

# A Quantitative Health Impact Assessment of Private Sector Housing in East Cambridgeshire Executive Summary

An evaluation of the impact of poor private sector housing on health in East Cambridgeshire







The model used for this HIA begins by estimating the health effects on occupiers and visitors to dwellings and then estimates the costs to the NHS of treating these harmful events. These are then extrapolated to include the costs to society (which are estimated at two and a half times those to the NHS). The model then assesses the cost to mitigate these hazards and looks at the savings such mitigation would generate for both the NHS and society as a whole. Furthermore, to understand more readily the relative benefits of taking action to mitigate the hazards, cost-benefit scenarios have been developed for each hazard, showing the cost, benefit and break-even point of carrying out mitigation works for all dwellings with category 1 hazards. Further scenarios are then produced to show the cost and benefit to the NHS and to society of carrying out work to dwellings with the least expensive 50% and 20% of required works.

Beyond estimating the health impact of poor housing and consequent financial costs to the NHS and wider society, the HIA also compares the geographical distribution of housing hazards with particular health data. Whilst it is important to understand that there is not necessarily a causal relationship, the HIA shows there are areas of the district where there are higher rates of hospital admissions with hip fractures in over 65s and also high levels of falls hazards. Also, there are some areas with a high prevalence of asthma which have higher estimated levels of excess cold.

Table 1 links the key housing related hazards in East Cambridgeshire to the main health outcomes and shows the number of people estimated to be affected by those harm outcomes. There are an estimated 8,122 category 1 hazards in East Cambridgeshire's private sector housing stock, of which 4,053 relate to excess cold; and there are 3,197 fall hazards which could affect older people. The estimated total cost of mitigating all these hazards is approximately £23 million.

Altogether these housing hazards lead to an estimated 283 incidents of harm each year. It is important to note that the numbers given in this report are entirely due to poor housing and therefore incidents occurring as a result of accidents or ill health due to other environmental or health issues are excluded.

The main report provides a wealth of quantitative health cost benefit information regarding poor housing in the district, the costs and benefits of improving dwellings and mitigating hazards. It demonstrates the potential for a programme of simple low-cost improvement works that lead to relatively shorter payback periods and greater health benefits. The data indicates that initiatives to reduce falls generally provide the fastest benefits. However, the reduction of hazards such as damp and mould growth, (for which the most vulnerable age group is persons aged 14 years and under) may have the greatest long-term health gain. The hazard of excess cold is the most common and presents the greatest challenge in East Cambridgeshire as it can be comparatively expensive to mitigate.

**Table 1: Summary of the main hazards, their effects, vulnerable groups affected and potential mitigation actions – private sector stock**

Housing hazards	No. of hazards	Estimated no. of instances requiring medical intervention	Main health conditions	Vulnerable groups	Mitigating the hazard
Excess cold	4,053	23	Respiratory diseases, chronic obstructive pulmonary disease (COPD), cardiovascular conditions Increased risk of falls Worsening of symptoms of rheumatoid arthritis and leg ulcers Excess winter deaths Work and school days lost; reduction in educational attainment (Marmot report*)	Older people People in fuel poverty Families	Improving heating and thermal efficiency measures
Damp and mould growth	56	28	Asthma exacerbation, lower respiratory infections Social isolation	Children Adults	Improved heating
Entry by intruders	48	16	Fear of burglary Emotional stress	All	Window and door locks, security lighting and key safes
Accidents affecting older people (falls in baths, on stairs, trips and slips)	3,197	129	Accidents Fractures in older people and consequent loss of independence General health deterioration	Older people	Stair rails, balustrades, grab rails, repair to paths
Accidents affecting children (falling between levels, flames and hot surfaces, electrical hazards, collision and entrapment)	491	60	Physical injury, falls, electrocution, severe burns and scalds	Children	Identifying hazards, provide more space, education of professionals

\*The Health Impacts of Cold Homes and Fuel Poverty, Marmot Review Team for Friends of the Earth 2011

## Headline results

The health impact from poor housing has been found to be considerable, as summarised in Table 2. The headline figures are as follows:

- There are an estimated 8,122 category 1 hazards in 5,819 dwellings in East Cambridgeshire's private sector stock, of which 6,381 are in the owner occupied sector and 1,741 are within the privately rented sector.
- Poor housing conditions in the private sector are responsible for an estimated 283 harmful events requiring medical intervention each year. These almost completely avoidable events range from respiratory diseases like COPD associated with cold homes, to fractures and injuries associated with homes containing fall hazards.
- The estimated total cost of mitigating all these hazards is £23.4 million, with £4.9 million in the private rented sector.
- The estimated cost to the NHS of treating accidents and ill-health caused by these hazards is £1.4 million each year. If the wider costs to society are considered, the total costs are estimated to be £4 million.
- If these hazards are mitigated then the total annual savings to society are estimated to be £3 million, including £1.3 million of savings to the NHS.

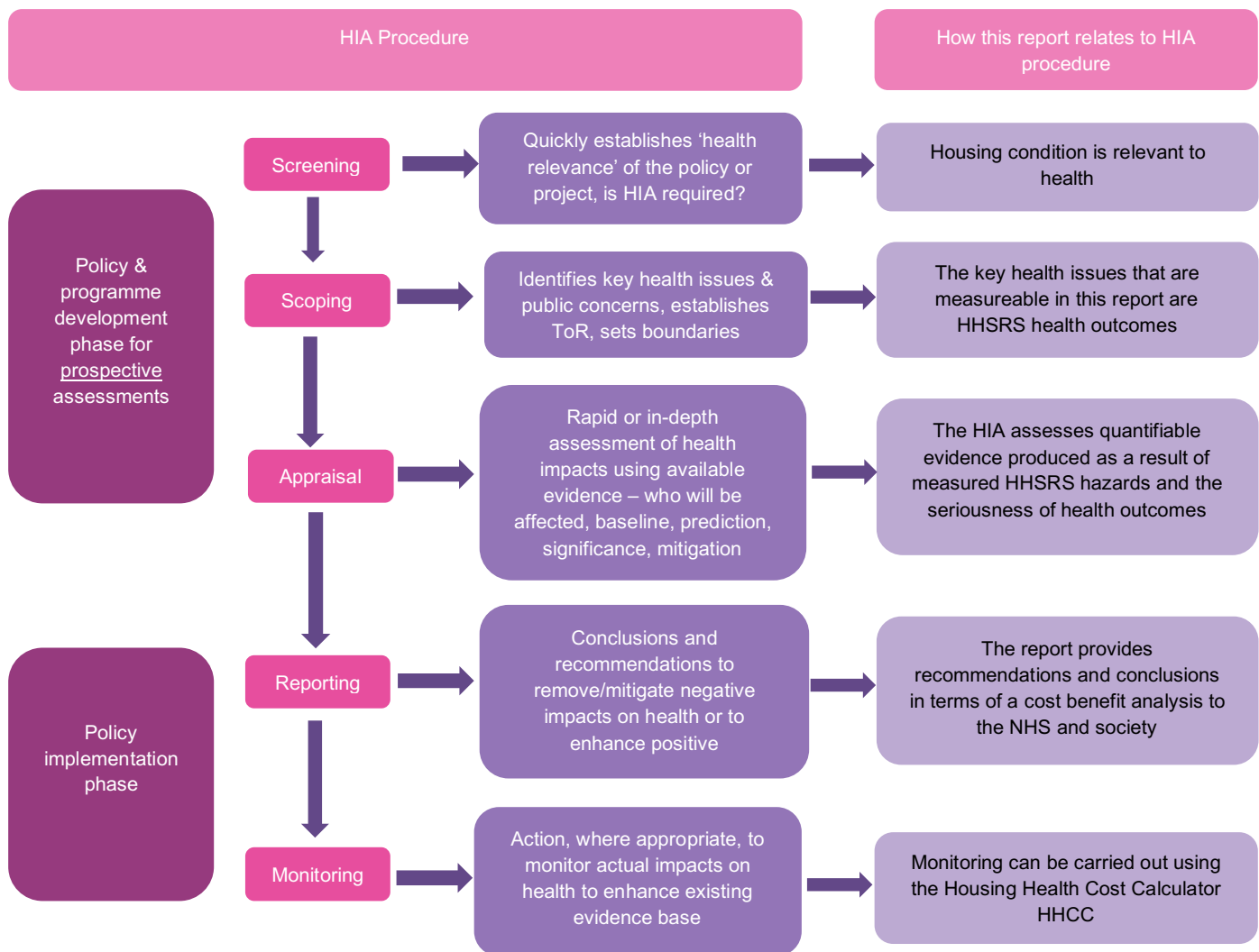
**Table 2: Summary of results, private sector stock**  
(N.B. due to data availability, some hazards are excluded from the cost benefit analysis)

