



**LEFT OUT  
IN THE COLD  
THE HIDDEN  
HEALTH COSTS  
OF COLD HOMES**

Executive summary

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# FOREWORD

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In the UK today one third of all households, 9.6 million, can't afford a decent standard of living and are in poorly insulated homes. The resultant fuel poverty is a major contributor to the poor state of health of the country. The tragedy is that this problem should be entirely remediable.

Conceptually, fuel poverty is simple. It has three components: the price of fuel, the quality of housing and poverty. Whatever the aims of privatisation of energy in the UK, it is not delivering lower costs to the consumer. Fuel costs in the UK are 30% higher than the European Union average. Small energy companies have faced a torrid time, but large energy companies continue to make large profits.

Our housing stock is among the least energy efficient in Europe. There was welcome investment in energy efficiency of households in England from 2011-2013 resulting from government action. But in 2013 such investment fell off a cliff – there was a 90% reduction in installations of loft, cavity and solid wall insulation. The investment was not resumed.

Poverty should be a national scandal. The fact that it appears not to be is, in its way, more scandalous. At the severe end is destitution, the Joseph Rowntree Foundation (JRF), in its 2023 report, defined destitution as doing without 2 or more of 6 essentials: housing, heating, light, food, appropriate clothing, and toiletries. In 2022, 3.8 million people were in a state of destitution, including 1 million children. The figure for children was 2.9 times higher than five years previously. JRF also calculates a minimum income standard which is close to the median income of £33,000. It implies that half the population are struggling financially.

In our 2010 Review, *Fair Society Healthy Lives*, we had six domains of recommendations: early childhood, education, work and employment, minimum income for healthy living, living environments, healthier lifestyles. Often, I am asked to recommend one as a priority. The present report illustrates why they are all inter-related. Cold homes have influence on children's health, development and education. Poorly paid work contributes to poverty in general and fuel poverty, in particular. Poverty for those not working results from benefit payments insufficient to meet the cost of essentials. The quality of housing and environment is key to health and health equity. The high cost of housing contributes to poverty. Fuel poverty leads to impossible choices between healthy eating and a warm environment.

We have recently added two more to our six domains: tackle discrimination, racism and their consequences; pursue environmental sustainability and health equity together. Both of these are highly relevant to the current report. There is a high level of fuel poverty among some minoritised ethnic groups. Improving the thermal property of housing will aid in efforts achieve net zero greenhouse gas emissions.

What starts, then, as a concern with cold homes quickly becomes a much more general concern with the social determinants of health inequalities.

That said, this specific problem, can be addressed by spending £7.4 billion a year for a decade to retrofit our housing stock to bring it up to acceptable standards of energy efficiency.

In *Fair Society Healthy Lives*, we laid out the concept of proportionate universalism – universalist policies with effort proportionate to need. The widespread nature of insufficient incomes – half of the population below the minimum income standard – calls for universalist policies to address the three causes of fuel poverty. The particular problems of people in destitution argue for effort proportionate to need.

We work from the basic premise that good health should be a priority for all policies. The actions we recommend in this report are important steps to creating a fairer more sustainable society with greater health equity and protection of our environment. Government and prospective governments, please take note.

**Michael Marmot**  
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# EXECUTIVE SUMMARY

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In 2011 the Institute of Health Equity (IHE) was commissioned by Friends of the Earth to review and publish the evidence on cold homes and health and to make recommendations as to what needs to be done<sup>1</sup>. This report, commissioned again by Friends of the Earth, reviews the evidence and progress since that original report. The evidence base is now stronger and since 2011 both the World Health Association (WHO) and Public Health England have recommended that, for health, homes are kept at a minimum of 18°C<sup>2,3</sup>. We have also seen an increase in the proportion of properties insulated to Energy Performance Certificate (EPC) C or higher (energy efficient) from 15 per cent in 2011 to 47 per cent in 2021<sup>4</sup>.

However, while encouraging, these actions are not enough. Just over half of all households are living in energy-inefficient housing. This, together with excessive costs of fuel and increasing poverty, means that more of the population are at risk from the poor health and mortality associated with cold homes than when we published our first report more than a decade ago.

