



# The cost of poor housing in England

2021 Briefing paper

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# Executive Summary

This report has been produced by BRE using methodology developed by the BRE Trust in response to demand for an update of an earlier (2015) briefing paper on 'The Cost of Poor Housing to the NHS', which has been widely quoted in studies that look at the impact on health of housing and the benefits of improving it.

While the condition of the English housing stock has improved since the last report (mainly due to heating and insulation upgrades), both the total cost of rectifying the most serious hazards and the overall cost burden to the NHS of treating people living in homes are very similar to the estimated costs produced in 2015.

It is costing the NHS some £1.4bn per year to treat those people who are affected by poor housing.

These are first year treatment costs alone. For many hazards there may be ongoing treatment beyond the first year. There will be 'societal costs', such as those relating to care, which in some cases may continue for a lifetime. There will be a loss of economic potential (poorer educational achievement, loss of productivity, career prospects) for victims of hazards, family carers and employers. There will be the mental health cost of suffering and trauma.

When these societal costs are included, it is estimated that the full cost to society of leaving people living in poor housing is some £18.5bn per annum.

These cost burdens to the NHS and wider society from unhealthy housing will continue unless a targeted effort is undertaken to improve the poorest housing stock.

The most common extreme hazards likely to be found in the home are those relating to cold and home accidents, particularly falls on stairs. These are, generally, not expensive to rectify compared with the long-term cost to the health services and society if they are ignored. Such hazards are particularly harmful to the most vulnerable, especially older people and families with young children.

Improving poor housing has multiple benefits, beyond those that just relate to the health of their occupants. These include reduced energy costs and carbon emissions, higher residual asset values, and local job creation opportunities.

It is recommended that further research is undertaken to inform a full 30 year cost-benefit analysis of the impact of improving poor housing in England.

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# Introduction

In 2015 the BRE Trust published 'The Cost of Poor Housing to the NHS' [1], research which sought to quantify the financial cost of people living in poor housing in England to the National Health Service. Using English Housing Survey (EHS) published data on health and safety hazards in the home and National Health Service (NHS) treatment cost data, the research estimated that leaving people living in the poorest 15% of England's housing was costing the NHS £1.4bn in first year treatment costs alone.

Further work, published in 'The Full Cost of Poor Housing' [2] the following year, estimated that these NHS treatment costs accounted for some 8% of the total health related costs to society of leaving people living in poor housing, which equated to £18.6bn at 2015 prices.

These reports have been well received and widely quoted. In response, comparable reports for Wales and Northern Ireland were commissioned [3, 4], and extrapolations based on cost of poor housing (COPH) methodology have produced estimates for Europe [5] and Ireland [6].

***This new briefing paper presents a summary of the findings of a BRE funded project to update the published estimates of the cost to the NHS of living in England's poorest housing.***

The research replicates the methodology used in 'The Full Cost of Poor Housing', which will not be described in detail here. The difference is that, in this report, the most recent publicly available 2018 English Housing Survey (EHS) data and NHS treatment cost information is used (2018 prices).

The results are summarised in Table 1.