Housing hazard type	Numbers of hazards (total private sector stock)	Estimated number of instances requiring medical intervention	Cost of mitigating all hazards	Potential annual costs of not mitigating hazards		Potential annual savings from mitigating hazards		Cost benefit analysis			
				Costs to NHS	Costs to society	Savings to NHS	Savings to society	Cost benefit to NHS		Cost benefit to Society	
								Positive cost benefit year where 20% works are carried out	Positive cost benefit year where 50% works are carried out	Positive cost benefit year where 20% works are carried out	Positive cost benefit year where 50% works are carried out
Damp and mould growth	56	28	£421,886	£19,070	£47,675	£19,010	£47,525	4	7	2	3
Excess cold	4,053	23	£18,794,841	£681,300	£1,703,250	£613,170	£1,532,925	7	15	3	6
Crowding and space	2	0	£39,675	£2,880	£7,200	£2,880	£7,200	5	12	2	5
Entry by intruders	48	16	£51,799	£10,840	£27,100	£10,360	£25,900	2	4	1	2
Domestic hygiene, Pests and Refuse	32	11	£61,573	£3,340	£8,350	£3,340	£8,350	Excluded	Excluded	Excluded	Excluded
Food safety	44	7	£108,751	£8,270	£20,675	£8,260	£20,650	Excluded	Excluded	Excluded	Excluded
Personal hygiene, Sanitation and Drainage	39	6	£45,242	£7,330	£18,325	£7,330	£18,325	Excluded	Excluded	Excluded	Excluded
Falls associated with baths etc	213	12	£112,525	£43,070	£107,675	£42,830	£107,075	0	0	0	0
Falling on level surfaces etc	950	53	£751,211	£201,520	£503,800	£181,370	£453,425	1	2	1	1
Falling on stairs etc	2,034	64	£1,767,131	£346,170	£865,425	£321,810	£804,525	1	2	1	1
Falling between levels	300	30	£281,979	£33,750	£84,375	£33,560	£83,900	2	5	1	2
Electrical hazards	17	1	£41,477	£4,170	£10,425	£4,160	£10,400	Excluded	Excluded	Excluded	Excluded
Fire	160	3	£589,408	£29,430	£73,575	£29,130	£72,825	4	9	2	4
Flames, hot surfaces etc	110	18	£271,449	£15,930	£39,825	£15,450	£38,625	1	2	1	1
Collision and entrapment	64	11	£45,154	£6,620	£16,550	£6,160	£15,400	0	0	0	0
<b>TOTAL</b>	<b>8,122</b>	<b>283</b>	<b>£23,384,102</b>	<b>£1,413,690</b>	<b>£3,534,225</b>	<b>£1,298,820</b>	<b>£3,247,050</b>	<b>n/a</b>	<b>n/a</b>	<b>n/a</b>	<b>n/a</b>

## What is a Health Impact Assessment (HIA)?

HIA is a formal method of assessing health impact and is advocated by the WHO. Figure 2 shows an adaptation of the WHO's methodology. The screening stage establishes that housing has an effect on the health of occupiers and visitors. The 'scoping stage' gives examples of expected health impacts and the 'appraisal stage' measures what these are likely to be. The 'reporting stage' provides conclusions and recommendations. Finally, the 'monitoring stage' can be carried out in the future to evaluate interventions and to measure the cost savings to the NHS and to society by using the Housing Health Cost Calculator (HHCC<sup>4</sup>).

Figure 2: HIA procedure (adapted from WHO Tools and Methods)<sup>5</sup>



4 [www.housinghealthcosts.org](http://www.housinghealthcosts.org)

5 WHO, Tools and Methods, 2013, <http://www.who.int/hia/tools/en/>

## Number of hazards

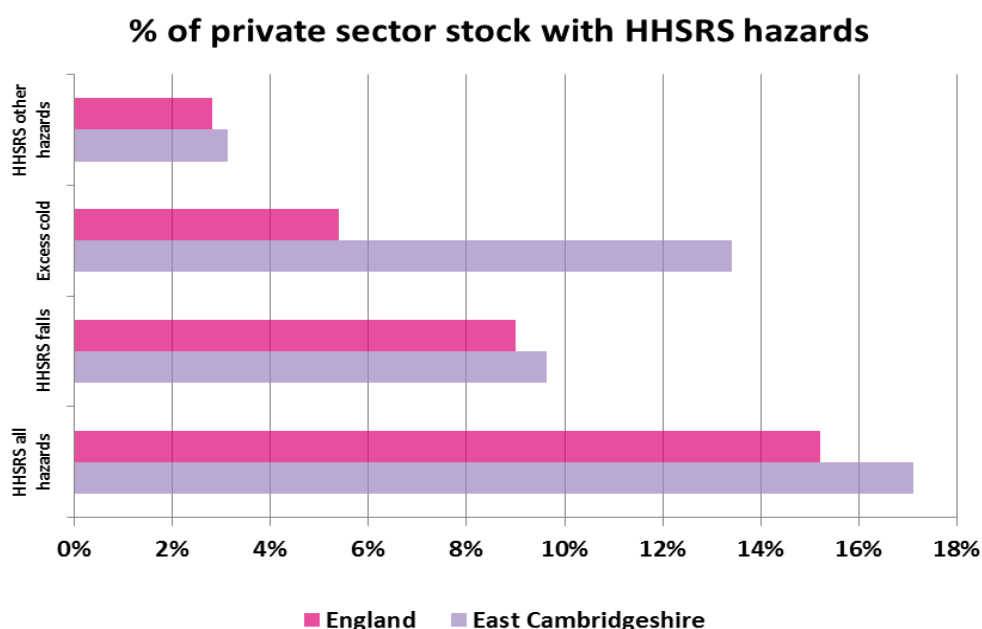
Table 3 shows the estimated number of hazards in East Cambridgeshire’s private sector stock as well as the estimated number of instances caused by these hazards which would require medical intervention. Excess cold has the greatest number of hazards overall (over 4,000), with falling on stairs accounting for just over 2,000; however the estimated number of instances requiring medical intervention is generally higher for falls on stairs (64) compared to excess cold (23).

**Table 3: The estimated number of category 1 hazards by tenure and estimated number of instances requiring medical intervention in East Cambridgeshire – private sector stock**

Housing hazard type	Numbers of hazards			Estimated number of instances requiring medical intervention
	Total Private Stock	Owner occupied	Private rented	
Damp and mould growth	56	44	12	28
Excess cold	4,053	3,211	842	23
Crowding and space	2	2	0	0
Entry by intruders	48	38	10	16
Domestic hygiene, Pests and Refuse	32	25	7	11
Food safety	44	34	9	7
Personal hygiene, Sanitation and Drainage	39	30	8	6
Falls associated with baths etc	213	166	47	12
Falling on level surfaces etc	950	739	211	53
Falling on stairs etc	2,034	1,582	452	64
Falling between levels	300	235	65	30
Electrical hazards	17	14	4	1
Fire	160	126	35	3
Flames, hot surfaces etc	110	86	24	18
Collision and entrapment	64	50	14	11
<b>TOTAL</b>	<b>8,122</b>	<b>6,381</b>	<b>1,741</b>	<b>283</b>

Figure 3 shows how East Cambridgeshire compares to England for all hazards and broken down into falls, excess cold and other hazards. East Cambridgeshire generally performs slightly worse compared to England, but for the hazard of excess cold it performs significantly worse.

