



**Tackling poor health in older people
resulting from cold homes:
A rapid review of effective interventions**

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Executive Summary

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Background

Cold homes are linked to an increased risk of adverse health outcomes for older people. To mitigate this risk, homes need to be heated to an appropriate temperature. Interventions to address the internal temperature of homes include those that: make **structural** changes to homes and heating systems (e.g. insulation schemes); supplement **financial** resources of older people to increase the affordability of heating (e.g. national fiscal or local funding schemes); and focus on **behavioural** changes related to heating (e.g. using energy more efficiently).

A systematic review published in 2013 identified a number of structural interventions and concluded that these improved health outcomes, especially for people with respiratory conditions.¹ Evidence in this field has grown substantially in the past decade since this review. A synthesis of this evidence is needed to understand the range and effectiveness of interventions to tackle the health consequences of cold homes.

Aims

This work aimed to:

- identify which interventions, designed to improve heating and temperatures within homes, benefit which health outcomes;
- summarise evidence of cost-effectiveness;
- summarise the content of effective interventions; and
- identify areas of low quality or absent evidence using an intervention/outcome evidence map.

Methods

We undertook a rapid review of evidence.

Search strategy

Searches were carried out in Applied Social Sciences Index and Abstracts (ASSIA) on ProQuest and translated to other databases: MEDLINE (OVID), PsycINFO (OVID), and CINAHL (EBSCO). We also searched sources of grey literature and the reference lists of relevant reports, and undertook forward citation chaining.

Review criteria

Evaluations of structural, financial or behavioural interventions designed to improve home temperatures for the health benefit of residents aged 18+ years were eligible. Due to the changing nature of structural technologies for heating homes (e.g. insulation), we prioritised contemporary evidence published from 2010.

Study selection

Titles and abstracts of records were screened for relevance using Rayyan, an online tool to support systematic reviews. The full texts of selected records were retrieved and assessed against the review criteria. Both stages of screening were undertaken by two independent researchers, with disagreements resolved through discussion, with arbitration to a third researcher if necessary.

Quality assessment, data extraction and synthesis

Studies were quality assessed, and data were extracted into a Microsoft Excel spreadsheet. Data were summarised in a narrative synthesis and mapped using EPPI-Reviewer software.

Findings

After screening, we included 18 studies reported across 19 publications. The majority of studies (n=15) reported evaluations of structural changes to homes. Only three studies reported evaluations of behavioural interventions. We found no studies that reported financial interventions.

Half of the studies (n=9) reported evidence about adults aged 60 years and over. Five studies reported evidence about populations aged 18 years and over (27.8%), and a minority of studies (n=4) reported evidence for all ages (0-60+) where we extracted outcomes for study participants aged 18 years and over. Eleven studies included populations with long-term health conditions: respiratory, (e.g. asthma and chronic obstructive pulmonary disease (COPD)) and/or cardiovascular (e.g. high blood pressure) diseases.

The duration of interventions ranged from three months to 20 years, with follow-up ranging from 1 to 10 years. The funders and implementers of the interventions were governments (n=8), local councils (n=5), energy efficiency agencies (n=3), and housing associations (n=2).

The most common components of structural interventions were:

- insulation retrofits (n=12)
- heating system improvements (n=11)
- double-glazing to replace single-glazed windows (n=8)

For the behavioural interventions, the components were:

- energy counselling home visits (n=1)
- instructions to change thermostat settings (n=1)
- wearable telemetry with a low-temperature alarm to measure blood pressure (n=1)

Of the four randomised controlled trials (RCTs) included in this review, two were rated poor^{2,3} and two were fair^{4,5} in quality. For the non-randomised studies, seven were rated fair⁶⁻¹³ and eight were rated poor quality.¹⁴⁻²¹

Behavioural interventions

Evidence about the impact of behavioural interventions on physical and mental health, quality of life and health service utilisation was inconsistent.

Structural interventions

Structural interventions were linked to better mental health and quality of life, a reduction in some types of health service utilisation, and improvements in satisfaction with internal home temperature, social interactions, and financial difficulties. The impact on physical health outcomes varied by age, gender, and long-term conditions. However, there was no clear picture as to which groups were most likely to see health improvements. Evidence about the impact on mortality was inconsistent, with reports of both reduced and increased risk of mortality. Cost savings were observed in studies that reported reductions in health service use and mortality.

Evidence gaps

An evidence gap map was produced, available at [EPPI-Mapper](#). The majority of evidence was concerned with physical and mental health outcomes of structural interventions. No evidence was identified for financial approaches to improving home temperatures. More evidence is needed about the impact of interventions on mortality.

Discussion

Evidence published in the last 13 years suggests that improvements in home insulation, heating systems and glazing are likely to improve mental health outcomes and some aspects of physical health. Such interventions may also reduce utilisation of some health services, with potential for cost savings. Evidence about the impact of these interventions on mortality was inconsistent.

A very small body of evidence on behavioural interventions failed to demonstrate consistent health benefits. We identified no evaluations of financial approaches to increasing temperatures within the home that reported health outcomes. The absence of evidence about financial approaches may be because there are few interventions available to evaluate.

Where studies reported data separately for older (60+) populations, evidence was inconsistent about the benefits of behavioural and structural interventions for health. Similarly, evidence about the benefits for populations with long-term health conditions did not offer a conclusive picture.

Finally, the overall quality of the studies is low, with around half of the studies judged to be poor. Thus, whilst evidence does point to the benefits of structural interventions to improve some health outcomes, the data offer few insights into the size of any benefits.

Policy implications

Mitigating the health impact of cold homes for older people is a policy priority. Evidence suggests that structural interventions are promising to improve mental health, quality of life and reduce some health care utilisation. However, the nature of the impact on physical health and which groups are most likely to benefit is unclear.

Conclusions

Structural improvements (e.g. heating systems, insulation, double glazed windows) offer the potential to increase home temperatures and improve some aspects of health. Behavioural interventions did not demonstrate consistent benefits to health or service utilisation. Further evidence is needed to clarify the impact of interventions on mortality and physical health outcomes. Other key gaps in this evidence base that should be addressed in future evaluations include: studies of financial interventions, the impact of interventions on quality of life, and economic evaluations of all types of interventions.

This document is available in large print.

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