3226 C=6/2654; not significant (p value not given)
Notes	Blinding - u Outcomes 80% - y Balance - n/a

Risk of bias

Bias	Authors' judgement	Support for judgement
Allocation concealment (selection bias)	Unclear risk	Unclear

(C) = clustered allocation
Numerators and denominators only presented for outcomes not included in meta analyses.
Blinding: y = yes, n = no, u = unclear
Outcomes measured on 80% (Outcomes 80%) of participants in each arm: y = yes, n = no, u = unclear
Treatment arms balanced for confounding (Balance): y = yes, n = no, u = unclear, n/a = not applicable

Characteristics of excluded studies *[ordered by study ID]*

Study	Reason for exclusion
Abdelilah 1991	Does not report study design of interest
Adesso 1974	Does not report outcome of interest
Adler-Grinberg 1985	Does not report outcome of interest

Study	Reason for exclusion
Alaii 2003	Does not report outcome of interest
Alpert 1966	Does not report study design of interest
Altundag 2007	Does not report study design of interest
Anonymous 1994	Does not report study design of interest
Armstrong 2000	Does not report intervention of interest
Aronson 1980	Does not report study design of interest
Asher 1995	Does not report outcome of interest
Atkins 2004	Does not report outcome of interest
Bablouzian 1997	Does not report study design of interest
Barnes-Boyd 1995	Does not report study design of interest
Barone 1986	Does not report study design of interest
Bass 1985	Does not report study design of interest
Baudier 1996	Does not report study design of interest
Beirens 2008	Does not report study design of interest
Belanger-Bonneau 2002	Does not report study design of interest
Bernard-Bonnin 2003	Does not report study design of interest
Bjerre 1997	Does not report participants of interest
Bjerre 1998a	Does not report participants of interest
Bjerre 1998b	Does not report participants of interest
Bjerre 2000	Does not report participants of interest
Bouter 1989	Trial did not take place
Braden 1979	Does not report outcome of interest
Cagle 2006	Does not report study design of interest
Cardenas 1993	Does not report outcome of interest
Carmel 1991	Does not report outcome of interest
Chapman 2000	Does not report outcome of interest
Charney 1983	Does not report intervention of interest
Chen 2003	Does not report study design of interest

Study	Reason for exclusion
Chevallier 1999	Does not report study design of interest
Chung 2004	Does not report outcome of interest
Cooper 1988	Does not report study design of interest
CPSC (USA) 2004	Does not report study design of interest
Davidson 1994	Does not report outcome of interest
Day 2001	Does not report study design of interest
Dershewitz 1984	Does not report study design of interest
Dickson 1964	Does not report study design of interest
DiGuiseppi 1999	Does not report study design of interest
DiLillo 2001	Does not report outcome of interest
Duckart 1998	Does not report study design of interest
Duff 2002	Does not report study design of interest
Dugdill 1991	Does not report study design of interest
Duggan 1999	Does not report intervention of interest
Duncan 1996	Does not report outcome of interest
Duperrex 1999	Does not report study design of interest
Eaton-Jones 2000	Does not report study design of interest
Eckelt 1985	Does not report study design of interest
Ekman 1996	Does not report study design of interest
Facchin 2004	Does not report study design of interest
Fallat 1993	Does not report study design of interest
Farmakakis 2004	Does not report study design of interest
Fergusson 2005	Does not report outcome of interest
Fisher 1985	Does not report study design of interest
Frank 1992	Does not report outcome of interest
Frankenfield 1991	Does not report study design of interest
Frederick 2000	Does not report outcome of interest
Gaffney 1996b	Does not report outcome of interest

Study	Reason for exclusion
Gallagher 1984	Does not report study design of interest
Gallagher 1985	Does not report study design of interest
Gatheridge 2004	Does not report outcome of interest
Geddis 1989	Does not report study design of interest
Gielen 1996	Does not report outcome of interest
Gielen 2001	Does not report participants of interest
Ginnelly 2005	Does not report study design of interest
Glotzer 1997	Does not report study design of interest
Grant 1992	Does not report outcome of interest
Grant 2004	Does not report study design of interest
Gray 1979	Does not report intervention of interest
Gresham 2001	Does not report outcome of interest
Gross 1990	Does not report intervention of interest
Grossman 2000	Does not report outcome of interest
Guldvog 1993	Trial did not take place
Gutelius 1977	Does not report intervention of interest
Guyer 2000	Does not report intervention of interest
Hall 1985	Does not report study design of interest
Hall 1994	Does not report study design of interest
Hardy 1989	Does not report intervention of interest
Hardy 1996	Does not report outcome of interest
Hardy 2002	Does not report outcome of interest
Harre 1998a	Does not report study design of interest
Harre 1998b	Does not report study design of interest
Harre 2000	Does not report study design of interest
Hemmo-Lotem 2005a	Does not report study design of interest
Hemmo-Lotem 2005b	Does not report study design of interest
Himle 2004	Does not report outcome of interest

Study	Reason for exclusion
HIPRC 2004	Does not report study design of interest
Huxley 1993	Does not report intervention of interest
Jackson 1980	Does not report study design of interest
Jackson 1983	Does not report study design of interest
Johnson 1993	Does not report intervention of interest
Johnson 2000	Does not report intervention of interest
Johnston 2002	Does not report outcome of interest
Jones 2001	Does not report study design of interest
Jordan 1993	Does not report study design of interest
Jordan 2003	Does not report intervention of interest
Kaplan 1999	Does not report study design of interest
Katcher 1987	Does not report study design of interest
Kendrick 2009	Does not report study design of interest
Ketvertis 2003	Does not report study design of interest
King 1999	Does not report study design of interest
Kitzman 1997	Does not report intervention of interest
Klassen 1995	Does not report study design of interest
Koniak-Griffin 2003	Does not report intervention of interest
Korn 2009	Does not report study design of interest
Kravitz 1973	Does not report study design of interest
Krenzelok 1981	Does not report study design of interest
Kuhn 1994	Does not report study design of interest
Lagerberg 2000	Does not report study design of interest
Lamb 2006	Does not report outcome of interest
Lane 1971	Does not report participants of interest
Lanphear 1999	Does not report intervention of interest
Larcher 1987	Does not report study design of interest
Larson 1980	Does not report intervention of interest

Study	Reason for exclusion
Lealman 1983	Does not report study design of interest
Lechman 1991	Does not report outcome of interest
Leduc 1999	Does not report study design of interest
Lee 2002	Could not obtain reference
Lenton	Does not report study design of interest
Lenton 2000	Trial did not take place
Liller 1998	Does not report study design of interest
Liller 2003	Does not report outcome of interest
Linares 1979	Does not report study design of interest
Lindqvist 1998b	Does not report study design of interest
Loescher 1995	Does not report outcome of interest
Lowe 1999	Does not report outcome of interest
Luria 2000	Does not report outcome of interest
Mackenzie 2004	Does not report study design of interest
Malouin 2003	Does not report outcome of interest
Margolis 2001	Does not report study design of interest
Marion 2004	Does not report outcome of interest
McConnell 1996a	Does not report study design of interest
McConnell 1996b	Does not report outcome of interest
McWhirter 2000	Does not report outcome of interest
Melhuish 2008	Does not report outcome of interest
MET 1986	Does not report outcome of interest
Milliner 1980	Does not report study design of interest
Milne 1999	Does not report outcome of interest
Milne 2000	Does not report outcome of interest
Milne 2002	Does not report outcome of interest
Minchom 1984	Does not report study design of interest
Minkovitz 2001	Does not report intervention of interest

Study	Reason for exclusion
Minkovitz 2003	Does not report intervention of interest
Mondozzi 2001	Does not report outcome of interest
Moore 2004	Does not report study design of interest
Mori 1986	Does not report outcome of interest
Morrison 1988	Does not report study design of interest
Morrongiello 1998	Does not report outcome of interest
Naidoo 1984	Could not obtain reference
Nicholson 2002	Does not report study design of interest
Nossar 2001	Does not report study design of interest
Novick 1997	Does not report outcome of interest
O'Connor 1982	Does not report study design of interest
O'Connor 1990	Does not report outcome of interest
O'Donnell 1996	Does not report study design of interest
Oakley 1998	Does not report intervention of interest
Olds 1986	Does not report intervention of interest
Olds 1999	Does not report intervention of interest
Olds 2002	Does not report study design of interest
Palmisano 1981	Does not report study design of interest
Parcel 1983	Does not report study design of interest
Paulson 1981	Does not report study design of interest
Pena 1994	Does not report outcome of interest
Peterson 1984a	Does not report outcome of interest
Peterson 1984b	Does not report outcome of interest
Petridou 1994	Does not report study design of interest
Petridou 1995	Does not report study design of interest
Petridou 2002	Does not report study design of interest
Phillips 1980	Does not report study design of interest
Phillips 1986	Does not report study design of interest

Study	Reason for exclusion
Pocknall 1993	Does not report study design of interest
Polivka 1999	Does not report study design of interest
Potts 1998	Does not report study design of interest
Powell 2000	Does not report study design of interest
Quan 1990	Does not report outcome of interest
Rahman 2002	Could not obtain reference
Reichelderfer 1976	Does not report study design of interest
Rhoads 1999	Does not report intervention of interest
Rutstein 1977	Does not report study design of interest
Sadan 1995	Does not report study design of interest
Sahlin 1990	Does not report study design of interest
San Agustin 1973	Does not report study design of interest
Schnell 1993	Does not report study design of interest
Schwebel 2002	Does not report study design of interest
Sell 1977	Does not report study design of interest
Sherman 1980	Does not report study design of interest
Sibert 1977	Does not report study design of interest
Sibert 1999	Does not report study design of interest
Sibert 2002	Trial did not take place
Smith 1984	Does not report outcome of interest
Smith 2002	Does not report study design of interest
Smith 2006	Does not report outcome of interest
Smithson 1998	Does not report study design of interest
Smithson 2000	Does not report study design of interest
Solis 1991	Does not report study design of interest
Sorensen 1976	Does not report study design of interest
Spallek 2004a	Does not report study design of interest
Spallek 2004b	Does not report study design of interest

Study	Reason for exclusion
Speigel 1995	Does not report study design of interest
Spiller 2004	Does not report outcome of interest
St Pierre 1999	Does not report intervention of interest
Stanley 1979	Does not report study design of interest
Stennies 1999	Does not report outcome of interest
Stephen 1993	Does not report study design of interest
Stevens 2002	Does not report outcome of interest
Sullivan 1990	Does not report study design of interest
Sundelin 1996	Does not report outcome of interest
Svanstrom 1996	Does not report study design of interest
Swaine 2000	Does not report study design of interest
Taha 1999	Does not report study design of interest
Temple 1978	Does not report study design of interest
Tenn 1996	Does not report outcome of interest
Terzidis 2007	Does not report study design of interest
Thompson 1998	Does not report study design of interest
Thomson 1999	Does not report intervention of interest
Thuen 1994	Does not report study design of interest
Timpka 1999	Does not report outcome of interest
Towner 1996	Does not report outcome of interest
Towner 1998	Does not report outcome of interest
Velsog 1996	Does not report outcome of interest
Vernberg 1984	Does not report outcome of interest
Vogel 1968	Does not report outcome of interest
Webne 1989	Does not report study design of interest
Wester 1985	Does not report study design of interest
Whitfield 2000	Does not report study design of interest
Whitt 1982	Does not report outcome of interest

Study	Reason for exclusion
Wiggins 2004	Does not report intervention of interest
Wortel 1991	Does not report study design of interest
Wurtele 1989	Does not report outcome of interest
Young 2000	Does not report outcome of interest
Ytterstad 2000	Does not report study design of interest
Zwi 2004	Does not report study design of interest

Characteristics of ongoing studies *[ordered by study ID]*

Cusimano (Canada)

Trial name or title	The long term persistence of the "Think First for Kids" injury prevention programme at six and eighteen months
Methods	
Participants	Elementary school children
Interventions	I = 8 week implementation of "Think First for Kids" programme C = no "Think First for Kids" programme
Outcomes	Reduction in risky behaviour
Starting date	2002
Contact information	cusimanom@smh.toronto.on.ca
Notes	

Grossman (USA)

Trial name or title	Raise the Alarms (A trial of smoke detector types)
Methods	
Participants	784 owner occupied dwellings in King County
Interventions	I_1 = installation of ionisation smoke detector I_2 = installation of photoelectric smoke detector
Outcomes	Functional smoke alarm at 9 and 15 months follow-up
Starting date	not reported
Contact information	bmueller@fhcrc.org

Grossman (USA) *(Continued)*

Notes

DATA AND ANALYSES

Comparison 1. Medically attended or self reported injury rates

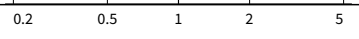
Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 Comparing medically attended or self-reported injury rates - unadjusted for baseline rates	15	24406	IRR (Random, 95% CI)	0.93 [0.83, 1.05]
2 Comparing medically attended or self-reported injury rates - adjusted for baseline rates	15	24406	IRR (Random, 95% CI)	0.89 [0.78, 1.01]

Analysis 1.1. Comparison 1 Medically attended or self reported injury rates, Outcome 1 Comparing medically attended or self-reported injury rates - unadjusted for baseline rates.

