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Chilled to Death: The human cost of cold homes

1 Introduction

Every year an official estimate is made of the number of Excess Winter Deaths in the UK. This is an assessment of how many more people die in the winter than at other times of year. These deaths are primarily due to illnesses brought on by the cold.

It is important to understand the role of cold homes in causing these deaths, because keeping homes warm is a huge opportunity for the Government to tackle one of the main root causes of Excess Winter Deaths.

It is estimated by the World Health Organisation that 30% of these Excess Winter Deaths are due to people living in cold homes. These deaths could be prevented if people were kept warm during the winter months.

To calculate the number of cold home deaths during the last five years of this Parliament, we have taken the official figures¹ for Excess Winter Deaths for 2010/11 to 2012/13, used the provisional figure for winter 2013/14 and calculated our own estimate for this last winter, 2014/15. We find that since the coalition Government came to power in 2010:

- 155,720 Excess Winter Deaths have occurred in the UK over the last five winters
- **Around 46,700 of these deaths in the last five winters are due to people living in cold homes**
- This winter will have seen the highest rate of Excess Winter Deaths and cold home deaths in the last five years. We estimate that there will have been 46,100 Excess Winter Deaths this winter, of which around 13,800 are due to people living in cold homes.

¹ From the ONS (England and Wales), NRS (Scotland) and NISRA (Northern Ireland)

- The average number of Excess Winter Deaths over the previous five years is 27,830, of which around 8,350 are due to cold homes. So this winter has seen an increase in Excess Winter Deaths of 66% above the average.

Ed Davey, Secretary of State for Energy and Climate Change, said in March 2015, “*the link between bad health and fuel poverty is undeniable*”². The UK has a high rate of deaths due to cold homes because of its poor quality, inefficient housing (as explained in our briefings, *The Cold Man of Europe*³ and *Energy efficiency and Excess Winter Deaths: Comparing the UK and Sweden*⁴). The UK still has one of the most poorly insulated housing stocks in western Europe.

Making the homes of the fuel poor energy efficient is the most effective way to combat cold home deaths, reduce energy bills and bring them out of fuel poverty. But the Government’s new energy efficiency policies have failed badly⁵:

- **During the winter of 2014/15, the number of key energy efficiency measures delivered to homes under Britain-wide programmes has been 80% lower than in winter 2011/12**⁶.
- **The Government boasts that its new energy efficiency policies have helped 1 million households. But if the old energy efficiency policies had been left in place, then they would have helped 2.8 million households by now.**

Homes which are inefficient and unaffordable to heat can have serious health impacts: cold conditions worsen chronic lung disease and asthma, suppress the immune system and reduce capacity to fight off infection, leading to an increased risk of bronchitis and pneumonia (Donaldson, 2010). Cold housing increases the level of minor illnesses such as colds and flu and exacerbates arthritis and rheumatism (Marmot Review Team, 2011).

These impacts do not only harm elderly people; research by ACE for the Energy Bill Revolution⁷ found families and children also suffer, with children in cold homes being more likely to experience breathing problems. Mental health is also negatively affected by fuel poverty and cold housing, for people of all ages (Marmot Review Team, 2011). Cold homes are estimated to burden the NHS with costs of £1.36 billion per annum (Fuel Poverty Advisory Group, 2015).

In 2013, in England and Wales, cold homes killed over four times as many people as road and rail accidents; nearly four times as many people as drug misuse; and about as many people as alcohol. In terms of number of deaths, cold homes were thirty times more lethal than fire.

Cold housing is one of a number of important issues for public health and safety. Focusing more resources on tackling this crisis does **not** mean taking resources away from tackling other health problems, such as those mentioned here. In fact it may free up resources to address them.