## The UK has unacceptably high numbers of households living in cold homes

Using the government measure of fuel poverty in 2011, between 2011 and 2022 the numbers in fuel poverty, in England, doubled and were projected to increase further in 2023 so that 12 million households would have spent more than 10 percent of income on fuel after housing costs. 8.83 million households would have spent more than 10% of income on fuel before housing costs<sup>5</sup>.

The official government estimate for 2023, using the government's *new* measure of fuel poverty, suggests that 3.53 million households in England would have both a low income (below 60 per cent of median income) and inefficient housing (below EPC band C)<sup>6</sup>. However, several surveys suggest that this may underestimate the true extent of fuel poverty. For example, in 2022 13 million households in the UK, out of the 28 million (46%), were not putting on heating in cold spells<sup>7</sup>.

We estimate that 9.6 million households in the UK, 34%, are at risk of living in a cold home, on a low income and unable to pay anything to help insulate their home. This estimate, based on English Housing Survey (EHS) data, is the number of households living in energy-inefficient homes with incomes below the JRF minimum income standard.

## Cold homes and fuel poverty have a large negative impact on health and other social outcomes

As noted in 2011, cold homes have direct negative impacts on the health of both children and adults. Cold homes increase blood pressure, which can increase the risk of a heart attack. In addition, cold air restricts the airways, suppresses immune response and exacerbates damp and mould, which in turn increase the risk of developing winter infections, and respiratory problems.

Arthritis, grip strength and sickle cell anaemia can all be made worse by living in cold conditions and a reduction in dexterity leads to an increased risk of falls in the home.

In 2022 we reported that children's lung function and brain development can be negatively impacted by living in a cold home, resulting in impaired cognitive development<sup>8</sup>. In addition, 28 per cent of young people are likely to be at risk of multiple mental health symptoms due to living in a cold home, compared to four per cent of children living in adequate warmth<sup>9</sup>.

The evidence has strengthened on the negative impacts of cold homes on mental health. Becoming unable to heat a home doubles the risk of adults developing new mental health conditions and triples the risk of these getting more severe if people already had mild mental health conditions, even after controlling for other socio-economic variables<sup>10</sup>.

Recent data on winter mortality suggests that those who are living with dementia and Alzheimer's disease have a high risk of mortality in the winter<sup>11</sup>. This may be because they forget to put heating on or wear appropriate clothing and the National Institute for Health and Care Excellence (NICE) should review their 'who is at risk' guidelines in light of this evidence.

Having to spend more on heating to stay warm has wider implications for health. Households living in poverty and in cold homes have choices to make regarding what they spend their money on: for instance, prioritising heating places households at greater risk of malnutrition. Poverty and accompanying stress levels are associated with an increased risk of disease and a shorter life span.

Living in a cold home can have other social consequences, such as increased social isolation and loneliness<sup>12</sup> and lower school attainment. UK children miss more school days due to disease burden from damp than any EU member state, with rates over 80 per cent higher than the EU average. As well as missing days in school, it is much more difficult for children to do homework and study in a cold home where households crowd into one or two heated rooms<sup>13</sup>. This negatively impacts GCSE results<sup>14</sup>.

While not specific to cold homes, it is worth noting that lack of action on climate change is having an additional negative impact on the mental health of adolescents. In 2022, 70 per cent of children between the ages of 12 and 18 were experiencing what is now known as eco-anxiety<sup>15</sup>. Another multi-country study found that across 10 countries including the UK, more than 45 per cent of respondents said their feelings about climate change negatively affected their daily life and functioning<sup>16</sup>.

### **On all causes of cold homes, the UK is behind European counterparts**

Action to increase incomes, insulate homes and reduce fuel prices could all help to reduce the health risk from cold homes. However, government policies have left Britain in the cold.

The proportion of properties insulated to EPC C or higher (energy efficient) increased from 15 per cent in 2011 to 47 per cent in 2021. However the majority of that work was in 2011-2013. There has been a 90 per cent reduction in installations of loft, cavity and solid wall insulation since 2013, and rates have not recovered<sup>17</sup>. **Our housing stock is one of the least energy efficient in Europe<sup>18</sup>.**

**The price of fuel in the UK is 30 per cent higher than the EU average<sup>19</sup>.**

**Incomes in the UK have flatlined since 2007 and income growth has been lower than in Europe.** Low-income households are now around 27 per cent poorer than their French and German counterparts, taking home £4,300 per annum less than their French equivalents<sup>20</sup>. Given stagnant wage growth, calculating poverty as 60 per cent of median income disguises the real numbers in hardship. Median income is approximately the same as the JRF minimum income standard – a minimum income for a decent standard of living. This could be considered a poverty threshold, with half the population below it.