Study or subgroup	Intervention N	Control N	log[IRR] (SE)	IRR IV, Random, 95% CI	Weight	IRR IV, Random, 95% CI
Babul 2007	332	146	-0.1 (0.313)		3.43%	0.94[0.51,1.73]
Bentzen 1997	112	37	-0 (0.411)		2.1%	0.98[0.44,2.19]
Carman 2006	70	48	0.2 (0.368)		2.58%	1.18[0.57,2.43]
Gittelman 2007	111	204	0.1 (0.373)		2.51%	1.06[0.51,2.2]
Guyer 1989	687	626	-0.1 (0.438)		1.87%	0.88[0.37,2.08]
Kelly 1987	31	30	0.3 (0.382)		2.4%	1.29[0.61,2.73]
Kendrick 1999	686	645	0 (0.12)		13.3%	1[0.79,1.27]
King 2001	877	843	-0.3 (0.128)		12.47%	0.75[0.58,0.96]
Lindqvist 1998a	337	202	0 (0.379)		2.44%	1.04[0.49,2.18]
Phelan 2010	216	207	-0.4 (0.236)		5.5%	0.69[0.44,1.1]
Sangvai 2007	160	159	-0.2 (0.221)		6.06%	0.86[0.56,1.32]
Svanstrom 1995	1135	1499	0.2 (0.405)		2.16%	1.24[0.56,2.75]
Watson 2005	3584	3884	0.1 (0.048)		22.74%	1.1[1,1.21]
Yorkston 2007	475	1183	0.2 (0.279)		4.18%	1.18[0.68,2.03]
Zhao 2005	3226	2654	-0.3 (0.095)		16.25%	0.76[0.63,0.91]
Total (95% CI)					**100%**	**0.93[0.83,1.05]**

Heterogeneity: Tau^2=0.01; Chi^2=21.49, df=14(P=0.09); I^2=34.84%

Test for overall effect: Z=1.13(P=0.26)



Favours intervention — Favours control

Analysis 1.2. Comparison 1 Medically attended or self reported injury rates, Outcome 2 Comparing medically attended or self-reported injury rates - adjusted for baseline rates.

Study or subgroup	Intervention N	Control N	log[IRR] (SE)	IRR IV, Random, 95% CI	Weight	IRR IV, Random, 95% CI
Babul 2007	332	146	-0.1 (0.313)		3.9%	0.94[0.51,1.73]
Bentzen 1997	112	37	-0.1 (0.563)		1.34%	0.95[0.31,2.86]
Carman 2006	70	48	-0.1 (0.493)		1.72%	0.93[0.35,2.44]
Gittelman 2007	111	204	-0.2 (0.477)		1.83%	0.78[0.31,1.99]
Guyer 1989	687	626	-0.5 (0.616)		1.13%	0.59[0.18,1.97]
Kelly 1987	31	30	0.3 (0.382)		2.75%	1.29[0.61,2.73]
Kendrick 1999	686	645	0 (0.12)		14.37%	1[0.79,1.27]
King 2001	877	843	-0.3 (0.128)		13.53%	0.75[0.58,0.96]
Lindqvist 1998a	337	202	-0.4 (0.54)		1.45%	0.67[0.23,1.92]
Phelan 2010	216	207	-0.4 (0.236)		6.19%	0.69[0.44,1.1]
Sangvai 2007	160	159	-0.2 (0.221)		6.8%	0.86[0.56,1.32]
Svanstrom 1995	1135	1499	-0.1 (0.535)		1.48%	0.9[0.32,2.57]
Watson 2005	3584	3884	0.1 (0.048)		23.44%	1.1[1,1.21]
Yorkston 2007	475	1183	-0.2 (0.379)		2.79%	0.79[0.37,1.66]
Zhao 2005	3226	2654	-0.3 (0.095)		17.3%	0.76[0.63,0.91]
Total (95% CI)					**100%**	**0.89[0.78,1.01]**

Heterogeneity: Tau^2=0.02; Chi^2=22.04, df=14(P=0.08); I^2=36.49%

Test for overall effect: Z=1.8(P=0.07)

Favours intervention — Favours control

Comparison 2. Thermal injury rates

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 Comparing thermal injury rates	4	22682	IRR (Random, 95% CI)	0.85 [0.51, 1.42]

Analysis 2.1. Comparison 2 Thermal injury rates, Outcome 1 Comparing thermal injury rates.

Study or subgroup	Intervention N	Control N	log[IRR] (SE)	IRR IV, Random, 95% CI	Weight	IRR IV, Random, 95% CI
Kendrick 1999	2277	2141	0.2 (0.233)		34.54%	1.2[0.76,1.89]
Watson 2005	3513	3808	0.2 (0.255)		32.77%	1.19[0.72,1.96]
Ytterstad 1998	742	4321	-1.1 (0.748)		9.78%	0.35[0.08,1.51]
Zhao 2005	3226	2654	-0.8 (0.394)		22.91%	0.46[0.21,0.99]
Total (95% CI)					**100%**	**0.85[0.51,1.42]**

Heterogeneity: Tau^2=0.15; Chi^2=6.97, df=3(P=0.07); I^2=56.98%

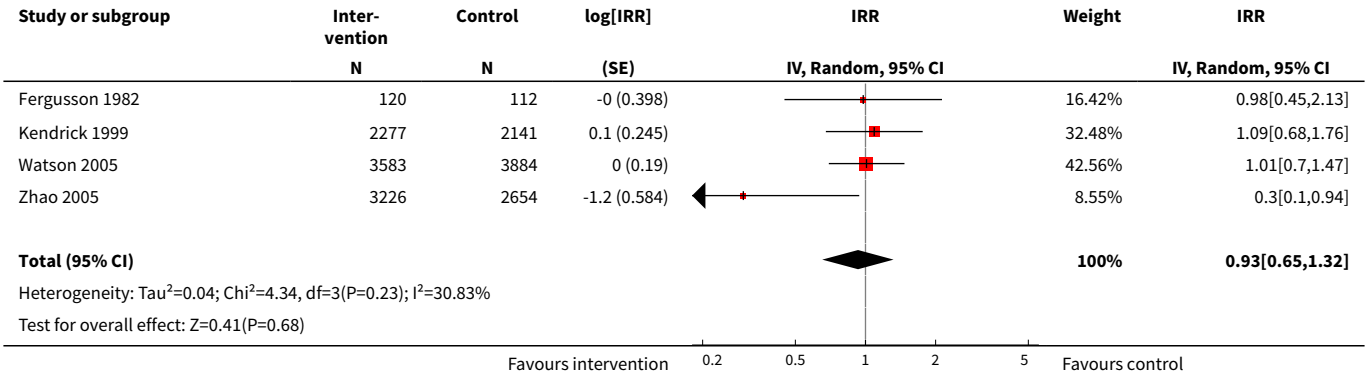
Test for overall effect: Z=0.62(P=0.54)

Favours intervention — Favours control

Comparison 3. Poisoning injury rates

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 Comparing poisoning rates	4	17997	IRR (Random, 95% CI)	0.93 [0.65, 1.32]

Analysis 3.1. Comparison 3 Poisoning injury rates, Outcome 1 Comparing poisoning rates.

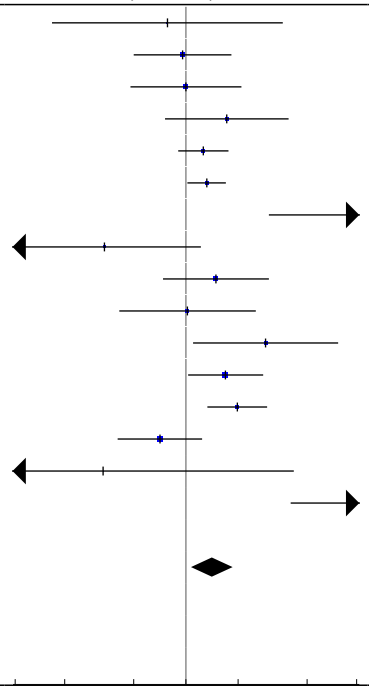


Comparison 4. Thermal injuries

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 Safe hot tap water temperature	16	3727	Odds Ratio (M-H, Random, 95% CI)	1.41 [1.07, 1.86]
2 Possession of a functional smoke alarm	17	5107	Odds Ratio (M-H, Random, 95% CI)	1.81 [1.30, 2.52]
3 Use of fire guards	4	2945	Odds Ratio (M-H, Random, 95% CI)	1.40 [1.00, 1.95]
4 Keeping hot drinks or food out of reach of children	6	1660	Odds Ratio (M-H, Random, 95% CI)	0.95 [0.61, 1.48]
5 Storage of matches or lighters out of reach of children	6	2169	Odds Ratio (M-H, Random, 95% CI)	1.03 [0.63, 1.68]
6 Possession of a fire extinguisher	5	1803	Odds Ratio (M-H, Random, 95% CI)	0.90 [0.53, 1.51]
7 Has a fire escape plan	4		Odds Ratio (Random, 95% CI)	2.01 [1.45, 2.77]
8 Smoke alarm batteries checked or changed	4	633	Odds Ratio (M-H, Random, 95% CI)	1.15 [0.63, 2.08]

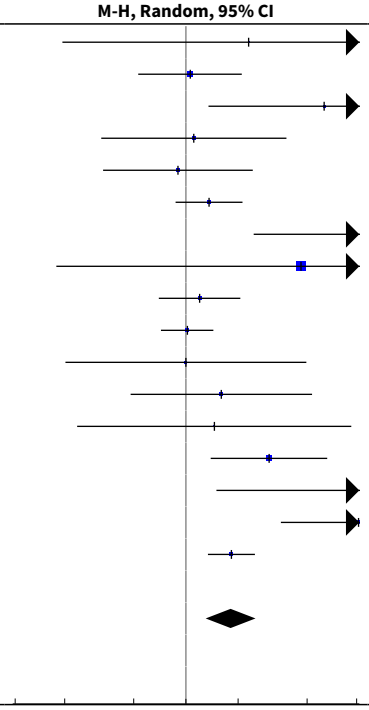
Analysis 4.1. Comparison 4 Thermal injuries, Outcome 1 Safe hot tap water temperature.

Study or subgroup	Intervention n/N	Control n/N	Odds Ratio M-H, Random, 95% CI	Weight	Odds Ratio M-H, Random, 95% CI
Georgieff 2004	3/26	5/35		2.61%	0.78[0.17,3.62]
Nansel 2002	25/85	27/89		7.51%	0.96[0.5,1.83]
Gielen 2002	27/57	27/57		6.73%	1[0.48,2.09]
Kelly 1987	41/55	34/54		6.03%	1.72[0.76,3.91]
Kendrick 1999	103/350	88/354		10.78%	1.26[0.9,1.76]
King 2001	257/482	218/469		11.53%	1.32[1.02,1.7]
Thomas 1984	22/29	6/26		3.56%	10.48[3.01,36.47]
Katcher 1989	76/100	28/31		3.45%	0.34[0.09,1.22]
Waller 1993	21/51	31/97		7.02%	1.49[0.74,3.01]
Barone 1988	16/40	15/38		5.4%	1.02[0.41,2.53]
Williams 1988	22/38	11/34		5.02%	2.88[1.1,7.55]
Phelan 2010	109/146	94/148		9.01%	1.69[1.03,2.79]
Babul 2007	234/336	80/149		10.12%	1.98[1.33,2.94]
Nansel 2008	42/206	26/98		8.38%	0.71[0.4,1.24]
Sangvai 2007	6/9	6/7		1.1%	0.33[0.03,4.19]
Kendrick 2010	13/16	2/15		1.75%	28.17[4.02,197.45]
Total (95% CI)	**2026**	**1701**		**100%**	**1.41[1.07,1.86]**
Total events: 1017 (Intervention), 698 (Control)					
Heterogeneity: Tau^2=0.16; Chi^2=40.27, df=15(P=0); I^2=62.75%					
Test for overall effect: Z=2.42(P=0.02)					

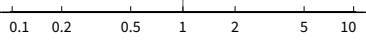


Analysis 4.2. Comparison 4 Thermal injuries, Outcome 2 Possession of a functional smoke alarm.

Study or subgroup	Intervention n/N	Control n/N	Odds Ratio M-H, Random, 95% CI	Weight	Odds Ratio M-H, Random, 95% CI
Barone 1988	23/24	20/22		1.59%	2.3[0.19,27.3]
Bulzachelli 2009	109/139	55/71		8.7%	1.06[0.53,2.1]
Clamp 1998	81/83	71/82		3.48%	6.27[1.35,29.27]
DiGuiseppi 2002	8/44	5/30		4.79%	1.11[0.33,3.8]
Gielen 2002	44/54	44/53		6.19%	0.9[0.33,2.43]
Gielen 2007	345/384	325/375		11.11%	1.36[0.87,2.12]
Hendrickson 2002	37/38	26/40		2.14%	19.92[2.46,161.05]
Johnston 2000	31/31	20/21		0.97%	4.61[0.18,118.72]
Kendrick 1999	249/276	246/278		10.14%	1.2[0.7,2.06]
King 2001	406/482	394/469		12.05%	1.02[0.72,1.44]
Matthews 1988	6/12	6/12		3.29%	1[0.2,4.95]
Miller 1982	12/22	9/21		4.91%	1.6[0.48,5.34]
Mock 2003	3/72	2/69		2.68%	1.46[0.24,8.99]
Phelan 2010	130/140	112/138		7.93%	3.02[1.39,6.53]
Sangvai 2007	16/17	5/10		1.72%	16[1.5,171.2]
Sznajder 2003	27/47	6/50		5.94%	9.9[3.53,27.74]
Watson 2005	692/764	619/737		12.37%	1.83[1.34,2.5]
Total (95% CI)	**2629**	**2478**		**100%**	**1.81[1.3,2.52]**
Total events: 2219 (Intervention), 1965 (Control)					
Heterogeneity: Tau^2=0.21; Chi^2=39.55, df=16(P=0); I^2=59.55%					



Study or subgroup	Intervention n/N	Control n/N	Odds Ratio M-H, Random, 95% CI	Weight	Odds Ratio M-H, Random, 95% CI
Test for overall effect: Z=3.5(P=0)					



Analysis 4.3. Comparison 4 Thermal injuries, Outcome 3 Use of fire guards.