Investment in making homes highly energy efficient can be increased significantly by making this a UK infrastructure capital spending priority. The UK Treasury has plans to spend £100 billion of public money on infrastructure over the course of the next Parliament. Investing just 3% of this budget in making homes highly energy efficient, alongside existing energy efficiency budgets, can bring two

² <https://www.gov.uk/government/speeches/address-to-the-ecobuild-exhibition>

³ <http://www.ukace.org/wp-content/uploads/2013/03/ACE-and-EBR-fact-file-2013-03-Cold-man-of-Europe.pdf>

⁴ <http://www.energybillrevolution.org/wp-content/uploads/2013/12/ACE-Research-Comparing-the-UK-and-Sweden-3.12.13.pdf>

⁵ <http://www.energybillrevolution.org/wp-content/uploads/2014/07/ACE-and-EBR-fact-file-2014-06-ECO-and-the-Green-Deal.pdf>

⁶ <http://www.ukace.org/wp-content/uploads/2015/02/ACE-and-EBR-fact-file-2015-01-Left-out-in-the-cold.pdf>

⁷ <http://www.ukace.org/wp-content/uploads/2013/02/ACE-and-EBR-fact-file-2012-02-Families-and-fuel-poverty.pdf>

million UK low income homes up to a high standard of energy efficiency (EPC Band C) by 2020. The Energy Bill Revolution is calling for all six million low income homes to be brought up to this standard by 2025.

This would create the world's most ambitious home energy efficiency programme, reducing cold home deaths, slashing energy bills and carbon emissions, creating over 100,000 jobs and helping end fuel poverty. It would also reduce costs for the NHS.

2 Methods and findings

2.1 Excess Winter Deaths

This analysis uses official data on Excess Winter Deaths (EWDs). This is an indicator of how many more people die in the winter than other times of year. The method defines the winter period as December to March, and compares the number of deaths that occurred in this winter period with the average number of deaths occurring in the preceding August to November and the following April to July.

$$\text{Excess winter mortality} = \text{winter deaths} - \text{average non-winter deaths}$$

Excess winter mortality data for England and Wales is published annually by the Office for National Statistics (ONS)⁸. Data for Scotland is published by National Records of Scotland (NRS)⁹, and for Northern Ireland by the Northern Ireland Statistics and Research Agency (NISRA)¹⁰.

Final figures have been published up to winter 2012/13 and provisional figures have been published for 2013/14.

To estimate how many EWDs will occur in winter 2014/15, we used the latest provisional monthly and weekly data. For England and Wales and Northern Ireland, this data is available up to the end of February 2015, at the time of writing. For Scotland it is only available up to the end of December 2014.

For months where data is lacking, we used the average for that month over the last five years, for that nation. This is a cautious approach; if current trends continue, EWDs this winter may be higher, especially in Scotland. Table 1 shows the results.

Table 1: Excess Winter Deaths in the UK and its nations since 2010

Winter	England and Wales	Scotland	Northern Ireland	UK total
2010/11	26,080	2,450	741	29,271
2011/12	24,200	1,420	496	26,116
2012/13	31,280	2,000	559	33,839
2013/14 (provisional)	18,200	1,600	593	20,393
2014/15 (estimate)	42,687	2,521	893	46,102
Total	142,447	9,991	3,282	155,720

⁸ <http://www.ons.gov.uk/ons/publications/re-reference-tables.html?edition=tcn%3A77-338623>

⁹ <http://www.nrscotland.gov.uk/statistics-and-data/statistics/statistics-by-theme/vital-events/deaths/winter-mortality>

¹⁰ <http://www.nisra.gov.uk/demography/default.asp32.htm>

2.2 Attributing deaths to cold homes

A World Health Organisation report states that around 30% of Excess Winter Deaths can be attributed to cold housing (Rudge, 2011). This is based on a detailed review of scientific studies, and is judged by the report to be a conservative estimate. The real figure is uncertain and although it may be lower, it could be higher. The difficulty of making a precise estimate means that there has been a reluctance by Government to draw attention to the number of Excess Winter Deaths likely to have been caused by cold homes. However, it is critical that an assessment is made using the best available evidence to ensure that this crisis is not hidden away and a solution is found.