In addition to these pressures, **the cost of housing is higher than the European average**, and this is placing more pressure on already stretched budgets. In 2020, half of the lowest earners and almost one in four (23 per cent) of all those who rent privately in the UK had to spend 40 per cent or more of their salary on housing<sup>21</sup>, meaning they were overburdened by housing costs; only Colombia scored worse. Since then, rents have increased substantially, up 56 per cent since October 2019<sup>22</sup>. For those who can consider buying, the cost of buying a two bedroomed flat is 36 per cent higher than the European average<sup>23</sup>.

Government promises to ‘level up’ appear disingenuous. Income inequality is worse now in the UK than in any other large European country - the rich have got richer and the poor poorer<sup>24</sup>.

### **Priority groups for action**

Action is needed on two fronts. Homes need to be insulated and incomes need to be sufficient. For example, those who live in social housing are more likely to live in a cold home despite improvements to this housing stock over the last decade and this is because they still cannot afford the heating<sup>25</sup>.

A study found that between 2019 and 2021 one in five of those who are out of work due to a health condition live in a cold home<sup>26</sup>. This group is at most risk of worsening health outcomes and mortality. Given that 2.5 million are off work due to ill health in the UK, then at least half a million will be living in cold homes that are very likely to make their condition worse and make returning to productive work harder. NICE guidelines state that people at risk from the negative impacts of living in a cold home should be discharged to a warm home.

A current government scheme called ECO4 Flex provides local authorities and devolved administrations with the ability to refer those with existing health conditions at risk of living in a cold home for insulation measures to be fitted<sup>27</sup>. However, the scheme aims to help just 450,000 households, of which half can be referred by local authorities and will therefore be insufficient, given that children and older people with health conditions must also be in warm homes<sup>28</sup>.

Households in arrears with housing payments must be another priority group, as they are highly likely to be living in cold homes. Those eligible for Universal Credit should be next – 90 per cent of households on Universal Credit last year were going without basic essentials and will struggle to heat their homes adequately<sup>29</sup>. People of colour are more likely to be living in damp housing and be in fuel poverty and so action to address damp and incomes is needed for this group.

Following that, a wider scheme to support all those in energy-inefficient homes who are below the minimum income standard will be needed, starting with those households with members over 65 years of age and with children.

Regional mortality data on excess winter deaths could be used to help target at-risk areas earlier. This data shows, for instance, that homes in the North West, South West and Wales are more likely to be too cold and that excess winter deaths are higher in areas with high levels of deprivation<sup>30</sup>. Action to improve incomes is needed to tackle deprivation. In addition, the regional statistics suggest that area by area, street by street action may be an efficient way to deliver improvements, enabling economies of scale.

## This public health crisis caused by cold homes is costing society billions per year

The End Fuel Poverty Coalition has estimated that 4,950 excess winter deaths in the UK were caused by cold homes last winter<sup>31</sup>. This is the most tragic consequence of living in a cold home. However, the wider impacts on health, society and the climate are highly significant, widespread and warrant more focus. Evidence suggests that cold homes are costing billions per year, for example through increased costs to the NHS; higher caring costs; bigger bills; lost productivity and larger carbon emissions.

The Building Research Establishment Group (BRE) has calculated that the very worst housing in England – approximately 720,000 homes with a category one hazard of excess cold (typically insulated to bands F or G) – cost the NHS £0.5 billion per year in first-year treatment costs alone. It estimates an average cost of £6,635 per household to remedy, meaning that improving these homes would pay back within nine years, in NHS savings alone<sup>32</sup>.

