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Social support, educational, and behavioral modification interventions for improving household disaster preparedness in the general community-dwelling population (Protocol).  
*Cochrane Database of Systematic Reviews* 2021, Issue 5. Art. No.: CD014934.  
DOI: [10.1002/14651858.CD014934](https://doi.org/10.1002/14651858.CD014934).

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[Intervention Protocol]

# Social support, educational, and behavioral modification interventions for improving household disaster preparedness in the general community-dwelling population

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**Editorial group:** Cochrane Public Health Group.

**Publication status and date:** Edited (no change to conclusions), published in Issue 5, 2023.

**Citation:** Amberson T, Heagele TN, Castner J, Wyte-Lake T, Couig MP, Bell SA, Mammen MJ, Wells V. Social support, educational, and behavioral modification interventions for improving household disaster preparedness in the general community-dwelling population (Protocol). *Cochrane Database of Systematic Reviews* 2021, Issue 5. Art. No.: CD014934. DOI: [10.1002/14651858.CD014934](https://doi.org/10.1002/14651858.CD014934).

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**Editorial note:** This protocol will not be progressed to the review stage as it no longer meets Cochrane's methodological standards.

## ABSTRACT

### Objectives

This is a protocol for a Cochrane Review (intervention). The objectives are as follows:

- To ascertain the state of the science on social support, educational, and behavioural modification interventions to improve all-hazard household disaster preparedness
  - The PICO research question is as follows: in the general, non-institutionalised, community-dwelling population (P), do social support, educational, and behavioural modification interventions (I) compared to no intervention or usual mass public service messaging (C) improve all-hazard household disaster preparedness behaviours, supplies, and/or knowledge (O)
- To assess whether social support, educational, and behavioural modification interventions have effects on healthcare utilisation (emergency department utilisation, hospitalisation, morbidity), mortality, and mental health or physical functioning post disaster

## BACKGROUND

### Description of the condition

This review synthesises available evidence on the effects of social, educational, and behavioural modification interventions to improve all-hazard household disaster preparedness in non-institutional residential settings. Disaster preparedness is defined as evidence of individual household plans, supplies, and established household communication plans to shelter-in-place, evacuate, and locate other loved ones or social support persons who do not reside in the same household. Household disaster preparedness information disseminated through public health and clinician education, social networks, and behavioural modification interventions is widely assumed and delivered as best-evidence practice (Bronfman 2019; Claver 2015; Levac 2012).

### Disaster and disaster classifications

Disaster is defined as “a situation or event that overwhelms local capacity, necessitating a request at the national or international level for external assistance; an unforeseen and often sudden event that causes great damage, destruction and human suffering”, according to the Centre for Research on the Epidemiology of Disasters (CRED) (CRED 2019; CRED 2020). When operationalising this definition of disaster for the International Disaster Database (EM-DAT), CRED requires one or more of the inclusion criteria be present: 10 or more people reported killed, 100 or more people reported affected, declaration of a state of emergency, and/or a call for international assistance (CRED 2020). Disasters are classified as natural or technological, emphasising that human causes are linked to both disaster groups, and that human agency can prevent and mitigate their impact (CRED 2020). In this EM-DAT classification system, natural disasters are subdivided into subgroups of geophysical, meteorological, hydrological, climatological, biological, and extraterrestrial. Technological disasters are subdivided into subgroups of industrial, transport, and miscellaneous (collapse, explosion, fire, other) accidents. The EM-DAT disaster taxonomy may be used to further classify disasters by primary type (e.g. storm as the main type of meteorological subgroup), subtype (e.g. convective storm as a subtype of storm), and sub-subtype (e.g. storm surge as a sub-subtype of convective storm).

It is important to clarify the distinction between disaster and hazard. Hazards are defined by CRED as extreme or severe events (earthquake, flood, heat wave, etc.) that naturally occur all over the world (CRED 2020). These hazards are considered disasters only when they affect a vulnerable human settlement and lives are lost or livelihoods affected (Mizutori 2020). In this review, the term “natural disaster” will denote a natural hazard that has affected a human settlement that was not appropriately organised or resourced to withstand its impact. This highlights the potential power of disaster risk governance to effectively reduce and manage disaster risk (Mizutori 2020). Here, the hazard exposure or the type of hazard exposure is not the focus of our review. Rather, we focus on disaster preparedness at the household level.

### Description of the intervention

Household disaster preparedness social support, educational, and behavioural modification interventions are developed and implemented to improve knowledge, motivation, and resources

and are expected to translate into concrete preparedness behaviours.

### Social support interventions

Social support interventions include the provision of philanthropic, or public, social services and peer support. Social support interventions and intervention components are particularly relevant to households with economic vulnerability. Social support interventions often mitigate the inability to achieve household preparedness without material support or human networked co-functioning, particularly in circumstances where individual or collective household knowledge or motivation alone is not sufficient to achieve the intended outcome. Social support interventions are emotional and financial and involve resource-sharing, peer-training, social network information dissemination, and companionship offered among family, friends, peers, faith-based or service communities (including non-governmental aid organisations), or neighbours. Social support may include social service agency interventions for subsidised housing, materials, and supplies, or structured support groups. Outside of train-the-trainer models, social support typically does not include training, professional counselling, or educational interventions consisting of professional, paid services from a public health worker, a health educator, or a clinician. However, paraprofessionals provide social support as structured components of community health worker networks or successful referrals to social service agencies. Referrals for household disaster registry, transportation, or other disaster resources are considered social support interventions.

Lack of social support is a major risk factor for poor household preparedness and worsened post-disaster mental and physical health outcomes (Bei 2013; Strine 2013). Social support improves self-management and self-reliance for people with complex chronic diseases such as diabetes (Al-Dwaidat 2019; Chlebony 2006). Incorporating small group discussions and social support has led to greater improvement in household preparedness education interventions compared to population-level media education alone (Eisenman 2009). Social connections are a key aspect of rural older adult household disaster preparedness (Ashida 2017). Direct provision of disaster supplies can improve longitudinal household preparedness as seen in families of children with special needs (Baker 2012). Well-established social networks and community social support services enhance disaster preparedness and resilience after disasters (Aldrich, 2015; Levac 2012).

### Educational interventions

Educational interventions may include systematic instruction, structured information-sharing, or professional provision of self-care information and information resources. Household preparedness educational interventions can take place in clinical and community education settings, and can be provided as specific take-home reading materials and Internet-available or pre-prepared video/audio instruction. As defined by Wakefield and colleagues, mass media campaigns utilise existing media channels such as mail, radio, and television to expose large numbers of people to messages that encourage behaviour change (Wakefield 2010). For the purposes of this review, we will not consider population-level mass media campaigns as educational interventions. Rather, they will serve as a control.

