THE COST OF POOR HOUSING IN NORTHERN IRELAND

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IHS   bre press   Housing Executive   bretrust

PUBLISHER'S NOTE

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FOREWORD

I am pleased to be able to present this research report, which is based on secondary analysis of the data from the 2009 Northern Ireland House Condition Survey. The report makes a valuable contribution to our understanding of the links between good health and good housing and confirms the view that poor health can be alleviated by providing good-quality housing for low-income households.

The obvious connection between poor housing and ill health was a key factor that led to the public health legislation of the nineteenth century. Since then there have been enormous improvements in relation to the quality of the water supply and the provision of sanitation. This success helped to make the case for state intervention in the provision, maintenance and improvement of housing. Notwithstanding the progress that has been made, there is still evidence of a clear association between good housing and good health. However, a direct causal link has been more difficult to establish. This report is therefore important for two reasons: not only does it provide clear evidence that undertaking carefully targeted improvements to homes can directly lead to significant improvements in health, it also gives an insight into the very significant savings to the public purse that can result from this investment in housing.

The research and analysis underpinning the report found that even simple, low-cost safety improvements – handrails on dangerous stairs and steps, hard-wired smoke and carbon monoxide detectors and better home security – are effective in making a difference to people's health. Remedial works to deal with excess cold and dampness in the housing stock, although more expensive, are also effective, particularly when targeting certain types of properties with basic packages of work.

At a time of severe constraints on public expenditure therefore, this report is a very welcome addition to the underlying evidence base for well-targeted public investment in housing, which would not only bring significant improvements in the physical and mental health and well-being of households, but would also increase the value of the housing stock and could facilitate very considerable savings in the health budget in Northern Ireland.

Dr John McPeake
Chief Executive
Northern Ireland Housing Executive

1 EXECUTIVE SUMMARY

This report summarises the results of a research project commissioned by the Northern Ireland Housing Executive and BRE Trust to apply a methodology developed to calculate the cost of poor housing in England and Wales to the housing of Northern Ireland. A full description of the original methodology is contained in *The real cost of poor housing*[1]. A summary of the findings for Wales is published in the companion document *The cost of poor housing in Wales*[2].

The results of this research show that there is proportionately less poor housing in Northern Ireland than in England or Wales. This is largely due to the fact that Northern Ireland has the most modern housing stock of the UK nations. However, there is still an unacceptably high (and previously unreported) proportion of health and safety hazards in the housing of Northern Ireland. Although great strides have been made in improving the energy efficiency of the housing stock, the excessively high fuel prices in Northern Ireland have meant that a very large number of households are still in fuel poverty.

If works are targeted to reduce the worst health and safety hazards in these poor homes to an acceptable level, it is estimated that there will be a benefit to the NHS of some £33 million per year. This figure could double if we widen our definition of poor housing to include all homes with a Standard Assessment Procedure[3] (SAP) energy efficiency rating of 40 or less and target basic heating and insulation improvements on these homes. Dealing with fuel poverty will save even more!

2   INTRODUCTION

2.1   BACKGROUND

There is a long established, recognised relationship between poor housing and poor health. During the nineteenth century, several cholera and typhus epidemics in Ireland highlighted the health risks associated with poorly designed and constructed buildings with no sanitary accommodation. The 1841 census reported that two-fifths of the houses in Ireland were single-room mud cabins without windows. The devastating effects of the potato famine of 1846 were further exacerbated by poor, overcrowded and insanitary living conditions in both private dwellings and the workhouses that provided lodgings for the most destitute.

In the following 50 years several pieces of legislation were enacted to improve housing and public health. The 1848 Public Health Act was the first of these. However, it had limited impact because it was only compulsory in municipal corporations. The 1866 Sanitary Act enforced the connection of all houses to a new main sewer, set definite limits for the use of cellars as living rooms and established a definition of 'overcrowding'. The 1875 Artisans' Dwelling Act gave local authorities the power to buy and demolish slum houses. However, because of severe opposition these powers were permissive rather than compulsory. Finally, the Public Health Act (Ireland) of 1878 specified a number of measures that local authorities had to adopt to improve public health, including ensuring that there was an adequate water supply, drainage and sewage disposal and that any nuisances were removed.

Although the incidence of many infectious diseases had decreased dramatically by the end of the nineteenth century, tuberculosis (TB) was still a major problem and, in contrast to the rest of the British Isles, deaths from TB in Ireland were actually rising at this time. It was only in the first decade of the twentieth century that mortality from TB began to fall, and even then it remained higher in Ireland than in Britain and many other European nations throughout the first half of the twentieth century. The problems of disease associated with 'slum' living have now largely been eradicated, but there remains a significant number of health and safety hazards in the housing stock of Northern Ireland.

Many studies have investigated the relationship between housing and health but, because of the number of intervening variables, it has been difficult to demonstrate clear and measurable cause-effect relationships. Nevertheless, there is a large and growing body of evidence linking systematically adverse health effects with poor housing conditions. These conditions include: dampness; living in a cold home; household accidents; noise; the fear of crime; overcrowding; and fire safety.

The statutory minimum standard for housing in Northern Ireland is the Housing Fitness Standard. This is essentially a count of serious defects to a dwelling that will have various effects on the health and safety of the occupants. In England and Wales the Housing Fitness Standard was replaced by the Housing Health and Safety Rating System[4] (HHSRS) in 2006. This produces scores

Figure 1: Glynn village showing group of people outside houses with one woman at a spinning wheel
© National Museums Northern Ireland
Collection Ulster Museum

Figure 2: Raphael Street – view looking east, dated 23 January 1912
© National Museums Northern Ireland
Collection Ulster Museum

for dwellings based on the statistical risk of 29 health and safety hazards, in particular to vulnerable people. As such, it measures the effect of the defect and its impact can be quantified.

The 2009 Northern Ireland House Condition Survey[5] (NIHCS) measured the presence of HHSRS hazards in the home and from this the national risk of poor housing and the cost of remedial action can be quantified. Through the research methodology developed for *The real cost of poor housing*[1] we now also have the ability to link this information to medical and social costs to estimate the 'cost to society' of poor housing in Northern Ireland.

2.2   METHOD/OBJECTIVES

In summary, our approach was to:
- define a measure of poor housing
- quantify the number and type of poor homes in Northern Ireland
- quantify the cost of improving these poor homes to an acceptable level
- quantify the costs to society of people living in these poor homes
- apply the BRE Trust methodology to demonstrate the health cost-benefit of interventions to reduce health and safety hazards in some examples of poor homes.

2.3   DEFINING POOR HOUSING

'Poor housing' can be defined in a number of different ways. The Housing Fitness Standard is an obvious one because it is still the statutory minimum standard for housing in Northern Ireland. However, for the purpose of this research poor housing is considered to be a home that has one or more Category 1 HHSRS hazards (see below for definition). Unlike other measures of poor housing, this measure focuses on health outcomes and its development is informed by a large body of research and statistics on the links between housing and health. It also has the advantage that it is now measured through the NIHCS and so can be quantified at individual dwelling and national level.

2.4   THE HOUSING HEALTH AND SAFETY RATING SYSTEM (HHSRS)

The HHSRS[4] is a means of identifying defects in dwellings and evaluating the potential effect of any defects on the health and safety of occupants, visitors, neighbours and passers-by. The system provides a means of rating the seriousness of any hazard, so that it is possible to differentiate between minor hazards and those where there is an immediate threat of major harm, or even death. The emphasis is placed on the potential effect of any defects on the health and safety of people, particularly those who might be regarded as 'vulnerable'. There are 29 potential HHSRS hazards identified, which fall into four groups (Table 1).

The HHSRS scoring procedure uses a formula to generate a numerical score for each of the hazards identified at a property. The higher the score, the greater the severity of the hazard. Potential hazards are assessed in relation to the most vulnerable class of person who might typically occupy or visit the dwelling. For example, for falls associated with stairs and steps the vulnerable group is the elderly (60+ years), while for falls between levels it is children under five years old.

The hazard score formula requires a surveyor to make two judgements:
- the likelihood of an occurrence that could result in harm to a vulnerable person over the following 12-month period (the likelihood is to be given as a ratio – eg 1 in 10, 1 in 500)
- the likely health outcome, or harms, that would result from the occurrence.

From any occurrence there may be a most likely outcome, and other possible ones that may be more or less severe. For example, a fall from a second-floor window could result in a 60% chance of severe concussion, but there may also be a 30% chance of a more serious injury and a 10% chance of something less serious. The four classes of harm and their associated weightings are listed in Table 2.

From the judgements made by the surveyor, a hazard score can be generated for each hazard. Table 3 illustrates this, using the example hazard of falls between levels.

Using this approach, hazard scores can range from 1 (very safe) to over 5,000 (very dangerous). A score of 1,000 or more is considered to be a Category 1 HHSRS hazard and it is this that we have taken to be our definition of poor housing.

Table 1: The 29 potential housing hazards covered by the Housing Health and Safety Rating System

Physiological requirements	Psychological requirements	Protection against infection	Protection against accidents
1 Damp and mould growth	11 Crowding and space	15 Domestic hygiene, pests and refuse	19 Falls associated with baths etc.
2 Excess cold	12 Entry by intruders	16 Food safety	20 Falls on the level
3 Excess heat	13 Lighting	17 Personal hygiene, sanitation and drainage	21 Falls associated with stairs and steps
4 Asbestos (and MMF)	14 Noise	18 Water supply for domestic purposes	22 Falls between levels
5 Biocides			23 Electrical hazards
6 Carbon monoxide and fuel combustion products			24 Fire
7 Lead			25 Hot surfaces and materials
8 Radon (radiation)			26 Collision and entrapment
9 Uncombusted fuel gas			27 Explosions
10 Volatile organic compounds			28 Position and operability of amenities (ergonomics)
			29 Structural collapse and failing elements

MMF – Manufactured mineral fibres.