Table 2: EWDs and deaths due to cold homes in the UK and its nations since May 2010

Year		England & Wales	Scotland	Northern Ireland	UK
2010/11	EWDs	26,080	2,450	741	29,271
	Deaths due to cold homes	7,824	735	222	8,781
2011/12	EWDs	24,200	1,420	496	26,116
	Deaths due to cold homes	7,260	426	149	7,835
2012/13	EWDs	31,280	2,000	559	33,839
	Deaths due to cold homes	9,384	600	168	10,152
2013/14 (provisional)	EWDs	18,200	1,600	593	20,393
	Deaths due to cold homes	5,460	480	178	6,118
2014/15 (estimate)	EWDs	42,687	2,521	893	46,102
	Deaths due to cold homes	12,806	756	268	13,831
Total	EWDs	142,447	9,991	3,282	155,720
	Deaths due to cold homes	42,734	2,997	985	46,716

We estimate that there have been a total of 155,720 EWDs since 2010 in the UK. If we attribute 30% of these deaths to cold housing, then cold homes have caused 46,700 deaths since 2010. We also find that this winter (2014/15) has seen the highest number of EWDs during the last five years. We estimate there have been 46,100 Excess Winter Deaths of which around 13,800 are due to people living in cold homes.

It is important to note that not all deaths due to cold homes will occur during the winter months (Vardoulakis et al., 2014), so the figures given here, using excess winter mortality, may underestimate how many people die due to cold housing.

2.3 Putting cold homes in the context of other risks

To understand the scale of the impacts of cold homes, it is useful to consider other risks to public health and safety. To provide context to the figure for cold housing mortality, we looked at data on some other causes of death in England and Wales. This is not intended as a systematic comparison of all risks. Rather, we have selected some problems that are of significant concern to the public and policy-makers, to illustrate the magnitude of the impacts of cold homes¹¹.

¹¹ Mortality is only one crude indicator of the scale of a problem, and many other factors should be taken into account in considering how serious a problem is. These include, for example; healthy life years lost; inequality of impacts; and wider impacts on society. This analysis does not intend to rank problems by their severity or importance, but only to put data on deaths due to cold housing in context.

For this illustration, we use data from three official sources:

- ONS data on causes of death for England and Wales for 2013¹²
- ONS data on alcohol-related deaths for England and Wales for 2013¹³
- ONS data on deaths related to drug misuse for England and Wales for 2013¹⁴

To estimate how many EWDs occurred in 2013, we assume that half of the 2012/13 EWDs and half of the 2013/14 EWDs occurred in 2013. In England and Wales, that is 24,700 EWDs, of which around 7,400 can be attributed to cold housing. This is also close to the average figure for the last five years for which we have data (7,500 deaths due to cold homes).

Further details of these methods are provided in Appendix I.

Table 3 puts this latter figure in context by showing selected other causes of death in England and Wales in 2013. This is not a systematic comparison, but helps to illustrate the problem of deaths due to cold homes.

Table 3: Selected causes of death in 2013, England and Wales

Cause of death	Number of deaths in 2013
Air travel accidents	18
Carbon monoxide	197
Fire	246
Assault	309
Road and rail accidents	1,574
Drug misuse	1,947
Motor neuron disease	2,170
Skin cancer	2,641
Brain cancer	3,567
Parkinson's disease	4,518
Related to alcohol	7,059
Related to cold homes	7,400
Prostate cancer	9,726
Breast cancer	10,230

This means in England and Wales in 2013, cold homes killed over four times as many people as road and rail accidents; nearly four times as many people as drug misuse; and about as many people as alcohol. In terms of number of deaths, cold homes were thirty times more lethal than fire.

Figure 1 gives a visual representation of these figures.

¹² <http://www.ons.gov.uk/ons/publications/re-reference-tables.html?edition=tcn%3A77-327590>

¹³ <http://www.ons.gov.uk/ons/publications/re-reference-tables.html?edition=tcn%3A77-370966>

The ONS figure for alcohol-related deaths is the total number of deaths due to a defined list of causes. It only includes those causes regarded as being most directly due to alcohol consumption (e.g. alcoholic liver disease). It does not include other diseases where alcohol has been shown to have some causal relationship, such as cancers of the mouth, oesophagus and liver. It does not include road traffic and other accidents.