Educational interventions are widely used to improve clinician disaster preparedness to optimise community health outcomes

(Aluisio 2016; Behar 2008; Bistaraki 2011). Structured education on household preparedness includes information on evacuation, supplies, shelter-in-place, and communication (Ardalan 2013), as well as drills and exercises to practise household disaster response (Chen 2019). Household preparedness interventions were tested in households (Ardalan 2013), in community education (Eisenman 2009; Glik 2014a; Yasunari 2011), as part of virtual reality (Tarnanas 2001), and in clinical settings (Baker 2012), and were explored for use in pregnant women (Yasunari 2011), as well as in families with special needs children (Baker 2012; Baker 2013), members of Hispanic/Latinx communities (Eisenman 2009), and general community members (Ardalan 2013; Chen 2019). All-hazard disaster preparedness interventions may be delivered in the form of any drill or evacuation plan versus no drill or plan, or education may be tailored to address one or more of the most prevalent disaster hazard vulnerabilities of the region in which the study takes place. Education may also be tailored to the specific needs of a population with a chronic disease or disability, depending on the inclusion criteria of the original study. Population-based all-hazard household disaster preparedness tends to involve a comprehensive approach, with additional optional materials tailored to specific vulnerabilities (pet or livestock owners, households with members with cognitive or functional impairment, etc.).

### Behavioural modification interventions

Behavioural modification interventions are intended to change human behaviour patterns through motivational techniques, often with positive and negative reinforcement. Behavioural modification interventions include motivational interviewing, cognitive or behaviour therapy, and report-back interventions. Behavioural modification interventions are generally delivered individually or by household by a professional clinician such as a psychotherapist. Behavioural modification interventions have been shown to enhance healthy household environmental modifications (Hahn 2019), with little sustenance of behaviour change over time (Butler 2019; Hahn 2019a). Emergency preparedness messages generally focus on telling people how to prepare. Still it is important to ensure that this education is delivered to encourage behaviour change, and that it is translated into concrete actions (Kruger 2020). Although many organisations have developed interventions to address emergency preparedness communication or have devised educational interventions, inclusion of behaviour modification intervention components within the intervention can be critical in attaining concrete preparedness.

### How the intervention might work

The Behaviour Change Wheel conceptual framework illustrates how behaviour change occurs as a function of social, educational, and behavioural modification interventions (Michie 2011). Interventions and intervention components function by enhancing household members' capability, opportunity, and motivation to achieve outcome targets. First, social interventions function by increasing opportunity for household members to achieve the desired outcome. Examples of social interventions include environmental and social restructuring and enablement. For example, a social restructuring intervention may consist of a faith community organising communication lists for all members of a vulnerable group that includes contact information for all members and contact information for an agency or individual willing to provide disaster response aid. Enablement is another example of

a social intervention component whereby an interventionist or a community support group places the household member on a disaster registry or connects the household member to a social service that provides an actual disaster supply kit. The disaster registry may enable rescue evacuation when required and/or the disaster supply kit may become essential for sustaining life during sheltering-in-place at the time of a disaster. Social interventions are particularly relevant for households with economic vulnerability or independent functioning that may not have the resources to effect the desired outcome otherwise. These intervention components are anticipated to result in improved disaster evacuation, shelter-in-place, first aid, and communication, all of which subsequently decrease morbidity and mortality or improve post-disaster functioning.

Second, educational intervention components are achieved through the Behavior Change Wheel intervention elements of education and training (Michie 2011). Examples of education and training include providing information or demonstrations about how to create a household disaster preparedness plan and the health consequences of poor household preparedness. Videos, patient education or public health handouts, demonstrations, and checklists are examples of the educational components of an intervention; they function by enhancing memory, cognition, physical skills, knowledge, and self-efficacy, and thereby the capability, of the household member to achieve the desired outcome. As with social support interventions, these educational intervention components are anticipated to result in improved disaster evacuation, shelter-in-place, first aid, and communication, which subsequently decrease morbidity and mortality or improve post-disaster functioning.

Third, behavioural modification interventions may be achieved as a function of improved motivation (Michie 2011). Intervention components to improve motivation may include persuasion, incentive, coercion (cost or fine), modelling, and environmental restructuring. An example of motivation modelling may involve a celebrity or a person of substantial influence in a social network modelling the value and importance of an evacuation plan and household disaster supply kit. The intervention may motivate teenage members of the household to encourage household conformity with the positively modelled behaviour. As with social and educational interventions, these motivational intervention components are anticipated to result in improved disaster evacuation, shelter-in-place, first aid, and communication, which subsequently decrease morbidity and mortality or improve post-disaster functioning.

A more prepared public leads to more resilient communities and therefore more effective recovery and response in the post-disaster period (Chandra 2011; DeBastiani 2015; Glik 2014; Tierney 2013). Disaster preparedness research over the past 20 years reveals that some households have made efforts to be prepared. However, many studies have found that globally, households remain unprepared for disasters, even in disaster-prone areas (Nojang 2020). Research from Asia (Chan 2016; Hoffman 2019), North America (Bogdan 2021), New Zealand (Becker 2012), Australia (Cretikos 2008), and Africa (Morton 2017), as well as from the Middle East (Ardalan 2020; Joffe 2019), has revealed low levels of household disaster preparedness (Kohn 2012). For example, in Iran, Ardalan 2020 found very low levels of household disaster preparedness, despite the country's elevated risk of natural

disasters. In the United States, surveys at both national and local level consistently demonstrate that the US public remains under-prepared (Bell 2020; CDC 2012; Kapucu 2008; Murphy 2009). Another study involving 3541 households from four regions in China found poor household preparedness levels (Chen 2019). To improve preparedness behaviours, someone working to effect behaviour change would first need to understand the barriers and motivators associated with adopting said behaviour (DeBastiani 2015). Considerations should be made to engage individuals at varying levels of awareness, motivation, and preparedness in improving household preparedness. Therefore, any intervention must target or tailor messages to specific population groups, as well as to those at different stages of preparedness (Glik 2014). Thus, all-hazard household disaster preparedness interventions will be tailored to one or more of the most common or most threatening disaster hazards in the study setting, and to the unique vulnerabilities applicable to the population included in the study. Multi-component interventions with social support, educational, and behavioural modification intervention components as described here are well poised to develop a tailored approach to the different stages of preparedness when developing translatable and adaptable preparedness behaviours. Ultimately, healthcare utilisation, mortality, and post-disaster functioning may be improved for members within a household who are better prepared for disaster as seen through pre-specified plans, supplies, and established household communication plans to shelter-in-place, evacuate, and locate other loved ones or social support persons outside the household.

### Why it is important to do this review

Around the globe, disasters have had and will continue to have an impact on individuals, households, communities, states, regions, and nations. In October 2020, the CRED and the United Nations Office for Disaster Risk Reduction (UNDRR) released a report on the toll of disasters. This report concluded that during the time from 1999 to 2019, 7348 disaster events were recorded worldwide, claiming approximately 1.23 million lives, for an average of 60,000 per annum, and affected a total of over 4 billion people. Additionally, disasters led to approximately USD 2.97 trillion in economic losses worldwide (CRED, UNDRR 2020). Furthermore, the COVID-19 pandemic has demonstrated that with globalisation, people may be indirectly affected by product supply chain disruption for supplies necessary to maintain life during home quarantine or isolation (Shih 2020). Our proposed systematic review will synthesise existing research on household emergency preparedness interventions and will fill a current gap in the literature. Adjacent topics in currently published literature include the following: (1) a literature review on how social capital can be used to foster household emergency preparedness (Levac 2012); (2) a literature review on the effectiveness of various preparedness educational activities targeted at health professionals (Gowing 2017); (3) a literature review on the social and physical determinants of disaster-related morbidity and mortality of elderly and medically frail community members (Heagele 2018); (4) a scoping review on how community-based service providers can foster household emergency preparedness for community-dwelling clients (Subramaniam 2019); (5) a literature review on how home health agencies can improve the disaster preparedness of patients and providers (Wyte-Lake, 2015); (6) an integrative review describing knowledge and skills that healthcare providers need to provide appropriate care for elderly community members during

disaster response efforts (Johnson 2015); (7) a methodological review on how practitioners evaluate the effectiveness of disaster education programmes targeted to children (Johnson 2014); and (8) a systematic review of post-disaster chronic disease outcomes for older adults (no intervention studies included) (Bell 2019).