**Figure 3: HHSRS category 1 hazards in East Cambridgeshire compared to England – private sector stock**

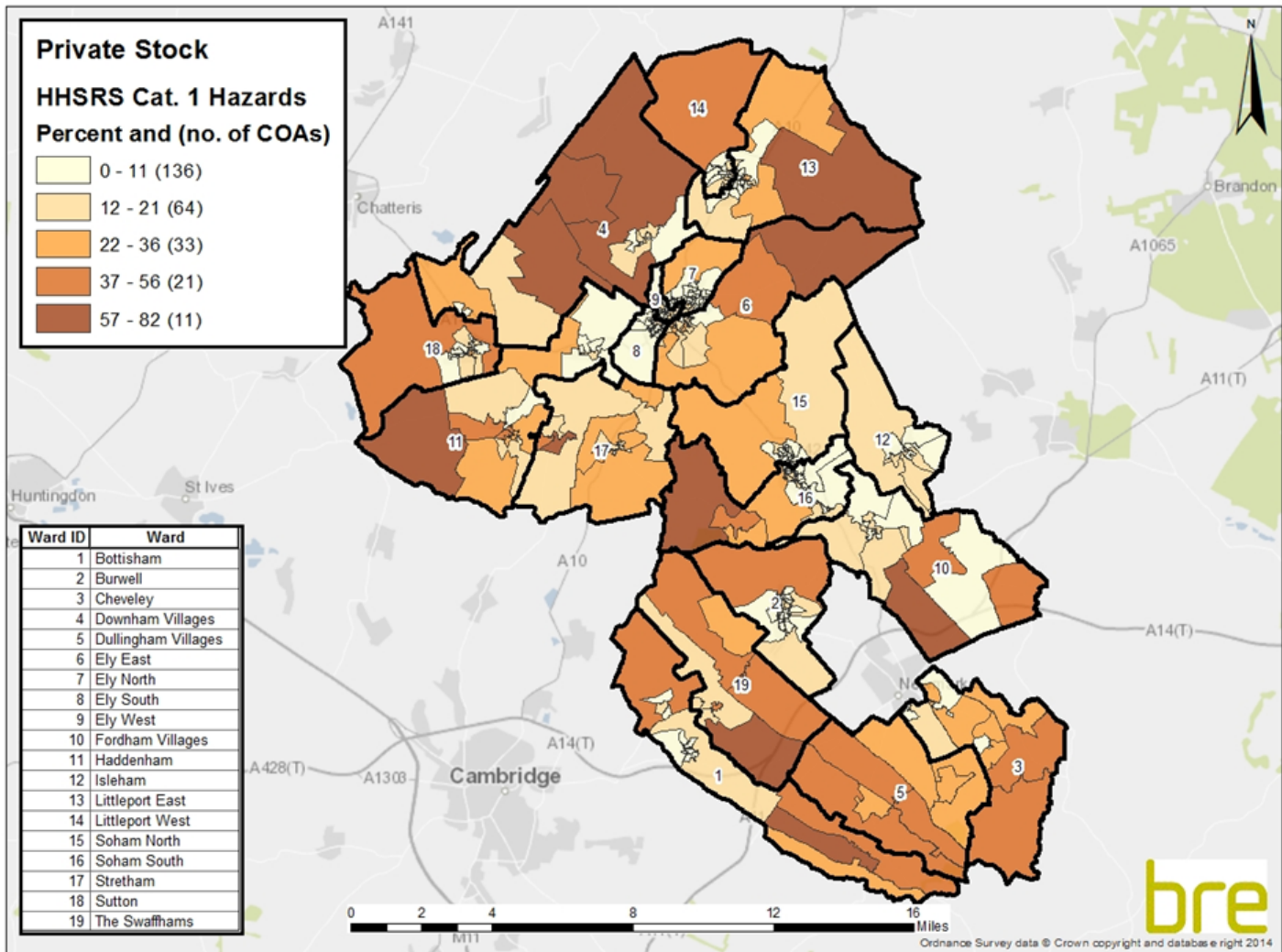


## Distribution of category 1 hazards in East Cambridgeshire

Map 1 shows the distribution of category 1 hazards - there are higher levels in Dullingham Villages, the Swaffhams and Downham Villages.

The most prevalent hazards in East Cambridgeshire are estimated to be hazards associated with excess cold and falls hazards and therefore Map 2 and Map 3 focus on these hazards respectively.

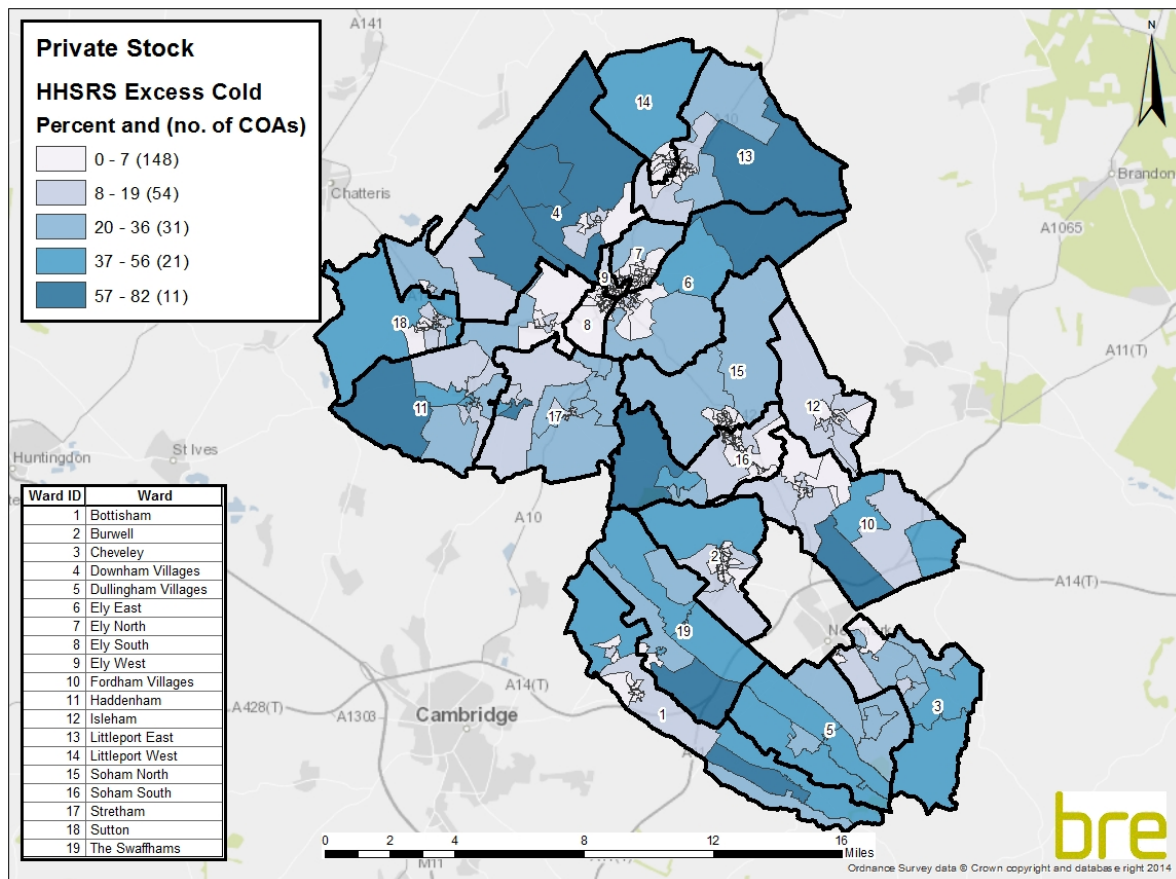
**Map 1<sup>6</sup>: Expected distribution of HHSRS category 1 hazards in East Cambridgeshire – private sector stock**