Other work by the same group estimated the total societal cost of the 720,000 category one cold hazard homes to be £15.26 billion in 2016, suggesting that the cost of insulating these homes would be recovered in less than six months. Societal costs include care costs, loss of economic potential and potential mental health costs. However, given new evidence on the direct impact of cold homes on mental health, it would be useful to have these explicitly costed in future BRE calculations because the mental health addition utilised by BRE in this calculation will be an underestimate<sup>33</sup>.

The BRE estimate of £15 billion in societal costs of cold homes per year for England is also likely to be a considerable underestimate because it only applies to the very worst homes and needs updating in line with inflation. The Housing Health and Safety Rating System (HHSRS) was created in 2004 and at that time band F and G homes were identified as being category one cold hazard homes because the prohibitive cost of heating them (insufficient heating systems and insulation) would mean that many households would be unable to heat them to a sufficient standard<sup>34</sup>. However, currently eight million households in England are in energy-inefficient housing and below the JRF minimum income standard, and will be struggling to heat their home effectively. It is evident that the cost to society has the potential to be significantly higher than £15 billion and higher again when extrapolated to the 9.6 million homes across the UK.

Future analyses should also factor in carbon emission cost which is not included in the above costs. Using data from the latest English Housing Survey (EHS) and a recent financial estimate of the impact of carbon

emissions from the United States Environmental Protection Agency (USEPA) it is possible to put a price on the failure to insulate homes to an adequate standard (EPC band C). Bringing all properties with low-incomes in the UK – those below the Joseph Rowntree Foundation's Minimum Income Standard (MIS) – up to EPC band C would save £2.9 billion a year in avoided climate impacts<sup>1,35</sup>.

If we add £2.9 billion to £15 billion then the available analyses suggests that uninsulated homes are costing society at least £17.9 billion a year, however the BRE figures are just for F and G band homes. The joint combination of energy-inefficient homes (lower than EPC band C) and low incomes will be costing tens of billions more, given the current cost-of-living crisis and the level of mental health harm identified. Further work to update cost-benefit analyses is warranted.

## It makes moral, health and economic sense to bring forward investment needed to insulate homes to reach net zero targets

The Climate Change Committee has recommended that homes are insulated to EPC band C to reduce household carbon emissions to meet legally binding domestic carbon reduction targets and the UK's international commitments<sup>36</sup>.

The evidence demonstrates that to minimise ill health from poorly insulated homes, homes need to be insulated up to EPC band D for warmth if consumers can afford current heating bills<sup>37</sup>. For those that cannot, then homes need to be insulated to EPC band C to enable them to afford to heat to an acceptable standard. It is important to note that insulation must be fitted with adequate ventilation to help to avoid damp, poor internal air quality and over-heating.

Using English Housing Survey data on the cost of retrofit we have also calculated the cost of retrofitting all low-income homes (below MIS) in England at £62.2 billion (£74.5 billion for the UK). The English Housing Survey estimates the average cost of bringing homes EPC E or lower to EPC C at £13,931, and the average cost of EPC D to EPC C homes at £6,221<sup>38</sup>. Spread over a ten-year period, this equates to an expenditure of £6.2 to £7.4 billion per year.

Overall, this means that a one-off 10-year programme of investment in housing insulation of £60 billion, as the Labour Party originally suggested in its Green Prosperity Plan, would more than pay for itself through avoided health costs and climate costs, savings that will continue to accumulate over decades. Further there are likely to be economic benefits from such a large programme in terms of jobs in manufacturing and installation. The current government has recently pledged £6 billion for the three-year period from 2025

to 2028, equating to £2 billion a year to retrofit the public estate, schools, hospitals, and social housing; while welcome, this level of investment is insufficient.

### **Genuine action to increase disposable incomes is needed**

People need to be able to afford to heat their homes, eat and maintain a healthy standard of living. 90 per cent of those on Universal Credit last year could not afford essentials and this crisis is deepening. For example, the numbers having to reduce meals, skip meals or go hungry was up from 5.7 million low-income households in May 2023, to 5.9 million in October 2023<sup>39</sup>. A study published in 2020 found that rates of stunted growth were increasing, with British five-year-olds shorter than the five-year-old populations of our European neighbours, with significant height inequalities between poor and wealthy areas within this country<sup>40</sup>.

There is room for the UK social protection system to be more generous with more progressive taxation, however given constrained government budgets, better targeting of limited tax revenue may also be warranted.