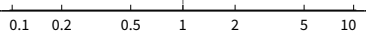
Study or subgroup	Intervention n/N	Control n/N	Odds Ratio M-H, Random, 95% CI	Weight	Odds Ratio M-H, Random, 95% CI
Clamp 1998	56/83	30/82		15.29%	3.6[1.89,6.83]
Kendrick 1999	216/309	210/309		26%	1.09[0.78,1.54]
Kendrick 2005	202/312	206/352		27.11%	1.3[0.95,1.78]
Watson 2005	414/763	374/735		31.6%	1.15[0.93,1.4]
Total (95% CI)	**1467**	**1478**		**100%**	**1.4[1,1.95]**
Total events: 888 (Intervention), 820 (Control)					
Heterogeneity: Tau^2=0.08; Chi^2=11.74, df=3(P=0.01); I^2=74.45%					
Test for overall effect: Z=1.97(P=0.05)					

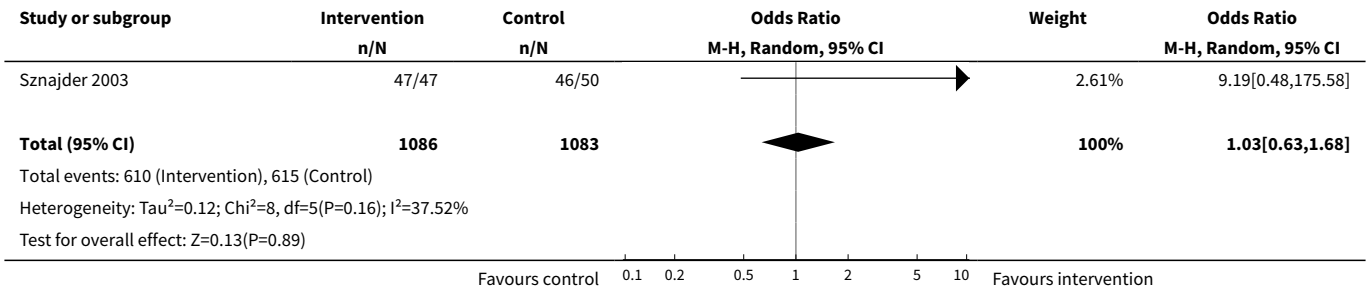
Analysis 4.4. Comparison 4 Thermal injuries, Outcome 4 Keeping hot drinks or food out of reach of children.

Study or subgroup	Intervention n/N	Control n/N	Odds Ratio M-H, Random, 95% CI	Weight	Odds Ratio M-H, Random, 95% CI
Babul 2007	325/335	147/149		7.57%	0.44[0.1,2.04]
Hendrickson 2002	37/38	36/40		3.77%	4.11[0.44,38.57]
Kendrick 1999	191/318	201/320		48.67%	0.89[0.65,1.22]
Nansel 2002	78/85	84/89		11.66%	0.66[0.2,2.18]
Nansel 2008	125/131	55/62		12.55%	2.65[0.85,8.25]
Posner 2004	34/46	38/47		15.79%	0.67[0.25,1.79]
Total (95% CI)	**953**	**707**		**100%**	**0.95[0.61,1.48]**
Total events: 790 (Intervention), 561 (Control)					
Heterogeneity: Tau^2=0.08; Chi^2=6.66, df=5(P=0.25); I^2=24.96%					
Test for overall effect: Z=0.23(P=0.82)					

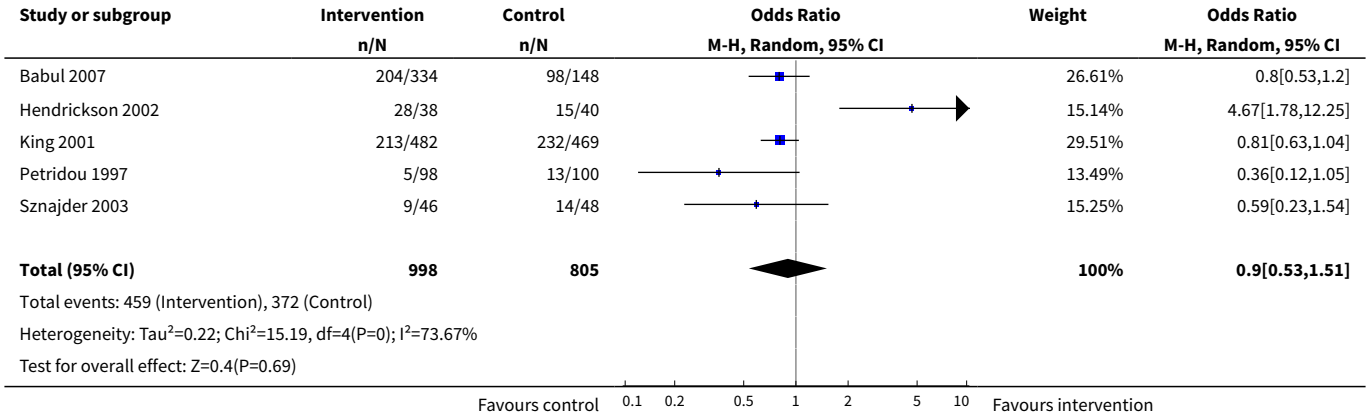
Analysis 4.5. Comparison 4 Thermal injuries, Outcome 5 Storage of matches or lighters out of reach of children.

Study or subgroup	Intervention n/N	Control n/N	Odds Ratio M-H, Random, 95% CI	Weight	Odds Ratio M-H, Random, 95% CI
Dershewitz 1977	54/101	61/104		31.36%	0.81[0.47,1.41]
Hendrickson 2002	36/38	33/40		7.58%	3.82[0.74,19.7]
Kelly 1987	51/55	49/54		10.21%	1.3[0.33,5.13]
Kendrick 1999	356/363	364/366		8.1%	0.28[0.06,1.35]
King 2001	66/482	62/469		40.14%	1.04[0.72,1.51]

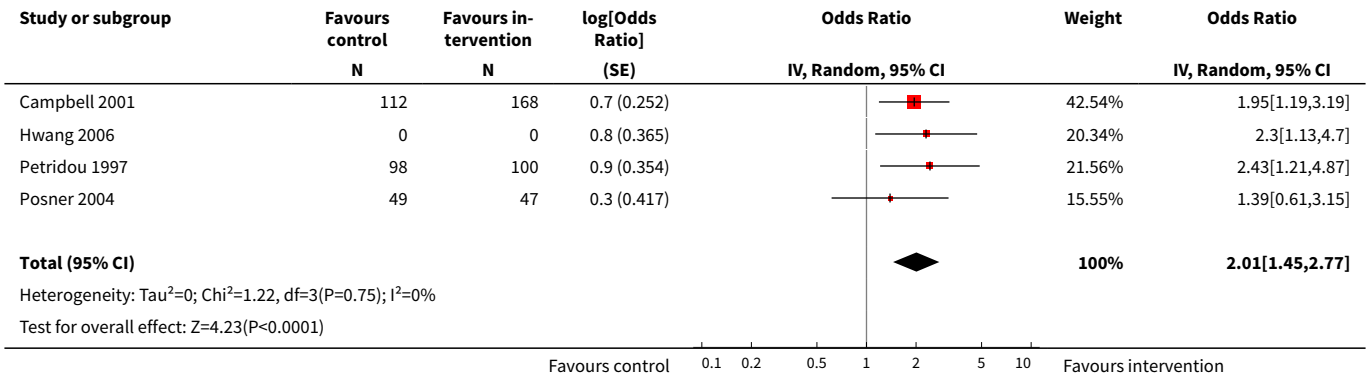




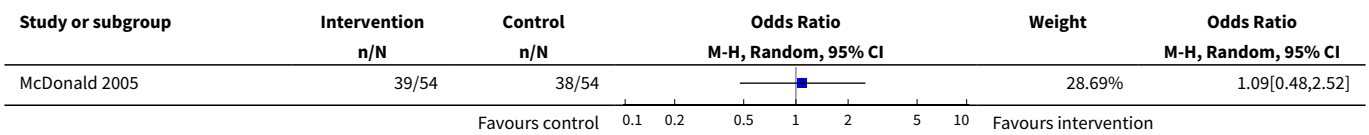
Analysis 4.6. Comparison 4 Thermal injuries, Outcome 6 Possession of a fire extinguisher.

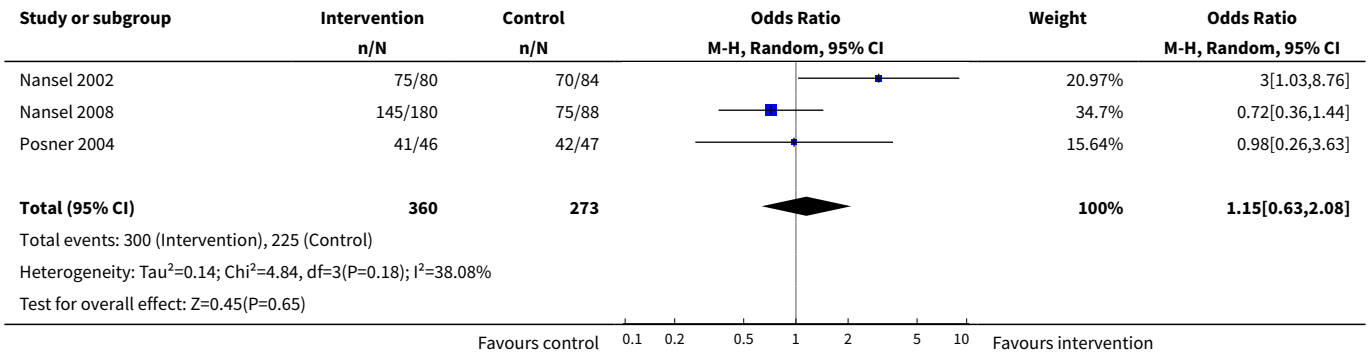


Analysis 4.7. Comparison 4 Thermal injuries, Outcome 7 Has a fire escape plan.



Analysis 4.8. Comparison 4 Thermal injuries, Outcome 8 Smoke alarm batteries checked or changed.