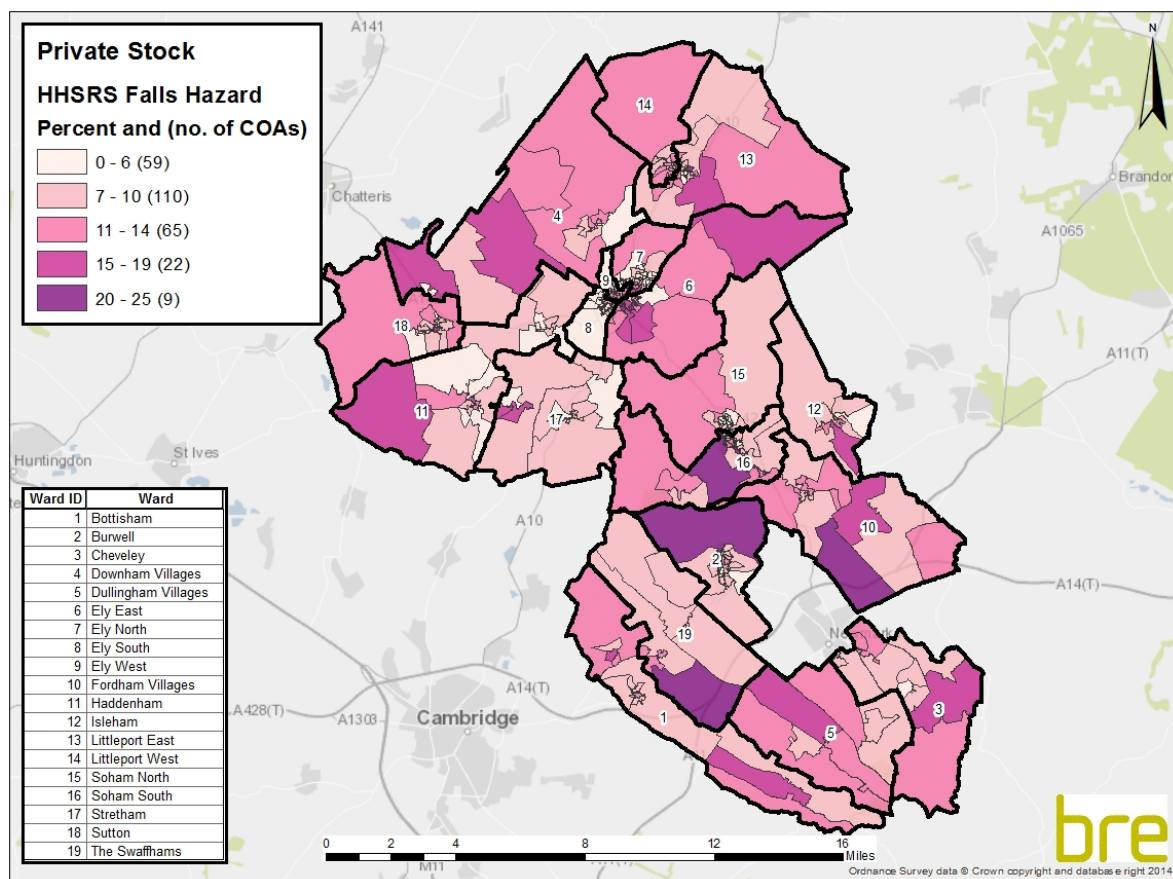
<sup>6</sup> The maps are at Census Output Area (COA) level - COAs are typically made up of 125 households, usually including whole postcodes and having similar sized populations. Each ward on the map is split into several COAs and, for example, there are 11 COAs that have 57 – 82% of private sector dwellings estimated to have the presence of a category 1 hazard.



Map 2: Expected distribution of HHSRS category 1 excess cold hazards in East Cambridgeshire – private sector stock



Map 3: Expected distribution of HHSRS category 1 falls hazards in East Cambridgeshire – private sector stock



## Mitigating hazards

The cost of work necessary to mitigate the hazards is based on bringing the dwelling up to the standard for an 'average dwelling'. The average dwelling likelihoods of harm, and harm outcomes, are given in the HHSRS Operating Guidance<sup>7</sup>. The exception to the rule of bringing dwellings up to the average is for the hazard of excess cold because the requirement to meet certain minimum standards results in the dwelling becoming 'better than average'. Table 4 shows the mitigation costs for the different hazards in East Cambridgeshire, with the highest total cost being for excess cold at almost £19 million. Furthermore, the average mitigation cost per dwelling is highest for crowding and space and lowest for the falls hazards.

**Table 4: The total cost of mitigating all category 1 hazards by tenure in East Cambridgeshire and the average cost per dwelling – private sector stock**

Housing hazard type	Cost of mitigating hazards			Avg. mitigation cost per dwelling
	Total Private Stock	Owner occupied	Private rented	
Damp and mould growth	£421,886	£330,847	£91,038	£7,484
Excess cold	£18,794,841	£14,890,263	£3,904,578	£4,637
Crowding and space	£39,675	£31,114	£8,561	£17,123
Entry by intruders	£51,799	£40,621	£11,178	£1,078
Domestic hygiene, Pests and Refuse	£61,573	£48,286	£13,287	£1,948
Food safety	£108,751	£85,284	£23,467	£2,495
Personal hygiene, Sanitation and Drainage	£45,242	£35,479	£9,763	£1,170
Falls associated with baths etc	£112,525	£87,515	£25,010	£528
Falling on level surfaces etc	£751,211	£584,246	£166,964	£791
Falling on stairs etc	£1,767,131	£1,374,368	£392,763	£869
Falling between levels	£281,979	£221,131	£60,848	£940
Electrical hazards	£41,477	£32,527	£8,950	£2,393
Fire	£589,408	£462,220	£127,188	£3,682
Flames, hot surfaces etc	£271,449	£212,873	£58,576	£2,470
Collision and entrapment	£45,154	£35,410	£9,744	£702
<b>TOTAL</b>	<b>£23,384,102</b>	<b>£18,472,186</b>	<b>£4,911,917</b>	

## Potential annual costs of treating health issues

Costs to the NHS are based on real estimates of the costs of incidents occurring as a result of the hazards and have been developed by looking at typical health outcomes and first year treatment costs that can be attributed to selected HHSRS hazards. This information is published in 'The Real Cost of Poor Housing'<sup>8</sup> and as updated in 'The Cost of Poor Housing to the NHS'<sup>9</sup>. The NHS costs do not take into account the more complex nature of the wider cost impacts to society. 'The Real Cost of Poor Housing' report estimates that the costs to society are two and a half times those of the NHS costs and cover a variety of costs, for example increased spending on benefits and cost of enforcement action by councils.

Table 5 shows the estimated costs to society by hazard and by tenure in East Cambridgeshire, with the highest cost of £1.7 million being attributed to excess cold. The cost to society of accidents due to falls associated with baths, falls on level surfaces and on stairs (i.e. those where the vulnerable group is the over 60s) is estimated at almost £1.5 million in total.

<sup>7</sup> Housing Health and Safety Rating System Operating Guidance, Housing Act 2004, Guidance about Inspections and Assessments given under Section 9, ODPM, 2006

<sup>8</sup> The Real Cost of Poor Housing, M Davidson et al, IHS BRE Press, February 2010

<sup>9</sup> Briefing Paper: The Cost of Poor Housing to the NHS, S Nicol et al, 2015 - <http://www.bre.co.uk/filelibrary/pdf/87741-Cost-of-Poor-Housing-Briefing-Paper-v3.pdf>

**Table 5: Potential annual costs to society and the NHS of category 1 housing health hazards in East Cambridgeshire by tenure – private sector stock**