¹⁴ <http://www.ons.gov.uk/ons/publications/re-reference-tables.html?edition=tcn%3A77-375474>

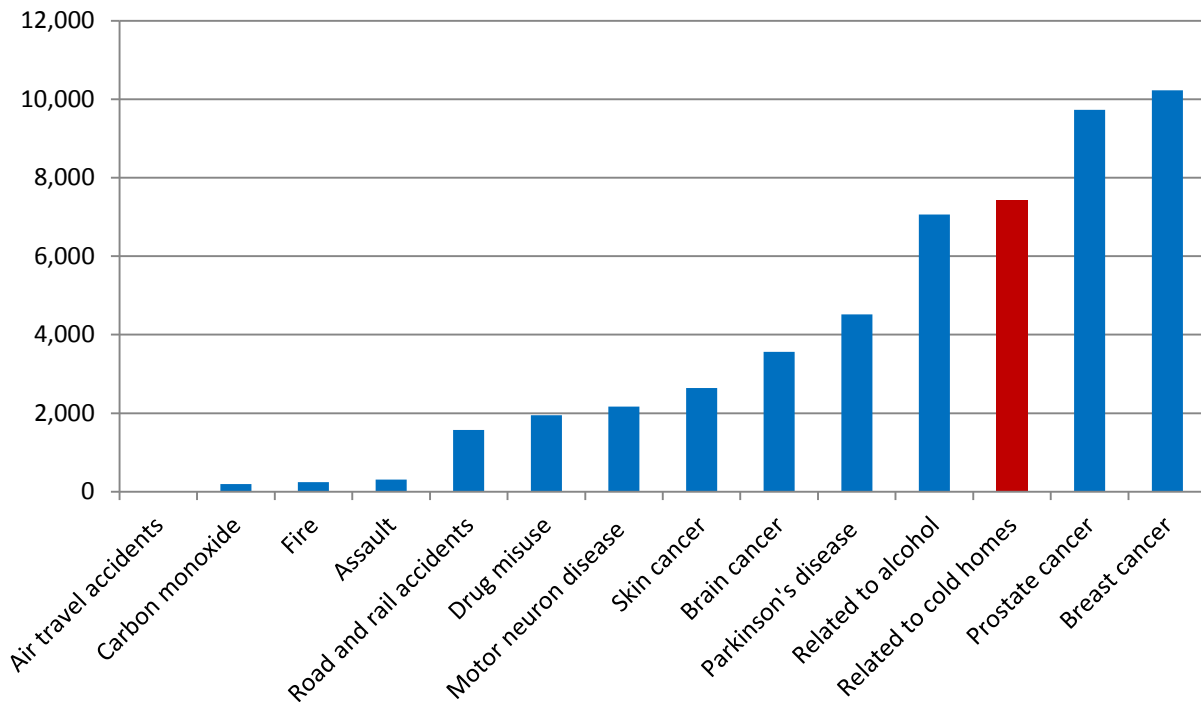


Figure 1: Number of deaths in 2013, by selected causes, in England and Wales

3 Conclusion: addressing the health impacts of cold homes

Despite causing many thousands of deaths each year, the health risks of cold homes are not well-known to the public, and receive relatively little attention from the media and from policy-makers. Yet cold homes are estimated to burden the NHS with costs of £1.36 billion per annum (Fuel Poverty Advisory Group, 2015). This analysis highlights the opportunity to save on clinical health spending by addressing cold homes as a cause of ill-health and mortality.

Ensuring people are able to keep warm at home has multiple benefits, with positive impacts on respiratory and heart conditions, mental health and well-being, and also on children's education (Howden-Chapman et al., 2008; Marmot Review Team, 2011). This is now recognised by the National Institute for Health and Care Excellence (NICE). Its new guidance, published in March 2015¹⁵, states that Health and Wellbeing Boards should develop a strategy to address the health consequences of cold homes. This should include:

- Identifying people whose health is at risk from cold homes, and groups that may face particular problems, such as those living in hard-to-heat homes or who need more warmth (for instance, because of limited mobility or specific health conditions).
- Assessing how heating and insulation needs to be improved to raise properties to an acceptable standard assessment procedure (SAP) rating. As a minimum, properties should be raised to a band C (69–80) and ideally, to a band B (81–91) rating.

¹⁵ <http://www.nice.org.uk/guidance/ng6/chapter/1-recommendations>

In this way, the guidance states that Health and Wellbeing Boards should work to prevent mental and physical health problems as well as deaths from cold homes. This guidance should act as a wake-up call not only to local health authorities, but also to central Government, which has a vital role to play in addressing the cold homes crisis.