Table 2: Classes of harm and weightings used in the Housing Health and Safety Rating System

Class	Examples	Weightings
Class I	Death, permanent paralysis below the neck, malignant lung tumour, regular severe pneumonia, permanent loss of consciousness, 80% burn injuries	10,000
Class II	Chronic confusion, mild strokes, regular severe fever, loss of hand or foot, serious fractures, very serious burns, loss of consciousness for days	1,000
Class III	Chronic severe stress, mild heart attack, regular and persistent dermatitis, malignant but treatable skin cancer, loss of a finger, fractured skull, severe concussion, serious puncture wounds to head or body, severe burns to hands, serious strain or sprain injuries, regular and severe migraine	300
Class IV	Occasional severe discomfort, chronic or regular skin irritation, benign tumours, occasional mild pneumonia, a broken finger, sprained hip, slight concussion, moderate cuts to face or body, severe bruising to body, 10% burns, regular serious coughs and colds	10

Table 3: Generating hazard score using the example hazard of falls between levels

Class of harm weighting			Likelihood 1 in		Spread of harm (%)		
I	10,000	÷	100	×	0	=	0
II	1,000	÷	100	×	30	=	300
III	300	÷	100	×	60	=	180
IV	10	÷	100	×	10	=	1
				Hazard score		=	**481**

3   QUANTIFYING POOR HOUSING IN NORTHERN IRELAND

3.1   THE 2009 NORTHERN IRELAND HOUSE CONDITION SURVEY (NIHCS)

The HHSRS[4] is measured at national level through the NIHCS[5]. The NIHCS is currently undertaken biennially and provides the Northern Ireland Housing Executive and the Northern Ireland Department of the Environment with information to develop and monitor policies directed at improving the condition and energy efficiency of the existing housing stock. The HHSRS was first measured in the 2006 NIHCS although only five of the hazards were assessed in detail by the surveyors. For 2009 (and the 2011 survey, which is currently in the field) 10 hazards were measured in detail, and another 12 were identified (Table 4). The remainder were modelled from other information on the survey form. The 2009 NIHCS estimates are based on a sample of 2,174 dwellings and interviews were carried out with the households living in 1,889 of these.

Excess cold is modelled using the SAP rating calculated for each dwelling: a home with a SAP rating of 35 or less (using the SAP 2001 methodology[6]) is considered to be a Category 1 excess cold hazard. Radiation is modelled through a combination of geological mapping and building features. Lead is modelled using data on the presence of lead piping in the mains water supply in the kitchen and the plumbo-solvency of the water supplied. Overcrowding is modelled using the number of occupants per habitable room. Appendix G in the main report of the 2009 NIHCS contains more information about this modelling.

3.2   CATEGORY 1 HAZARDS IN NORTHERN IRELAND, 2009

The 2009 NIHCS estimates that some 144,000 (20%) of Northern Ireland's homes have at least one Category 1 hazard and thus by our definition are deemed to be 'poor housing'. This compares with 22% in England[7] and 29% in Wales[8]. The most common types of Category 1 hazard in Northern Ireland relate to 'falls'; in particular falls associated with stairs and steps and falls on the level. These are followed by excess cold, while some of the other hazards hardly figure at all in their extreme form (Figure 3).

3.3   COMPARISON WITH UNFITNESS

Some 18,000 homes in Northern Ireland were estimated to be unfit in 2009, almost all of which also had one or more Category 1 hazards (Figure 4). There were eight times as many homes with Category 1 hazards as there were unfit dwellings.

3.4   TYPES OF HOME WITH CATEGORY 1 HAZARDS

The presence of Category 1 hazards is strongly linked to dwelling age: over one-third (36%) of all homes built before 1919 have Category 1 hazards compared with 9% of those built after 1980 (Figure 5).

The higher incidence of Category 1 hazards in the oldest dwellings is not surprising because these tend to have lower levels of insulation and are more likely to have a steep or winding staircase than newer homes. The NIHCS confirms that they also tend to suffer from higher levels of disrepair, which will impact on a number of other hazards such as damp and mould growth.

The presence of Category 1 hazards is also strongly linked to the type of dwelling. Flats are notably less likely to have Category 1 hazards than other dwelling types: around 11% of flats have at least one Category 1 hazard compared with over 25% of detached houses (Figure 6).

Homes in rural locations are also more likely to have Category 1 hazards than those in towns or urban areas. It is estimated that around one-quarter (23%) of homes in all rural areas have at least one Category 1 hazard compared with 18% of all homes in urban locations. This arises mainly because a higher proportion of homes in rural locations were built before 1919 or are vacant.

Private-sector homes are twice as likely to have Category 1 hazards as those in the social sector, 20% compared with 9% (Figure 7). Almost four in 10 (39%) of vacant dwellings have one or more Category 1 hazards.

Table 4: The 26 HHSRS hazards covered by the 2009 NIHCS

Fully measured by surveyors	Identified as extreme risks by surveyors	Modelled using other data collected
Falls associated with stairs and steps	Excess heat	Excess cold
Falls on the level	Lighting	Radon (radiation)
Falls between levels	Water supply for domestic purpose	Lead
Falls associated with baths etc.	Food safety	Crowding and space
Fire	Personal hygiene, sanitation and drainage	
Hot surfaces and materials	Position and operability of amenities (ergonomics)	
Damp and mould growth	Uncombusted fuel gas	
Entry by intruders	Explosions	
Noise	Electrical hazards	
Collision and entrapment	Carbon monoxide and fuel combustion products	
	Domestic hygiene, pests and refuse	
	Structural collapse and failing elements	
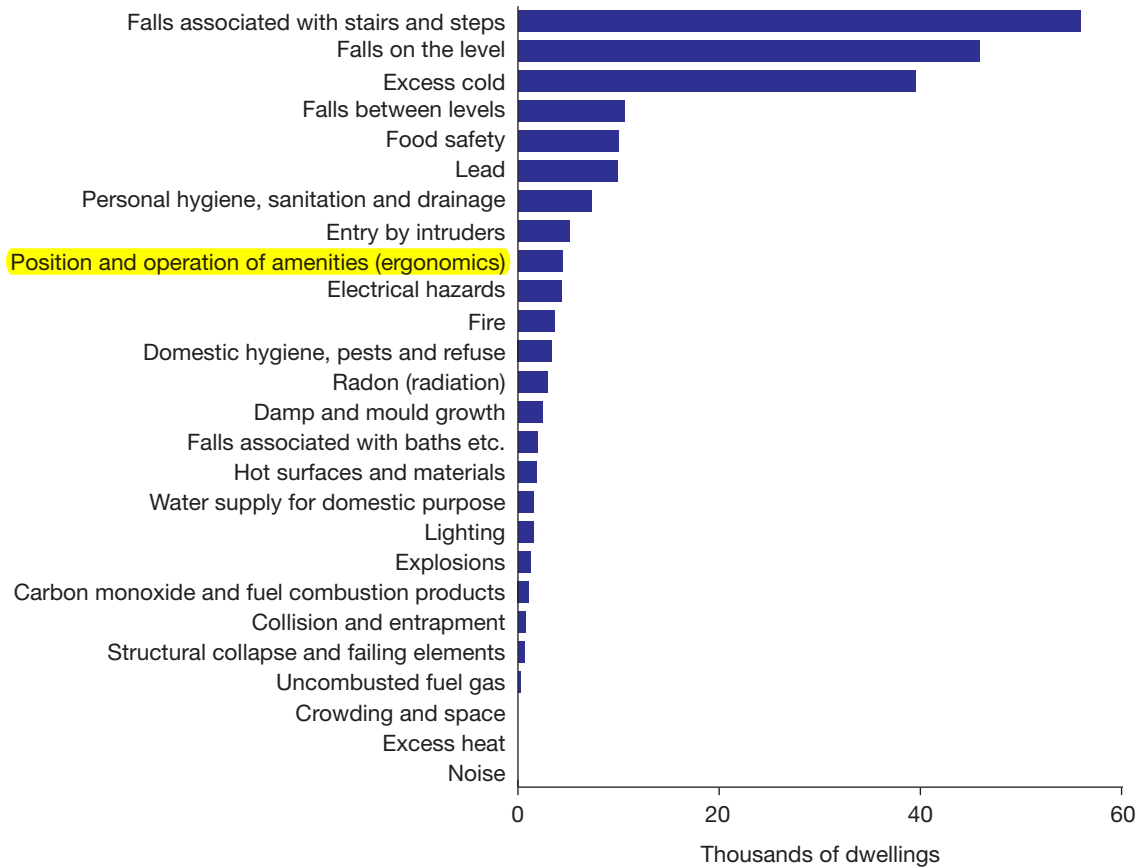
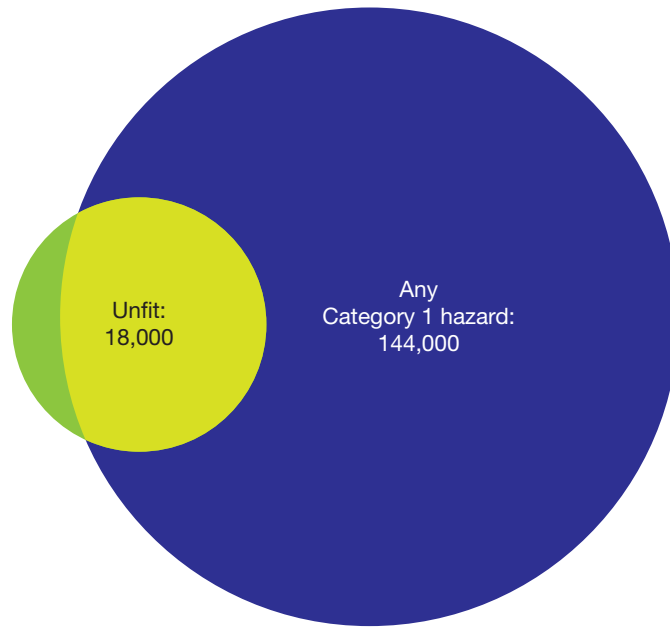Figure 3: The number of dwellings with different types of Category 1 hazard (2009)[5]

Figure 4: The overlap between the HHSRS and unfitness (2009)
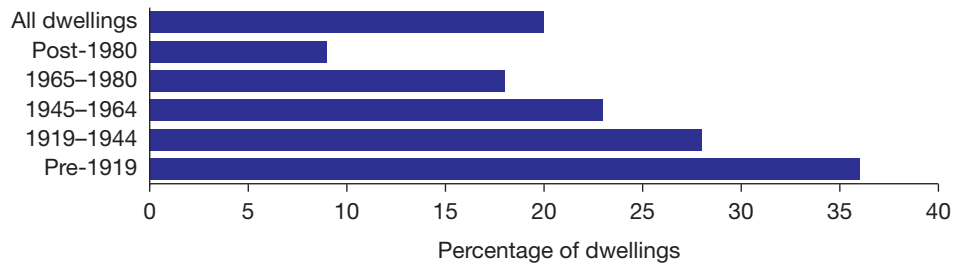