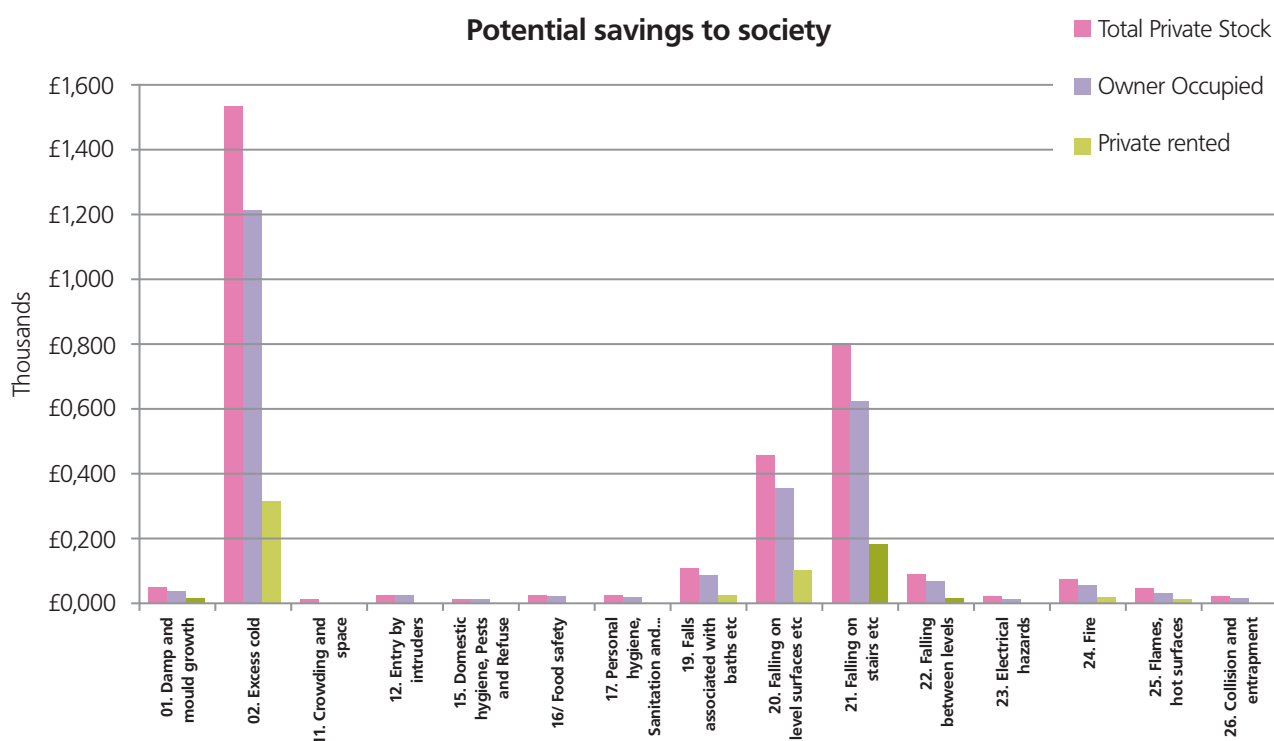
Housing hazard type	Potential annual costs of not mitigating hazards					
	Total Private Stock		Owner occupied		Private rented	
	Cost to society	Cost to NHS	Cost to society	Cost to NHS	Cost to society	Cost to NHS
Damp and mould growth	£47,675	£19,070	£37,375	£14,950	£10,275	£4,110
Excess cold	£1,703,250	£681,300	£1,349,400	£539,760	£353,825	£141,530
Crowding and space	£7,200	£2,880	£5,650	£2,260	£1,550	£620
Entry by intruders	£27,100	£10,840	£21,250	£8,500	£5,825	£2,330
Domestic hygiene, Pests and Refuse	£8,350	£3,340	£6,550	£2,620	£1,800	£720
Food safety	£20,675	£8,270	£16,200	£6,480	£4,450	£1,780
Personal hygiene, Sanitation and Drainage	£18,325	£7,330	£14,375	£5,750	£3,950	£1,580
Falls associated with baths etc	£107,675	£43,070	£83,750	£33,500	£23,925	£9,570
Falling on level surfaces etc	£503,800	£201,520	£391,825	£156,730	£111,975	£44,790
Falling on stairs etc	£865,425	£346,170	£673,075	£269,230	£192,350	£76,940
Falling between levels	£84,375	£33,750	£66,175	£26,470	£18,200	£7,280
Electrical hazards	£10,425	£4,170	£8,175	£3,270	£2,250	£900
Fire	£73,575	£29,430	£57,675	£23,070	£15,875	£6,350
Flames, hot surfaces etc	£39,825	£15,930	£31,225	£12,490	£8,575	£3,430
Collision and entrapment	£16,550	£6,620	£12,975	£5,190	£3,550	£1,420
<b>TOTAL</b>	<b>£3,534,225</b>	<b>£1,413,690</b>	<b>£2,775,675</b>	<b>£1,110,270</b>	<b>£758,375</b>	<b>£303,350</b>

## Potential annual savings

The potential annual estimated savings to society if all category 1 hazards were mitigated is £3.2 million per year, or £32 million over 10 years. This is based on being able to mitigate all the problems contributing to category 1 hazards within the housing stock.

Figure 4 shows the potential savings to society by hazard and by tenure. This is a useful distinction as different tenures may require different interventions to mitigate the hazards. Where the dwellings are owned by a private landlord enforcement action can require landlords to carry out the work at their own cost.

**Figure 4: Potential annual savings to society from mitigating hazards in East Cambridgeshire – all private sector stock and split into tenure**



## Effect on occupiers

It is possible to make some estimates of the number of persons living within East Cambridgeshire that are expected to be affected by these housing health hazards. These are based on dwellings being occupied by a person who may be in the 'risk' group for a particular hazard (the vulnerable age group).

### Excess cold

**There were an estimated 17,100 excess winter deaths in England in 2013/14, of which one fifth are estimated to be directly attributed to cold homes<sup>10</sup>**

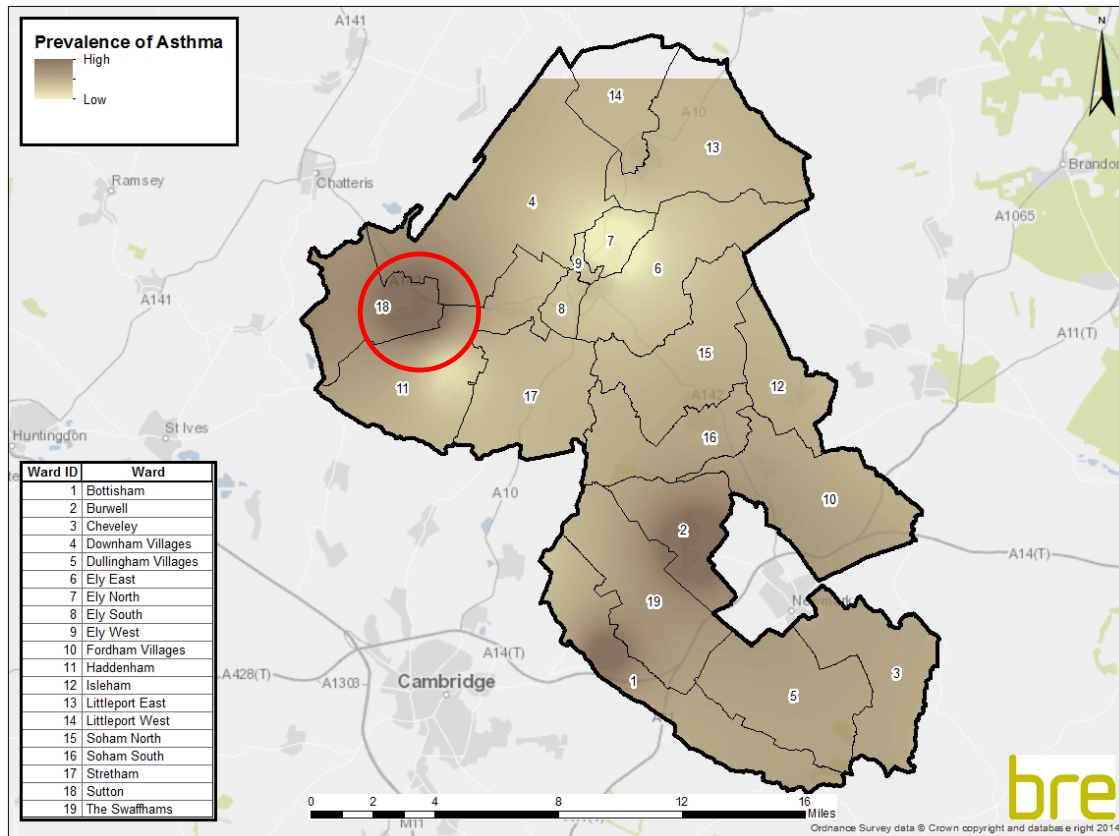
Excess cold is the most frequently occurring hazard in East Cambridgeshire and is significantly higher than the figure for England as a whole. This hazard particularly affects persons over 65 years of age and approximately a third of incidences would be expected to result in an extreme harm outcome, leading to death, or a heart attack followed by death. It is estimated that 8 incidents per year, of this severity, would be expected from this hazard. Severe and serious harm outcomes lead to 7 incidents per year of cardiovascular and respiratory illnesses. Excess cold has also been shown to contribute to a worsening of symptoms of other illnesses such as rheumatoid arthritis and leg ulcers. Examples of incidents that relate to less serious classes of harms are serious or regular colds. Altogether 23 incidents to persons over 65 years old caused by excess cold could potentially be avoided.

In East Cambridgeshire, the number of excess winter deaths was 40 in 2012/13<sup>11</sup>, therefore, the estimated figure of 8 incidents of death per year as a result of cold homes is comparable to one fifth of excess winter deaths being attributed to cold homes.