# Methodology and findings

**Table 1: Summary of costs and benefits, with Category 1 hazards ordered by total cost to repair, England 2018**

Hazard	Number of category 1 hazards	Average cost per dwelling (£)	Total cost to mitigate hazard (£)	Savings to the NHS per annum if hazard mitigated (£)	Payback (years)	Savings to society per annum if hazard mitigated (£)	Societal payback (years)
Excess cold	835,829	7,119	5,950,186,695	857,196,218	7	15,264,086,238	0.4
Falls on stairs	1,047,690	1,242	1,301,131,602	218,744,202	6	1,745,063,956	0.7
Overcrowding	36,879	19,757	728,623,327	4,971,969	147	79,644,689	9.1
Fire	122,751	3,805	467,102,923	17,735,312	26	282,132,623	1.7
Falls on the level	409,643	854	349,705,301	104,035,971	3	257,514,387	1.4
Dampness	74,946	3,590	269,091,625	38,356,200	7	95,694,405	2.8
Falls between levels	180,932	1,263	228,513,031	50,953,543	4	280,298,050	0.8
Radon	87,558	1,411	123,538,757	10,145,567	12	185,760,473	0.7
Hot surfaces	63,368	1,739	110,198,376	17,480,330	6	83,447,309	1.3
Lead	36,748	2,079	76,415,848	7,828,305	10	18,993,940	4
Pests (Domestic hygiene)	21,507	3,286	70,662,605	4,377,730	16	8,572,661	8.2
Food safety	16,426	3,182	52,268,646	3,419,130	15	9,088,747	5.8
Electrical problems	8,020	2,275	18,244,946	1,679,686	11	7,736,855	2.4
Entry by intruders	15,793	1,122	17,712,227	7,711,722	2	19,239,879	0.9
Collision and entrapment	20,783	709	14,726,241	8,856,329	2	57,629,829	0.3
Sanitation (Personal hygiene)	17,629	743	13,094,097	3,672,035	4	9,761,020	1.3
Carbon monoxide	13,596	608	8,262,694	2,543,879	3	5,995,340	1.4
Noise	4,893	1,410	6,898,603	2,392,242	3	5,804,335	1.2
Ergonomics	10,015	633	6,341,273	2,115,323	3	5,429,813	1.2
Structural collapse	8,848	637	5,639,287	1,369,730	4	14,797,611	0.4
Falls - baths	8,265	627	5,181,460	2,299,090	2	25,628,882	0.2
Excess heat	2,522	633	1,596,874	331,689	5	5,751,757	0.3
Water supply	653	1,612	1,052,515	139,117	8	337,542	3.1
Uncombusted fuel gas	-	-	-	-	-	-	-
Lighting	-	-	-	-	-	-	-
Explosions	-	-	-	-	-	-	-
Total with any Category 1 hazard	2,575,715	3,780	9,826,188,952	1,368,355,319	7	18,468,410,341	0.5

*Table 1 Notes:*

- 1. The total sum of all dwellings with Category 1 hazards will be less than the sum of the individual hazards as some dwellings will have more than one Category 1 hazard.*
- 2. The total sum required to remedy all Category 1 hazards is less than the total number of Category 1 hazards multiplied by the average costs; this is because the modelling avoids the double counting of costs where repair work/energy improvements mitigate more than one hazard.*
- 3. Sample sizes for some Category 1 hazards are very small and are included for quantification purposes only. For some, like explosions, no cases were identified in the survey. There will, therefore, be a degree of uncertainty around these estimates because any calculations relating to cost benefits and payback periods are very sensitive to the mix of hazards present in England.*
- 4. Three of the 29 Housing Health and Safety Rating System (HHSRS) hazards are not measured in the EHS (asbestos; biocides, volatile organic compounds) because they require an intrusive inspection, which is not practicable in a sample survey.*

The BRE COPH model uses the following data, which is presented in Table 1, above.

1. The number of homes in poor condition.
2. The average repair cost of making these homes acceptable.
3. The total repair cost of mitigating the hazards.
4. The costs to the NHS of leaving the hazards un-mitigated.
5. The NHS pay-back period of mitigating the hazards now.
6. The costs to society of leaving the hazards un-mitigated.
7. The societal pay-back period of mitigating the hazards now.

## 1. Poor housing

'Poor housing' can be defined in many ways, but for the BRE COPH research it has been defined as 'a dwelling that fails to meet the statutory minimum standard of housing in England', i.e., a dwelling that contains one or more Category 1 Housing Health and Safety Rating System (HHSRS) hazards. This is the same as the minimum condition measure of the Decent Homes Standard [7] and the poor housing indicator used in the Indices of Deprivation [8]. It is also measured through the EHS [9].

A full description of the HHSRS is found in 'The Full Cost of Poor Housing'. There are 29 recognised HHSRS hazards [7], 26 of which are collected for the EHS. In 2018, the EHS estimated that 2.6 million (11%) of England's homes had at least one Category 1 hazard and were thus considered to be 'poor'. The most common hazards identified were those relating to falls on stairs and excessive cold (Table 1). Some are so rare (such as the risk from explosions) that none were picked up in the 2018 EHS. Examples of some common HHSRS hazards are found in Appendix 1.