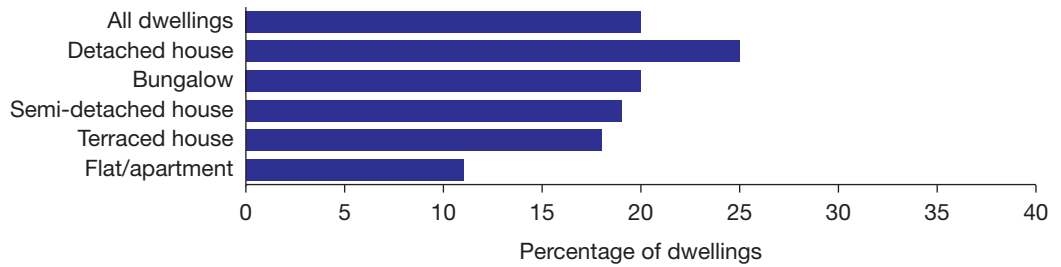*Figure 5:* Percentage of dwellings in each age band with Category 1 hazards (2009)

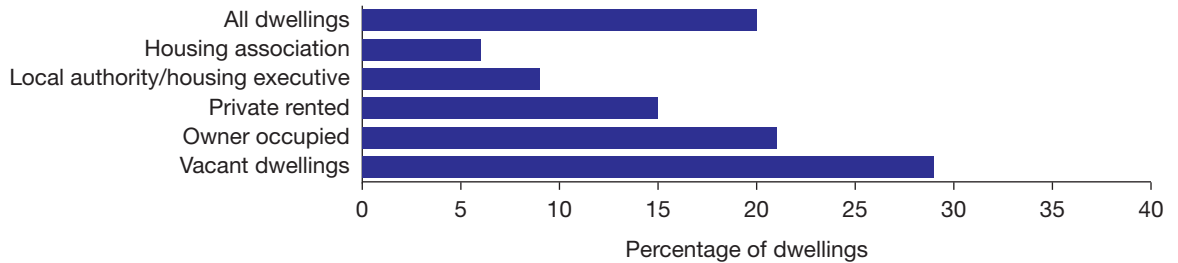*Figure 6:* Percentage of each type of dwelling with Category 1 hazards (2009)

Figure 7: Percentage of dwellings in each tenure with Category 1 hazards (2009)

3.5   HOUSEHOLDS LIVING IN DWELLINGS WITH CATEGORY 1 HAZARDS

The HHSRS statistics indicate that people in certain age groups are more likely to be adversely affected by different types of hazard. For example, older people are the most vulnerable with respect to falls associated with stairs and steps, falls on the level and excess cold, whereas young children aged under five years are the most vulnerable to falls between levels, fire, and hot surfaces and materials. People suffering from certain pre-existing medical conditions or who have mobility or sensory impairments are also probably more vulnerable than average to many hazards irrespective of their age.

Generally, the incidence of Category 1 hazards varies far less with household characteristics than dwelling characteristics. However, households containing one or more people aged 75 or over or containing at least one person with a long-term limiting illness or disability are more likely to live in homes with any Category 1 hazards than other groups (Table 5).

The differences are particularly pronounced for excess cold. Households with one or more people aged 75 or over are twice as likely to live in homes with Category 1 excess cold hazards than average, 8% compared with 4% (Figure 8). This is of particular concern as these elderly residents are most likely to suffer severe consequences as a result of living in these homes.

3.6   COMPARISONS WITH ENGLAND AND WALES

Using the same methodology and survey form, there is a slightly lower incidence of homes with Category 1 hazards in Northern Ireland than in England and a much lower incidence than in Wales. Some 20% of homes in Northern Ireland have one or more such hazards compared with 22% in England and 29% in Wales. Both the England and Wales figures relate to 2008 but we would expect them to be very similar in 2009. The main reason for this is the much lower incidence of Category 1 excess cold hazards in Northern Ireland, 5% compared with 8% in England and 11% in Wales. The incidence for fall hazards in general is about the same as in England but much lower than in Wales (Figure 9).

The lower incidence of hazards in Northern Ireland arises largely because the stock tends to be newer and contains a higher proportion of bungalows – both of these would imply a lower prevalence of Category 1 hazards. However, this is not the whole story. Northern Ireland has a larger private rented sector and also a higher proportion of vacant dwellings than England; both factors would be likely to increase the figures for Northern Ireland (Table 6).

It is also clear that 'similar' groups of dwellings in the two nations have rather different proportions of homes with Category 1 hazards: pre-1919 dwellings in Northern Ireland are less likely to have Category 1 hazards than dwellings of this age in England, but the reverse is true for those built after 1919 (Figure 10).

There are also some differences by tenure. Rented dwellings in Northern Ireland are much less likely to have Category 1 hazards than those in England and, especially, Wales. In contrast, the proportion of owner-occupied homes with Category 1 hazards is very similar in Northern Ireland and England and vacant homes in Northern Ireland are more likely to contain such hazards than vacant dwellings in England (Figure 11).

Table 5: **Percentage of each household group in homes with Category 1 hazards (2009)**

All households		18.2%
Household size	1 person	22.2%
	2 people	17.4%
	3 people	10.1%
	4 or more people	20.2%
Dependent children in household	Youngest child aged under 5	15.4%
	Youngest child aged 5–15	17.3%
	No children under 16	18.9%
Older people in household	Nobody aged 60 or over	17.0%
	Oldest person aged 60–74	18.1%
	Oldest person aged 75 or over	23.7%
Anyone with a long-term limiting illness/disability?	No	16.6%
	Yes	21.0%
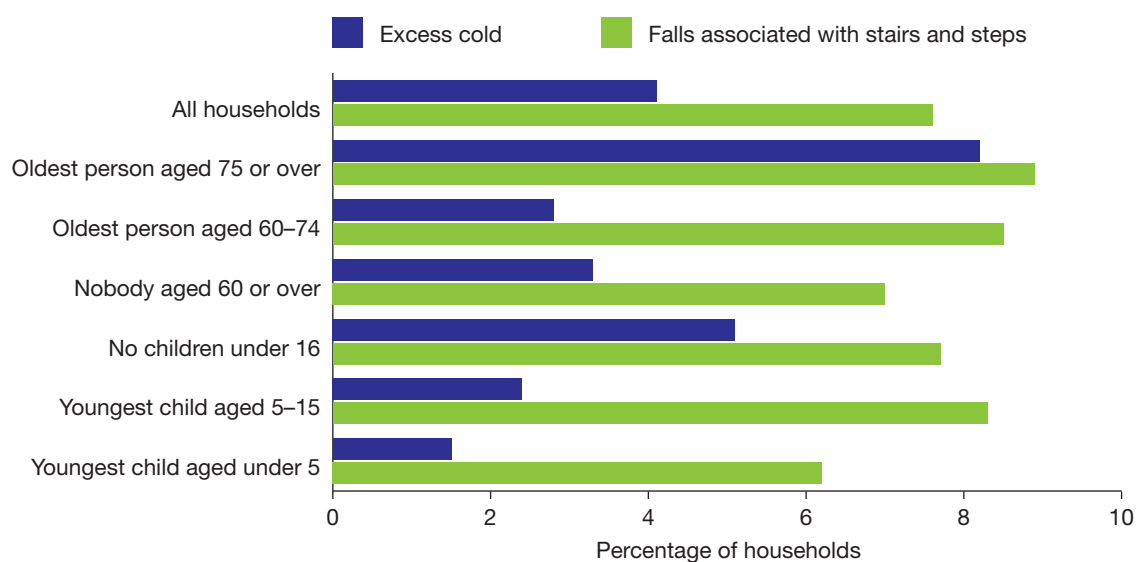
Figure 8: Percentage of each household group in homes with Category 1 hazards related to falls associated with stairs and steps and excess cold (2009)
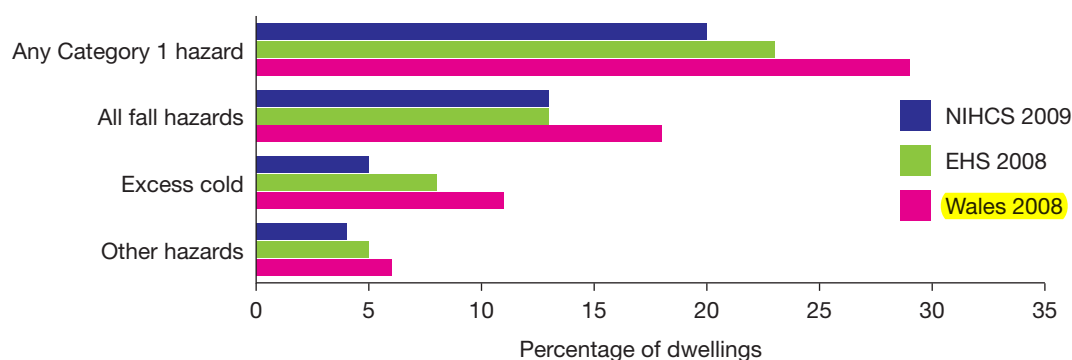
Figure 9: Percentage of dwellings with Category 1 hazards in Northern Ireland (2009), England (2008) and Wales (2008)

Table 6: Stock profiles in Northern Ireland (2009), England (2008) and Wales (2008)

		Northern Ireland	England	Wales
Tenure	Owner occupied	62.3%	65.7%	73.0%
	Private rented	16.8%	12.9%	9.0%
	Local authority/housing executive	11.6%	8.5%	11.0%
	Housing association	3.3%	8.4%	7.0%
	Vacant dwellings	5.9%	4.6%	not inc
	All tenures	100.0%	100.0%	100.0%
Dwelling age	Pre-1919	14.4%	21.4%	30.2%
	1919–1944	10.6%	16.4%	10.9%
	1945–1964	16.9%	19.6%	21.2%
	1965–1980	24.6%	21.6%	20.0%
	1981–1990	11.7%	8.8%	7.4%
	Post-1990	21.9%	12.2%	10.2%
	All ages	100.0%	100.0%	100.0%
Dwelling type	Terraced house	31.3%	28.6%	31.4%
	Semi-detached house	19.8%	26.0%	27.9%
	Detached house	19.0%	17.4%	20.1%
	Bungalow	21.6%	9.4%	12.1%
	Flat/apartment	8.2%	18.6%	8.4%
	All types	100.0%	100.0%	100.0%

Figure 10: Percentage of dwellings in each age band with Category 1 hazards in Northern Ireland (2009), England (2008) and Wales (2008)