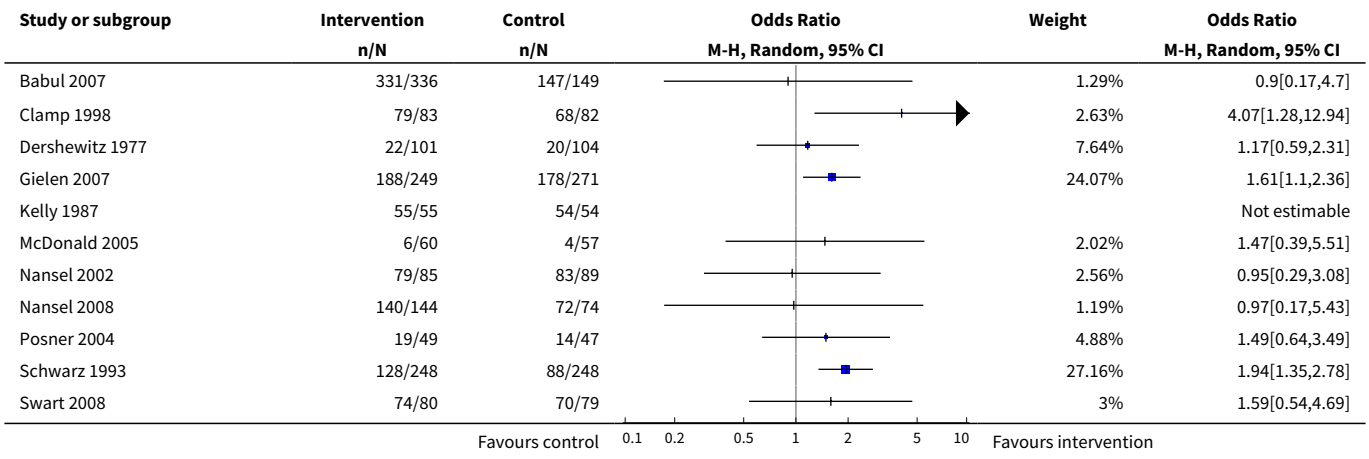


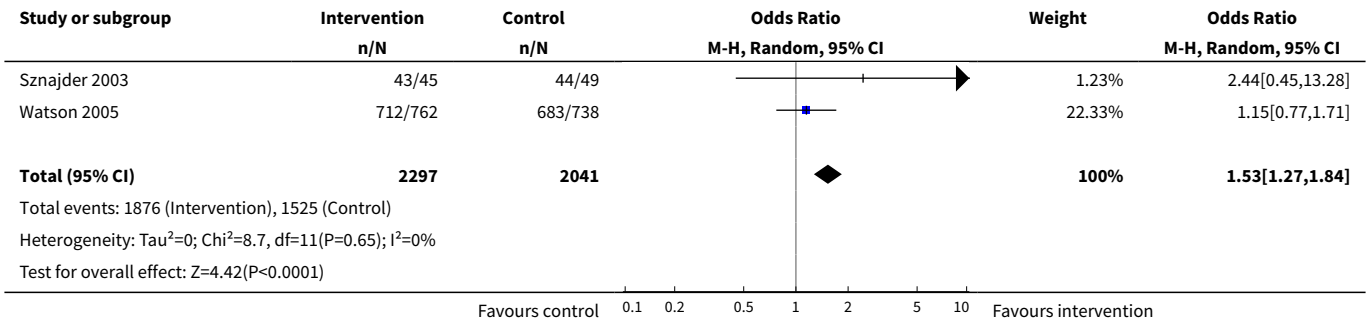


Comparison 5. Poisoning outcomes

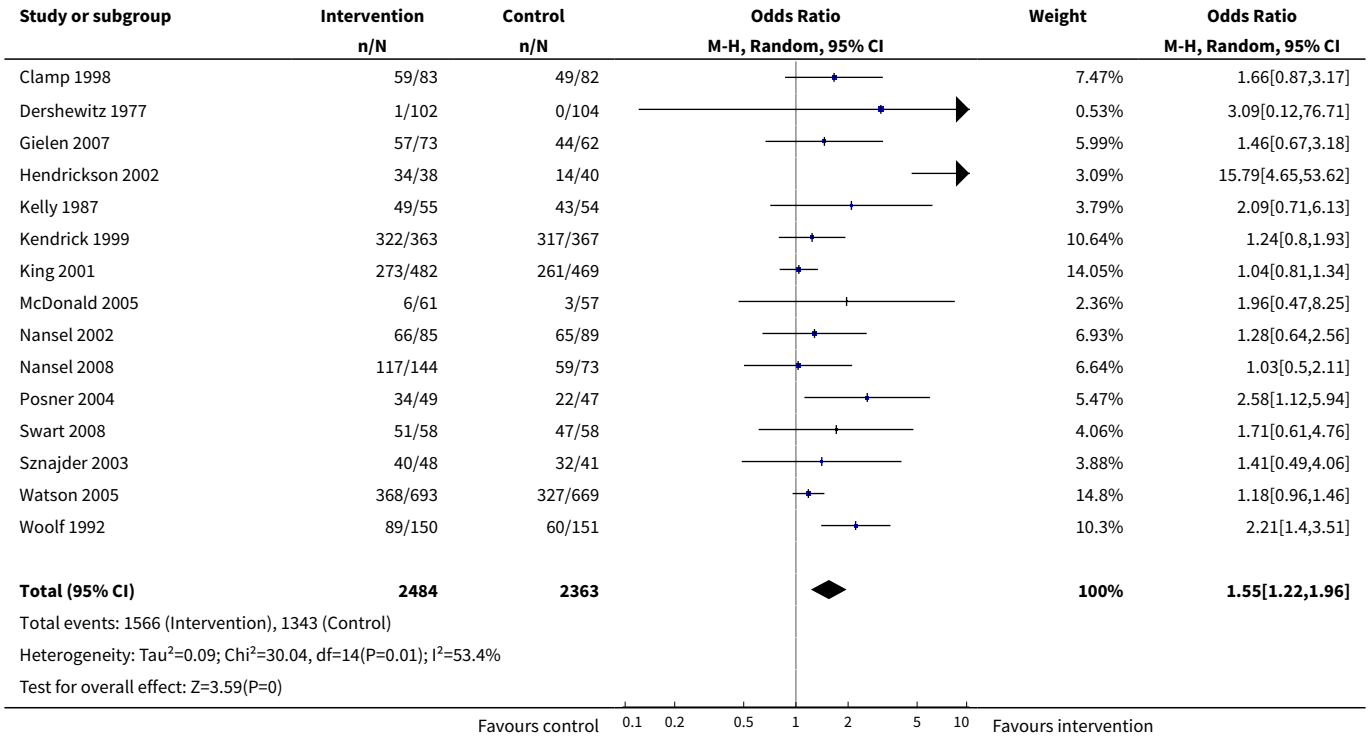
Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 Storage of medicines out of reach	13	4338	Odds Ratio (M-H, Random, 95% CI)	1.53 [1.27, 1.84]
2 Storage of cleaning products out of reach	15	4847	Odds Ratio (M-H, Random, 95% CI)	1.55 [1.22, 1.96]
3 Possession of syrup of ipecac	10	2183	Odds Ratio (M-H, Random, 95% CI)	3.34 [1.50, 7.44]
4 Having a poison control centre sticker available	9	1839	Odds Ratio (M-H, Random, 95% CI)	3.30 [1.70, 6.39]
5 Storage of poisons out of reach	5	1252	Odds Ratio (M-H, Random, 95% CI)	2.07 [0.92, 4.66]
6 Storage of plants out of reach	3	608	Odds Ratio (M-H, Random, 95% CI)	1.18 [0.40, 3.48]

Analysis 5.1. Comparison 5 Poisoning outcomes, Outcome 1 Storage of medicines out of reach.

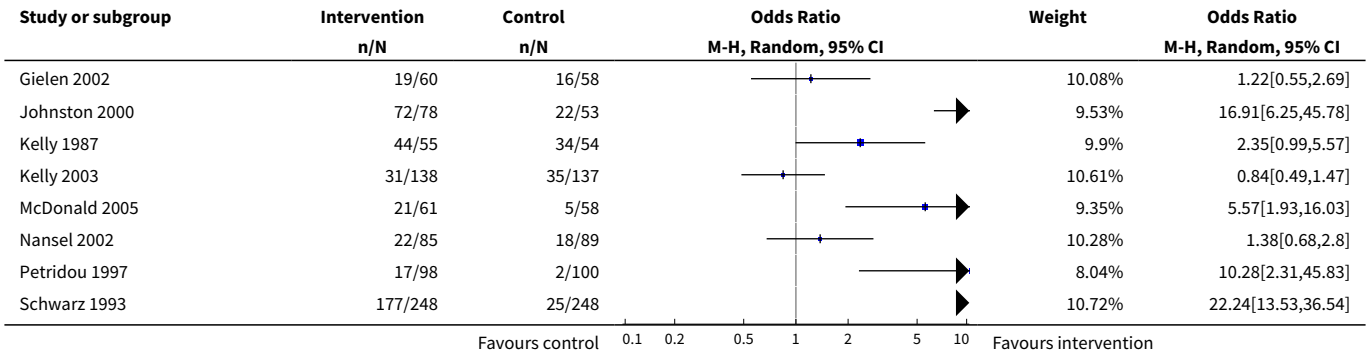


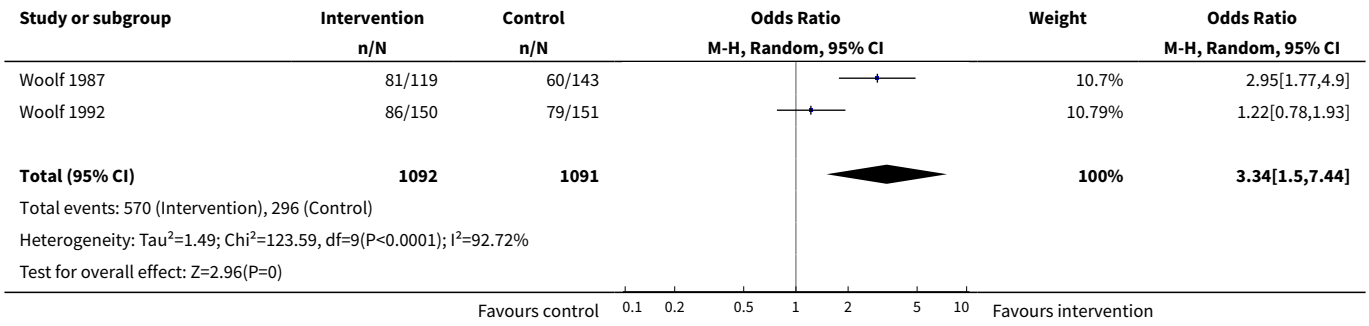


Analysis 5.2. Comparison 5 Poisoning outcomes, Outcome 2 Storage of cleaning products out of reach.

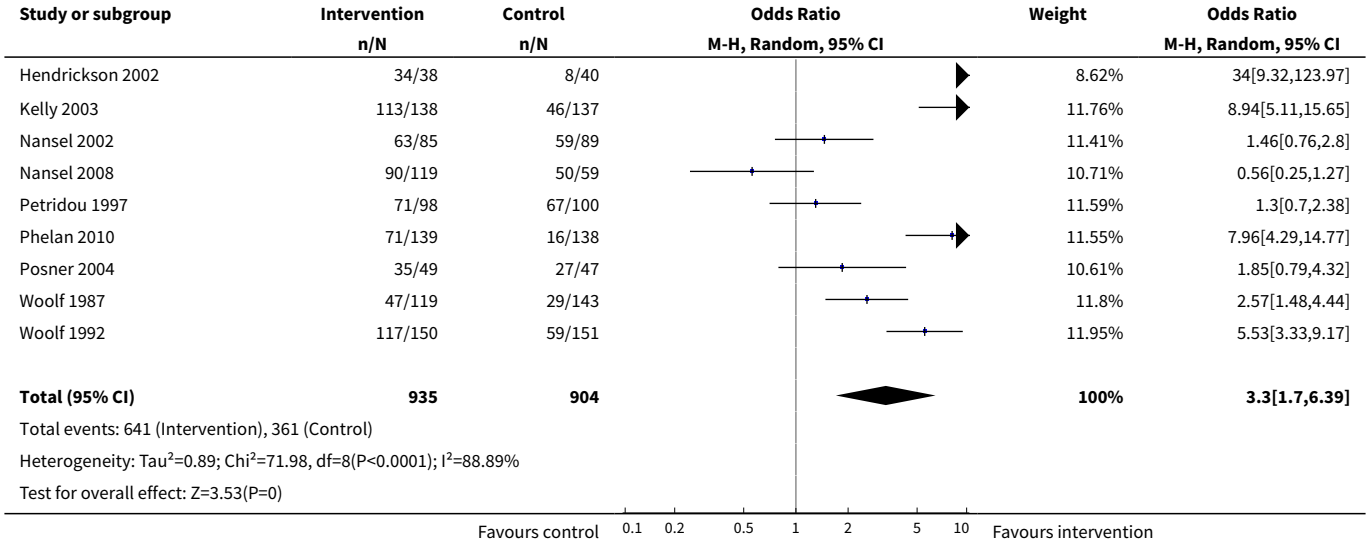


Analysis 5.3. Comparison 5 Poisoning outcomes, Outcome 3 Possession of syrup of ipecac.

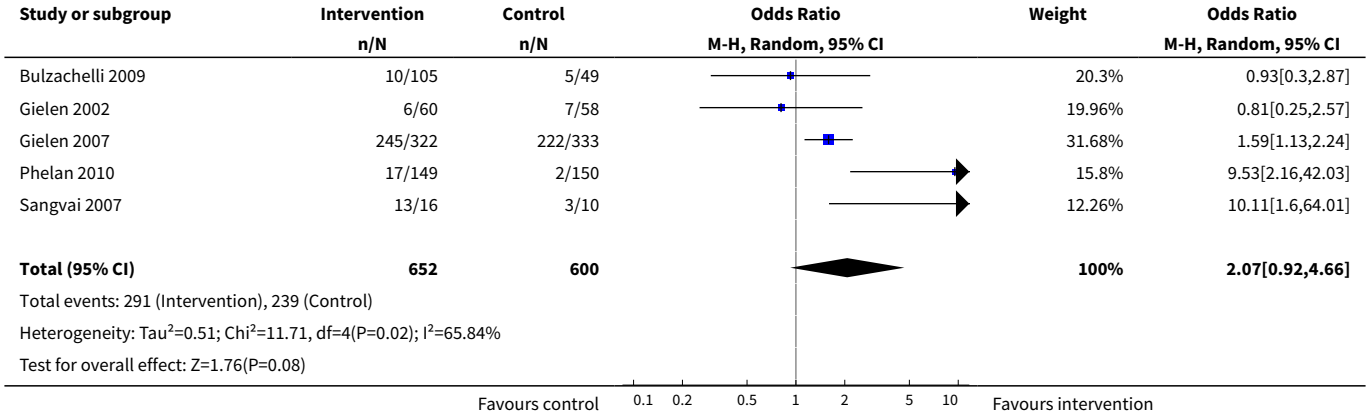




Analysis 5.4. Comparison 5 Poisoning outcomes, Outcome 4 Having a poison control centre sticker available.



Analysis 5.5. Comparison 5 Poisoning outcomes, Outcome 5 Storage of poisons out of reach.



Analysis 5.6. Comparison 5 Poisoning outcomes, Outcome 6 Storage of plants out of reach.

