

Cost to make dwellings safe in Northern Ireland 2016



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This report is based on data from the House Condition Survey 2016. The main report for the survey is published on the Housing Executive's website:

[Click here to view the House Condition Survey 2016 report](#)

For further information about the 'Cost to make dwellings safe in Northern Ireland', or the House Condition Survey contact:

The Research Unit
Northern Ireland Housing Executive
2 Adelaide Street Belfast
BT2 8PB

Karly Greene (Lead Statistical Official)
Email: karly.greene@nihe.gov.uk

Tel: (028) 9598 2540

or

Jahnet Brown
Email: jahnet.brown@nihe.gov.uk

Tel: (028) 9598 2548



Introduction & Executive Summary

This report was produced by the [Building Research Establishment \(BRE\)](#) on behalf of the Northern Ireland Housing Executive. It is based on Housing Health and Safety Rating System (HHSRS) data collected through the 2016 Northern Ireland House Condition Survey (NIHCS).

The HHSRS is a means of identifying defects in dwellings and of 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 imminent threat of major harm or even death. The emphasis is placed on the potential effect of any defects on the health and safety of occupants and visitors; particularly vulnerable people. Table 1 on page 5 lists the hazards considered. These hazards fall within four main groups: physiological requirements; psychological requirements; protection against infection and protection against accidents. Further information can be found in the main 2016 House Condition Survey report on page 143 *Appendix G: Modelling Housing Health and Safety Rating System Category 1 Hazards (see website link below)*.

The main 2016 HCS report can be found on the Housing Executive's website:
[Click here to view the House Condition Survey 2016 report](#)

In 2016 there were an estimated 69,900 Category 1 hazards¹ in the Northern Ireland housing stock (9%).

As part of the NIHCS, surveyors identified remedial works required to mitigate risks that are significantly higher than average to an acceptable level – this level usually being the average for the type and age of dwelling. For the 2016 NIHCS, these remedial works were costed up using standard prices used for the English Housing Survey. For the modelled hazards (apart from excess cold) a 'typical' package of works has been used. For excess cold BRE used the latest EPC improvements model for Northern Ireland which means these costs are not directly comparable to previous estimates for mitigating excess cold in Northern Ireland.

This report presents the average (mean) costs to reduce Category 1 hazards to an acceptable level. It is important to note that the average cost is impacted by homes with high costs (outliers) for example, long term vacant and/or unfit dwellings. In order to demonstrate the effect of these outliers, the report also makes reference to the median cost, and to the mean cost if vacant dwellings were removed.

The NIHCS estimates that the average (mean) cost for reducing Category 1 hazards to an acceptable level in 2016 is £4,366.

The average cost is impacted by those homes with very high costs (outliers) normally found among long term vacant and/or unfit dwellings. Therefore the median repair cost has also been calculated.

The median cost of repair to mitigate Category 1 hazards is much lower at £1,294 per dwelling.

The total cost of dealing with HHSRS Category 1 hazards in Northern Ireland is estimated to be some £305 million in 2016.

The highest average (mean) cost relates to dealing with damp and mould growth around £20,600 per dwelling.

¹ Category 1 hazards are deemed to fail the statutory minimum standard.



Cost to make dwellings safe in Northern Ireland - method

Costs to mitigate Category 1 HHSRS hazards, known as costs to make safe, provide notional costs to remedy each type of Category 1 hazard to an acceptable level - this level usually being the average for the type and age of dwelling.

For the hazards fully measured by the surveyor² this involves two processes;

- costing the required work(s) identified by the surveyor in the HHSRS section of the physical survey form; a 'typical' specification of work has been devised by an experienced HHSRS practitioner for the remedial action
- using repair cost work described elsewhere on the form.

For costs to mitigate excess cold at a dwelling the latest EPC methodology for the NIHCS is used to identify both the energy improvement work required and the associated cost.