This systematic review of household emergency preparedness interventions for community-dwelling non-institutionalised people, or household members, of the general population is the first such review, to the review authors' knowledge. Research on the effectiveness of interventions and on community residential dwelling is greatly needed. The review information generated would assist public health and healthcare clinicians with evidence-based decisions on specific interventions to be implemented in their respective communities, and would enable researchers to ascertain gaps and strengths in the existing evidence. In particular, disaster preparedness professionals, disaster medical response teams, public health practitioners, emergency nurses, and public health nurses will benefit from these findings. This review will provide evidence-based recommendations to guide policymakers across multiple disciplines to support all-hazard preparedness decision-making. It will also assist other stakeholders (public and private) in prioritising how to best invest in disaster preparedness efforts to enhance effective community response while minimising loss of life.

### OBJECTIVES

- To ascertain the state of the science on social support, educational, and behavioural modification interventions to improve all-hazard household disaster preparedness
  - The PICO research question is as follows: in the general, non-institutionalised, community-dwelling population (P), do social support, educational, and behavioural modification interventions (I) compared to no intervention or usual mass public service messaging (C) improve all-hazard household disaster preparedness behaviours, supplies, and/or knowledge (O)
- To assess whether social support, educational, and behavioural modification interventions have effects on healthcare utilisation (emergency department utilisation, hospitalisation, morbidity), mortality, and mental health or physical functioning post disaster

### METHODS

#### Criteria for considering studies for this review

##### Types of studies

As eligible study designs, we will include:

- randomised controlled trials (RCTs), including individual, cluster (cRCTs), and cross-over trials;
- non-randomised controlled trials (nRCTs); and
- controlled before-after (CBAs) studies.

CBAs and nRCTs will be included in line with Cochrane Effective Practice and Organisation of Care Group (EPOC) criteria wherein controlled studies require more than one intervention and more than one control, contemporaneous data are collected for intervention and control groups, and selection of control sites is appropriately justified (EPOC 2017). We will also include

programme evaluation studies wherein the intervention is delivered as part of a health services or social services programme, programme participants are assigned or included in the service non-randomly, and programme participants are tested with contemporaneous comparator groups. nRCTs will be included due to the unplanned and often sudden nature of disaster events; thus we will include instances of nRCTs in which the intervention is delivered just-in-time during the immediate pre-disaster or initial disaster onset period to all members of an organisational or service line with a comparator group that may be assigned non-randomly. For example, the intervention may be delivered to all home health patients of a service or home-based primary care practice in neighbourhood A, but not in neighbourhood B.

Trial registry summaries will be included. Unpublished data, conference abstracts, preprint deposits, and theses/dissertations will not be included. The search will be conducted using English language terms. If a reference, abstract, or full-text report is available in a language other than English, German, or French, translation will be performed.

### Types of participants

Study participants will include individuals or households as a unit of measurement. Studies with participants who are non-institutionalised, community-dwelling adults will be included. Studies with participants residing in rental housing or in an apartment will be included. Studies of individuals who are homebound in a residential setting or under house arrest will be included.

Interventions including only individuals who are incarcerated in prison or half-way home locations (in transition to or from an independent residence); hospitalised individuals; and those in assisted living, long-term care, dormitory, refugee camp, and other institutionalised settings will be excluded. Studies focusing on workplace occupational disaster preparedness, Emergency Medical System (EMS) response preparedness, and student or healthcare worker preparedness alone will be excluded. Studies on hospital and clinic facility preparedness, as well as K through 12 and post-secondary school-based studies, will be excluded if the main purpose is not residential household preparedness. Interventions targeted to children alone will be excluded. Otherwise, we applied no restrictions on participant age, diagnostic criteria, location, or setting.

### Types of interventions

The Behavior Change Wheel framework classifies interventions as education, persuasion, incentive, coercion, training, environmental restructuring, modelling, enablement, and/or restriction (Michie 2011). Descriptions of these interventions and multi-component interventions may include more than one Behavior Change Wheel category and are listed in the primary categories below, which should not be interpreted as mutually exclusive from other categories. We have included interventions that may be delivered at the organisational, household, or individual level while excluding interventions aimed at general messaging whereby all information is made publicly available with no additional individual, household, or group intervention component. The review will include studies reporting interventions designed to improve household disaster preparedness, as follows.

Education (educational Interventions).

- Disaster preparedness patient education.
- Disaster preparedness household education.
- Disaster preparedness group education.
- Disaster preparedness community education with specified participants.

Persuasion (behavioural interventions).

- Motivational interviewing.
- Household emergency plan coaching.
- Cognitive therapy.
- Behaviour therapy.

Incentive/Coercion (behavioural interventions).

- Risk management.

Training (educational interventions).

- Disaster preparedness community programme with specified participants.
- Disaster drill.
- Disaster simulation.

Environmental restructuring (social interventions).

- Evacuation planning.
- Home health case management: disaster planning.
- Pandemic preparedness.
- Alternate sources of daily gathering of household fuel or water (low-income country settings).
- Alternate practices to manage household sanitation (low- and middle-income country settings).
- Disaster interpersonal violence prevention.
- Disaster gender-based and sexual violence prevention.

Modelling (behavioural interventions).

- Collaboration or coalition-building to provide disaster preparedness resources.

Enablement (social interventions).

- Life span care.
- Coping assistance.
- Referrals for household disaster registry, transportation, or other disaster resource provision.
- Disaster preparedness kit delivery.

The review will exclude the following interventions (unless used as control or comparator as noted).

- Communication enhancement.
- General public service announcements (comparator).
- Mass advertising on radio, television, print, Internet, or in a similar public format (comparator).
- Disaster preparedness screening (comparator as measurement only, no intervention).
- Vaccine status alone.
- Vaccine response alone.

- Post-disaster mental health interventions.

Comparators consist of no intervention or interventions that are passively available to any member of the public including mass media, mass public health messaging campaigns, Internet, or publicly available educational materials, with no aligned effort to distribute or translate these materials into meaningful action change or household/individual education. Otherwise, studies will not be excluded based on intervention delivery format, intervention duration or intensity, co-interventions, or complexity of multi-component interventions.

### Types of outcome measures

Outcome measures for household disaster preparedness are frequently tailored to the most common disaster hazard vulnerabilities in the geographic region of study and may also be tailored to the special needs requirements of each individual household to successfully shelter-in-place, evacuate, and communicate (CDC 2012; Chan 2019; Heagele 2020). Thus, one region may have tsunami-specific preparations, another volcanic eruption preparations, and another blizzard and flooding preparations. Most often, outcomes are defined in the original study as an index, composite, or proportion of positively observed or endorsed measurement items divided only by the total number of items relevant to that individual household, creating a consistent continuous measure that can be aggregated and compared across global studies. For example, a household with a person who requires a wheelchair for mobility will include a specific measure for durable medical equipment in the composite score, while a household with pets or livestock will include food and water stocks for animals as a relevant preparedness item within the composite measure. Due to the potential heterogeneity of specific items that generate the composite, index, or proportion score across studies, this review also includes extraction of individual items as binary (endorsed/not endorsed) components of household preparedness that can allow more detailed and disaster-specific types of comparisons across studies. Review authors will use the composite, index, or proportion measures reported in the original studies and will not calculate measures for the purposes of this review.