Study or subgroup	Control n/N	Intervention n/N	Odds Ratio M-H, Random, 95% CI	Weight	Odds Ratio M-H, Random, 95% CI
Babul 2007	112/147	259/332		53.46%	0.9[0.57,1.43]
Posner 2004	9/16	11/16		28.7%	0.58[0.14,2.48]
Sznajder 2003	48/49	41/48		17.84%	8.2[0.97,69.4]
Total (95% CI)	**212**	**396**		**100%**	**1.18[0.4,3.48]**
Total events: 169 (Control), 311 (Intervention)					
Heterogeneity: Tau^2=0.51; Chi^2=4.47, df=2(P=0.11); I^2=55.23%					
Test for overall effect: Z=0.3(P=0.76)					

Favours control — Favours intervention

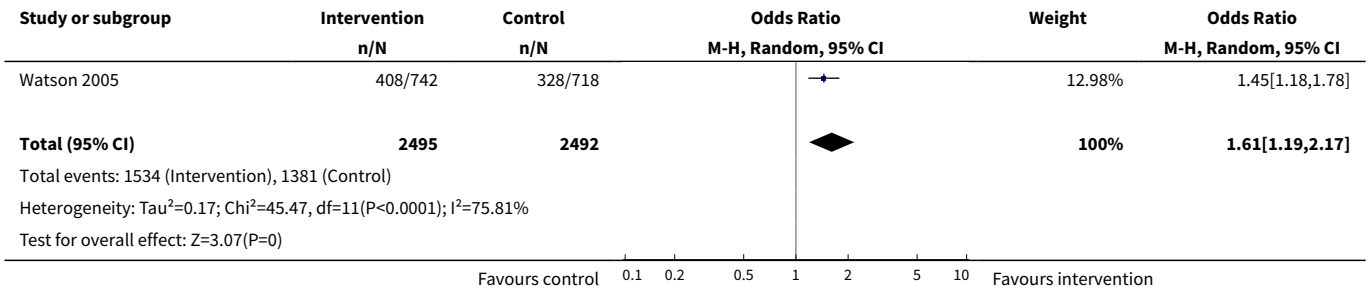
Comparison 6. Falls outcomes

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 Having a fitted stair gate	12	4987	Odds Ratio (M-H, Random, 95% CI)	1.61 [1.19, 2.17]
2 Possession and use of a baby walker	9	3273	Odds Ratio (M-H, Random, 95% CI)	1.57 [1.18, 2.09]
3 Possession of window locks, screens or mechanisms to limit opening on at least some windows	6	3724	Odds Ratio (M-H, Random, 95% CI)	1.17 [0.87, 1.57]
4 Possession of non-slip bath mats or decals	4	690	Odds Ratio (M-H, Random, 95% CI)	1.10 [0.68, 1.79]
5 Does not leave child unattended on a high surface	3	661	Odds Ratio (M-H, Random, 95% CI)	0.84 [0.58, 1.20]

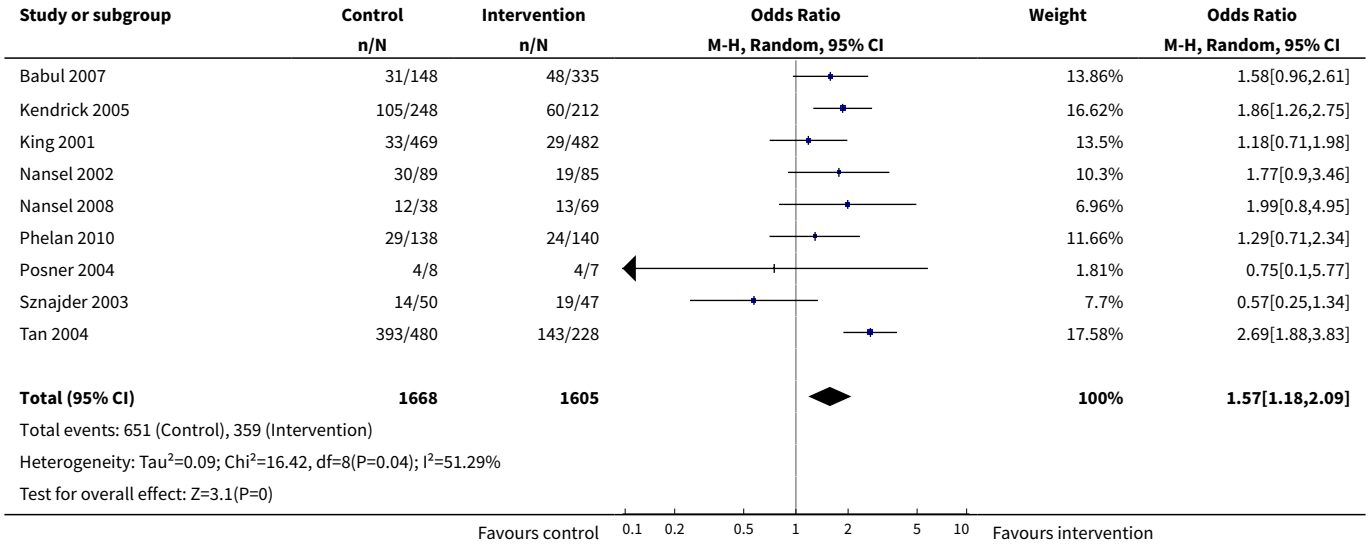
Analysis 6.1. Comparison 6 Falls outcomes, Outcome 1 Having a fitted stair gate.

Study or subgroup	Intervention n/N	Control n/N	Odds Ratio M-H, Random, 95% CI	Weight	Odds Ratio M-H, Random, 95% CI
Clamp 1998	52/64	50/69		6.85%	1.65[0.72,3.74]
Gielen 2002	13/48	11/48		6.02%	1.25[0.49,3.16]
Kendrick 1999	223/323	214/323		11.87%	1.14[0.82,1.58]
Kendrick 2005	311/377	348/436		11.62%	1.19[0.84,1.7]
King 2001	158/482	166/469		12.46%	0.89[0.68,1.16]
McDonald 2005	30/63	17/58		7.46%	2.19[1.03,4.65]
Nansel 2002	76/85	70/89		6.55%	2.29[0.97,5.4]
Nansel 2008	60/69	29/38		5.34%	2.07[0.74,5.77]
Phelan 2010	131/146	78/147		8.69%	7.73[4.14,14.43]
Posner 2004	28/49	25/47		6.98%	1.17[0.52,2.62]
Sznajder 2003	44/47	45/50		3.17%	1.63[0.37,7.23]

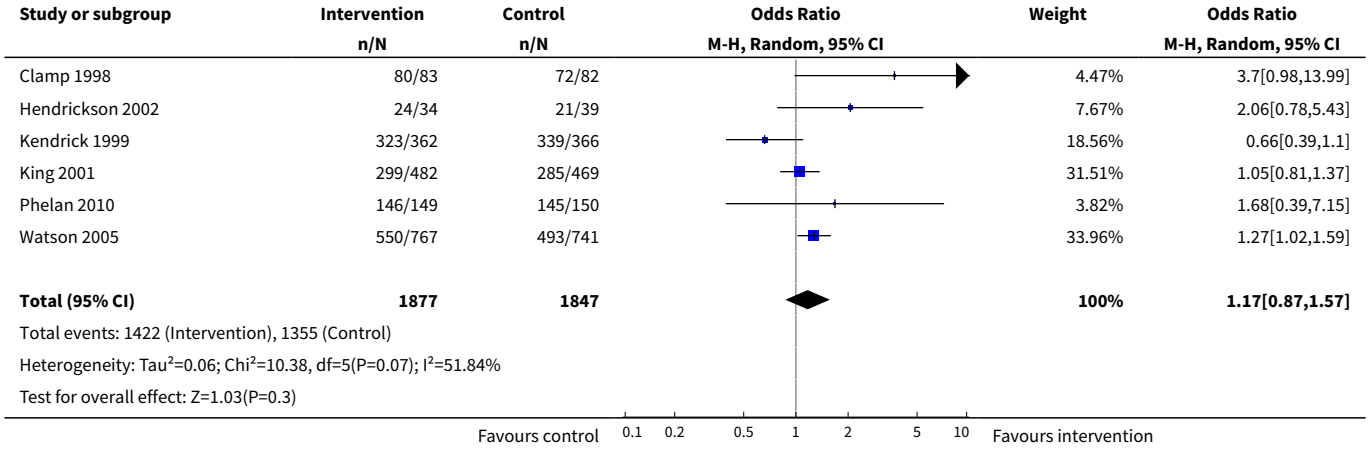
Favours control — Favours intervention



Analysis 6.2. Comparison 6 Falls outcomes, Outcome 2 Possession and use of a baby walker.

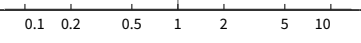


Analysis 6.3. Comparison 6 Falls outcomes, Outcome 3 Possession of window locks, screens or mechanisms to limit opening on at least some windows.



Analysis 6.4. Comparison 6 Falls outcomes, Outcome 4 Possession of non-slip bath mats or decals.

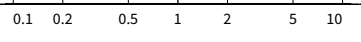
Study or subgroup	Intervention n/N	Control n/N	Odds Ratio M-H, Random, 95% CI	Weight	Odds Ratio M-H, Random, 95% CI
Petridou 1997	49/98	50/100		31.28%	1[0.57,1.75]
Phelan 2010	59/149	56/150		35.76%	1.1[0.69,1.75]
Posner 2004	44/49	34/47		13.7%	3.36[1.09,10.36]
Sznajder 2003	31/48	37/49		19.26%	0.59[0.25,1.43]
Total (95% CI)	**344**	**346**		**100%**	**1.1[0.68,1.79]**
Total events: 183 (Intervention), 177 (Control)					
Heterogeneity: Tau^2=0.11; Chi^2=5.81, df=3(P=0.12); I^2=48.34%					
Test for overall effect: Z=0.4(P=0.69)					



Favours control — Favours intervention

Analysis 6.5. Comparison 6 Falls outcomes, Outcome 5 Does not leave child unattended on a high surface.

Study or subgroup	Control n/N	Intervention n/N	Odds Ratio M-H, Random, 95% CI	Weight	Odds Ratio M-H, Random, 95% CI
Babul 2007	69/148	173/331		85.67%	0.8[0.54,1.18]
Nansel 2008	21/24	55/62		6.21%	0.89[0.21,3.77]
Posner 2004	6/47	5/49		8.13%	1.29[0.37,4.54]
Total (95% CI)	**219**	**442**		**100%**	**0.84[0.58,1.2]**
Total events: 96 (Control), 233 (Intervention)					
Heterogeneity: Tau^2=0; Chi^2=0.51, df=2(P=0.77); I^2=0%					
Test for overall effect: Z=0.98(P=0.33)					



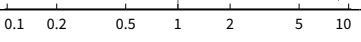
Favours control — Favours intervention

Comparison 7. Electrical injuries

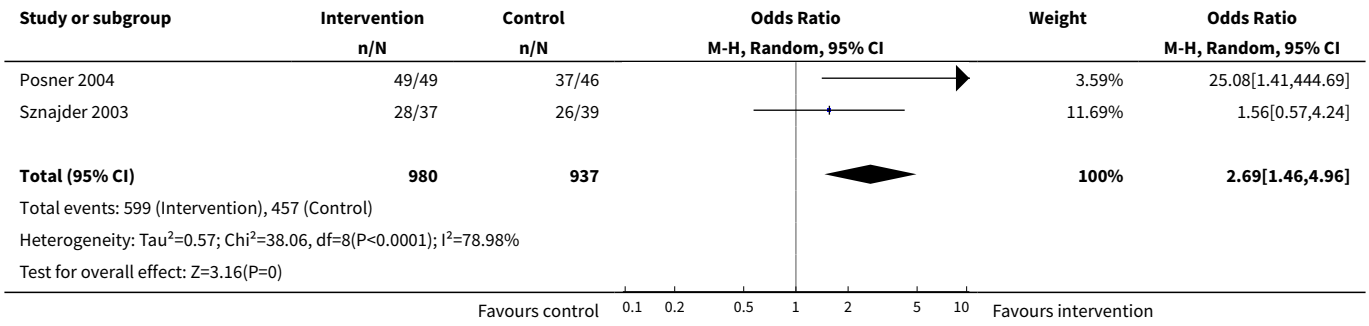
Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 Use of socket covers	9	1917	Odds Ratio (M-H, Random, 95% CI)	2.69 [1.46, 4.96]

Analysis 7.1. Comparison 7 Electrical injuries, Outcome 1 Use of socket covers.

