Health Impacts of Home Energy Interventions
Summary Report
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Introduction

It has been known for a long time that cold, damp homes are bad for our health. The range of health-related problems linked to poor housing is wide, and new linkages are emerging over time.

The most prominent housing-related health issues are two of our biggest killers: heart disease and respiratory disease. More recently, it has been realised that a third big killer, Alzheimer’s and related dementias, are also more deadly for people in cold homes, and research has shown how dementia sufferers struggle in many ways to cope with cold, which in turn is a major threat to their health and wellbeing.

Poor housing also has a very significant impact on people’s mental health, and there are many more wellbeing issues that appear to be linked to poor housing including: mobility problems and falls, arthritis and rheumatism, blood disorders, skin healing/ulcers, runny nose, colds and flu, gastric and digestive problems, allergies and eczema, sickle cell disease, infant health and development problems, hypothermia, carbon monoxide poisoning, total NHS use, poor diet, education, school or work days missed, low wellbeing, social isolation and an inability to use all the rooms in a home.

As we see in the above list, it’s not just health that suffers. Social functioning, education and work can all be affected by cold and damp homes – leading to wider personal and societal impacts and costs.

Through the Build 2 Low Carbon project, Severn Wye commissioned a report from environmental researcher and writer Kate de Selincourt, to bring together previous research on the impact home energy efficiency improvements have had on the health and wellbeing of their residents, and whether the positive changes are significant enough to be relevant to public health planning.

This report summary outlines the key elements of the research carried out over the last 10 years or so. A full report with an analysis of methodologies, bibliography and details of individual research studies will be available on the Build2LC project page on Severn Wye’s website.
Findings

Damp, Ventilation and Air Quality

Anyone working with people in fuel poverty knows that cold homes are often damp as well, yet moisture and indoor air quality have not been a prominent concern in the mainstream UK energy efficiency programmes. Damp is known to harm health, independently of cold. In fact, in some analyses, damp can affect health more than cold.

Damp is probably the most important indoor pollutant, because of its ubiquity. Damp and condensation cause mould growth, and promote the proliferation of house dust mites, a very common asthma and allergy trigger – although many other indoor pollutants impact health as well. Household ventilation in the UK is all too often inadequate; poorly designed and poorly installed. It tends to be ineffective or noisy – and often both. If anything, the problem can be worse in new buildings, because many have windowless bathrooms.

Many retrofit measures will reduce air leakage – sometimes this is the main objective – so if existing ventilation is inadequate, problems may arise. One Welsh study, for example, recorded indoor humidity before and after energy retrofit with and without additional ventilation. While relative humidity dropped after the retrofit in the homes that received insulation plus ventilation, the average humidity rose in the homes that had received energy efficiency measures but no ventilation. This suggests that while energy efficiency measures may tend on balance to reduce dampness, they are not always enough on their own.

CASE STUDY

“Families reported being happier and their wellbeing had increased. Not just in one or two homes, but in home after home, street after street. Huge amounts of anecdotal evidence suggested that the biggest difference we had made since retrofitting the home was to the health of our customer”
Housing and Mental Health

The link between cold, damp homes and poor mental health is well-established. The Adult Psychiatric Morbidity Survey 2007 found that those with a common mental disorder such as depression or anxiety were more likely to experience all aspects of fuel-related poverty, including:

- Not being able to heat the home in winter
- Having a combination of fuel and other debt
- Having mould
- Limiting fuel use because of cost

These are all predictors of mental health disorders. Research by the World Health Organization has found that extensive exposure to dampness and mould increased the chance of depression by 60 per cent.

In a study of households which had had energy efficiency measures installed during the Warm Front programme, “recipients of heating and insulation measures were almost 40% less likely to report high levels of psychological distress following the intervention than they did prior to it.” The incidence of common mental disorders fell from 300 to 150 per 1000 residents following the provision of measures.

The effect on young people

A recent report on fuel poverty research funded by the Cheshire Lehmann Foundation pointed out that while the health implications of fuel poverty have very often focused on excess winter deaths, this is “the extreme tip of the iceberg” when it comes to the health impacts of cold homes and fuel poverty, highlighting in particular the effect on young people’s lives.

It was found that young people in cold homes are more likely to experience multiple mental health symptoms and that:

- 28% of young people lacking affordable warmth were at risk of multiple mental health symptoms, compared with just 4% of young people living in sufficiently warm homes
- 10% of children living in cold homes reported feeling unhappy compared with 2% of children living in warm homes
Living with a disability: The energy penalty

The phrase ‘energy penalty’ was coined by researchers from Leicester University to convey the way fuel poverty is both likelier and makes life particularly hard for people with a disability or a chronic condition. This group are in triple jeopardy; at home most of the time, likely to need more heat/hot water/energy and with a higher chance of living in poor quality housing.