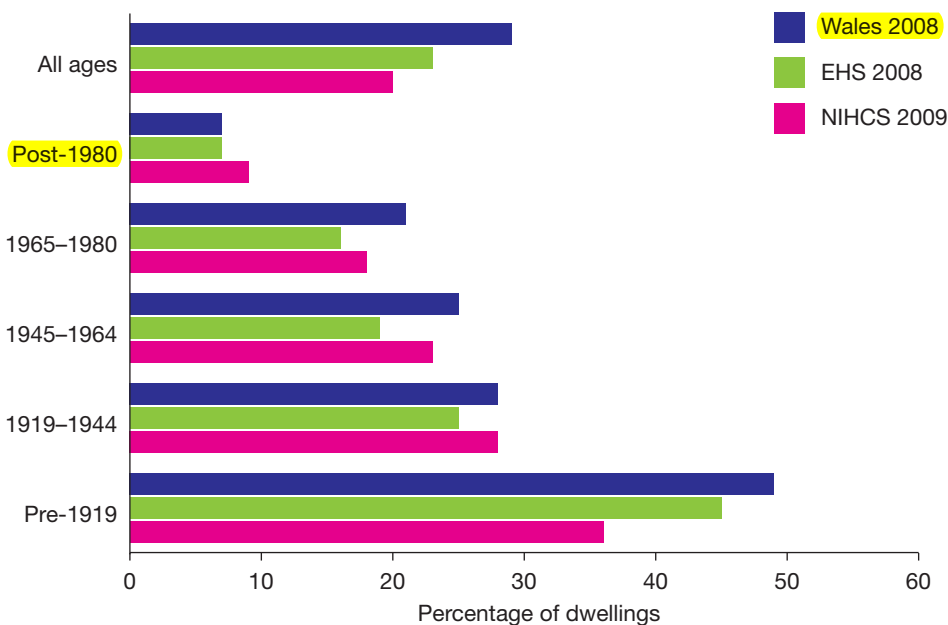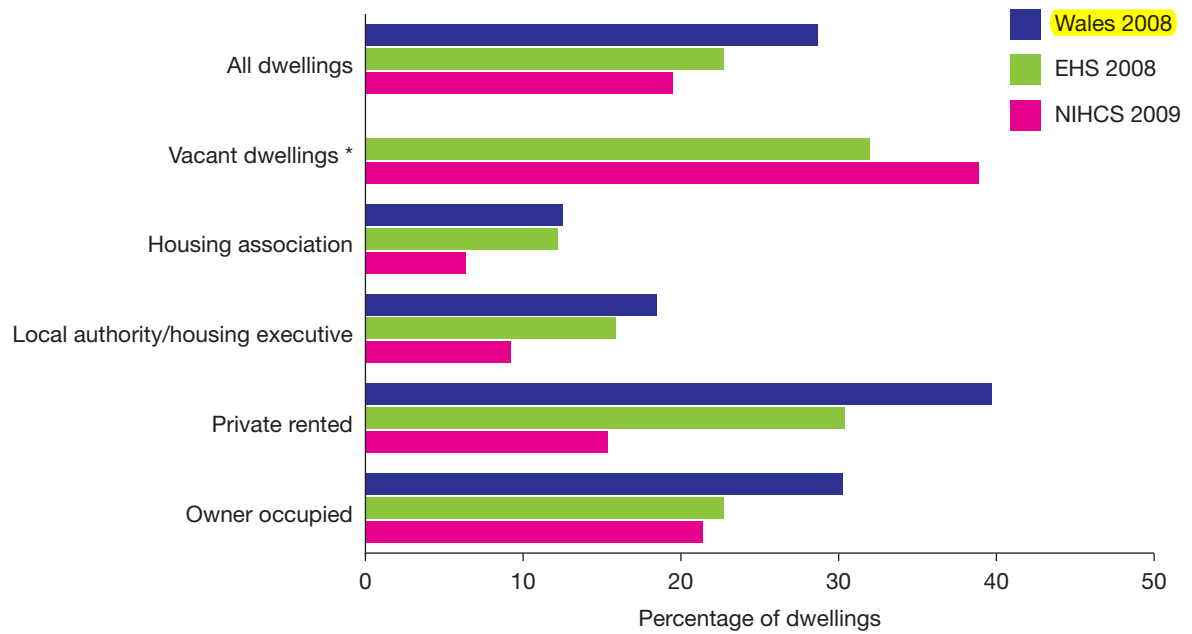* The Living in Wales property survey does not include vacant dwellings.

Figure 11: Percentage of dwellings in each tenure with Category 1 hazards in Northern Ireland (2009), England (2008) and Wales (2008)

4 EXAMPLES OF CATEGORY 1 HAZARDS IN NORTHERN IRELAND

4.1 FALLS ASSOCIATED WITH STAIRS AND STEPS

Falls associated with stairs and steps are the most common cause of accidental death in the home, but are largely viewed as an inevitable consequence of living in houses and blocks of flats that contain staircases. The most recent published data (2002) reported 581 deaths associated with stairs or steps in the home in the UK[9].

While many of these accidents are solely attributable to human behaviour or carelessness, it is statistically proven that the design and condition of stairs and steps is a causal factor in these accidents (Figure 12). Conversely, replacing a dangerous staircase with a well-designed one, or making it safer by providing handrails or removing obstacles, can reduce deaths and injuries significantly.

Approximately 80% of serious falls on stairs occur when people are descending the stairs. Usually they fall backwards, leading to multiple impacts with the lower step nosings as they bump down the stairs and they

may then collide with building features (eg radiators, glass doors) or objects placed at the bottom of the flight. Occasionally the person falls forward down the stairs, leading to serious upper body and head injuries. Injuries resulting from falls while ascending the stairs tend to be less severe because the person generally falls forward onto higher steps. However, steps with sharp-edged metal nosings can lead to more serious cuts with this type of fall. Occasionally, the person may fall backwards while ascending, which would lead to serious upper body and head injuries. The most vulnerable group for this hazard is people over the age of 60. This vulnerability is compounded when they live alone and there is no one to raise the alarm if a fall occurs.

Some 56,000 (7.6%) of homes in Northern Ireland have Category 1 hazards relating to falls associated with stairs and steps. This is a similar proportion to that in England (8.5%), although less than Wales (13.3%), which has an older housing stock and more challenging topography.

Figure 12: Examples of Category 1 hazards for falls associated with stairs and steps
(a) Steep internal stairs, with trip step at the top and no handrails
(b) External steps with sloping nosings, covered in slippery algae

4.2   FALLS ON THE LEVEL

The consequences of falls on the level are rarely fatal. There were 145 cases of death recorded from slipping, tripping or stumbling on the level in UK homes in 2002. Falls resulting in injury are much more common, particularly in elderly people whose bones become more brittle with age. Such falls often involve extensive treatment and recovery periods.

The majority of falls are initiated with a slip, which tends to happen when underfoot conditions change suddenly from what is expected. Most of these slip accidents occur on wet floors. Tripping usually occurs on uneven or badly maintained floors or where there are small changes in level (Figure 13). Some 46,000 (6.2%) of homes in Northern Ireland have Category 1 hazards relating to falls on the level.

Figure 13: Examples of Category 1 hazards for falls on the level – the uneven and slippery cobbles, combined with a raised manhole cover and numerous small steps, significantly increase the risk of a fall

4.3   FALLS BETWEEN LEVELS

Falls between levels (Figure 14) are not common but can have serious consequences. Fatal falls most frequently involve young children, particularly those living in apartment blocks. Most of the fatal or serious falls between levels are from windows and occur when people are climbing in or out of windows, opening windows or when children are playing at or near a window. Accidents involving falls from windows can also occur during cleaning and maintenance, particularly in older properties with tall sash windows, and where reach limitations result in attempted access using unsafe stepladders and other means.

Falls can also occur from balconies, landings and walls. Hazardous conditions linked to falls from balconies include: overbalancing; slipping; falling after deliberately climbing on the balcony guarding; children playing on the balcony.

Some 10,000 (1.4%) of homes in Northern Ireland have a Category 1 hazard relating to falls between levels, which is a similar proportion to England. Northern Ireland has a small proportion of apartments in its housing stock (8%) and most of these are likely to have locks or restrictor catches on windows and suitable locks to any balcony doors.

Figure 14: Examples of Category 1 hazards for falls between levels
(a) A block of flats with a multitude of potential fall hazards
(b) This flat uses the flat roof over the ground floor extension as a 'roof terrace' but there are no guard rails or balustrade to prevent falls

4.4   EXCESS COLD

Cold environmental conditions are associated with increased deaths from heart attacks, strokes and respiratory illnesses. In the UK, there are approximately 40,000 more deaths between December and March than in other months of the year. This seasonal fluctuation is termed 'Excess Winter Deaths' and is higher in the UK than in most other countries in Europe and Scandinavia. The extent to which housing contributes is unclear, but the indication is that people living in dwellings that are poorly heated are at significantly greater risk. A proportion of the Excess Winter Deaths, particularly those due to respiratory disease, can be attributed to cold indoor conditions.

Every year in Northern Ireland there are Excess Winter Deaths, many of which will be the direct result of people living in homes that cannot be heated to a safe and healthy temperature. The vast majority of these Excess Winter Deaths are for people aged 65 or over. While the number of Excess Winter Deaths is generally decreasing over time as more homes are insulated and have better heating systems (Figure 15), a particularly cold winter can temporarily reverse this general downward trend. The average number of Excess Winter Deaths in Northern Ireland from 2001 to 2009 was around 500 per year, but it rose to just over 1000 in 2008/2009 as a result of that particularly cold winter.

4.4.1   The effects of living in a cold home

A healthy indoor temperature is around 21°C and a small risk of adverse health effects begins once the temperature falls below 19°C. Below 16°C there is a substantially increased risk of respiratory and cardiovascular conditions, especially among the elderly. Below 10°C the risk of hypothermia becomes appreciable, especially for the elderly.

Low temperatures can impair the thermoregulatory system of the elderly and the very young. Cold air streams may affect the respiratory tract and can slow the heart temporarily. These increase strain on the heart and also blood pressure. Low temperatures can also worsen the symptoms of rheumatoid arthritis, aggravate conditions like sickle cell anaemia and the related thalassaemia, and can affect the healing of leg skin ulcers.