Study or subgroup	Intervention n/N	Control n/N	Odds Ratio M-H, Random, 95% CI	Weight	Odds Ratio M-H, Random, 95% CI
Clamp 1998	68/83	38/82		13.88%	5.25[2.59,10.65]
Dershewitz 1977	89/101	88/104		13.17%	1.35[0.6,3.01]
Hendrickson 2002	30/38	3/40		8.95%	46.25[11.27,189.74]
Kelly 1987	28/55	23/54		13.53%	1.4[0.66,2.97]
Kendrick 1999	232/363	210/366		16.37%	1.32[0.98,1.77]
Nansel 2008	73/105	31/56		14.14%	1.84[0.94,3.6]
Phelan 2010	2/149	1/150		4.68%	2.03[0.18,22.6]



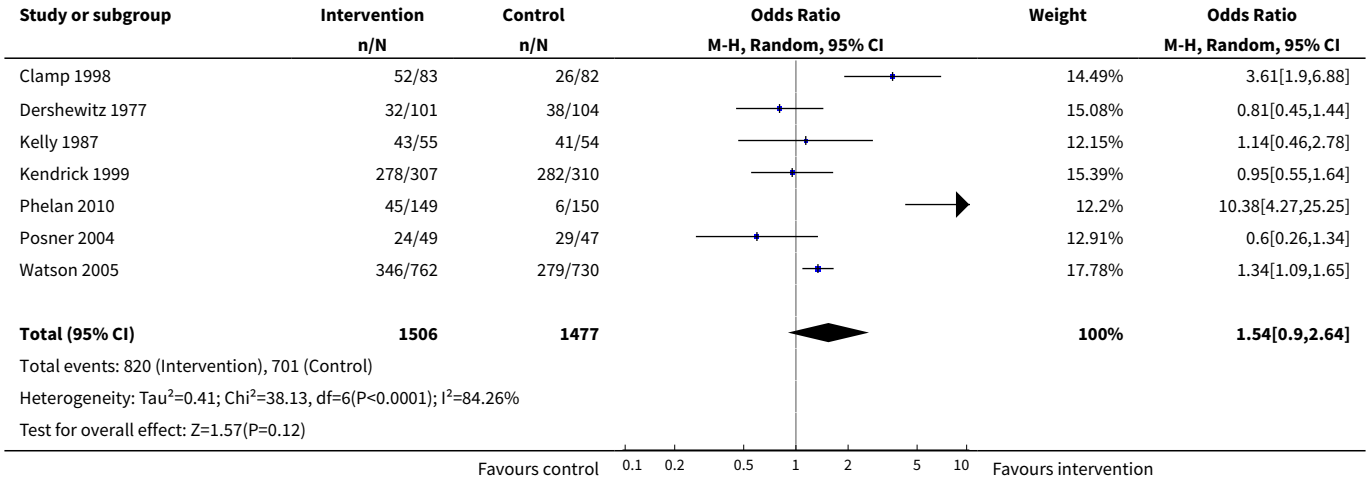
Favours control — Favours intervention



Comparison 8. Lacerations and bruising

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 Storage of sharp objects out of reach	7	2983	Odds Ratio (M-H, Random, 95% CI)	1.54 [0.90, 2.64]

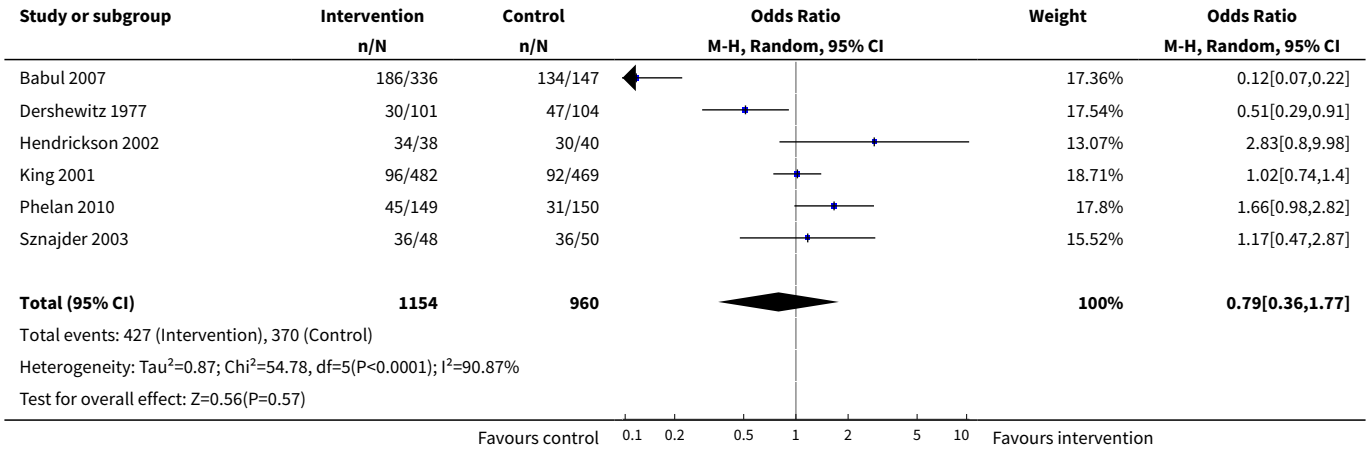
Analysis 8.1. Comparison 8 Lacerations and bruising, Outcome 1 Storage of sharp objects out of reach.



Comparison 9. Suffocation

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 Keeping small objects out of reach	6	2114	Odds Ratio (M-H, Random, 95% CI)	0.79 [0.36, 1.77]

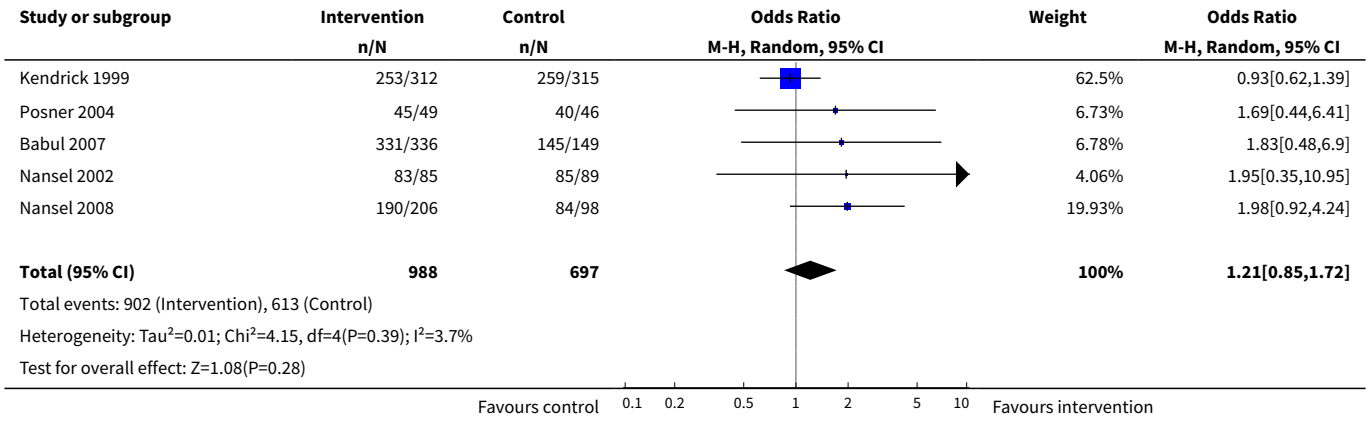
Analysis 9.1. Comparison 9 Suffocation, Outcome 1 Keeping small objects out of reach.



Comparison 10. Drowning

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 Never leaving child alone in the bath	5	1685	Odds Ratio (M-H, Random, 95% CI)	1.21 [0.85, 1.72]

Analysis 10.1. Comparison 10 Drowning, Outcome 1 Never leaving child alone in the bath.



ADDITIONAL TABLES

Table 1. Demographic and social characteristics of studies included in meta-analyses (%)

1st Author	Mean/median age, years	Male	Non-owner occupier	Single parents	BME group	Unemployment

Table 1. Demographic and social characteristics of studies included in meta-analyses (%) *(Continued)*

Yorkston 2007	-	51	-	-	9	-
Zhao 2006	-	-	-	-	-	-
Phelan 2010	0 (prenatal mothers)	46	-	18	30	17
Bulzachelli 2009	2.5	53	-	70	96	53
Sangvai 2007	-	-	-	-	48	-
Swart 2008	-	-	-	52	-	67
Kendrick 2010	-	-	100	70	8	65
Nansel 2008	1.2	52	71	32	66	-
Kendrick 2007	8.7	52	-	-	-	-
Hwang 2006	-	-	-	-	-	-
Gittelman 2007	-	-	-	-	84	-
Gielen 2007	-	50	-	69	93	48
Carman 2006	-	-	-	-	-	-
Babul 2007	1	52	39	11	-	-
Dershewitz 1977	-	-	-	0	-	81
Baudier 1988	-	-	-	-	-	-
Campbell 2001	13	51	-	-	-	-
Kendrick 2005	0.75	-	20	5	4	-
McDonald 2005	0.81	48	83	54	93	-
Watson 2005	2.15	51	46	28	15	70
Posner 2004	2.26	57	55	-	84	34
Kelly 2003	-	-	-	13	93	-
Sznajder 2003	1.36 (youngest child)	-	-	13	-	34
DiGuiseppi 2002 (smoke alarm ownership data only)	-	-	100	13	18	-
Gielen 2002	0.25	-	-	87	94	77
Hendrickson 2005	2	62	-	27	88	74

Table 1. Demographic and social characteristics of studies included in meta-analyses (%) *(Continued)*

Nansel 2002	0.95	48	73	19	95	-
King 2001	2	59	-	-	-	-
Johnston 2000	4.5	53	-	56	30	57
Clamp 1998	2.59	-	21	10	1	12
Waller 1993	2	-	-	-	-	-
Woolf 1992	1.92	-	-	11	10	-
Katcher 1989	8.5	-	-	-	3	-
Barone 1988	-	-	-	-	-	-
Williams 1998	-	-	-	-	-	-
Matthews 1988	-	-	-	-	-	-
Davis 1987	9	-	-	-	-	-
Kelly 1987	0.5	-	89	81	95	-
Woolf 1987	-	-	-	42	56	56 (maternal)
Thomas 1984	-	-	-	-	-	-
Kendrick 1999	0.67	52	33	12	7	11
Fergusson 1982	2	-	-	9	7	-
Miller 1982	-	-	13	-	-	-
Tan 2004	0.75	-	79	-	-	-
Georgieff 2004	1.5	-	-	25	2	-
Mock 2003	6	-	-	-	-	-
Lindquist 1998, 1999, 2001, 2002, 2004	-	-	-	-	-	-
Ytterstad 1995, 1998	2	-	-	-	-	-
Petridou 1997	9.5	-	-	4	-	-
Bentzen 1997	-	-	-	-	-	-
Svanstrom 1995	-	-	-	-	-	-
Schwarz 1993	-	-	-	-	96	-
Guyer 1989, 1991	-	-	48	-	8	-

Table 1. Demographic and social characteristics of studies included in meta-analyses (%) *(Continued)*

Jenkins 1996	-	63	-	28	48	22 (paternal)

Table 2. Odds ratios for thermal injury prevention practices (95% credible interval) by social variables

Social variables	Functional Smoke Alarm	Fire Guards	Keeping matches out of reach	Safe Hot Water	Keeping hot drinks and food out of reach	Fire extinguishers	Fire Escape Plans	Checking/changing smoke alarm batteries
GENDER								
Boys	2.00 (0.55, 12.82)	*N/A*	*N/A*	1.07 (0.63, 1.79)	0.88 (0.36, 2.38)	1.14 (0.50, 2.57)*	*N/A*	2.12 (0.84, 5.68)
Girls	1.88 (0.52, 12.22)	*N/A*	*N/A*	1.66 (0.97, 2.79)	1.02 (0.43, 2.84)	0.64 (0.22, 1.91)	*N/A*	1.11 (0.38, 3.34)
Interaction term (ratio of odds ratios)	1.06 (0.63, 1.74)	*N/A*	*N/A*	0.65 (0.38, 1.07)	0.86 (0.48, 1.54)	1.77 (0.27, 11.25)	*N/A*	1.92 (0.37, 10.18)
ETHNIC GROUP								
Black and minority ethnic groups	3.21 (0.94, 15.14)	1.50 (0.41, 6.28)	1.28 (0.01, 184.7)	1.14 (0.51, 2.72)	1.38 (0.36, 7.51)	*N/A*	*N/A*	1.29 (0.80, 2.07)
White	2.74 (0.89, 12.86)	1.45 (0.43, 5.43)	1.04 (0.01, 329.10)	1.23 (0.54, 2.82)	0.91 (0.19, 4.17)	*N/A*	*N/A*	0.39 (0.08, 1.40)
Interaction term (ratio of odds ratios)	1.16 (0.54, 2.50)	1.02 (0.57, 1.86)	1.04 (0.02, 28.40)	0.94 (0.49, 1.83)	1.58 (0.57, 5.02)	*N/A*	*N/A*	3.33 (0.82, 18.15)
FAMILY TYPE								
Single parent family	1.63 (0.66, 4.64)	1.38 (0.83, 2.45)	*N/A*	1.45 (0.45, 6.18)	0.95 (0.16, 5.16)	2.18 (0.27, 23.74)*	*N/A*	1.10 (0.39, 2.99)
Two parent family	1.99 (0.81, 5.42)	1.20 (0.81, 1.87)	*N/A*	1.64 (0.59, 7.91)	1.06 (0.31, 4.64)	0.86 (0.54, 1.36)	*N/A*	1.11 (0.63, 1.98)
Interaction term (ratio of odds ratios)	0.83 (0.51, 1.33)	1.16 (0.76, 1.76)	*N/A*	0.85 (0.42, 1.72)	0.87 (0.22, 3.16)	2.52 (0.24, 36.80)	*N/A*	0.99 (0.26, 3.43)
HOUSING TENURE								
Non-owner occupied	1.73 (0.67, 4.99)	1.39 (0.91, 2.32)	*N/A*	1.70 (0.48, 7.48)	0.94 (0.32, 2.53)	*N/A*	*N/A*	1.75 (0.85, 3.65)

Table 2. Odds ratios for thermal injury prevention practices (95% credible interval) by social variables *(Continued)*

Owner occupied	1.88 (0.72, 5.44)	1.13 (0.77, 1.76)	*N/A*	1.88 (0.54, 9.21)	0.78 (0.27, 2.09)	*N/A*	*N/A*	0.96 (0.23, 4.27)
Interaction term (ratio of odds ratios)	1.09 (0.64, 1.90)	1.22 (0.88, 1.71)	*N/A*	0.89 (0.43, 1.83)	1.20 (0.61, 2.36)	*N/A*	*N/A*	1.82 (0.32, 10.14)
PARENTAL UNEMPLOYMENT								
1 or more parent not in paid employment	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	2.72 (1.14, 6.79)*	*N/A*	*N/A*
Both parents in paid employment	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	0.76 (0.24, 2.32)	*N/A*	*N/A*
Interaction term (ratio of odds ratios)	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	3.56 (0.84, 15.97)	*N/A*	*N/A*
AGE								
Odds ratio at age 0	Model does not converge	1.13 (0.70, 1.89)	Model does not converge	1.36 (0.89, 1.93)	1.37 (0.50, 4.99)	1.12 (0.74, 1.69)	1.37 (0.52, 3.69)	1.35 (0.71, 2.57)
Odds ratio at age 4	Model does not converge	1.30 (0.79, 2.31)	Model does not converge	1.22 (0.54, 3.02)	0.35 (0.04, 2.56)	0.93 (0.66, 1.29)	1.55 (0.80, 3.06)	0.61 (0.14, 2.32)
Interaction term (ratio of odds ratios)	Model does not converge	1.04 (0.91, 1.16)	Model does not converge	0.97 (0.75, 1.31)	0.72 (0.38, 1.29)	0.96 (0.82, 1.10)	1.03 (0.94, 1.13)	0.82 (0.52, 1.27)