Repeated measures of the outcome will be extracted to describe both the initial outcome measure after the intervention and, if different, the last measured outcome. The initial measure after the intervention is included to assess efficacy, and the last measure is justified to assess sustainability of the intervention effect. We will include a field for change over time in the data extraction tool. In a review of social support, educational, and behavioral modification interventions for improving household disaster preparedness, the main outcomes will be defined as 'short-term' (immediately after to one month from intervention commencement) or 'long-term' (longer than five weeks from intervention commencement). Although short-term outcomes are critical to measure the efficacy of the intervention, long-term outcomes are considered important but are not specified as critical to efficacy because of the potential influence of participant attrition or other confounding. We will extract data by outcome measure, so studies with multiple outcome measures of a single intervention will be extracted in more than one table. Multiple reports of the same sample and/or intervention in different samples will be annotated. Similarly, specific components of the outcomes will be annotated and listed separately. For example, rather than reporting

an overall proportion of disaster preparedness behaviours, some studies list individual components of the outcome such as a supply of water, a supply of food, stocks of medications, pre-packaged first aid kits, and pre-packed supplies in vehicle/ready for unplanned travel. The importance of outcomes has been ranked by life-saving behaviour or supply (e.g. water before flashlights), as specified in the primary outcomes section below.

### Primary outcomes

Primary outcomes considered critical for this review include index measures of:

- all-hazard household preparedness supplies;
- all-hazard household preparedness behaviours (including written communication and evacuation plans); and
- household preparedness knowledge.

All-hazard household preparedness is a multi-dimensional construct that may be defined differently across studies and is often tailored to individual household requirements. Each is defined as an index, composite, or proportion of all positively observed or endorsed items on a study's total possible measurement scale relevant to the individual participant. These primary outcomes are understood to mitigate post-disaster losses, morbidity, and mortality across disasters, settings, and subpopulations, and are prioritised as meaningful to the public, to practitioners, and to policymakers (Joffe 2019). Because of this, indexes, composite scores, or proportions of the three primary outcomes will be synthesised and considered critical to the review. A description of the main individual components that will be considered in the definitions of the three primary, multi-dimensional outcomes is provided below (CDC 2012; Heagele 2020).

### All-hazard household preparedness supplies

- Potable water, minimum of one gallon per household member per day for three days
- Non-perishable food supply for minimum of three days
- For those who take prescription medications, minimum of a three-day supply of extra medications
- Non-electric portable light source (e.g. headlamp, flashlight, glow sticks, candles)
- Solar, hand-crank, battery-operated or ham radio or other equipment to receive disaster communications during utility outage
- First aid kit/supplies
- Sleeping bag or warm blanket
- Personal hygiene supplies
- Extra batteries for the non-electric light source and/or radio communications
- Matches
- Cash money reserves
- Multi-purpose tool, wrench, or pliers sufficient to turn off utilities
- Fire extinguisher
- For those who wear prescription glasses or contact lenses, an additional pair/supply
- For those who have a pet/livestock animal, non-perishable food supplies and additional water for minimum of three days



- For those with pet/livestock who take medication, a two-week supply of these medications
- For those with a baby, a supply of formula, bottles, and non-perishable baby food for minimum of three days
- For those with a baby or other dependent in diapers, a supply of clean diapers for minimum of three days
- For those who take prescription medications that require refrigeration, a small cooler, portable ice chest, ice box, cool box, or chilly bin or cold/freezer packs for refrigeration of medications
- For those with special diet requirements, syringes, blood sugar monitoring strips, oxygen cylinders, or other medical supplies; minimum of a three-day supply
- Power generator or alternate source of power
- Smoke detector
- Carbon monoxide detector
- Emergency whistle
- Filtering face mask
- Manual can opener
- Duct tape or heavy-duty tape adhesive with sheeting, tarps, or enough plastic garbage bags to cover doors/windows

#### All-hazard household disaster preparedness behaviours

- Written (or otherwise recorded pictograph/braille/voice reminder) disaster plan
- Written (or otherwise recorded pictograph/braille/voice reminder) evacuation plan with specified routes and transportation modes
- Written (or otherwise recorded pictograph/braille/voice reminder) communications plan
- Copied and/or stored important documents in portable waterproof/fire-resistant container, portable electronic drive, or cloud
- Written (or otherwise recorded pictograph/photo-documented/braille/voice reminder) list of prescription medications
- Written (or otherwise recorded pictograph/braille/voice reminder) list of health history
- Participation in household disaster drill
- First aid training
- Registration with community alert or search and rescue database
- Tested smoke detectors
- Regular check of disaster supplies for expired items
- Written (or otherwise recorded pictograph/braille/voice reminder) contact information for family and friends
- Designated meeting place outside the home and neighbourhood to find family or friends
- Emergency evacuation kit readied
- For those who have a pet animal, evacuation considerations and plans for pet
- Ready-to-go bag with at least one change of clothing/shoes

#### Household preparedness knowledge

- Knows how to turn off household utilities
- Has fire escape plan
- Knows types of disasters most likely to occur in community

- Knows location of local emergency shelter

#### Secondary outcomes

- Healthcare utilisation (emergency department utilisation, hospitalisation, morbidity)
- Mortality
- Mental health functioning post disaster on scales with documented validity and reliability, such as Patient-Reported Outcomes Measurement Information System (PROMIS) or 12-Item Short Form Health Survey (SF-12)
- Physical functioning post disaster on scales with documented validity and reliability, such as PROMIS

Individual components considered in the definitions of primary outcomes have been categorised as (1) important, but not critical, or (2) of limited importance based on the life-saving or life-sustaining potential for each intervention in the event of a disaster. Individual components classified as "important, but not critical" will be analysed as secondary outcomes. For **all-hazard household preparedness supplies**, components of this composite measure considered important but not critical to the review are water, non-perishable food, prescription medications, light source, communication equipment, and first aid supplies. For **all-hazard household preparedness behaviours**, components of this composite measure considered important but not critical to the review are written disaster plan, written evacuation plan, written communications plan, documents, list of prescriptions, and health history list. For **all-hazard household preparedness knowledge**, components of this composite measure considered important but not critical to the review are utilities shut-off, first escape plan, local disaster risk knowledge, and location of emergency shelter. All other individual components are of limited importance for this review and will not be analysed as secondary outcomes.

#### Adverse effects

- Interpersonal conflict among household members measured by any self-report or participant endorsement of the experience
- Stigmatisation measured by any self-report or participant endorsement of the experience
- Emotional distress measured by scales with documented validity and reliability, such as PROMIS or the General Health Questionnaire

In the event of multiple measures of the same outcome, we will first prioritise measures that are also considered generic or standard common data elements in participant-reported outcomes. Next, we will select the outcome that we assess demonstrates highest levels of reliability, validity, responsiveness, and interpretability among the listed outcomes. Finally, as a last process of measure selection, we will include the first reported outcome if none of the other criteria can be applied.