Low indoor temperatures arise most frequently in dwellings where it is difficult and/or expensive to heat the main rooms to a reasonable temperature (Figure 16). This is a combination of a number of dwelling-related factors, most of which are taken into account in calculating the SAP rating:
• thermal insulation
• type, size and efficiency of heating system
• heating fuel
• heating controls
• ventilation
• dampness (damp insulation is less effective)
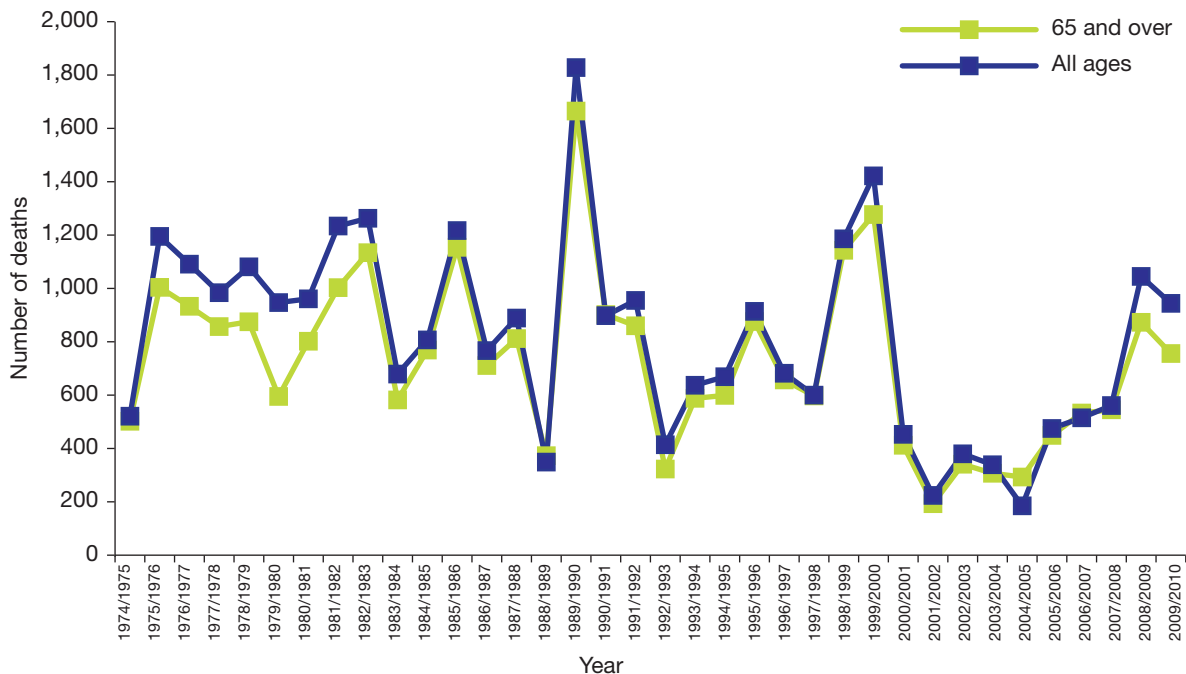• draughts.

Figure 15: Excess Winter Deaths in Northern Ireland 1974/1975 to 2009/2010
Note: Because the base for each of the calculations is different, it is possible for the estimated number of Excess Winter Deaths among those aged 65 and over to exceed those for persons of all ages.
(Source: Demography and Methodology Branch, Northern Ireland Statistics and Research Agency)

Figure 16: Examples of Category 1 hazards for excess cold
(a) Pre-1919 detached dwellings make up 37% of NIHCS 2009 dwellings with Category 1 excess cold hazards – this dwelling has solid fuel fires, no insulation and draughty sash windows, and has a SAP rating of 1
(b) A rural bungalow with a SAP rating of 16

Surveyors have to take all of the above into account when assessing a home in relation to HHSRS excess cold. It should be reiterated that it is the dwelling that is being assessed as if it is being occupied or visited by a vulnerable person – in this case a person aged 65 or over. The actual household and its ability to heat the home to a safe temperature is not being assessed. This is covered by fuel poverty (see below).

For the purposes of the 2009 NIHCS, excess cold is not measured directly by the surveyors but is modelled from the SAP calculation for each dwelling (a home with a SAP rating of 35 or less is considered to be a Category 1 excessive cold hazard in the NIHCS). Some 40,000 (5.3%) homes in Northern Ireland had a SAP rating of 35 or less (using the SAP 2001 methodology[6]) in 2009 and were therefore deemed to suffer from a Category 1 hazard. Homes with excess cold hazards were most likely to be found in the older, rural housing stock, and to not have access to mains gas.

4.5   THE LINK BETWEEN HHSRS EXCESS COLD AND FUEL POVERTY

A 'fuel-poor household' is defined as one needing to spend in excess of 10% of its household income on all fuel used to achieve a satisfactory standard of warmth (21°C in the main living area and 18°C in other occupied rooms). The 2009 NIHCS estimated that approximately 302,000 (44%) of households in Northern Ireland were in fuel poverty; an increase of 10% since 2006. The main reason for this increase was the sharp rise in fuel prices.

In 2009 the fuel poverty rate was much higher in Northern Ireland than England (16%) or Wales (26%). This is mainly because a much larger proportion of homes are heated by oil and a much lower proportion by mains gas. Only 16% of homes in Northern Ireland are heated by mains gas compared with 80% in Wales and 84% in England (Figure 17).

While the great majority of the 29,000 occupied homes with a Category 1 hazard also contain a fuel-poor household (Figure 18), the number of fuel-poor households who do not live in poor housing is some 10 times greater than this.

While we can do much to improve the housing stock of Northern Ireland to make it more energy-efficient, it is clear that the greatest impact on health is likely to arise because a large proportion of households cannot afford to heat even moderately energy-efficient homes. This report focuses on the housing stock, but more research needs to be carried out on the relationship between households in fuel poverty and ill health.

4.6   OTHER HHSRS HAZARDS
4.6.1 Food safety, personal hygiene, domestic hygiene

The risk of infection from food preparation, lack of adequate bathing and WC facilities and from waste (Figure 19) is a major component of the Housing Fitness Standard but, although it is measured through the HHSRS, it does not feature as often as falls and excess cold as a Category 1 hazard. This is because the health impact of any defect is usually temporary and rarely leads to hospital treatment or death.

Unsatisfactory facilities for the preparation and cooking of food was the most common reason for unfitness in the 2009 NIHCS (10,500 dwellings; 60% of all unfits), and this is reflected in the similar number of dwellings that had a Category 1 food safety hazard (see Figure 3 on page 6).
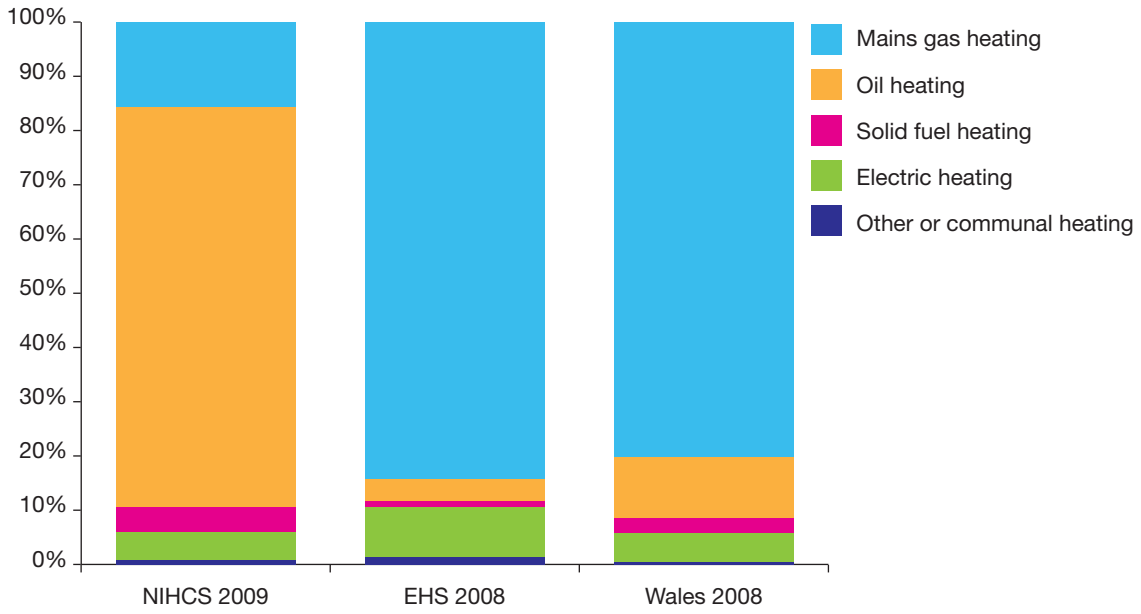
Figure 17: Percentage of dwellings using different fuel for heating in Northern Ireland (2009), England (2008) and Wales (2008)
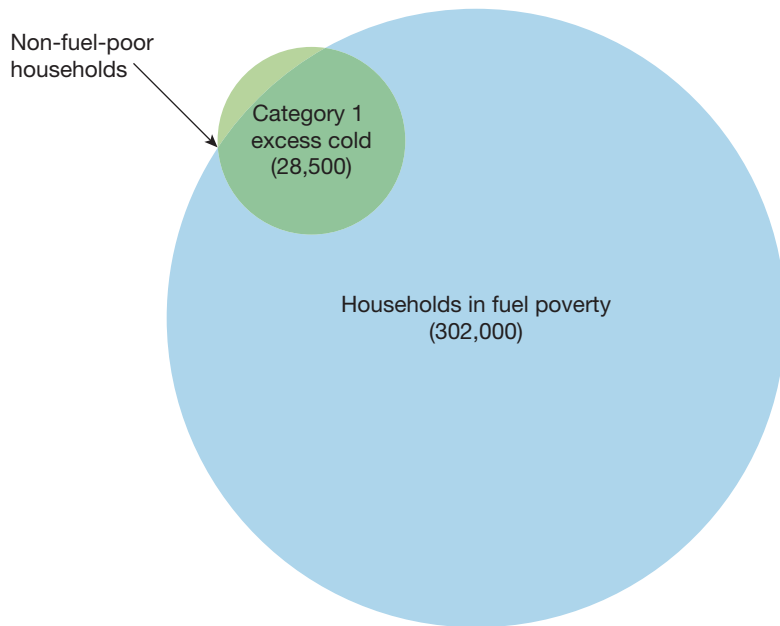

Figure 18: Occupied dwellings with Category 1 excess cold hazards vs. households in fuel poverty

Figure 19: Examples of Category 1 hazards for food safety and personal hygiene
(a) A kitchen where food could not be prepared safely
(b) An outside WC carries a risk of infection, especially as there is no indoor alternative here and no wash hand basin nearby

4.6.2   Damp and mould growth

Dampness (Figure 20) can reduce indoor temperature and lead to discomfort and stress. However, it is the mould growth associated with inherent dampness that has the greatest effects on health. Mould growth is capable of causing and exacerbating allergies, infections, toxic reactions, cancer and psychological symptoms.