In 2021/22, 64 per cent of working age households in the UK in poverty had a person in the household in work<sup>41</sup>, up from 52.9 per cent in 2009/10. This is a worrying trend, but worse is the rise in households in poverty where both adults work. In 2019/20 18.8 per cent of children and working-age adults in poverty lived in families where all adults were working and at least one adult was working full time, up from 12.6 per cent in 2009/10.

Support to help people work full time, paying at least the living wage, and better profit sharing in companies should be explored to reduce poverty among staff and supply chains. The resulting reduction in the number of workers needing top-up payments could help to better fund those in need of government support with more generous payments.

Better targeting of winter fuel payments to those on low incomes could redirect more than £2 billion a year towards insulation and greater support for those most in need, albeit that some additional costs would be associated with the administration costs of means-testing this scheme.

Increasing incomes, without insulating homes or moving to carbon-neutral power sources, will increase carbon emissions as people will be able to afford to heat their homes. Insulation and a movement towards carbon-neutral fuels are necessary steps to take to mitigate against this.

### **Fuel and property prices need to move closer to the European average**

The cost-of-living crisis and rising poverty are placing additional strain on households which is damaging health. A focus on reducing the cost of fuel and housing is needed to help incomes stretch further.

The cost of fuel in the UK is 30% higher than the EU average. Standing charges cost consumers around 80 pence per day if they pay by direct debit and £1 per day if they pay by prepayment meter<sup>42,43</sup>. These are not progressive taxes and have a disproportionate impact on low-income households in energy-inefficient homes. A more progressive levy applied to income tax would be beneficial for low-income consumers. With a shift to electric heating over coming decades, we need to reduce the cost of electricity through building renewable energy sources more quickly. In addition, consumers pay for the most expensive unit of power to generate, rather than the average. A review of this pricing strategy is needed to bring fuel prices down.

The cost of housing is too high. Half of low-income households are spending more than 40 per cent of their income on housing and are therefore overburdened by housing costs according to the Organisation for Economic Co-operation and Development. For those who can afford to buy, property prices are 36% higher than in Europe.

## RECOMMENDATIONS

1

The government should commit at least £62.2 billion (England) to £74.5 billion (UK) to a 10-year retrofit programme targeted to those on low incomes in energy-inefficient housing. This will save tens of billions of pounds a year through improvements in productivity, health, climate and other costs. This programme should be strategically planned, including giving councils a clear role in targeting insulation programmes street by street in the areas most in need, and include setting higher standards for privately rented homes, with necessary fiscal incentives to ensure costs do not result in higher rents.

If this scale of spending is rejected by both main political parties, as appears to be the case, then the government must publish how it will use other levers to insulate all 9.6 million low-income homes to EPC C level as fast as possible and at least within a decade, and ensure that the reductions in carbon emissions from homes are sufficient to meet the international and domestic 2030 carbon reduction goals alongside the other carbon reduction measures it will need to deploy.

2

Local authorities and devolved administrations to utilise the powers they now have to socially prescribe insulation with adequate ventilation through the ECO4 Flex scheme for those living in energy-inefficient homes with low incomes and with existing health conditions such as heart disease or asthma. Government to increase the scope of schemes to deal with demand to cover all those living in energy-inefficient homes with a household income below the JRF minimum income standard and a health condition beyond the 225,000 planned maximum.

3

Government and business leaders to do more to tackle poverty and ensure households can afford a healthy life, including through ensuring the National Minimum Wage and National Living Wage are sufficient, and by more equitable redistribution of profits within companies to reduce in-work poverty.

4

The government to support the JRF and Trussell Trust campaign to raise Universal Credit to ensure that it covers the basic essentials and continues to do so, with at least an annual review.

5

Government to work with energy companies to bring UK fuel prices down to the EU average or below to ensure those on lower incomes can afford to heat their homes. For example, to revisit non progressive standing charges and pricing strategies that mean consumers pay for the highest cost of fuel to generate rather than the average cost of fuel. Government to pay for improvements to energy generation through more progressive taxes.

6

Government to bring in schemes to increase the supply of affordable good quality, sustainable housing, including through reform to the private housing market and through increased investment in building social housing.

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