#### Search methods for identification of studies

We will use the draft search strategy for MEDLINE as the prototype for search strategies in other databases. The search terms and Boolean operators to combine search terms are included in [Appendix 1](#).

## Electronic searches

In addition to MEDLINE (OVID), we will search the following databases.

- Cumulative Index to Nursing and Allied Health Literature (CINAHL; EBSCO).
- Embase (OVID).
- Web of Science - Social Science Citation Index; Science Citation Index and CABI and Global Health.
- PsycINFO (EBSCO).
- Education Resource Information Center (ERIC; EBSCO).
- SocIndex with full text (EBSCO).
- Latin American Caribbean Health Sciences Literature (LILACS).

We will search the following for relevant registered trials that have not been published.

- Clinicaltrials.gov.
- World Health Organization (WHO) International Clinical Trials Registry.
- EU Clinical Trials Register.
- Cochrane Central Register of Controlled Trials (CENTRAL), in the Cochrane Library.

We will search for published reports at the following organisations (included organisations; country, primary URL).

- Centre for Research on the Epidemiology of Disasters (includes Emergency Events Database (EM-DAT); Belgium; [www.cred.be](http://www.cred.be)).
- World Health Organization (includes WHO Collaborating Centres; Switzerland; [www.who.int/](http://www.who.int/)).
- United Nations (includes UN Office of Disaster Risk Reduction (UNDRR); SENDAI Framework; Office for the Coordination of Humanitarian Affairs (OCHA); UN Educational, Scientific, and Cultural Organisation (UNESCO); and United Nations International Children's Emergency Fund (UNICEF); Switzerland; [www.un.org/en](http://www.un.org/en)).
- Asian Disaster Reduction Centre (Japan; [www.adrc.asia/project/](http://www.adrc.asia/project/)).
- International Federation of Red Cross and Red Crescent Societies (includes all listed regions and respective societies; Switzerland; [www.icrc.org/en/who-we-are/movement](http://www.icrc.org/en/who-we-are/movement)).
- RAND Corporation (United States; [www.rand.org](http://www.rand.org)).
- Stockholm Environment Institute (SEI); Sweden; [www.sei.org](http://www.sei.org)).
- International Tsunami Prevention Society (Belgium; [www.itic.ioc-unesco.org/index.php](http://www.itic.ioc-unesco.org/index.php)).
- World Bank (includes Global Facility for Disaster Reduction and Recovery; United States; [www.worldbank.org/en/home](http://www.worldbank.org/en/home)).
- United States Department of Health and Human Services (includes Office of the Secretary, Office of the Assistant Secretary for Preparedness and Response, Administration for Children and Families, Centers for Disease Control and Prevention, Centers for Medicare and Medicaid Services, National Institutes of Health, Substance Abuse and Mental Health Services Administration, Medical Reserve Corps; United States; [www.hhs.gov](http://www.hhs.gov)).
- United States Government Accountability Office (United States; [www.gao.gov](http://www.gao.gov)).
- Ready.gov (includes Citizen Corps and Community Emergency Response Teams; United States; [www.ready.gov](http://www.ready.gov)).

- United States Health and Human Services Office of the Assistant Secretary for Preparedness and Response (United States; [www.phe.gov/about/pages/default.aspx](http://www.phe.gov/about/pages/default.aspx)).
- Administration for Children & Families (United States; [www.acf.hhs.gov](http://www.acf.hhs.gov)).
- Corporation for National & Community Service (includes Senior Corps, AmeriCorps, Social Innovation Fund-United We Serve; United States; [www.americorps.gov](http://www.americorps.gov)).
- Uniformed Services University of the Health Sciences (includes National Center for Disaster Medicine and Public Health; United States; [www.usuhs.edu](http://www.usuhs.edu)).
- United States Department of Homeland Security (includes Federal Emergency Management Agency; United States; [www.dhs.gov](http://www.dhs.gov)).
- Save the Children (United States; [www.savethechildren.org](http://www.savethechildren.org)).
- Natural Hazards Center (United States; [www.hazards.colorado.edu/](http://www.hazards.colorado.edu/)).

## Searching other resources

We will review the reference lists of all included studies and will follow citation trails to possibly relevant studies. We will contact experts in the field through the Centre for Research on the Epidemiology of Disasters (CRED) and other leading international research networks to identify additional published work.

## Data collection and analysis

### Selection of studies

Two review authors will independently review all titles and abstracts for inclusion using Covidence software in two stages: (1) title and abstract search, and (2) full text screening (Covidence 2017). A third review author will review any differences in the first two reviewers' determination at each stage. Any further areas of disagreement that cannot be resolved by the third review author will be reviewed by a fourth review author. If uncertain, the study will remain included. Reasons for all full-text exclusions will be documented in Covidence (Covidence 2017). Characteristics of excluded studies will be recorded in aggregate form and reported in the PRISMA flow chart (Moher 2009). We will determine inter-rater agreement for both abstract and full-text review using Cohen's kappa.

Studies added after review of the reference lists of included studies will be separately documented, with two review authors independently reviewing for inclusion/exclusion criteria. Studies selected for final inclusion will be reviewed by the entire review study team before data extraction. The last review author will resolve any potential areas of disagreement as needed.

### Data extraction and management

Two review authors will independently extract data from the included studies (TA and TH). Any disagreements will be resolved by discussion and, as needed, by a third review author. We will use the Cochrane Public Health Group Data Extraction and Assessment Template in Review Manager Web (RevMan Web 2020). We have piloted use of this extraction form. Extraction will include the following.

- Methods: design, unit of analysis and randomisation, measurement methods, conceptual framework.

- Participants: recruitment, inclusion/exclusion criteria, PROGRESS (detail below), sample size, moderators and confounders (detail below), subgroups.
- Interventions: description, delivery, provider, co-intervention, components (details below), disaster type classification(s), subgroups, sustainability.
- Outcomes: primary and secondary outcomes, adverse event outcomes, time points/repeated measures, unit of measurement, measurement instrument details, observed versus participant-reported.
- Additional information on conflicts of interest, funding, intervention fidelity.

The focus of the intervention and any intervention components explicitly stated in the research report will be extracted and categorised using the Behavior Change Wheel framework as education, persuasion, incentive, coercion, training, environmental restructuring, modelling, enablement, and/or restriction (Michie 2011). We will review information disclosed about the source of funding for each study to determine by consensus if the funding organisation had a potential conflict of interest in reporting of the results.

Data extraction will include the eight PROGRESS factors (Place, Race, Occupation, Gender, Religion, Education, Socioeconomic status, Social status) at baseline and at endpoint. Any strategies in which studies specifically addressed diversity or disadvantage will be documented. Moderators and confounders will be extracted. In addition to the eight PROGRESS factors, our data extraction will include important moderators of all-hazard disaster preparedness including the following items: veteran status, history of chronic disease, predominant language proficiency or literacy level in the language(s) of intervention, country or regional income group classification, age, household composition and familial structure, and ethnic/national origin identity.

We will present extracted data in an 'Overview of synthesis and included studies (OSIS)' table (Page 2020). We will construct this table using the following columnar topics.