* Fixed effect model used

Table 3. Odds ratios for poisoning prevention practices (95% credible interval) by social variables

Social variables	Storage of cleaning products out of reach	Possession of ipecac	Poison centre number	Storage of poisons out of reach	Storage of medicines out of reach	Plants*
GENDER						
Boys	1.63 (0.80, 3.76)	3.21 (1.25, 8.63)*	2.53 (0.05, 157.3)	2.26 (0.04, 201.2)	1.72 (0.76, 4.56)	*N/A*
Girls	1.83 (0.89, 4.32)	2.58 (1.02, 6.92)	3.48 (0.07, 234.50)	2.41 (0.04, 227.30)	1.41 (0.64, 3.81)	*N/A*
Interaction term (ratio of odds ratios)	0.89 (0.62, 1.27)	1.23 (0.27, 5.83)	0.72 (0.26, 2.00)	0.93 (0.49, 1.75)	1.22 (0.72, 2.00)	*N/A*
ETHNIC GROUP						
Black and minority ethnic groups	1.79 (1.05, 3.04)	3.53 (1.10, 12.68)	5.37 (1.42, 21.17)	2.05 (0.38, 17.43)	3.64 (0.98, 14.44)	*N/A*
White	1.88 (1.16, 3.59)	1.98 (0.28, 12.99)	2.25 (0.50, 9.16)	3.02 (0.42, 20.55)	2.54 (0.62, 10.93)	*N/A*
Interaction term (ratio of odds ratios)	0.94 (0.54, 1.54)	1.79 (0.21, 17.04)	2.40 (0.88, 7.12)	0.73 (0.21, 2.43)	1.43 (0.65, 3.23)	*N/A*
FAMILY TYPE						
Single parent family	1.74 (1.10, 3.08)	2.67 (0.90, 8.07)	3.64 (0.88, 15.65)	1.59 (0.19, 16.07)	2.60 (0.99, 7.06)	Model does not converge
Two parent family	1.60 (1.09, 2.66)	2.37 (1.00, 6.86)	3.64 (1.04, 12.35)	2.23 (0.22, 18.89)	2.48 (0.99, 6.29)	Model does not converge
Interaction term (ratio of odds ratios)	1.10 (0.73, 1.63)	1.11 (0.30, 3.75)	0.99 (0.38, 2.77)	0.75 (0.37, 1.57)	1.05 (0.59, 1.88)	Model does not converge
HOUSING TENURE						
Non-owner occupied	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
Owner occupied	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
Interaction term (ratio of odds ratios)	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
PARENTAL UNEMPLOYMENT						
1 or more parent not in paid employment	2.00 (1.15, 3.86)	0.38 (0.07, 2.00)*	5.95 (0.21, 172.10)	2.17 (0.31, 21.97)	2.86 (0.97, 9.21)	*N/A*

Table 3. Odds ratios for poisoning prevention practices (95% credible interval) by social variables *(Continued)*

Both parents in paid employment	1.71 (1.02, 3.31)	59.96 (4.37, 1001.00)	6.15 (0.23, 202.90)	2.35 (0.30, 20.73)	2.27 (0.80, 7.56)	*N/A*
Interaction term (ratio of odds ratios)	1.17 (0.80, 1.73)	0.01 (0.00, 0.43)	0.94 (0.27, 3.33)	0.97 (0.47, 1.95)	1.25 (0.72, 2.14)	*N/A*
AGE						
Odds ratio at age 0	1.34 (0.95, 1.96)	1.54 (0.57, 4.57)	1.99 (0.24, 12.63)	3.05 (0.38, 30.10)	1.03 (0.56, 2.10)	0.80 (0.18, 3.80)
Odds ratio at age 4	1.18 (0.84, 1.78)	1.20 (0.38, 5.04)	3.59 (0.44, 35.44)	0.77 (0.09, 7.22)	1.89 (1.02, 3.84)	0.22 (0.01, 2.00)
Interaction term (ratio of odds ratios)	0.97 (0.85, 1.10)	0.94 (0.71, 1.26)	1.17 (0.76, 1.84)	0.71 (0.54, 0.93)	1.16 (0.95, 1.43)	0.73 (0.25, 1.53)

* Fixed effect model used

Table 4. Odds ratios for falls prevention practices (95% credible interval) by social variables

Social variables	Fitted stair gate	No baby walker	Non-slip bath mat	Window locks	Not leaving child unattended on high surfaces
GENDER					
Boys	1.64 (0.85, 3.31)	0.67 (0.32, 1.37)	*N/A*	1.45 (0.80, 2.92)	*N/A*
Girls	1.92 (0.99, 3.85)	1.04 (0.49, 2.18)	*N/A*	0.85 (0.46, 1.70)	*N/A*
Interaction term (ratio of odds ratios)	0.86 (0.62, 1.18)	0.64 (0.26, 1.59)	*N/A*	1.72 (1.16, 2.57)	*N/A*
ETHNIC GROUP					
Black and minority ethnic groups	1.98 (1.17, 3.34)	0.77 (0.29, 2.49)	*N/A*	1.58 (0.58, 5.11)	*N/A*
White	1.65 (1.01, 2.76)	1.03 (0.30, 2.59)	*N/A*	1.36 (0.57, 3.43)	*N/A*
Interaction term (ratio of odds ratios)	1.19 (0.77, 1.85)	0.79 (0.33, 2.02)	*N/A*	1.13 (0.62, 2.05)	*N/A*
FAMILY TYPE					
Single parent family	2.03 (1.16, 3.62)	0.89 (0.32, 2.46)	0.60 (0.16, 1.99)*	0.98 (0.37, 3.19)	*N/A*
Two parent family	1.82 (1.12, 3.02)	0.92 (0.41, 1.87)	1.00 (0.69, 1.44)	1.51 (0.63, 4.76)	*N/A*
Interaction term (ratio of odds ratios)	1.11 (0.75, 1.65)	0.99 (0.44, 2.24)	0.60 (0.15, 2.14)	0.65 (0.40, 1.05)	*N/A*
HOUSING TENURE					

Table 4. Odds ratios for falls prevention practices (95% credible interval) by social variables *(Continued)*

Non-owner occupied	1.98 (1.48, 2.66)	1.22 (0.48, 2.93)	*N/A*	1.13 (0.03, 54.7)*	0.44 (0.04, 3.65)*
Owner occupied	1.22 (0.96, 1.61)	1.36 (0.53, 3.34)	*N/A*	1.48 (0.04, 75.5)	2.51 (0.58, 13.06)
Interaction term (ratio of odds ratios)	1.62 (1.18, 2.24)	0.90 (0.54, 1.47)	*N/A*	0.76 (0.50, 1.17)	0.18 (0.003, 5.76)
PARENTAL UNEMPLOYMENT					
1 or more parent not in paid employment	2.08 (0.77, 5.86)	0.39 (0.14, 1.04)*	2.07 (0.91, 4.78)*	1.40 (0.58, 4.23)	*N/A*
Both parents in paid employment	1.82 (0.67, 5.01)	0.87 (0.49, 1.51)	0.91 (0.59, 1.42)	1.40 (0.63, 4.49)	*N/A*
Interaction term (ratio of odds ratios)	1.15 (0.77, 1.71)	0.45 (0.14, 1.40)	2.28 (0.88, 5.86)	0.98 (0.62, 1.55)	*N/A*
AGE					
Odds ratio at age 0	1.40 (1.02, 2.06)	*N/A due to age of walker use*	1.16 (0.80, 1.71)*	1.00 (0.30, 4.87)	*N/A due to age for leaving child on high surfaces*
Odds ratio at age 4	1.26 (0.81, 2.02)	*N/A due to age of walker use*	1.08 (0.78, 1.50)	1.27 (0.35, 5.84)	*N/A due to age for leaving child on high surfaces*
Interaction term (ratio of odds ratios)	0.97 (0.84, 1.13)	*N/A due to age of walker use*	0.98 (0.90, 1.06)	1.06 (0.90, 1.23)	*N/A due to age for leaving child on high surfaces*

* Fixed effect model used

Table 5. Odds ratios for use of socket covers (95% credible interval) by social variables

Social variables	Socket covers
GENDER	
Boys	0.50 (0.00, 53.26)
Girls	1.17 (0.00, 129.70)
Interaction term (ratio of odds ratios)	2.36 (0.68, 8.27)
ETHNIC GROUP	
Black and minority ethnic groups	1.96 (0.09, 29.00)
White	1.25 (0.05, 18.05)

Table 5. Odds ratios for use of socket covers (95% credible interval) by social variables *(Continued)*

Interaction term (ratio of odds ratios)	1.59 (0.56, 4.49)
FAMILY TYPE	
Single parent family	2.15 (0.45, 11.07)
Two parent family	2.58 (0.63, 11.85)
Interaction term (ratio of odds ratios)	0.82 (0.33, 2.11)
HOUSING TENURE	
Non-owner occupied	0.68 (0.00, 111.70)
Owner occupied	0.25 (0.00, 38.68)
Interaction term (ratio of odds ratios)	2.76 (0.76, 11.09)
PARENTAL UNEMPLOYMENT	
1 or more parent not in paid employment	Model does not converge
Both parents in paid employment	Model does not converge
Interaction term (ratio of odds ratios)	Model does not converge
AGE	
Odds ratio at age 0	0.86 (0.01, 32.12)
Odds ratio at age 4	0.38 (0.00, 14.98)
Interaction term (ratio of odds ratios)	0.76 (0.51, 1.11)

Table 6. Odds ratios for storage of sharp objects out of reach (95% credible interval) by social variables

Social variables	Sharp objects
GENDER	
Boys	0.56 (0.04, 7.78)
Girls	0.49 (0.03, 6.79)
Interaction term (ratio of odds ratios)	1.15 (0.78, 1.66)
ETHNIC GROUP	
Black and minority ethnic groups	0.77 (0.16, 3.54)
White	0.85 (0.18, 3.72)
Interaction term (ratio of odds ratios)	0.92 (0.53, 1.58)

Table 6. Odds ratios for storage of sharp objects out of reach (95% credible interval) by social variables *(Continued)*

FAMILY TYPE*	
Single parent family	0.95 (0.22, 4.11)
Two parent family	0.85 (0.21, 3.58)
Interaction term (ratio of odds ratios)	1.12 (0.72, 1.76)
HOUSING TENURE	
Non-owner occupied	1.58 (0.55, 4.54)
Owner occupied	1.18 (0.40, 3.27)
Interaction term (ratio of odds ratios)	1.36 (0.92, 2.02)
PARENTAL UNEMPLOYMENT	
1 or more parent not in paid employment	0.91 (0.11, 6.46)
Both parents in paid employment	0.70 (0.09, 4.91)
Interaction term (ratio of odds ratios)	1.29 (0.87, 1.93)
AGE	
Odds ratio at age 0	1.89 (0.50, 7.22)
Odds ratio at age 4	1.58 (0.41, 6.24)
Interaction term (ratio of odds ratios)	0.96 (0.83, 1.09)

* See text for odds ratios from modelling within and between study variance separately

Table 7. Odds ratios for storage of small objects out of reach (95% credible interval) by social variables

Social variables	Storage of small objects out of reach
GENDER	
Boys	0.35 (0.20, 0.62)
Girls	0.14 (0.06, 0.27)
Interaction term (ratio of odds ratios)	2.54 (0.86, 7.91)
ETHNIC GROUP	
Black and minority ethnic groups	*N/A*
White	*N/A*
Interaction term (ratio of odds ratios)	*N/A*
FAMILY TYPE	

Table 7. Odds ratios for storage of small objects out of reach (95% credible interval) by social variables *(Continued)*

Single parent family	0.72 (0.19, 2.86)
Two parent family	0.38 (0.28, 0.52)
Interaction term (ratio of odds ratios)	1.90 (0.44, 8.31)
HOUSING TENURE	
Non-owner occupied	*N/A*
Owner occupied	*N/A*
Interaction term (ratio of odds ratios)	*N/A*
PARENTAL UNEMPLOYMENT	
1 or more parent not in paid employment	1.90 (0.79, 4.89)
Both parents in paid employment	0.63 (0.38, 1.04)
Interaction term (ratio of odds ratios)	3.02 (1.06, 9.04)
AGE	
Odds ratio at age 0	0.03 (0.01, 0.08)
Odds ratio at age 4	43.43 (10.06, 179.00)
Interaction term (ratio of odds ratios)	6.37 (3.43, 11.73)

Table 8. Odds ratios for never leaving a child alone in the bath (95% credible interval) by social variables

Social variables	**Bath Alone**
GENDER	
Boys	1.17 (0.51, 3.12)
Girls	1.73 (0.75, 4.97)
Interaction term (ratio of odds ratios)	0.67 (0.29, 1.53)
ETHNIC GROUP	
Black and minority ethnic groups	0.89 (0.23, 5.04)
White	1.0 (0.25, 5.46)
Interaction term (ratio of odds ratios)	0.89 (0.33, 2.45)
FAMILY TYPE	
Single parent family	0.53 (0.14, 1.93)*