Policy-makers have recently begun to pay some attention to the health impacts of cold homes. Ed Davey has announced a £3 million pilot programme to scale up local 'warmth-on-prescription' projects, and other innovative fuel poverty schemes¹⁶. This is a small positive step, but we need much more than pilot programmes in order to address this severe and nationwide problem. Schemes of this kind have been running for over 15 years, but have never received the support they need to move from niche initiatives to mainstream policy¹⁷.

Recent research by ACE for the Energy Bill Revolution has shown how inadequate current policy is to address fuel poverty¹⁸. Between October 2011 and March 2012, 860,000 of the main types of energy efficiency measures were installed under Britain-wide programmes. Between October of 2014 and March this year, the number of these measures set to be delivered is 170,000, a decline of 80%¹⁹. However, action by Government on cold homes does **not** mean taking resources away from other important health issues, such as those mentioned here. In fact it could release more resources to tackle these health challenges by saving NHS costs.

Investment in making homes highly energy efficient can be increased significantly by making this a UK infrastructure capital spending priority. The UK Treasury has plans to spend £100 billion of public money on infrastructure over the course of the next Parliament. Investing just 3% of this budget in making homes highly energy efficient, alongside existing energy efficiency budgets, can bring two million UK low income homes up to a high standard of energy efficiency (EPC Band C) by 2020. The Energy Bill Revolution is calling for all six million badly insulated low income homes to be treated up to this standard by 2025.

It would also be beneficial for the Government to re-double efforts to develop a methodology for calculating with precision the mortality and morbidity related to cold homes, and ensure these statistics are published annually.

Deaths and illnesses caused by cold homes have been neglected by successive Governments. This has made it easier for the Government to reduce support for energy efficiency programmes which help tackle the root causes of this crisis.

It is time for a new approach to recognise the full health cost of cold homes and to put in place an infrastructure programme to invest in making all UK homes highly energy efficient. This will save lives, reduce illness, cut healthcare costs, cut carbon emissions, improve energy security, create jobs and boost the economy. No other infrastructure investment could achieve so much.

¹⁶ <https://www.gov.uk/government/speeches/address-to-the-ecobuild-exhibition>

¹⁷ For example, parliamentary debates on the 1999 Health Care and Energy Efficiency Bill drew on case studies from Birmingham and Cornwall which targeted improvements to the homes of vulnerable people to improve their health. See: <http://hansard.millbanksystems.com/commons/1999/apr/23/health-care-and-energy-efficiency-bill>

¹⁸ <http://www.energybillrevolution.org/wp-content/uploads/2014/07/ACE-and-EBR-fact-file-2014-06-ECO-and-the-Green-Deal.pdf>

¹⁹ <http://www.ukace.org/wp-content/uploads/2015/02/ACE-and-EBR-fact-file-2015-01-Left-out-in-the-cold.pdf>

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Appendix I: Methodology for analysing causes of death

Most of the data used here on risks to health and safety is based on recorded causes of death in mortality data. However, EWDs and deaths from cold homes are not currently recorded and published as such. Instead, EWDs are mainly recorded as deaths due to respiratory diseases; dementia and Alzheimer's disease²⁰; circulatory diseases; and injury and poisoning (including falls²¹).

Therefore, we use an estimation method (explained in section 2.2) to assess the number of deaths due to cold homes. However, using these two different kinds of data means there is a risk of overlap between the categories in our table of causes of death (table 3); this would mean "double-counting" certain deaths. To minimise any overlap, we have not included respiratory diseases, dementia and Alzheimer's disease, circulatory diseases or falls as separate categories in the analysis. However, the data should be treated as an approximate illustration of the impacts of different problems, not a systematic comparison.

²⁰ Many people who have Alzheimer's disease or dementia also have other conditions; for example, pneumonia is listed as the ultimate cause of death in up to two-thirds of people with dementia (Alzheimer's Society, 2012). The increase in deaths due to dementia and Alzheimer's disease in winter may therefore be linked with an increase in respiratory problems. This is in addition to the deaths already recorded as due to respiratory diseases.

²¹ Falls may be linked with cold homes: strength and dexterity decrease as temperatures drop, increasing the risk of injuries and falls (South East Regional Public Health Group, 2009).