- Author, year.
- Location with World Bank income group classification (low, lower-middle, upper-middle, or high-income country).
- Study design.
- Overall risk of bias assessment.
- Other key details of the intervention.
- Reported outcomes (annotations to indicate outcomes included in synthesis).
- Sample size (intervention/control).
- Time point for each outcome measured.
- Type of disaster/Risk for disaster.
- Predictor variable(s) used in multi-variable analyses of the outcome.

We will organise reporting of OSIS tables starting with lowest risk of bias.

### Assessment of risk of bias in included studies

We will include a 'Risk of bias' table in the final report. We will use either the ROBINS-I tool (used to assess risk of bias in non-

randomised studies of interventions) (Sterne 2020), or the 'Risk of bias 2 (RoB2)' tool for randomised trials (Sterne 2019), depending on study design, to assess risk of bias. We will assess risk of bias for all primary and secondary outcomes. For repeated measures post intervention, we will assess the measure immediately post intervention and the last measure reported. The effect of interest is the effect of assignment. Using a domain-based approach, we will assess risk of bias in randomised trials from the randomisation process; bias due to deviations from intended interventions; bias due to missing outcome data; bias in measurement of the outcome; and bias in selection of the reported result (Higgins 2020a). For cluster-randomised trials, we will also assess for bias arising from the timing of identification and recruitment of participants, applying special design considerations to our assessment of deviations from intended interventions, missing outcome data, and measurement of the outcome (Higgins 2020). With the exception of providing a perishable supply, carry-over effects are reasonably anticipated from social support, educational, and behavioural modification interventions. Thus, we will use only data from the first period of the cross-over in case-cross-over randomised trials. We will judge risk of bias as low risk, some concerns, or high risk using the signalling questions and algorithms appropriate to each study design (Sterne 2019). The ROBINS-I tool in non-randomised studies of intervention (NRSIs) will assess risk of bias in the seven domains pre-intervention, at intervention, and post intervention. Bias due to confounding; bias in selection of study participants; bias in classification of interventions; bias due to deviations from intended interventions; bias due to missing data; bias in outcome measurement; and bias in selection of reported results will be assessed (Sterne 2016). Important pre-specified confounding will include country of intervention; different population groups; baseline characteristics of socioeconomic status; educational background; age groups; and recent experience with a disaster. We will identify hypothetical target trials for each NRSI evaluated. Potential confounding domains and possible co-interventions (i.e. differences in educational interventions) will be specified. Risk of bias for specific outcome(s) within each NRSI will be judged as low, moderate, serious, or critical, or no information, using signalling questions and algorithms according to detailed guidance provided by Sterne and colleagues (Sterne 2016). Two review authors will independently assess risk of bias for included outcomes and studies (TA and TH). Discrepancies will be resolved by discussion, and a third review author (JC) will resolve discrepancies as needed or will review independently if a conflict of interest is identified for the other review authors. In such instances when the third review author independently assesses outcomes and studies, a fourth review author (TWL or SAB) will also help to resolve discrepancies and/or assess risk of bias for any study in which a conflict of interest for the reviewing authors is identified. The RoB2 Excel software tool will be used.

### Measures of treatment effect

We will calculate standardised mean differences (SMDs) for continuous outcome data and odds ratios (ORs) for outcomes with binary data only, with 95% confidence intervals (CIs), using post-intervention measurements (rather than changes from baseline). For outcomes that include both continuous and binary data, we will present these as SMDs and will pool binary and continuous outcome measures by calculating SMDs from ORs.

## Unit of analysis issues

We will screen all studies for unit of analysis issues, as outcomes may be measured at within-person, between-person, household, or aggregate educational class levels. If studies with multiple intervention groups are included, to ensure that unit of analysis errors are not introduced due to double-counting of the same participants, we will adhere to methods outlined in the *Cochrane Handbook for Systematic Reviews of Interventions* (Higgins 2020). Specifically, we will combine study arms or we will divide the sample size among study arms, depending on how similar the groups are. If a cluster-randomised controlled trial is included for meta-analysis, we will assess whether the study has utilised appropriate analysis to account for clustering in the results. If clustering in the results has not been accounted for, we will calculate a design effect using the methods outlined in the *Cochrane Handbook for Systematic Reviews of Interventions*, and we will apply this effect to the sample size or standard error of such studies before including the outcomes in the synthesis (Higgins 2020). We will use the intracluster correlation coefficient (ICC) to calculate the design effect obtained from the original paper (if reported) or imputed using estimates of the ICC based on similar outcomes.

## Dealing with missing data

We will request missing data from the corresponding study author by email, phone, and postal mail, if contact information is presented in the published manuscript. We will transparently report attempts and data sources or inability to obtain missing data. For standard deviations, specifically, we will impute the standard deviation using available information if we are unable to obtain values from the study author.

## Assessment of heterogeneity

Due to the scope and nature of this review, we anticipate heterogeneity among all included studies. Although we anticipate heterogeneity among included participants, as some studies recruit from the general population and others target specific, vulnerable groups, we will group all studies with participants that meet our inclusion criteria and will consider subgroup analysis in response to detecting statistical heterogeneity. We will assess statistical heterogeneity among included studies using the  $I^2$  statistic.

## Assessment of reporting biases

Our method will include examining trial registers and including summary results. We will also compare trial registers to relevant published results and will report a list of trials with no published results or pre-specified outcomes in the protocol that were not reported. We will identify results that are completely or partially unavailable because of unreported point estimate, precision metrics, or P values, and we will classify them according to the Outcome Reporting Bias In Trials (ORBIT) system (Page 2020). If ten or more studies are included in the meta-analysis, we will generate a funnel plot and visually inspect for funnel plot symmetry using the post-intervention mean difference.

## Data synthesis

We will perform both fixed-effect and random-effects meta-analyses of primary and secondary outcomes, with the intent to present the random-effects result unless there is evidence of funnel

plot asymmetry. If funnel plot asymmetry is present, we will present both fixed-effect and random-effects meta-analyses if reasonable.

Separate meta-analyses will be undertaken for RCTs and nRCTs assessing the same outcome, with the effect estimate derived from the meta-analysis of RCTs considered for the primary analysis. If available, we will pool adjusted intervention effects instead of unadjusted intervention effects.

It may not be possible to undertake meta-analysis if we find (1) limited evidence for comparison (i.e. no studies or only one study provides evidence for our pre-specified outcome); (2) intervention effects that are incompletely reported; (3) different effect measures used to measure the same outcomes that are clinically incompatible (such as time-to-event); (4) clinical/methodological diversity; or (5) statistical heterogeneity determined by  $I^2 > 50\%$  (McKenzie 2020). If meta-analysis is not indicated for the reasons outlined above, we will proceed to synthesis without meta-analysis. In the event that meta-analysis is not indicated, we will follow methods recommended by the *Cochrane Handbook for Systematic Reviews of Interventions* to synthesise results without meta-analysis (McKenzie 2020), which we will also report in a manner consistent with Synthesis Without Meta-analysis (SWIM) guidelines (Campbell 2020). Specifically, we will report the SMD or OR (for outcomes for which only binary data are presented) for each study and for any method used to transform binary outcome data (for outcomes for which both continuous and binary data are presented) to calculate the SMD. We will calculate a summary statistic of intervention effect estimates and will report a count of studies based on the direction of effect. We will analyse and report heterogeneity by participants and methods. We will present data in table and forest plot figures.