While there are 7,400 homes that failed the Housing Fitness Standard in 2009 because of the presence of dampness, less than half of these were so damp and mouldy that they represented a Category 1 hazard to a household.
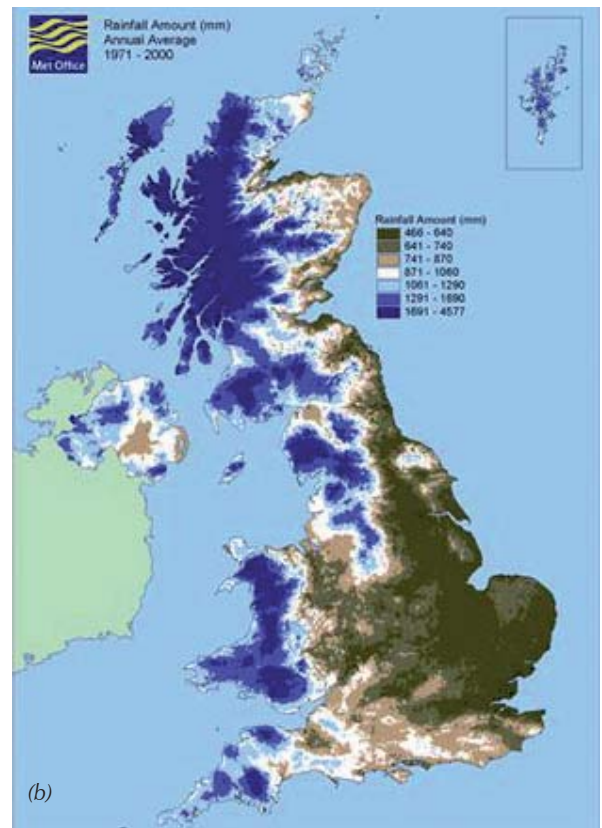

Figure 20: Damp and mould growth
(a) It is the mould growth associated with dampness that is most injurious to health, particularly if it is in a children's bedroom
(b) Northern Ireland tends to have a wetter climate than most of England (courtesy of The Met Office, © Crown 2000)

4.6.3 Radon (radiation)

Radon is a radioactive gas that enters buildings primarily from the underlying soils and rock. It is an important hazard because of its pervasiveness and potential for causing lung cancer and possibly other cancers. The Health Protection Agency (HPA) estimates that radon is responsible for about 1,200 lung cancer deaths per year in the UK.

Exposure to radon in the UK is highly localised. In Northern Ireland there are particular concentrations in parts of Newry and Mourne, Down, Strabane, Cookstown, Dungannon and Omagh (Figure 21). The HPA estimates that there are approximately 6,300 homes above the action level* in Northern Ireland[10] and the 2009 NIHCS estimates that about half of these (3,300) are likely to represent a Category 1 radiation hazard in Northern Ireland.
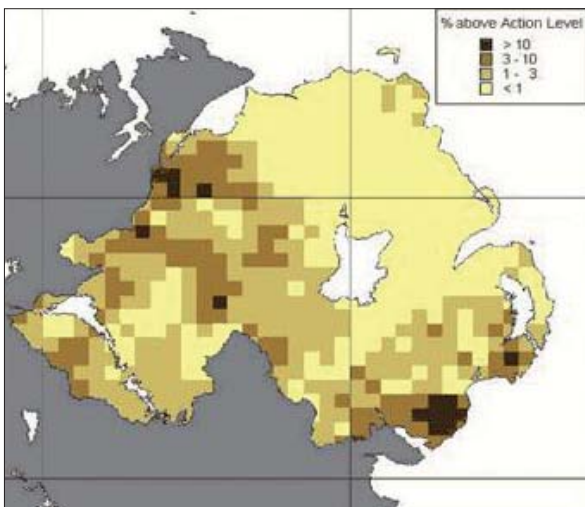

Figure 21: Map showing the proportion of dwellings above the radon action level in Northern Ireland
(Courtesy of Health Protection Agency, HPA)

4.6.4 Fire, burns and scalds

Category 1 hazards relating to fire and to hot surfaces and materials (Figure 22) are less prevalent in Northern Ireland than in England, perhaps again reflecting the fact that the housing stock is newer and contains fewer flats. Household fires will still occur, but if there is a working smoke alarm present and an adequate means of escape these will rarely lead to injury or fatality.

Figure 22: Examples of Category 1 hazards for fire and hot surfaces and materials
(a) There are still some 33,000 homes with solid fuel primary heating systems in Northern Ireland, which have the potential to start a household fire
(b) The positioning of a cooker next to a door can increase the likelihood of scalds and burns

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* The action level is the level (in Bq/m^3) above which action to reduce or manage radon levels should be taken. For residential properties in Northern Ireland, the action level is 200 Bq/m^3.

5   THE FINANCIAL IMPACT OF POOR HOUSING

The NIHCS also collects details on the types of work needed to reduce HHSRS hazards to an acceptable level. Surveyors are instructed not to specify all of the work required to eradicate the hazard altogether but just those works required to reduce it to an acceptable level – this level usually being the average for the type of dwelling. These works are costed up using standard prices. For hazards that are modelled (apart from excess cold) we use costs for a 'typical' package of work. For excess cold, we use BRE's Energy Upgrade Model to determine the most cost-effective works needed to raise the SAP rating above 35 and then use standard prices for these. We have also used this Energy Upgrade Model to determine the most cost-effective works needed to raise the SAP rating to 50 (the average SAP rating of dwellings) to determine the costs needed for comparative information.

The range of HHSRS costs is presented in Figure 23. This demonstrates that in many cases the costs of remedial work are not that high – some 20% of homes with Category 1 hazards could be made acceptable for a cost of just over £600 and 50% for less than about £1,600. However, costs rise sharply for the highest-costing 20% of homes, with some poor housing costing over £100,000 to remedy. Many of the dwellings with very high costs are vacant and semi-derelict and it may not always be cost-effective to improve them to an acceptable standard regarding health and safety. The average cost per dwelling for reducing Category 1 hazards to an acceptable level is £4,047.
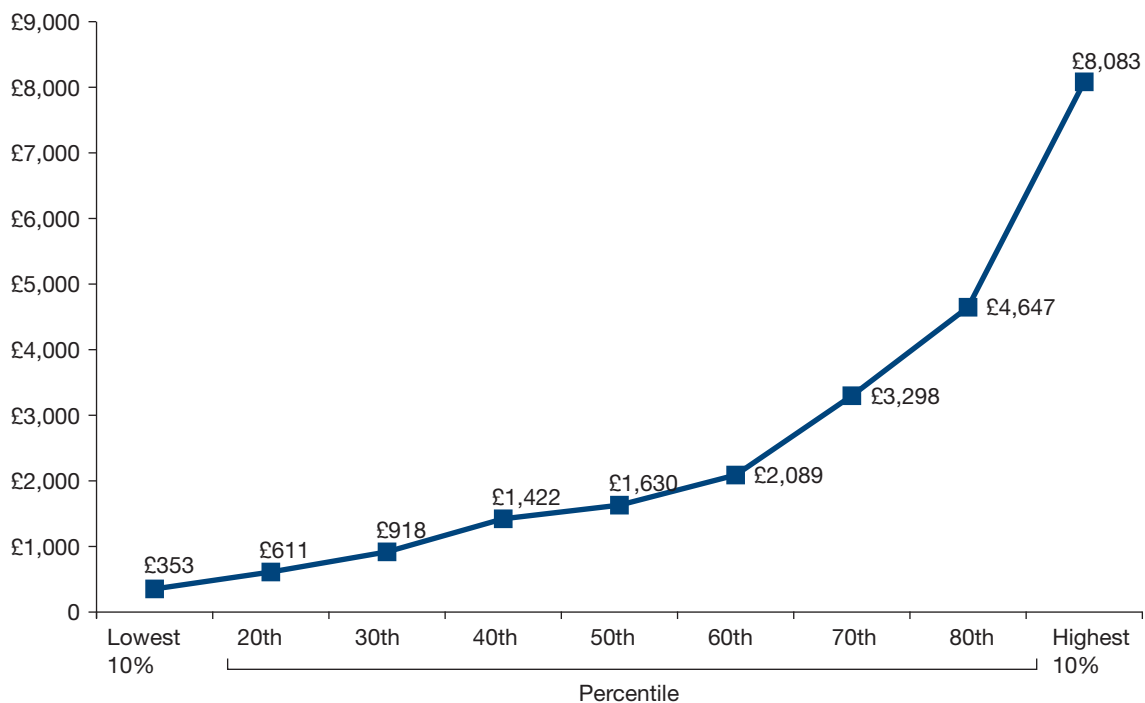

Figure 23: Distribution of costs per dwelling for remedial action on Category 1 hazards (2009 prices)

The costs of work vary by the type of hazard. Table 7 shows the average cost per dwelling for the remedial work required to deal with each type of Category 1 hazard. For many hazards, there is considerable variation around this average or mean value.

We also used the BRE Energy Upgrade Model to determine the most cost-effective works needed to raise the SAP rating to 50 in those dwellings with a Category 1 excess cold hazard. The average cost to improve these dwellings to a SAP rating of at least 50 is more than double the cost to raise them to a SAP rating of at least 35 (around £10,500 compared with £4,646).

Table 7: Average cost per dwelling for remedial work for each type of hazard (2009)

	Average cost
Damp and mould growth	£12,904
Structural collapse and failing elements	£8,729
Excess cold (raise SAP rating to 35)	£4,646
Fire	£3,930
Domestic hygiene, pests and refuse	£3,171
Food safety	£3,096
Electrical hazards	£2,971
Hot surfaces and materials	£2,385
Lighting	£2,327
Falls between levels	£1,733
Lead	£1,573
Personal hygiene, sanitation and drainage	£1,338
Falls associated with stairs and steps	£1,271
Radon (radiation)	£1,066
Water supply for domestic purpose	£1,032
Entry by intruders	£1,016
Falls associated with baths etc.	£957
Collision and entrapment	£942
Falls on the level	£873
Carbon monoxide and fuel combustion products	£500
Position and operation of amenities (ergonomics)	£470
Uncombusted fuel gas	£470
Explosions	£409

The two most expensive Category 1 hazards to remedy are damp and mould growth and structural collapse, which are largely associated with vacant, and often abandoned, dwellings. The median cost, for example, for remedial works to mitigate damp and cold is £8500; far lower than the mean cost.