- Health conditions like arthritis, Raynaud’s disease and circulatory issues increase in severity in cold and damp living conditions and increase the level of heating required for comfort.
- 97% of people with spinal injuries said they needed extra heating to help manage their condition and ensure they remain healthy.
- People with cancer often find that the condition and/or medical treatments make them less active, or affect their appetite or circulation, making them feel the cold more.
- Households with a disabled child are 50% more likely to live in overcrowded accommodation and to report problems with draughts and damp in the child’s bedroom.

**CASE STUDY**

“Jane’s disability causes her significant pain. When it gets cold, this causes her limbs and body to shake, which makes her very tired. When it was cold she found she was taking more morphine pills to deal with the pain.”

“Since the windows have been replaced, Jane has noticed the difference. It is much warmer in the whole house – it is a lot less draughty and she no longer has to have the radiator on in the bedroom. Jane has noticed that her health has improved; she does not experience the shakiness as much and so does not have to take as many painkillers.”
BRE and the ‘Full Cost of Poor Housing’

In their 2016 report ‘The Full Cost of Poor Housing’ the consultancy BRE made a comprehensive attempt to estimate the overall societal costs of sub-standard housing in England. This estimated the cost to the NHS of leaving England’s poor housing unimproved at £1.4 billion per year. They estimated that the total cost to society (including medical costs, lost education and employment opportunities) of the same homes is £18.6 billion. The NHS costs thus equated to 8% of the total cost to society.

The total cost of NHS treatment for the first year of treatment of a condition or injury triggered by poor housing was estimated to be £1.4 billion per year.

NHS costs were not broken down into separate costings for separate health outcomes, but rather used an averaged scoring system based on the assessed severity of harm.

Using this methodology, excess cold was responsible for the highest costs of any of the 26 different hazards examined – leading to an estimated £848 million of NHS expenditure – more than all the other hazards put together.

BRE compared the cost to the NHS with the cost of improving the properties to prevent new illnesses or injuries. If all substandard housing were brought up to an acceptable standard, the savings experienced by the NHS would pay back the necessary investment in just over 7 years.

Thus BRE estimates that remediation of a home suffering a “category 1 excess cold” hazard saves the NHS around £650 per year, or on average, £200-£300 per occupant.

HHSRS hazards in Gloucestershire and South Gloucestershire

South Gloucestershire Council commissioned BRE to investigate housing and health standards in the local authority’s area. They found that the proportion of homes with category 1 hazards, including cold, seems to be a lot higher in the rural parts of South Gloucestershire than the main settlements.
BRE also estimated the savings generated by the specific actions under the Warm and Well programme through the improvement in SAP score. Because the knock-on costs to society from cold housing includes paying directly for more fuel than necessary, the ‘multiplier’ is steep. Even taking into account the large health burden of cold homes, the overall societal costs of cold homes – and the savings from improving them – are estimated at around 18 times greater than NHS figures alone.

In Gloucestershire 251 central heating systems have been installed under the Warm Homes Fund. Health funding from the Gloucestershire Strategic Housing Partnership (CCG, County and Districts) was used as a top up where the client had a health condition. External funding from ECO and WHF totalled nearly £910,000 with the GSHPs contributing £69,000. BRE estimates that the savings to the NHS from these improvements will amount to over £148,000, with the overall societal benefits to Gloucestershire as a whole valued at almost £2.6 million.

There is clear evidence that NHS investment in energy efficiency measures enables further funding to be identified and leveraged in. Through WHF, every £1 of local authority health funding has helped leverage-in £10.70 from external sources.

It is also clear that energy efficiency interventions can have a huge impact on a household’s wellbeing and have wider societal benefits from better mental health, better school attendance and generally a higher contentment level.
Conclusion

It is overwhelmingly clear that fixing cold homes improves health and saves NHS expenditure. The studies also indicate that there is:

- A strong indication that **fixing damp/interior air quality is as important as fixing cold**
- Measures that reduce draughts, but are **not accompanied by ventilation**, may in fact **worsen health** in some cases

There are people with specific vulnerabilities where interventions would make a big difference:

- **Common mental disorders** (i.e. not just moderate or severe) in struggling households that are experiencing stress and/or have issues with truancy
- **Living with disability** (and relevant carers), and long-term conditions or illnesses including cancer. This group is in ‘triple jeopardy’ – at home most of the time, likely to need more heat/hot water/energy and with a higher chance they are living in poor housing
- For **people with dementia** (and relevant carers) there is merit in intervening at an early stage before the person is too vulnerable to cope with the disruption of contractors in their home
- **Respiratory disease, asthma and allergy sufferers** must have ventilation improvements included with energy efficiency work, as even moderate symptoms can impact school attendance, sleep and the frequency of chest infections
- **Large households and densely populated buildings** demonstrate another strong trend for additional ventilation need, especially if other signs of damp/IAQ issues are present
- Consider establishing a **referral / intervention programme for ventilation-only installs** for properties which have inadequate ventilation and/or signs of damp but the high SAP rating makes them ineligible for a heating programme grant