As no empirically based minimally important difference has been established for household disaster preparedness outcome measures, we will determine clinical relevance through consensus of the content expert members of the review team and will use this information to guide interpretation of review results.

## Subgroup analysis and investigation of heterogeneity

We will conduct *disaster-specific* subgroup analysis by type of disaster, using the EM-DAT classification system by Disaster Group, Disaster Main Type, Disaster Subtype, and Disaster Sub-subtype and the lowest classification in the taxonomy whereby two or more intervention studies can be grouped together (CRED 2020). This is justified, as interventions may be tailored to priority hazards for the region, even in an all-hazard preparedness approach. Likewise, outcomes may depend on experience with disasters most common to the region.

In the event that we observe considerable heterogeneity ( $I^2 \geq 50\%$ ; Michie 2011), we will further explore subgroup analysis by veteran status, history of chronic disease, language proficiency, income country context, age, household composition and familial structure, and ethnic/national identity. This is justified to ascertain clinical relevance of intervention types and clinical relevance as applied to special populations or subpopulations and demographic differences in household preparedness or health outcome vulnerability to disaster as reported in previous research publications (Ashida 2017; Becker 2012; Bell 2019; Bell 2020; Bogdan 2021; Bronfman 2019; CDC 2012; DeBastiani 2015; Heagele 2018; Joffe 2019; Murphy 2009). We will assess differences

among subgroups by using the formal statistical test outlined in the *Cochrane Handbook for Systematic Reviews of Interventions* (Deeks 2020). We will conduct subgroup analyses only for primary outcomes.

### Sensitivity analysis

We will conduct sensitivity analyses by risk of bias, which will involve excluding outcomes from RCTs with high risk of bias and outcomes from nRCTs with serious or critical risk of bias.

### Summary of findings and assessment of the certainty of the evidence

Two review authors (MJM and SAB) will use the GRADE approach to assess the three main outcomes: (1) all-hazard household preparedness supplies, (2) all-hazard household preparedness behaviours, and (3) all-hazard household preparedness knowledge, (4) water supplies, (5) non-perishable food supplies, (6) prescription medication supplies, and (7) adverse events (Schünemann 2013)

We will generate one 'Summary of findings' table that will include the following outcomes: **all-hazard household preparedness supplies index** (critical), **all-hazard household preparedness behaviours index** (critical), **all-hazard household preparedness knowledge index** (critical), water supplies, non-perishable food supplies, prescription medication supplies, and **adverse events**. If meta-analysis is not possible, we will present results in a narrative 'Summary of findings' table format. The outcome measurement taken immediately after intervention delivery will be prioritised for the 'Summary of findings' table. In the event of multiple effect estimates, we will present the effect estimate from the pooled analysis of RCTs and will annotate additional results. Although we will analyse both short-term and long-term time points, we will prioritise only short-term outcomes for inclusion in the 'Summary of findings' table.

We will generate a 'Summary of findings' table using GRADEpro GDT software (GRADEpro GDT 2020). The content experts have rated the relative importance of outcomes using a 9-point Likert scale, whereby a rating of 1 to 3 was assigned to

outcomes of low importance for clinical decision-making, 4 to 6 to outcomes important for clinical decision-making, and 7 to 9 to outcomes critically important for clinical decision-making. Outcomes considered critical (rated 7 to 9) for decision-making will be included in the evidence profile and in the 'Summary of findings' table (Schünemann 2013). Population, setting description, and experimental and comparison interventions will be listed in the heading. Primary outcomes will be listed in the first column. Illustrative comparative means (continuous outcome data) or risk as events per 100 people (binary outcome data) will be reported in the second column, followed by the relative effect (OR) with 95% CI, numbers of pooled participants and studies, overall GRADE rating for included outcomes, and comments. We will downgrade the quality of evidence based on risk of bias, inconsistency (heterogeneity), imprecision, indirectness, and publication bias domains. We will begin all nRCTs from a high level of evidence and will downgrade according to GRADE guidelines for incorporating ROBINS-I with GRADE (Schünemann 2019). We may upgrade the quality of evidence if there is a large magnitude of effect (large or very large effect), plausible confounding (for observational studies, if there is plausible confounding that would reduce demonstrated effect), or a dose response gradient (in observational studies not downgraded for any reason). The certainty of evidence for all outcomes included in the 'Summary of findings' table will be classified as high, moderate, low, or very low. Footnotes to the summary table will include detailed explanations to support statements in the 'Summary of findings' table, which will include the overall risk of bias determination from the RoB2 or ROBINS-I tool and all other reasons for rating decisions.

### ACKNOWLEDGEMENTS

The review authors gratefully acknowledge Jodie Doyle, Alix Hall, Miranda Cumpston, Arlini Timal, Brian Duncan, and the editorial team of the Cochrane Public Health Group, the University at Buffalo librarian Nell Aronoff, Hunter College librarian John Carey, and University at Michigan informaticist Kathryn Vanderboll. The review authors also thank advisory group members Morgan Torris Hedlund, Alison Hutton, and Mollie Mahany and contributors W. Scott Erdley, Barbara Polivka, and Stefan K. Lhachimi.

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**APPENDICES**
**Appendix 1. Appendix. Draft search terms for MEDLINE (OVID)**
**MEDLINE search strategy**
**Intervention terms**

1	((community or education* or social or support or behavior?r* or crisis) adj1 intervention*).ab,kf,ti.
2	Crisis Intervention/
3	(information adj3 (source* or dissemination or resource*)).ab,kf,ti.
4	(social adj1 (network* or support or services)).ab,kf,ti.
5	Social Support/
6	"support system*".ab,kf,ti.
7	Health education/
8	Health Knowledge, Attitudes, Practice/
9	(health adj1 (promotion or education or attitude* or practice)).ab,kf,ti.
10	Patient Education as Topic/
11	Community Health Services/
12	community health care.ab,kf,ti.
13	Communication/ or Health Communication/
14	Home Care Services/
15	Primary Health Care/
16	Public Health/
17	Domiciliary care.ab,kf,ti.
18	home care.ab,kf,ti.

(Continued)

19	care givers/
20	care giver*.ab,kf,ti.
21	Motivational Interviewing/
22	"motivational interview*".ab,kf,ti.
23	motivating.ab,kf,ti.
24	educating households.ab,kf,ti.
25	household education.ab,kf,ti.
26	(cognitive and (therapy or therapies)) .ab,kf,ti.
27	(cognitive and (psychotherapy or psychotherapies)) .ab,kf,ti.
28	(behavior and (therapy or therapies)) .ab,kf,ti.
29	lifespan care.ab,kf,ti.
30	Reinforcement, Psychology/
31	negative reinforcement.ab,kf,ti.
32	positive reinforcement.ab,kf,ti.
33	Risk Management/
34	(peer adj1 (support or training)) .ab,kf,ti.
35	Self-Help Groups/
36	"support group*".ab,kf,ti.
37	philanthropic services.ab,kf,ti.
38	public social services.ab,kf,ti.
39	public services.ab,kf,ti.
40	resource sharing.ab,kf,ti.
41	(disaster adj (drill or drills)) .ab,kf,ti.
42	"disaster simulation*".ab,kf,ti.
43	coalition building.ab,kf,ti.
44	(family adj1 (relations or relationships or dynamics)) .ab,kf,ti.
45	(program adj1 (development or evaluation* or effectiveness)) .ab,kf,ti.
46	coping assistance.ab,kf,ti.