The total cost of dealing with Category 1 hazards in Northern Ireland is some £469 million. Around two-fifths of the costs are associated with excess cold (Figure 24), work that includes updating heating systems and providing insulation. Just over one-quarter of costs are associated with reducing risks for the four falls hazards; mainly falls associated with stairs and steps, which account for around 15% of all costs.
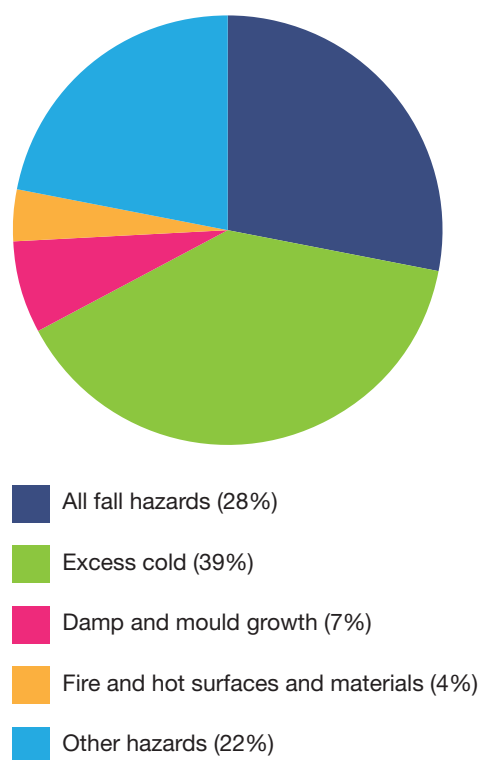

- All fall hazards (28%)
- Excess cold (39%)
- Damp and mould growth (7%)
- Fire and hot surfaces and materials (4%)
- Other hazards (22%)

Figure 24: The cost of dealing with Category 1 hazards[5]

6 THE COSTS TO SOCIETY AND COST-BENEFITS OF IMPROVING HOMES WITH CATEGORY 1 HAZARDS

The cost of repairing and improving homes only represents part of the total cost to society of living with poor housing conditions. Work on the task of measuring the 'exported costs' of poor housing has been developed independently in a number of countries. Lawson[11] argues that the UK NHS spends about one-fifth of its clinical budget on trying to cure illness that is actually caused by unemployment, poverty, bad housing and environmental pollution. More specifically, the costs to the NHS of treating ill health resulting from sub-standard housing have been estimated at £2.4 billion per year [12]. To put this in context, this can be compared with the NHS's own figures (2010 poster campaign), which state that £400 million per year is spent on health care as the result of smoking-related illness.

6.1 WHAT COSTS SHOULD BE INCLUDED?

This is a key question as some types of cost can be estimated or modelled more reliably than others. One of the most comprehensive reviews of poor housing[13] provides a matrix of costs, categorising them in terms of their measurability: costs that can be quantified (H); costs that could be quantified given better data (M); and costs that exist but are probably non-quantifiable (NQ) (Table 8).

Following a review of data sources and an attempt to cost up all of these factors and link them directly to hazards in the home, it was decided that we should focus on the NHS treatment costs alone (highlighted in Table 8). This is because:

- it is a transparent method of selecting a typical outcome for each level of harm of each hazard
- robust data are available to estimate the medical and care costs for the above
- we cannot be accused of overstating the case by making heroic assumptions.

However, our studies have enabled us to conclude that the annual cost to the NHS of treating Category 1 hazards accounts for a maximum of 40% of the total cost to society. Having determined this methodology, our next step was to provide descriptions of the NHS treatments for the different outcomes for the different HHSRS hazards. These could then be costed up, using NHS data (Table 9). Full details of these can be found in *The real cost of poor housing*[1].

6.2 THE TOTAL COST OF POOR HOUSING IN NORTHERN IRELAND

Earlier, we calculated that the total cost of reducing the Category 1 housing hazards in Northern Ireland to an acceptable level (the average for their age and type) was some £469 million. For the hazards that were fully measured through the NIHCS, we have a 'likelihood' score for all homes with a Category 1 hazard, and we have an average likelihood score for the same home for its age and type. Using the difference between the actual score and the average for the whole stock, an estimate for the total annual treatment cost to the NHS can be calculated, which in this case is just under £33 million per year if the homes are left unimproved (Table 10). Using this information, the direct payback period for all hazards can be calculated at 12.8 years, if the repairs or improvements are all made up front. This is considerably less than the 29-year payback period estimated for dealing with all hazards in England and arises largely because a lower percentage of homes with hazards in Northern Ireland are affected by excess cold and this has a very long theoretical payback period (around 500 years).

It should be remembered that the direct cost to the NHS used in this calculation accounts, at most, for only 40% of the total cost to society. By multiplying this saving up to 100%, the total cost to society is estimated at some £82 million per year and the payback period for all hazards would be reduced from 13 years to five years.

6.3 THE HEALTH COST-BENEFIT OF ENERGY IMPROVEMENTS

The very long payback period for excess cold, above, arises largely because the 'average' position assumed in the Version 2 HHSRS statistics is so poor[4]. If we were to upgrade these homes to a current 'UK average' (around SAP = 50), then the payback period would almost halve for excess cold (Table 11).

Case study 2 on page 26 shows that there can be considerable health cost-benefits associated with a basic package of heating and insulation works to a 'cold home' that raise it from a SAP rating of 26 to a SAP rating of 53.

Table 8: The cost to society of poor housing[13]

Residents' costs	External costs
Annual loss of asset value if owned (H)	Annual loss of asset value if rented (H)
Poor physical health (H)	Higher health service treatment cost (H)
Poor mental health (M)	Higher health service treatment cost (H)
Social isolation (NQ)	Higher care service treatment cost (M)
Higher home fuel bills (H)	Higher building heating costs (H)
Higher insurance premiums (H)	Higher external insurance premiums (NQ)
Uninsured content losses (M)	Uninsured external losses (M)
Underachievement at school (NQ)	Extra school costs/homework classes (H)
Loss of future earnings (M)	Loss of talents to society (NQ)
Personal insecurity (NQ)	High policing cost (H)
More accidents (M)	High emergency service costs (H)
Poor hygienic conditions (NQ)	High environmental health costs (H)
Costs of moving (M)	Disruption to service providers (M)
Adopting self-harming habits (M)	Special health care responses (H)
	Government and EU programmes (H)

H – Costs that can be quantified.
M – Costs that could be quantified given better data.
NQ – Costs that exist but are probably non-quantifiable.

Table 9: Typical outcomes and first-year treatment costs for selected HHSRS hazards

Hazard	Class 1	Class 2	Class 3	Class 4
Damp and mould growth	Not applicable	Type 1 allergy (£1,998)	Severe asthma (£1,120)	Mild asthma (£180)
Excess cold	Heart attack, care, death (£19,851)	Heart attack (£22,295)*	Respiratory condition (£519)	Mild pneumonia (£84)
Radon (radiation)	Lung cancer, then death (£13,247)	Lung cancer, survival (£13,247)*	Not applicable	Not applicable
Falls on the level	Quadriplegic (£59,246)*	Femur fracture (£25,424)*	Wrist fracture (£745)	Treated cut or bruise (£67)
Falls associated with stairs and steps	Quadriplegic (£59,246)*	Femur fracture (£25,424)*	Wrist fracture (£745)	Treated cut or bruise (£67)
Falls between levels	Quadriplegic (£59,246)*	Head injury (£6,464)*	Serious hand wound (£1,693)	Treated cut or bruise (£67)
Fire	Burn, smoke, care, death (£11,754)*	Burn, smoke, care (£,7878)*	Serious burn to hand (£2,188)	Burn to hand (£107)
Hot surfaces and materials	Not applicable	Serious burns (£,4652)	Minor burn (£1,234)	Treated very minor burn (£107)
Collision and entrapment	Not applicable	Punctured lung (£3,459)	Loss of finger (£1,536)	Treated cut or bruise (£67)

* Costs after one year are likely to occur; these are not modelled.
Not applicable – HHSRS class very rare or non-existent.

Table 10: The costs and benefits to the NHS of reducing Category 1 hazards in Northern Ireland to an acceptable level[5]

Hazard (ordered by savings to the NHS)	Number of Category 1 hazards	Average cost per dwelling (£)	Total cost (£)	Savings to the NHS per annum if hazard fixed (£)	Payback (years)
Damp and mould growth	2,460	12,904	31,743,840	599,143	53.0
Excess cold	39,502	4,646	183,526,292	360,820	508.6
Carbon monoxide and fuel combustion products	1,096	500	548,000	88,678	6.2
Lead	9,882	1,369	13,528,458	1,399,878	9.7
Radon (radiation)	2,904	1,066	3,095,664	230,080	13.5
Crowding and space	0	0	–	–	0.0
Noise	0	0	–	–	0.0
Domestic hygiene, pests and refuse	3,385	3,171	10,733,835	326,234	32.9
Personal hygiene, sanitation and drainage	7,331	1,338	9,808,878	984,035	10.0
Falls on the level	45,893	873	40,064,589	10,052,199	4.0
Falls associated with stairs and steps	55,884	1,271	71,028,564	13,908,270	5.1
Falls between levels	10,621	1,733	18,406,193	1,860,087	9.9
Electrical hazards	4,330	2,971	12,864,430	653,613	19.7
Fire	3,656	3,930	14,368,080	688,448	20.9
Hot surfaces and materials	1,853	2,385	4,419,405	124,736	35.4
Entry by intruders	5,102	1,016	5,183,632	1,191,445	4.4
Falls associated with baths etc.	1,901	957	1,819,257	300,865	6.0
Collision and entrapment	753	892	671,676	72,203	9.3
Total	144,458	2,146	421,810,793	32,840,731	12.8

Note: The NIHCS is not designed to deliver data to this level of disaggregation or accuracy and these figures are subject to large margins of error. They are only published here to demonstrate how the costings have been derived.

Table 11: The costs and benefits of improving excess cold to different levels[5]

	Number of dwellings with Category 1 excess cold hazards	Average cost per dwelling (£)	Total cost (£)	Savings to the NHS per annum if hazard fixed (£)	Payback (years)
Improve all to SAP of at least 35	39,502	4,646	183,526,292	360,820	509
Improve all to SAP of at least 50	39,502	10,499	414,731,498	1,508,905	275

6.4 THE HEALTH COST-BENEFIT OF HOUSING INTERVENTIONS

Clearly it is neither feasible nor affordable to spend the £469 million needed to rectify every Category 1 hazard in Northern Ireland immediately. However, the assumptions and outputs of this, and the earlier English House Condition Survey-based research, have enabled us to design a cost-benefit spreadsheet model to inform strategies for dealing with poor housing, and to target improvement works.

The example spreadsheet shown in Figure 25 has been developed in Excel and uses the NIHCS-derived data for falls associated with stairs and steps and the other assumptions of this research. It is very flexible and can be used to calculate the health cost-benefit of a number of different scenarios since it is possible to change the following:

- the hazard to be considered
- the scenario to be applied (all up front, annual payment, no change)
- the number of properties to be improved
- the proportion of properties to improve (all, cheapest 20%, cheapest 50%)
- flexibility in value of costs and benefits
- different discount rates for net present value (NPV) calculations.

In Figure 25 the scenario 'all up front' has been applied. This shows that if all of the £71 million required to reduce the Category 1 hazards for falls associated with stairs and steps in Northern Ireland was spent now, the treatment costs to the NHS would be recouped within five years, and there would be a cumulative benefit of over £295 million in 25 years.