For the hazards modelled after the physical survey fieldwork, a typical action has been selected by an experienced HHSRS practitioner (as above for measured hazards). The exceptions are for: falls associated with baths³, entry by intruders, noise and collision and entrapment. In 2016 these four hazards were assessed as extreme risks, having previously been fully measured by surveyors. For these hazards the average costs of mitigating the hazard is based on analysis of annual English Housing Survey (EHS) data. This analysis looked at trends in costs over time and whether these costs varied according to dwelling type and size. For example, the costs to make safe for hazards relating to entry by intruders varied according to whether the dwelling was a flat or house, so the programme to create the derived cost to make safe variable for this hazard includes different average costs for flats and houses.

The outputs from the processes above are then combined to provide the notional overall costs for all 26 hazards collected by the NIHCS. Any double counting of work (e.g. heating improvements may be required to mitigate dampness and excess cold) is removed where feasible. Actions are grouped into broad work areas e.g. insulation, heating, kitchens, stairs. Remedial works that do not fit into these classifications, and are independent of any other jobs, are grouped as 'other' e.g. work to mitigate the risk of harm from lead or overcrowding.

² The six fully measured hazards are: falls associated with steps and stairs; falls between levels; falls on the level; fire; flames, hot surfaces and materials; damp and mould growth.

³ No category 1 hazards for falls associated with baths were reported for the NIHCS 2016; likely due to the small sample size of the survey.



Cost to make dwellings safe in Northern Ireland - results

In 2016 there were an estimated 69,900 Category 1 hazards in the Northern Ireland housing stock (9%). As part of the NIHCS, surveyors identify remedial works required to mitigate risks that are significantly higher than average to an acceptable level – this level usually being the average for the type and age of dwelling. For the 2016 NIHCS, these remedial works were costed up using standard prices used for the English Housing Survey. For the modelled hazards (apart from excess cold) a ‘typical’ package of works has been used. For excess cold BRE used the latest EPC improvements model for Northern Ireland which means these costs are not directly comparable to previous estimates for mitigating excess cold in Northern Ireland.

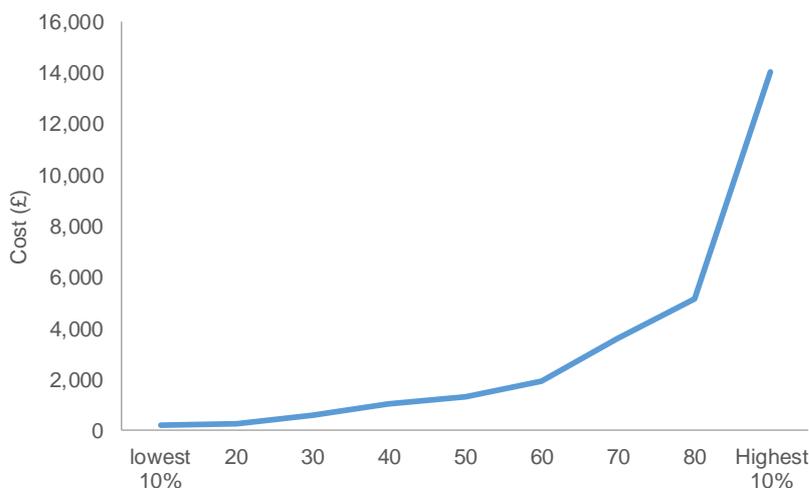
The NIHCS estimates that the average (mean) cost for reducing Category 1 hazards to an acceptable level is £4,366.

The average cost is impacted by those homes with very high costs (outliers) normally found among long term vacant and/or unfit dwellings.

The median cost of repair to mitigate Category 1 hazards is much lower at £1,294 per dwelling.

Figure 1 shows how the costs to make safe varies; for 20% of homes with Category 1 hazards it would cost around £250 or less to reduce the risk of harm so that it was no worse than average. For 50% of homes it would cost around £1,300 or less. At the other end of the scale, the highest costing 20% of homes with Category 1 hazards would cost at least £5,100 to repair and the highest 10% at least £14,000.

Figure 1: Distribution of costs for remedial action on HHSRS Cat 1 hazards (2016 prices)



Base: all dwellings with a Category 1 hazard



Table 1 summarizes the prevalence of each type of Category 1 hazard in the stock together with the average and total cost required to mitigate these hazards. The 2016 NIHCS did not find any Category 1 hazards for collision and entrapment, falls associated with baths, crowding and space, noise and excess heat; this is likely due to the small sample size of the survey.