(Continued)

47	(instruction* or training or workshop) .ab,kf,ti.
48	(community adj1 (participation or engagement)) .ab,kf,ti.
49	or/11-48

### Exposure terms

50	Disasters/
51	disaster* .ab,kf,ti.
52	Natural Disasters/ or Earthquakes/ or Cyclonic Storms/
53	Volcanic Eruptions/
54	Droughts/
55	hydrometeorological hazards.ab,kf,ti.
56	Famine/
57	Tsunamis/
58	Avalanches/
59	Landslides/
60	Floods/
61	Extreme Heat/
62	Extreme Weather/
63	Tidal Waves/
64	Wildfires/
65	Disease Outbreaks/
66	Epidemics/
67	Plague/
68	Ectoparasitic Infestations/
69	Communicable Diseases/
70	Water Pollutants, Chemical/ or Water Pollution, Chemical/
71	Explosions/

(Continued)

72	Petroleum Pollution/
73	Chemical Hazard Release/
74	Radioactive Hazard Release/
75	Biohazard Release/
76	Accidents, Aviation/
77	Civil Disorders/
78	Chemical Warfare/ or Warfare/ or Biological Warfare/ or Nuclear Warfare/
79	Exposure to Violence/
80	Ethnic Violence/
81	Gun Violence/
82	domestic violence/ or intimate partner violence/ or rape/
83	child abuse/ or elder abuse/
84	terror attack.ab,kf,ti.
85	Bioterrorism.ab,kf,ti.
86	Mass Casualty Incidents/
87	mass shooting.ab,kf,ti.
88	mass casualty.ab,kf,ti.
89	mass casualties.ab,kf,ti.
90	Terrorism/ or chemical terrorism/
91	"power outage*".ab,kf,ti.
92	sewage contamination.ab,kf,ti.
93	water contamination.ab,ti.
94	"pandemic*".ab,kf,ti.
95	Pandemics/
96	Disease Outbreaks/
97	"disease outbreak*".ab,kf,ti.
98	structural collapse.ab,kf,ti.
99	building collapse.ab,kf,ti.

(Continued)

100	(train adj1 derailment*) .ab,kf,ti.
101	(subsidence or infestation* or monsoon or hurricane* or freezing rain or blizzard* or storms or drought or flood* or lightening or mudslide* or stampede* or structural collapse or building collapse or cyclone* or tornado* or fire or fires or explosion*) .ab,kf,ti.
102	tragedy.ab,kf,ti.
103	or/50-102

**Outcome terms**

104	Civil Defense/
105	(disaster adj3 (prevention or victim* or warning* or management or planning or preparedness or preparation)) .ab,kf,ti.
106	((disaster or emergency) adj3 (plan or plans or planning or readiness)) .ab,kf,ti.
107	checklist/
108	(emergency adj3 (checklist* or shelter* or event* or evacuation or warning* or management or planning or preparedness or preparation)).ab,kf,ti.
109	Disaster Planning/
110	or/104-109

**Study terms (filters)** (Lefebvre 2019; Waffenschmidt 2020)

111	((control and (group* or stud)) or (time and factors) or program or survey* or ci or cohort or comparative stud* or evaluation studies or follow-up*).mp.
112	exp cohort studies/ or exp epidemiologic studies/ or exp clinical trial/ or exp evaluation studies as topic/ or exp statistics as topic/
113	randomized controlled trial.pt.
114	controlled clinical trial.pt.
115	randomi?ed.ab.
116	clinical trials as topic.sh.
117	randomly.ab.
118	trial.ti.
119	or /111-118

(Continued)

120	(animals/ not humans/) or comment/ or editorial/ or exp review/ or meta analysis/ or consensus/ or exp guideline/
121	hi.fs. or case report.mp.
122	120 or 121
123	119 NOT 122
124	49 and 103 and 110
125	123 and 124

## WHAT'S NEW

Date	Event	Description
22 May 2023	Amended	This protocol will not be progressed to the review stage as it no longer meets Cochrane's methodological standards.

## HISTORY

Protocol first published: Issue 5, 2021

## CONTRIBUTIONS OF AUTHORS

JC initiated and led the review protocol. JC, TH, TA, VW, TW-L, and MPC contributed to protocol development. All review authors provided substantive edits to the protocol.

## DECLARATIONS OF INTEREST

- **Taryn Amberson:** declared no conflicts of interest
- **Tara Heagele:** reports grant for study from Hunter College; personal payment (Clinical and Translational Science Center Pilot Award Seed Funding, Hunter College: The Nurse's Role in the Household Emergency Preparedness of Neonatal Parents' 2019-2020. Heagele, TN (PI), Nurse-Clarke, N (Co-I). The funding organization had no role in the design, implementation, interpretation, or reporting of this pilot study). Reports grant for study from PSC-CUNY; personal payment (PSC-CUNY Research Award Traditional A, The City University of New York: Household Emergency Preparedness Instrument Development: A Pilot Study. 2020-2021. Heagele, TN (PI), McNeill, CC (Co-I), Adams, LM (Co-I), Alfred, DM (Co-I), Swanson, M (Co-I). The funding organisation had no role in the design, implementation, interpretation, or reporting of this pilot study). Reports conducting the two household emergency preparedness intervention studies. Neither have been published yet. However, should they be published in time for this review, TH will not determine whether her household emergency preparedness intervention studies should be included in this systematic review, nor will she review her own work if the decision is made to include them
- **Jessica Castner:** reports being the principal owner of Castner Incorporated, a woman-owned enterprise small business where she is employed. Is the Editor-in-Chief (Independent Contractor) for *Journal of Emergency Nursing*; paid to institution. Reports NIH/NIA award subcontract to University at Louisville and Kansas University Medical Center: paid to institution. Reports lecture payments from Notify, LLC: paid to institution, and Emergency Nurses Association Trauma Nursing Core Course: paid to institution and author. Reports committed financial support for research from the US District Court for the Western District of Western New York through the University at Buffalo/SUNY Research Foundation
- **Tamar Wyte-Lake:** declared no conflicts of interest.
- **Mary Pat Couig:** declared no conflicts of interest.

- **Sue Anne Bell:** reports payments from HDR, Inc., a subcontractor for the US Army Corps of Engineers.
- **Manoj Mammen:** declared no conflicts of interest.
- **Valerie Wells:** declared no conflicts of interest.

## SOURCES OF SUPPORT

### Internal sources

- Tara Heegele, USA

Contributor has received a notice of award to support this project from the University Committee on Research at The City University of New York PSC-CUNY, Hunter College (Award # 64434-00 52; Heegele, PI).

### External sources

- Jessica Castner, USA

Castner Incorporated acknowledges the USA Small Business Administration Paycheck Protection Program.

- Sue Anne Bell, USA

Research reported in this publication was supported by the National Institute on Aging of the National Institutes of Health under award number K23AG059890 (Bell, PI). The content is solely the responsibility of the review authors and does not necessarily represent the official views of the National Institutes of Health.