## 2. Cost of remedial work

Where a Category 1 HHSRS hazard is identified in the EHS, the surveyor reports the work that would be required to reduce the hazard to bring it up to the average for the age and type of dwelling (some hazards cannot be removed altogether, e.g., stairs, and it is recognised that it would not be economically viable to require that all older housing to be brought up to, say modern Building Regulation standards for health and safety). This work is costed through the EHS 'cost to make safe' model at 2018 prices.

<sup>1</sup> The HHSRS likelihood of harm and harm outcome scores are also used in the COPH model.

The results in Table 1 show that some Category 1 hazards can be typically rectified for a small cost (such as moving the position of a dangerous cooker to reduce the risk of scalding), while others require more expensive work (for example, treating inherent dampness). The average cost of remedial work is £3,780.

### 3. Total cost to mitigate work

This is the number of poor homes multiplied by the average cost of remedial work for each HHSRS Category 1 hazard. The total cost of remedial work (see Table 1) is estimated to be £9.8bn.

### 4. Savings to the NHS per annum if hazard is mitigated

This is calculated by applying the NHS first year treatment costs for each Category 1 hazard through the BRE COPH algorithm (described in The Full Cost of Poor Housing).

The NHS data comes from publicly available NHS treatment cost data, predominantly the National Schedule of Reference Costs for 2017-18 (NHS Trusts and NHS Foundation Trusts). Every health incident in the home will have a unique outcome. The COPH method summarises and simplifies this to provide representative costs for four types of outcome (Table 2).

**Table 2: Representative cost to the NHS values<sup>2</sup>**

Cost value	Class I (£)	Class II (£)	Class III (£)	Class IV (£)
Representative cost (2018)	125,000	35,000	5,000	200

It is estimated that it is costing the NHS some £1.4bn per year to treat those people who are affected by poor housing.

This cost burden to the NHS has, therefore, remained similar to the level identified in the previous Cost of poor housing estimates in 2015.

### 5. NHS Payback period

The payback period is estimated by dividing the cost of remedial work by the savings to the NHS if the hazard is mitigated. If all remedial work was undertaken now, it is estimated that it would pay back the NHS treatment costs alone within 7 to 8 years.

### 6. The full costs to society of leaving hazards un-mitigated

The BRE COPH methodology focuses on first year treatment costs to the NHS because there is comprehensive data available on this which can be linked directly to the way we measure hazards in the home in the EHS. However, these first-year treatment costs are just part of the cost to society.

For many hazards there may be ongoing treatment beyond the first year. There may be care costs, sometimes for the rest of the victim's lifetime. There may be a loss of economic potential (poorer educational achievement, loss of working days and career prospects). There will also be the mental health cost of suffering and trauma.

<sup>2</sup> The representative costs in the 2015 Cost of poor housing estimates were; Class I- £90,000, Class II- £30,000, Class III- £1,800, Class IV- £120.



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The 'full cost of poor housing' concluded that the best way to assess the total cost to society is to use a tried-and-tested formula, such as the one developed by the Transport Research Laboratory (TRL) [10] which evaluates the costs of both fatal and non-fatal injuries. These costs include human impacts (pain, grief and suffering), indirect economic impacts, as well as direct medical costs. TRL have also conducted research for the Royal Society for the Prevention of Accidents (RoSPA) to value the impact of home accidents using these costs.

Using this approach, it is estimated that the total cost to society of poor housing in England is some £18.5bn per annum (Table 1). This suggests that the annual treatment costs to the NHS is around 7% of the societal costs of poor housing.

## 7. Societal payback period

The payback period is estimated by dividing the cost of remedial work by the savings that will fall to society if the hazard is mitigated. If all remedial work could be undertaken now, it is estimated that it would pay back the full societal costs **within a year**.