These spreadsheets have now been developed for a number of HHSRS hazards and are being used to demonstrate to local authorities and social landlords the health cost-benefits of their interventions to improve poor housing. All that is required is the HHSRS assessment of homes prior to improvement, the condition following improvement and the cost of the work. While the spreadsheet has been applied to the national housing stock, it can equally be applied to individual home improvements.

For example, the University of Warwick and BRE were recently commissioned by the Regional Leaders Board of the North West of England, 4NW, to investigate the health impact of housing interventions in six pilot authorities, using the methodology and Excel spreadsheets from this research[14]. In one authority it was estimated that the annual benefit to the health service of works undertaken to reduce the hazards in 30 sample homes was £34,900 against a total one-off cost of £310,000. This means that the payback period (the period when the cost of these housing interventions will be recovered) would be nine years. Some of the pilot authorities had lower payback periods than this because of the highly targeted nature of the works. The single lowest cost was £10 to address a fall on the level (trip) hazard; and in this case the benefit to the NHS was £21 per year with a payback period of just six months. Other low-cost mitigation works dealt with falls associated with baths etc. and entry by intruders. The longest payback periods were for hazards related to fire, damp and mould growth and food safety.

Case study 1 shows the cost-benefit to the NHS of undertaking some very basic works to a set of unsafe stairs to bring them out of Category 1 hazard status.

Case study 2 shows that the installation of an efficient heating system and the installation of loft and cavity wall insulation in a Category 1 excess cold home will not only raise the SAP rating well above the average, but the potential costs to the NHS might be recouped in around 10 years. If we add in the annual fuel savings, the cost of the improvement work might pay back in half this time. While more advanced energy improvements (eg installing renewable energy measures) will increase the fuel and carbon savings further, they will not have much impact on the health cost-benefit in this case because the initial improvements would have already made the home healthy and safe.
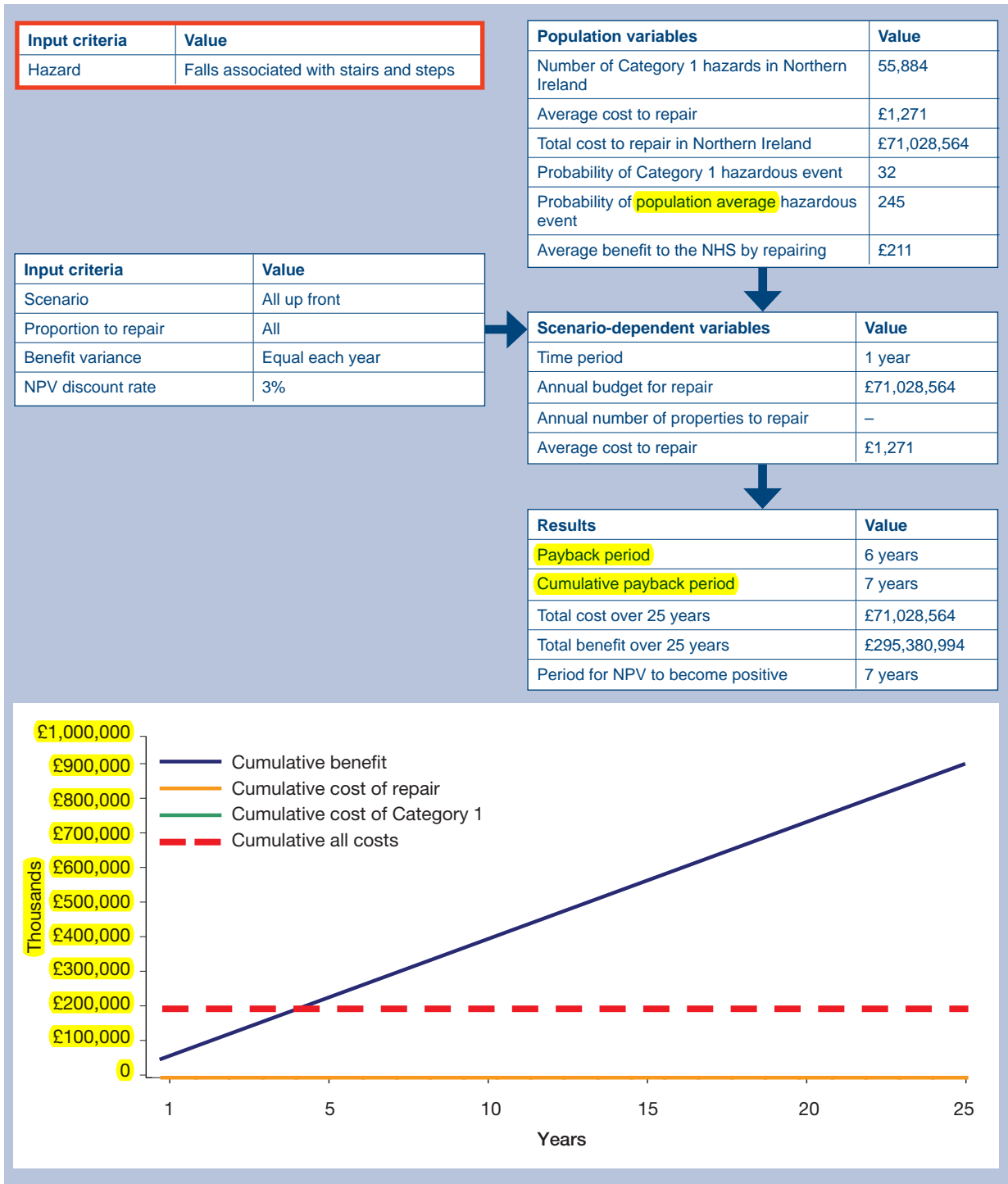
Input criteria	Value
Hazard	Falls associated with stairs and steps

Population variables	Value
Number of Category 1 hazards in Northern Ireland	55,884
Average cost to repair	£1,271
Total cost to repair in Northern Ireland	£71,028,564
Probability of Category 1 hazardous event	32
Probability of population average hazardous event	245
Average benefit to the NHS by repairing	£211

Input criteria	Value
Scenario	All up front
Proportion to repair	All
Benefit variance	Equal each year
NPV discount rate	3%

Scenario-dependent variables	Value
Time period	1 year
Annual budget for repair	£71,028,564
Annual number of properties to repair	–
Average cost to repair	£1,271

Results	Value
Payback period	6 years
Cumulative payback period	7 years
Total cost over 25 years	£71,028,564
Total benefit over 25 years	£295,380,994
Period for NPV to become positive	7 years

Figure 25: Example cost-benefit spreadsheet for falls associated with stairs and steps

Case study 1: Falls associated with stairs and steps

Description of existing dwelling

This is a housing association property where the tenant has removed the balustrading and handrail from the staircase to create a more open plan 'feel' to the circulation space. This has created a Category 1 hazard for a vulnerable person, in this case a small child, who might use the staircase over the next year.

Remedial work to dwelling

The upgrades applicable to this dwelling are shown in the table below:

- Cost of works to reinstate the balustrading and handrail and to repair the staircase = £314
- Annual benefit to the NHS = £146
- Payback period = 2.1 years

Upgrades applicable to the dwelling

Upgrade	Likelihood	HHSRS band	Cost of upgrade (£)	Potential savings to the NHS per annum (£)	Payback to the NHS (years)
Current	1 in 32	C	–	–	–
After repair	1 in 320	F	314	146	2.1

Case study 2: Cost-benefit of energy improvements to a Category 1 cold home in Northern Ireland

Description of existing dwelling and household type

- Cavity un-insulated walls, small amount of roof insulation, old large storage heaters, off-peak electricity, electric immersion for hot water
- Category 1 excess cold hazard present
- Vulnerable single pensioner

Remedial work to dwelling

The upgrades applicable to this dwelling are shown in the table below:

- Modern storage radiators with controls, loft insulation top-up, cavity wall insulation, hot water tank insulation and thermostat
- Removes Category 1 excess cold hazard

Upgrades applicable to the dwelling

Upgrade	SAP*	Annual fuel cost (£)	CO_2 emissions (kg per annum)	Cost of upgrade (£)	Potential saving to NHS per annum (£)	Payback to the NHS (years)
Current	26	1,200	13,500	–	–	–
After energy upgrades	53	700	8,100	3,000	300	10

* Based on SAP 2005 method.

7   CONCLUSIONS

Because of the way that information on the HHSRS is now collected through the NIHCS, and the availability of good-quality data from the NHS on the costs of treating the outcomes of HHSRS hazards, it has been possible for the first time to quantify the cost to society of poor housing in Northern Ireland. The total cost is some £33 million per year in terms of the savings in the first year of treatment costs to the NHS if the hazards are reduced to a more acceptable level. This represents some 3% of the primary health care budget for Northern Ireland in 2010 (£115 billion).The full cost to society of living with poor housing is estimated to be some £82 million per year.

These costs may actually seem quite low when compared with some of the heroic estimates that have been made in the past. However, it should be stressed that this research has focused on reducing the effect of the worst hazards, rather than eradicating them altogether or raising the standard of all housing to an optimum level. This pragmatic 'sticking plaster' approach has the earliest payback period in terms of cost savings, although some may regard it to be unambitious in the longer term where we should be aiming for ever higher housing standards.

This research demonstrates that simple home safety improvements – eg handrails on dangerous stairs and steps, hard-wired smoke and carbon monoxide detectors, better home security – are very cost-effective. It is more difficult to demonstrate the cost-effectiveness of remedial works to deal with excess cold and dampness problems across the whole housing stock because such works can be much more expensive, but targeting certain types of property with basic packages of work can be very effective.

More work is needed to explore the other significant costs to society associated with living with these problems; in particular the impact on mental health, educational attainment, quality of life and social participation. It would also be useful to examine hospital admissions data for Northern Ireland to see if the high risks from falls and excess cold identified in the NIHCS survey are corroborated by other data on injuries and the incidence of related health outcomes or treatments.

Fuel poverty is a major problem in Northern Ireland, affecting some 44% of households (compared with 16% in England and 26% in Wales) and we suggest that more work should be undertaken to estimate the health impact of fuel poverty in Northern Ireland, and the cost-benefit of bringing households out of fuel poverty.

The cost-benefit tool is a real practical outcome of this research and it is already helping local authorities in England to justify expenditure on private-sector housing renewal and to target the most cost-effective improvements towards vulnerable people in unhealthy housing.

Finally, this research is being used to present a more informed case to the UK government for investment in housing, on the basis that it not only improves people's health and life chances but that it makes sound economic sense and can actually save public money in the longer term.

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