The savings, in monetary terms, to the NHS are not the only savings; there are other effects which also need to be considered. For example, asthma and respiratory infections could mean work and school days lost, affecting both the household's and the national economy and educational attainment. This is evidenced by the recent report by the Marmot review team<sup>12</sup> giving evidence of the effect of excess cold on children and vulnerable families, as well as on older people.

Map 4 shows the prevalence of asthma in East Cambridgeshire, it shows a high prevalence of asthma in the Sutton ward, which does also have COAs with higher estimated levels of excess cold compared to other wards (see Map 2). However, it is important to note that the prevalence of asthma in East Cambridgeshire is relatively low across the local authority, ranging from 3% - 8%.

**Map 4: The prevalence of asthma in East Cambridgeshire (source: <http://fingertips.phe.org.uk>)**



10 Office for National Statistics Excess Winter Mortality in England and Wales, 2013/14 (Provisional) and 2012/13 (Final)  
 11 <http://www.ons.gov.uk/ons/publications/re-reference-tables.html?edition=tcn%3A77-338623>  
 12 The Health Impacts of Cold Homes and Fuel Poverty, Marmot Review Team for Friends of the Earth 2011

**Falls hazards**

**Predominantly an issue for older people and one of the causes of emergency admission to hospital**

The Cambridgeshire JSNA states that ‘falls are a major cause of disability and the leading cause of mortality due to injury in older people over 75 in the UK’<sup>13</sup>. All patients who have had a fall should be offered a multifactorial risk assessment which takes into account the persons physical abilities as well as their home environment. The National Institute of Clinical Excellence (NICE) recommends the assessment of home hazards as one part of a multifactorial assessment following a fall<sup>14</sup>.

Of the falls hazards, falling on stairs and steps is expected to cause the greatest number of fall incidents and Figure 5 shows a property in East Cambridgeshire with a missing balustrade resulting in a potential falls hazard. The vulnerable group here, where accidents are most likely, is people over 60 and recent data shows there were 93<sup>15</sup> fractures of the hip in people over 65 in East Cambridgeshire in 2013/14<sup>16</sup>. Altogether, 64 incidents requiring some type of medical intervention are expected to occur due to falls on stairs. It should be remembered that the incidents suggested here are caused by the dwelling condition only.

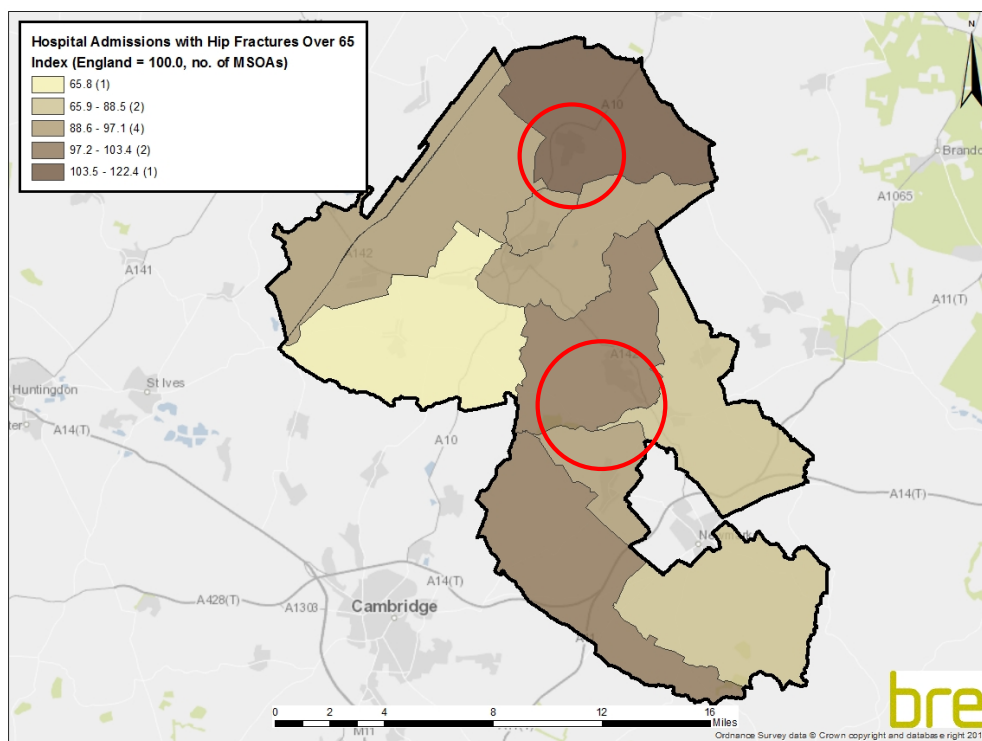
**Figure 5: A missing balustrade presenting a falling on stairs hazard in East Cambridgeshire**



An incident due to a falling on a level surface, or trip, hazard is expected to affect over 53 people in East Cambridgeshire. Again, the vulnerable group here is people over 60, and around 40% of the incidences are expected to cause extreme, severe and serious harm outcomes. These types of harm outcome will require hospital interventions, but moderate harm outcomes will still require intervention from a GP or district nurse.

Map 5 shows the prevalence of hospital admissions with hip fractures in over 65s. Whilst they use different geographical boundaries (COA compared with MSOA), this can be compared with Map 3 showing the distribution of fall hazards. Although this doesn't seem to suggest universally that areas containing higher levels of falls hazards also have higher rates of hospital admissions with hip fractures, there are higher proportions of admissions and high levels of falls hazards in the areas of Soham North and Soham South and to a lesser degree in the north eastern wards.

**Map 5: The prevalence of hospital admissions with hip fractures in over 65s in East Cambridgeshire (source: <http://www.localhealth.org.uk>)**



13 <http://www.cambridgeshireinsight.org.uk/file/2222/download>

14 The Assessment and Prevention of Falls in Older People, NICE, 2004

15 Standardised rate for age and sex, emergency admissions per 100,000 population aged 65 and over <http://www.apho.org.uk/resource/view.aspx?RID=171777>.

16 East Cambridgeshire Health Profile 2015, APHO, 2015

### Damp and mould growth

#### Includes threats to mental health and social wellbeing<sup>17</sup>

Humid environments can encourage the growth of allergens and dust mites which can cause asthma. The vulnerable group for this hazard is children under 14 years old. However, mental and social health effects of mould or damp staining, and the smells associated with damp and mould, can also cause depression and anxiety. These feelings of shame and embarrassment can lead to social isolation. There are an estimated 56 category 1 hazards for dampness and of these 28 are likely to result in a requirement for medical intervention - an example of a property suffering from these problems is shown in Figure 6.

**Figure 6: Hazard of damp and mould growth in East Cambridgeshire**



### Entry by intruders

#### Feeling safe in your own home

The potential health effects are the fear of a possible burglary, the stress caused by a burglary, and injuries associated with an aggravated burglary. The most common health impact is fear and associated stress. This occurs in 90% of cases where an incidence is recorded as being likely. The hazard can affect any age group. In East Cambridgeshire entry by intruders hazards are estimated to cause health problems to 16 persons a year. The majority of these incidents are expected to cause moderate harms.

### Fire, flames and hot surfaces, electrical and collision hazards

The health outcomes associated with these hazards are burns, scalds, electric shock and injuries due to collision with parts of the building (e.g. low beams, glazing) and trapping of limbs or fingers. The vulnerable group for the fire hazard is persons over 60 due to impairment of mobility; whereas children are more likely to be affected by the other three hazards of flames and hot surfaces, electrical and collision hazards. There is also evidence that households with children are twice as likely to experience a fire as those without. In East Cambridgeshire, it is estimated that around 30 people could be affected by these hazards.

Lesser hazards within homes will still exist but are likely to result in minor health outcomes compared to the other hazards.