## 8. Other actionable HHSRS hazards

This research also estimated the cost to the NHS of leaving other actionable hazards unmitigated. These actionable hazards are those where the risk of harm is significantly higher than average but not as serious as Category 1 hazards<sup>3</sup>. As such, they do not meet our definition of poor housing, even though they still present a risk to households.

The EHS estimated that in 2018 4.8 million (20%) of dwellings had these actionable hazards. Leaving these dwellings with significantly higher than average risks is estimated to be costing the NHS £545m in first year treatment costs.

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<sup>3</sup> These are high scoring Category 2 hazards with a HHSRS hazard rating score of over 500.

# The multiple benefits of improving poor housing

If you improve a home, making it healthy and safe, this has long term implications for the life chances of occupants and visitors, and benefits to society as a whole. The benefits of reducing home health and safety hazards include:

- Direct health benefits to the health sector, occupants and visitors
- Reduction in cost to the emergency services, following a home health incident
- Wellbeing and mental health benefits
- A reduction in direct care, aftercare and assistance
- Improved education and productivity
- Increased asset value of property
- Improved rental income of property
- Saved costs of future retrofitting
- Savings in energy and carbon emissions
- Reduction in cost of future interventions, including those of charities
- Increased social capital
- Local job opportunities and tax revenues

Some of these can be quantified, others cannot but are real social benefits.

The benefits accrue year-on-year, while the initial costs are a one-off. The problem is that those who receive the benefits are not always those who pay the up-front costs of delivering the home improvements.

The methodology used in this report focuses only on the costs and benefits related to health. While it is recognised that other benefits accrue, other than those associated with health, and that these can be substantial, we do not attempt to quantify these in this research. It is recommended that further research is undertaken to inform a full 30-year cost-benefit analysis of the impact of improving the poor housing in England.

The methodology focuses on the health and safety of the dwelling for any vulnerable occupant, rather than the actual occupant(s). As such, it does not cover 'Fuel Poverty', which is where the occupant may be unable to afford to heat their home, even where their heating system or insulation is not considered to be sub-standard.

## Using the COPH model at individual case level

The model used in the national estimates above, can be applied at the individual dwelling and scheme level. The example at Figure 1, below, is taken from 'The housing stock of the United Kingdom' [11] and demonstrates that an intervention to provide an elderly household living in fuel poverty with improved heating and insulation has multiple benefits, not least her own health and safety.

**Figure 1: Case study example of the cost-benefits of housing improvement**



This example shows the impact of poor housing on one household and some of the cost-benefits of improving the home.

This pre1919 terraced house is occupied by a vulnerable older lady owner whose only income is her state pension. The home has been partially improved over the years but is still too expensive for the occupant to heat effectively. It represents a HHSRS Category 1 excess cold hazard and the household is in fuel poverty.

A modest range of energy improvements is suggested to bring this home up to the average energy efficiency for the age and type of the dwelling. If the household takes advantage of the heating improvements, the HHSRS cold risk will be minimised and the household will be taken out of fuel poverty.

The chances of the occupant ending up in hospital requiring treatment will be reduced substantially.

If the improvement scheme was to include full insulation to the solid walls and floors, plus solar water heating, the costs of improvement would go up to £23,766 but with no additional health benefits over the basic modelled energy improvements. However, there would be additional fuel cost and carbon emission savings.

	<b>Pre-improvement</b>	<b>Post-improvement</b>
<b>Walls</b>	Solid, uninsulated	Not improved
<b>Ground floor</b>	Solid, uninsulated	Not improved
<b>Loft insulation</b>	50mm	Topped up to 270mm
<b>Double-glazing</b>	Partial	Full
<b>Space heating</b>	Gas fire with back boiler	Condensing boiler
<b>Heating controls</b>	Boiler controls only	Room thermostat, programmer and TRVs
<b>Hot water cylinder</b>	Un-insulated, no thermostat	80mm jacket and thermostat fitted
<b>Low energy lights</b>	Partial	Full
<b>Solar water heating</b>	No	No
<b>Cost of upgrade (EHS costs)</b>	£0	£4,766
<b>Energy efficiency (SAP)</b>	21	57
<b>Annual fuel cost</b>	£1,770	£895
<b>Household in Fuel Poverty</b>	Yes	No
<b>CO2 emissions (cubic m pa)</b>	8,430	3,960
<b>HHSRS excess cold (band)</b>	A	E
<b>Cost savings to NHS pa</b>	-	£730
<b>Payback to NHS (years)</b>	-	7
<b>Market value increase</b>	£0	£5,000