Table 8. Odds ratios for never leaving a child alone in the bath (95% credible interval) by social variables *(Continued)*

Two parent family	1.13 (0.71, 1.83)
Interaction term (ratio of odds ratios)	0.47 (0.11, 1.82)
HOUSING TENURE	
Non-owner occupied	1.80 (0.76, 4.34)
Owner occupied	1.05 (0.45, 2.86)
Interaction term (ratio of odds ratios)	1.68 (0.68, 4.09)
PARENTAL UNEMPLOYMENT	
1 or more parent not in paid employment	*N/A*
Both parents in paid employment	*N/A*
Interaction term (ratio of odds ratios)	*N/A*
AGE	
Odds ratio at age 0	0.62 (0.17, 2.14)
Odds ratio at age 4	3.02 (0.66, 18.18)
Interaction term (ratio of odds ratios)	1.50 (0.96, 2.43)

* Fixed effect model used

APPENDICES

Appendix 1. Search strategy

MEDLINE (Ovid) 1950 to May Week 1 2009
1.randomized controlled trial.pt.
2.exp Randomized Controlled Trial/
3.randomi?ed controlled trial*.mp.
4.exp Random Allocation/
5.exp Double-Blind Method/
6.exp Single-Blind Method/
7.exp Clinical Trial/
8.controlled clinical trial.pt.
9.comparative stud*.mp.
10.intervention stud*.mp.
11.control group*.mp.
12.placebo*.mp.
13.evaluation stud*.mp.
14.placebo*.mp.
15.exp Placebos/
16.exp control groups/
17.random allocation.mp.
18.or/1-17
19.Humans/
20.18 and 19
21.exp Child/

22.exp Infant/
23.exp Adolescent/
24.exp Minors/
25.(child* or adolesc* or infan* or young* or minor* or toddl* or baby or babies).mp.
26.or/21-25
27.exp "Early Intervention (Education)"/
28.exp Education/
29.exp Patient Education as Topic/
30.exp Health Education/
31.public health/ed
32.exp Parenting/
33.exp Counseling/
34.training.mp.
35.(educat* or train* or teach* or parent* or counsel*).mp.
36.or/27-35
37.exp Accident Prevention/
38.exp Safety/
39.exp Safety Management/
40.safety practice*.mp.
41.exp Drug Storage/
42.exp Hazardous Substances/po, ae [Poisoning, Adverse Effects]
43.or/37-42
44.exp Equipment Safety/
45.(safety adj3 equipment).mp.
46.exp Infant Equipment/
47.exp Protective Devices/
48.(fireguard* or fire-guard*).mp.
49.(stair* adj3 gate*).mp.
50.(bab* adj3 walk*).mp.
51.(protect* adj3 device*).mp.
52.(kettle* adj3 (flex* or cable* or wire*)).mp.
53.(cook* adj3 guard*).mp.
54.(smok* adj3 (alarm* or detect*)).mp.
55.or/44-54
56.exp Accidents/
57.exp Accidents, Home/
58.exp Burns, Chemical/
59.exp Eye Burns/
60.exp Burns/
61.exp Burns, Inhalation/
62.exp Burns, Electric/
63.exp Smoke/
64.exp Smoke Inhalation Injury/
65.exp Poisoning/
66.exp Carbon Monoxide Poisoning/
67.exp "Wounds and Injuries"/
68.(accident* or burn* or scald* or asphyx* or chok* or cut* or suffocat* or poison* or fracture* or wound* or injur*).mp.
69.exp Fractures, Bone/
70.exp Asphyxia/
71.suffocat*.mp.
72.exp Ipecac/
73.exp Drowning/
74.exp Near Drowning/
75.or/56-74
76.20 and 26
77.36 or 43 or 55
78.75 and 76 and 77
79.(2004* or 2005* or 2006* or 2007* or 2008* or 2009*).ed.
80.78 and 79

EMBASE (Ovid) (1980 to May 2009, Week 18)
1.exp Randomized Controlled Trial/

2.randomi?ed controlled trial*.mp.
3.exp Random Allocation/
4.exp Double-Blind Method/
5.exp Single-Blind Method/
6.exp Clinical Trial/
7.comparative stud*.mp.
8.intervention stud*.mp.
9.control group*.mp.
10.placebo*.mp.
11.evaluation stud*.mp.
12.placebo*.mp.
13.exp Placebos/
14.exp control groups/
15.random allocation.mp.
16.or/1-15
17.Humans/
18.16 and 17
19.exp Child/
20.exp Infant/
21.exp Adolescent/
22.exp Minors/
23.(child* or adolesc* or infan* or young* or minor* or toddl* or baby or babies).mp.
24.or/19-23
25.exp Early Intervention/
26.exp Education/
27.exp Patient Education/
28.exp Health Education/
29.exp Public Health/
30.26 and 29
31.exp Parenting/
32.exp Counseling/
33.training.mp.
34.(educat* or train* or teach* or parent* or counsel*).mp.
35.25 or 26 or 27 or 28 or 30 or 31 or 32 or 33 or 34
36.exp Accident Prevention/
37.exp Safety/
38.exp Safety Management/
39.safety practice*.mp.
40.exp Drug Storage/
41.exp Hazardous Substances/
42.or/36-41
43.exp Equipment Safety/
44.(safety adj3 equipment).mp.
45.exp Infant Equipment/
46.exp Protective Devices/
47.(fireguard* or fire-guard*).mp.
48.(stair* adj3 gate*).mp.
49.(bab* adj3 walk*).mp.
50.(protect* adj3 device*).mp.
51.(kettle* adj3 (flex* or cable* or wire*)).mp.
52.(cook* adj3 guard*).mp.
53.(smok* adj3 (alarm* or detect*)).mp.
54.or/43-53
55.exp Accidents/
56.exp Accidents, Home/
57.exp Burns, Chemical/
58.exp Eye Burns/
59.exp Burns/
60.exp Burns, Inhalation/
61.exp Burns, Electric/
62.exp Smoke/
63.exp Smoke Inhalation Injury/

64.exp Poisoning/
65.exp Carbon Monoxide Poisoning/
66.exp injury/
67.(accident* or burn* or scald* or asphyx* or chok* or cut* or suffocat* or poison* or fracture* or wound* or injur*).mp.
68.exp Fractures, Bone/
69.exp Asphyxia/
70.suffocat*.mp.
71.exp Ipecac/
72.exp Drowning/
73.exp Near Drowning/
74.or/55-73
75.18 and 24
76.35 or 42 or 54
77.74 and 75 and 76
78.(2004* or 2005* or 2006* or 2007* or 2008* or 2009*).em.
79.77 and 78

PsycINFO (Ovid) 1806 to May (week 3) 2009
1.randomi?ed controlled trial*.mp.
2.exp Clinical Trial/
3.comparative stud*.mp.
4.intervention stud*.mp.
5.control group*.mp.
6.placebo*.mp.
7.evaluation stud*.mp.
8.placebo*.mp.
9.exp control groups/
10.random allocation.mp.
11.or/1-10
12.(child* or adolesc* or infan* or young* or minor* or toddl* or baby or babies).mp.
13.exp Education/
14.exp Health Education/
15.exp Counseling/
16.training.mp.
17.(educat* or train* or teach* or parent* or counsel*).mp.
18.or/12-17
19.exp Accident Prevention/
20.exp Safety/
21.safety practice*.mp.
22.(safety adj3 equipment).mp.
23.(fireguard* or fire-guard*).mp.
24.(stair* adj3 gate*).mp.
25.(bab* adj3 walk*).mp.
26.(protect* adj3 device*).mp.
27.(cook* adj3 guard*).mp.
28.(smok* adj3 (alarm* or detect*)).mp.
29.or/19-28
30.exp Accidents/
31.exp Burns/
32.exp Smoke/
33.exp Poisoning/
34.exp Carbon Monoxide Poisoning/
35.(accident* or burn* or scald* or asphyx* or chok* or cut* or suffocat* or poison* or fracture* or wound* or injur*).mp.
36.exp Asphyxia/
37.suffocat*.mp.
38.or/19-36
39.11 and 18 and 29 and 38

ISI Web of Science: Science Citation Index Expanded (SCI-EXPANDED) 1970 to May 2009
ISI Web of Science: Social Sciences Citation Index (SSCI) 1970 to May 2009
ISI Web of Science: Conference Proceedings Citation Index- Science (CPCI-S) 1990 to May 2009
1.Topic=(child* or adolesc* or infan* or young* or minor* or toddl* or baby or babies)

2.Topic=(accident* or burn* or scald* or asphyx* or chok* or cut* or suffocat* or poison* or fracture* or wound* or injur* or drown* or Carbon Monoxide or Smoke Inhal* or Ipecac or Drug Storage or Hazardous Substance* or Infant Equipment or Protective Device* or fireguard* or fire-guard* or stair gate* or baby walk* or kettle flex* or kettle cable* or kettle wire* or cooker guard* or smoke alarm* or smoke detect*)
Topic=(educat* or train* or teach* or parent* or counsel* or early Intervention or public health or accident prevention or prevent* or safe or safety)
3.Topic=(Home*)
4.Topic=(randomized or randomised or controlled trial* or Random Allocation or Double-Blind or Single-Blind or Clinical Trial* or comparative stud* or intervention stud* or control group* or placebo* or evaluation stud* or placebo*)

CINAHL (EBSCO) 1982 to May 2009 (2004 to 2009)
1.TX (child* or adolesc* or infan* or young* or minor* or toddl* or baby or babies) and (accident* or burn* or scald* or asphyx* or chok* or cut* or suffocat* or poison* or fracture* or wound* or injur* or drown* or Carbon Monoxide or Smoke Inhal* or Ipecac or Drug Storage or Hazardous Substance* or Infant Equipment or Protective Device* or fireguard* or fire-guard* or stair gate* or baby walk* or kettle flex* or kettle cable* or kettle wire* or cooker guard* or smoke alarm* or smoke detect*) and (educat* or train* or teach* or parent* or counsel* or “early Intervention” or “public health” or “accident prevention” or prevent* or safe or safety)
2.TX Home*
3.4 and 5
4.randomized or randomized or controlled trial* or Random Allocation or Double-Blind or Single-Blind or Clinical Trial* or comparative stud* or intervention stud* or control group* or placebo* or evaluation stud* or placebo*

WHAT'S NEW

Date	Event	Description
31 October 2014	Amended	The authors have made corrections to the results section paragraph 'storage of poisons out of reach' which relates to Analysis 5.5.

HISTORY

Protocol first published: Issue 4, 2004
Review first published: Issue 1, 2007

Date	Event	Description
19 March 2012	New citation required and conclusions have changed	The review has been updated with the inclusion of 18 new studies. The authors of the review have changed.
25 November 2011	New search has been performed	The review has been updated with the inclusion of 18 new studies.

CONTRIBUTIONS OF AUTHORS

DK had the idea for the review, drafted the protocol and the funding application, contributed to study selection, data extraction, developing the statistical models for assessing the effect of the covariates and the analyses, and drafted the final report. CC contributed to study selection, developing the statistical models for assessing the effect of the covariates and to drafting the protocol, the funding application and the final report. CM contributed to study selection, quality assessment and drafting the protocol, the funding application and the final report. SS contributed to the searches, quality assessment and drafting the protocol and the final report. AJS developed the statistical models for assessing the effect of the covariates and contributed to drafting the protocol, the funding application and the final report. MW contributed to study selection and drafting the protocol, the funding application and the final report. AM-J (nee AW) contributed to study selection, quality assessment, the analyses and drafting the protocol, the funding application and the final report. BY contributed to the analysis and drafting the final report. PW and NI contributed to study selection, data extraction, quality assessment and drafting of

the final report. NJC contributed to the funding application, drafting the protocol, the analysis and drafting the final report. FAA and SJH contributed to drafting the protocol, the analysis and drafting of the final report.

DECLARATIONS OF INTEREST

Denise Kendrick, Carol Coupland, Michael Watson, Caroline Mulvaney and Amanda Mason-Jones are authors of some of the studies included in this review.

SOURCES OF SUPPORT

Internal sources

- University of Nottingham, UK.
- University of Leicester, UK.

External sources

- Department of Health, UK.
- National Institute for Health Research, UK.

This study was funded by the National Institute for Health Research (NIHR) under its Programme Grants for Applied Research funding scheme (RP-PG-0407-10231).The views expressed are those of the author(s) and not necessarily those of the NHS, the NIHR or the Department of Health.

NOTES

This work was undertaken by The University of Nottingham, which received funding from the Department of Health and the National Institute for Health Research. This review presents independent research commissioned by the National Institute for Health Research (NIHR) under its Programme Grants for Applied Research funding scheme (RP-PG-0407-10231). The views expressed in this review are those of the author(s) and not necessarily those of the NHS, the NIHR or the Department of Health.

INDEX TERMS

Medical Subject Headings (MeSH)

*Protective Devices; *Safety; Accident Prevention [instrumentation] [methods]; Accidental Falls [prevention & control]; Accidents, Home [*prevention & control]; Burns [prevention & control]; Burns, Electric [prevention & control]; Drowning [prevention & control]; Poisoning [prevention & control]; Randomized Controlled Trials as Topic

MeSH check words

Adolescent; Child; Child, Preschool; Humans; Infant; Infant, Newborn