## Cost-benefit scenarios

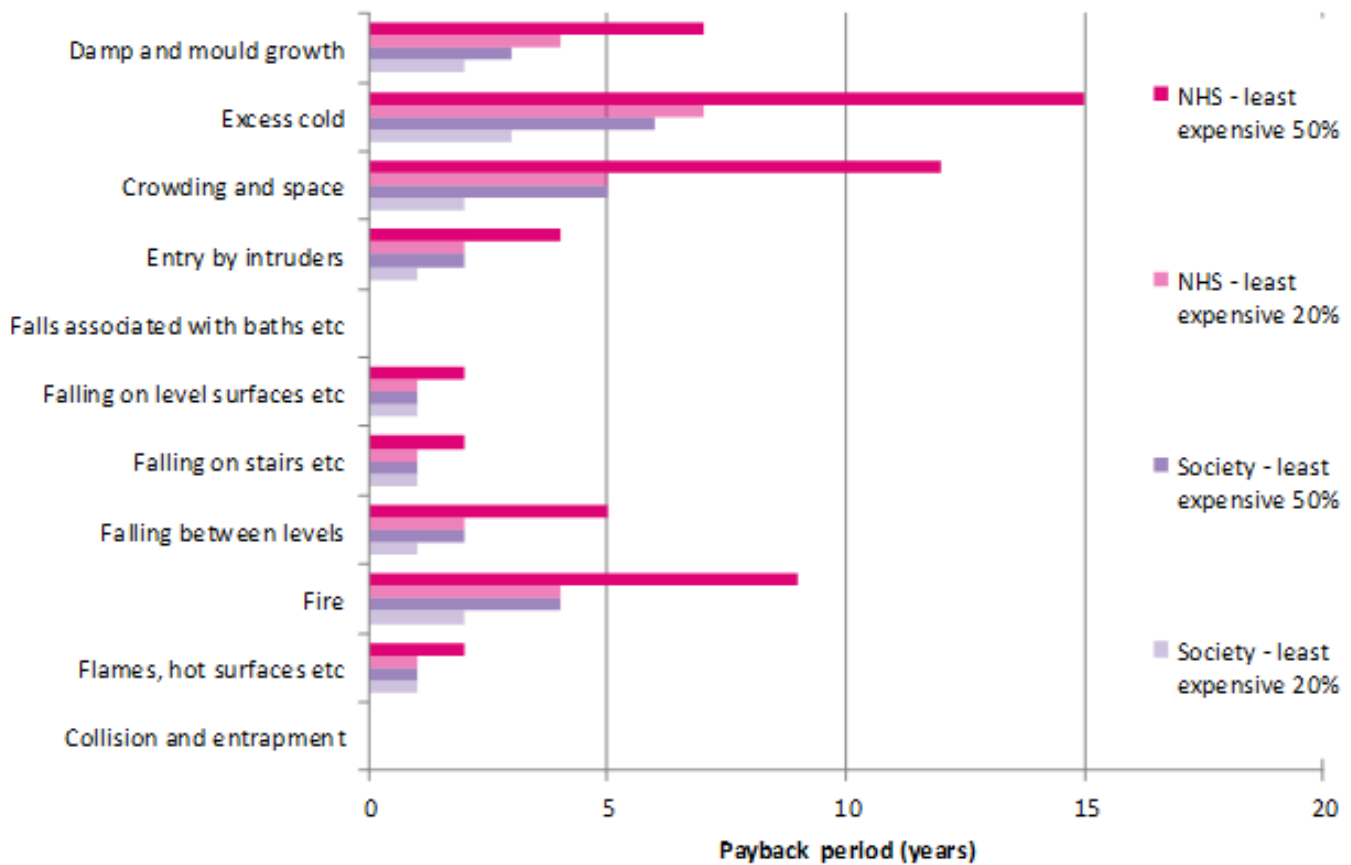
To understand more readily the relative benefits of taking action to mitigate the hazards, a number of scenarios have been produced that show the effects of interventions. All scenarios are based on the likely number of category 1 hazards and mitigating those hazards.

Cost-benefit scenarios have been developed for each hazard, showing the cost, benefit and break-even point of carrying out mitigation works for all dwellings with category 1 hazards. Further scenarios were produced to show the cost and benefit to the NHS and to society of carrying out work to dwellings with the least expensive 50% and 20% of required works. By focussing on the less expensive works, it is possible to reach the breakeven or cost-effective point earlier. An

example could be focussing on work where putting a handrail in place would mitigate the hazard rather than work which would involve replacing the stairs.

In all scenarios where dwellings only require the less expensive works to be carried out, the payback periods are at their lowest. In the case of the most common hazard, excess cold, the number of years to reach the breakeven point is between 3 and 15 years. Where fall hazards are mitigated, the payback period is much lower, being only 1 year in many of the scenario cases. This information is shown in Figure 7 and can be used to assist decision-making when considering which housing-related health-hazard interventions should be targeted.

**Figure 7: Payback periods for the NHS and society by hazard – where the least expensive 50% and 20% of hazards are mitigated, private sector stock (N.B. some payback periods are zero, hazards not shown on this chart have not been assessed here as there is insufficient data, either as the hazards are not present in sufficient numbers or there is insufficient background information from EHS data)**



Where the least expensive 20% of works to mitigate excess cold hazards are carried out over a period of 10 years, at a cost of around £40,000 per year, a saving of over £120,000 can be shown to society every year after year 10 (see Figure 8). Figure 9 shows a scenario looking at mitigating the least expensive 50% of falling on stairs hazards. An annual spend of £20,000 could result in an annual saving after 10 years of £160,000 to society.

Figure 8: Annual costs and savings to society where the least expensive 20% of works to mitigate category 1 excess cold hazards are carried out over 10 years – private sector stock

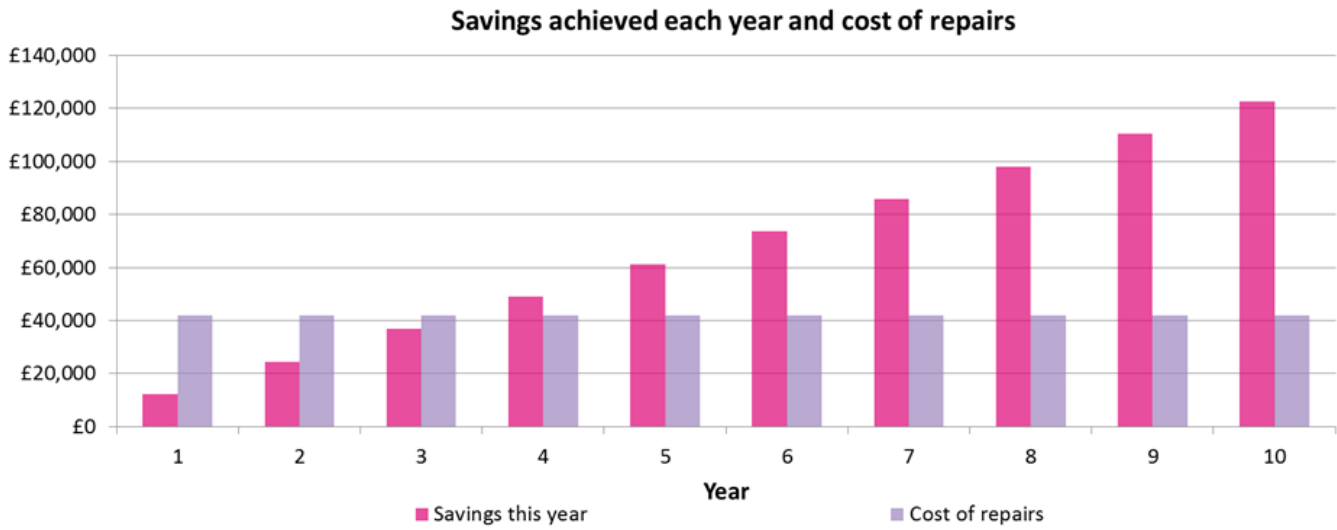
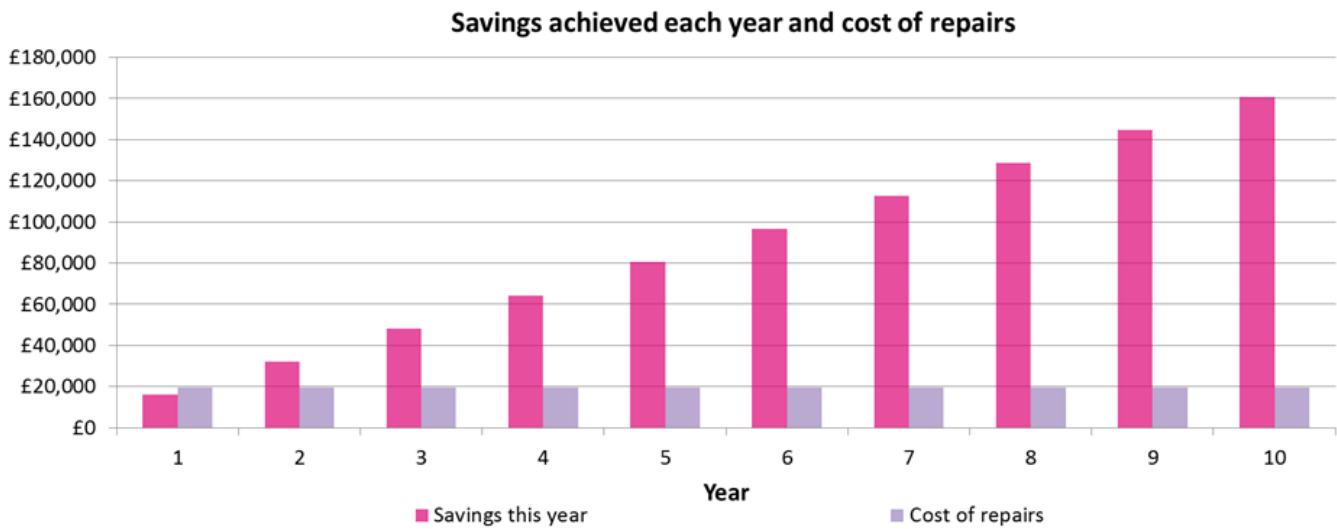