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# Appendix 1. Examples of ‘poor housing’ (homes with HHSRS Category 1 hazards)

## Falls hazards

The design and condition of homes and their accessways has a major impact on the likelihood of a fall occurring and the seriousness of the outcome. This is particularly the case when the home is lived in by a vulnerable occupant, even more-so when the occupant is elderly and lives alone.

There are some 400,000 treated injuries per year in England associated with home falls on stairs and steps, some 700 of these being fatal. If a fall does occur leading to hospital treatment, the first-year NHS treatment costs can vary from £160 for a cut or bruise to £100,000 for paralysis.

If, by nullifying a Category 1 HHSRS fall hazard, just one devastating injury was prevented each year, the costs savings to the NHS would reach over £1 million after 10 years. To this would be added the cost of the emergency services, continued aftercare, loss of earnings, wellbeing and social capital.

In Figure 2 below the home the accessway to the rear garden and garage is down a set of steep steps. These steps are in disrepair, slope dangerously and are slippery. The handrail is loose. To make matters worse, the rain-water drainage discharges directly onto the steps which means that they are always wet. Following a very cold night they would have ice on them. As this is a regularly used accessway this is deemed to be a Category 1 hazard to a vulnerable elderly person. If an elderly person was to have a fall on the steps the outcome would likely be severe. In the worst-case scenario, this could lead to paralysis requiring constant care.

**Figure 2: Category 1 falls on stairs**



## Cold homes

Older homes are generally more difficult to keep warm, particularly if they are poorly insulated and do not have gas central heating. Rural homes typically have oil-fired systems which are expensive to use, often resulting in the household living in 'fuel deprivation' or 'fuel poverty'. Elderly people are particularly affected by the effects of living in a cold home and often have limited resources to pay for fuel.

Figure 3 is a typical of a rural home still burning solid fuel as their main source of heating. These fires are expensive to use, particularly when supplemented by electric heaters. Such 'cold homes' may have a severe impact on both physical and mental health if the household cannot afford the heating costs; the outcome could be respiratory or circulatory problems and, in extreme cases, hypothermia. People will not be able to live comfortably or perform tasks efficiently in a cold home, and they will be less likely to invite friends to visit.

**Figure 3: Category 1 excessive cold**

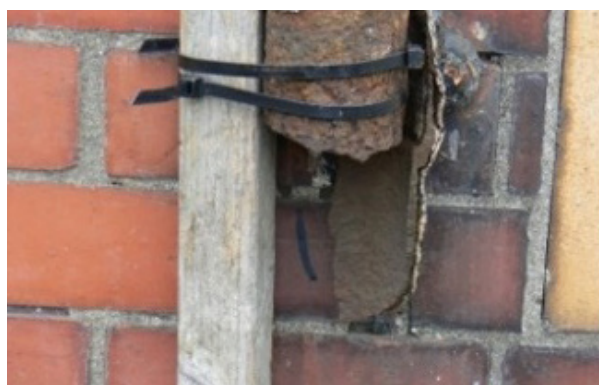


## Damp

Dampness is a major problem that can lead to all sorts of health problems, including asthma, discomfort and poor mental health. Older homes are more likely to have defects to their roof coverings, rainwater drainage, damp proof courses, render and brickwork. High rainfall is also a significant factor in aggravating damp problems.

General disrepair can let in water. In Figure 4, a defective damp proof course and a broken downpipe are the sources of Category 1 dampness.

**Figure 4: Category 1 dampness and mould growth**





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