Figure 9: Annual costs and savings to society where the least expensive 50% of works to mitigate category 1 falling on stairs hazards are carried out over 10 years – private sector stock





## Quality Adjusted Life Years (QALYs) relating to housing hazards

A QALY takes into account both the quantity and quality of life generated by health influencing activities. The National Institute for Health and Clinical Excellence (NICE) defines the QALY as a 'measure of a person's length of life weighted by a valuation of their health-related quality of life'. It is the arithmetic product of life expectancy and a measure of the quality of the remaining life-years.

In the calculation of QALYs, the number of life years over which an individual will experience a particular condition or life expectancy is combined with an assessment of their quality of life during those years.

Having used the QALY measurement to compare how much someone's life can be extended and improved, NICE then consider cost effectiveness in terms of the cost of the drug or treatment per QALY. This is the cost of using the drugs or treatment to provide a year of the best quality of life available - it could be one person receiving one QALY, but is more likely to be a number of people receiving a proportion of a QALY - for example 20 people receiving 0.05 of a

QALY. Different treatments can therefore be compared using the Incremental Cost-Effectiveness Ratio (ICER) expressed as '£ per QALY'. Each drug would be considered on a case-by-case basis. Generally, however, if a treatment costs more than £20,000-30,000 per QALY, then it would not be considered cost effective.

The cost of poor housing calculations look at a preventative measure which would reduce the probability of harm occurring, rather than a treatment which might improve a person's quality of life. It is therefore difficult to make a direct comparison with the described NICE methodology. However, based on a number of assumptions, it is possible to apply a QALY calculation to the model to determine the cost effectiveness of different interventions.

The total QALY saving if the repairs are carried out can be seen in Table 6. Since the cost of repair is known, the ICER for each hazard can be estimated. Only two of the hazards, however, has an ICER under £30,000 (falls associated with baths and collision and entrapment).

**Table 6: The QALY benefit and ICER of reducing HHSRS category 1 hazards to an acceptable level**

Housing hazard type	QALY years for all stock (years)			ICER before work
	Before work	After work	Saving	
Damp and mould growth	2	0	2	£208,213
Excess cold	114	11	103	£164,719
Crowding and space	1	0	1	£41,592
Entry by intruders	1	0	1	£70,455
Domestic hygiene, Pests and Refuse	0	0	0	£1,461,043
Food safety	0	0	0	£1,590,379
Personal hygiene, Sanitation and Drainage	0	0	0	£745,753
Falls associated with baths etc	6	0	6	£20,211
Falling on level surfaces etc	3	0	3	£229,354
Falling on stairs etc	30	3	27	£58,031
Falling between levels	5	0	5	£59,454
Electrical hazards	0	0	0	£106,510
Fire	6	0	6	£97,624
Flames, hot surfaces etc	2	0	2	£175,938
Collision and entrapment	2	0	2	£26,916
<b>TOTAL</b>	<b>172</b>	<b>15</b>	<b>157</b>	<b>£5,056,191</b>

It is worth noting that the ICER figures in Table 6 are based on treating category 1 hazards across the whole stock, regardless of repair costs. As has been demonstrated with the health cost benefit scenarios, the cost distribution of repairs for each hazard varies considerably and therefore, if less expensive repairs to mitigate category 1 hazards were selected, the ICER would be more favourable. Table 7 shows the hazards which now have an ICER below £30,000, based on mitigating hazards with lower repair costs (only hazards that provide an ICER

of below £30,000 for more than 10% of their original numbers are shown). Assessing the data in such a way means that the total number of hazards with an ICER below £30,000 is increased from 2 to 9. The total number of QALYs that could be saved by improving the housing stock and mitigating these 2,770 category 1 hazards is therefore around 56, with falls on stairs and excess cold standing out as hazards with a good QALY return for the treatment costs.

**Table 7: Determining the proportion of category 1 hazards that have an average cost of repair at a value to generate an ICER of £30,000 or below**

Housing hazard type	Original no. of category 1 hazards	% of all category 1 hazards	No. of category 1 hazards	Total QALY saving of repair (years)
Damp and mould growth	56	19.5%	11	0.4
Excess cold	4,053	28.2%	1,143	29.0
Crowding and space	2	<10%	-	-
Entry by intruders	48	38.9%	18	0.3
Domestic hygiene, Pests and Refuse	32	<10%	-	-
Food safety	44	<10%	-	-
Personal hygiene, Sanitation and Drainage	39	<10%	-	-
Falls associated with baths etc	213	69.9%	148	3.9
Falling on level surfaces etc	950	<10%	-	-
Falling on stairs etc	2,034	57.4%	1,167	15.8
Falling between levels	300	38.1%	114	1.8
Electrical hazards	17	<10%	-	-
Fire	160	39.0%	62	2.3
Flames, hot surfaces etc	110	57.6%	63	0.9
Collision and entrapment	64	69.4%	44	1.2
<b>TOTAL</b>	<b>8,122</b>	<b>-</b>	<b>2,770</b>	<b>55.5</b>

## Main recommendations to reduce the health impact of poor homes in East Cambridgeshire

- The owner occupied sector contains the greatest number of category 1 hazards requiring an estimated £18.4 million to mitigate. The most common hazards are excess cold (3,211), falling on stairs (1,582), and falling on the level (739). Therefore there should be appropriate services to assist owner occupiers in addressing these most common hazards which may range from financial assistance to support with the specification of remedial works and finding appropriate contractors.
- A Home Improvement Agency or a Handy Person Service are important ways of taking action. Not only will there be a need for help to be available, there should also be systems in place to identify those needing assistance; for example, setting up referral pathways between housing and health professionals so that occupational therapists or health visitors are aware and can make referrals to housing support services.
- Within the private rented sector, the annual cost to society of category 1 hazards is estimated to be £760,000. Work to mitigate these hazards will need to be carried out by landlords in accordance with legislation in the Housing Act 2004. To facilitate this, suitable housing procedures, policies and strategies, along with an active housing enforcement strategy will be necessary.
- The hazard of damp and mould particularly affects children and can cause long term effects that may well be underestimated by this piece of work (the evidence is not available to quantify the true cost over a long time period). Flames and hot surfaces and falling between levels also specifically affect children. Education using a multi-agency approach with Health Visitors or through Children's Centres and accessing local knowledge will be crucial to reducing these hazards. Professionals working with families in the private rented sector should be made more aware of landlord duties.
- The evidence indicates that initiatives to reduce the incidence of falls at home should be one of the more cost effective strategies. The cost benefit scenarios show that the best value initiatives will look to small-scale repair or improvement works to stairs, trip hazards within the home and to uneven paths. Targeting this initiative towards dwellings occupied by persons over 60 will bring the greatest benefit.
- The quantitative information provided in this HIA on the impact of private sector housing on health should be fed in the JSNA and Health and Wellbeing strategy. This will allow evidence on the costs, savings and benefits of improving housing in the private sector, and the costs to health of not doing so to be compared with other areas, and contribute to informed discussions identifying commissioning priorities.



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