The total cost of dealing with HHSRS Category 1 hazards in Northern Ireland is estimated to be some £305 million in 2016.

Table 1: Costs to mitigate Category 1 HHSRS hazards, 2016⁴

Hazard	Number of Category 1 Hazards	Average cost per dwelling (£)	Total cost to mitigate hazard (£)
Excess cold	16,029	4,145	66,445,532
Falls on the level	16,491	2,243	36,994,679
Food Safety	7,091	5,114	36,263,671
Falls associated with stairs and steps	25,746	1,266	32,582,417
Damp and mould growth	1,559	20,572	32,070,980
Fire	3,535	8,011	28,317,710
Falls between levels	8,258	2,424	20,013,510
Domestic hygiene, pests and refuse	3,441	4,071	14,007,904
Personal hygiene, sanitation and drainage	8,125	1,613	13,106,142
Electrical hazards	2,000	3,846	7,691,829
Radon (radiation)	5,825	1,294	7,538,203
Lighting	1,795	3,900	7,000,141
Lead	3,422	1,910	6,535,380
Entry by intruders	4,437	1,026	4,553,108
Water supply for domestic purposes	3,734	1,058	3,949,733
Structural collapse and falling elements	489	6,515	3,185,993
Position and operability of amenities (ergonomics)	4,477	570	2,552,308
Carbon monoxide and fuel combustion products	1,216	570	693,234
Uncombusted fuel gas	280	570	159,626
Explosions	280	570	159,626
Hot surfaces and materials	350	120	41,902
Collision and entrapment	-	-	-
Falls associated with baths etc	-	-	-
Crowding and space	-	-	-
Noise	-	-	-
Excess heat	-	-	-
Total with any Category 1 hazard	69,878	4,366	305,054,048

⁴ Average cost refers to the mean cost



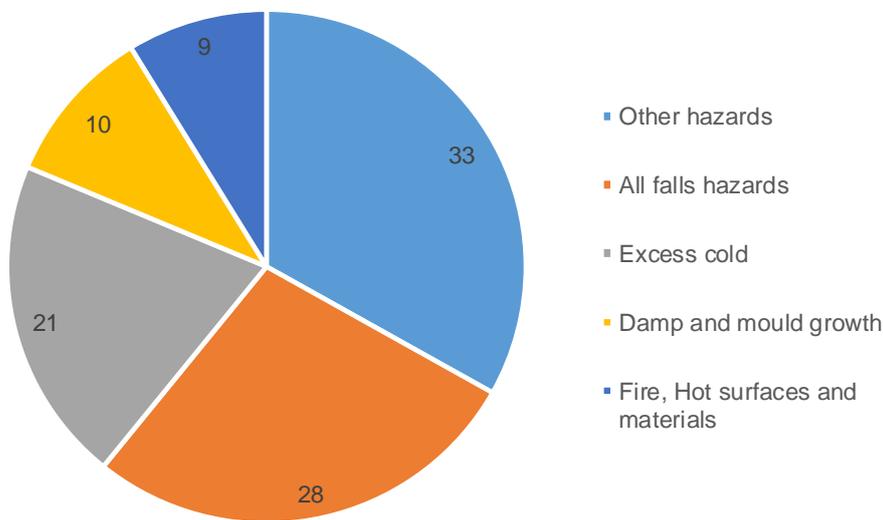
Note: the total sum required to remedy all Category 1 hazards is less than the total number of Category 1 hazards multiplied by the average costs; this is because the modelling avoids the double counting of costs where repair work/energy improvements mitigate more than one hazard.

Base: all dwellings with a Category 1 hazard

The highest average (mean) cost relates to dealing with damp and mould growth, around £20,600 per dwelling.

Mitigating the cost of the three fall hazards identified comprises about 28% of the total costs to make safe. Around one fifth (21%) of the estimated total cost of remedial work is required for making cold homes more comfortable, work which includes updating heating systems and providing or improving insulation, Figure 2.

Figure 2: Distribution of the total cost to mitigate all Category 1 hazards, 2016



Note: Percentages based on total cost to mitigate all Category 1 hazards before double counting is removed.

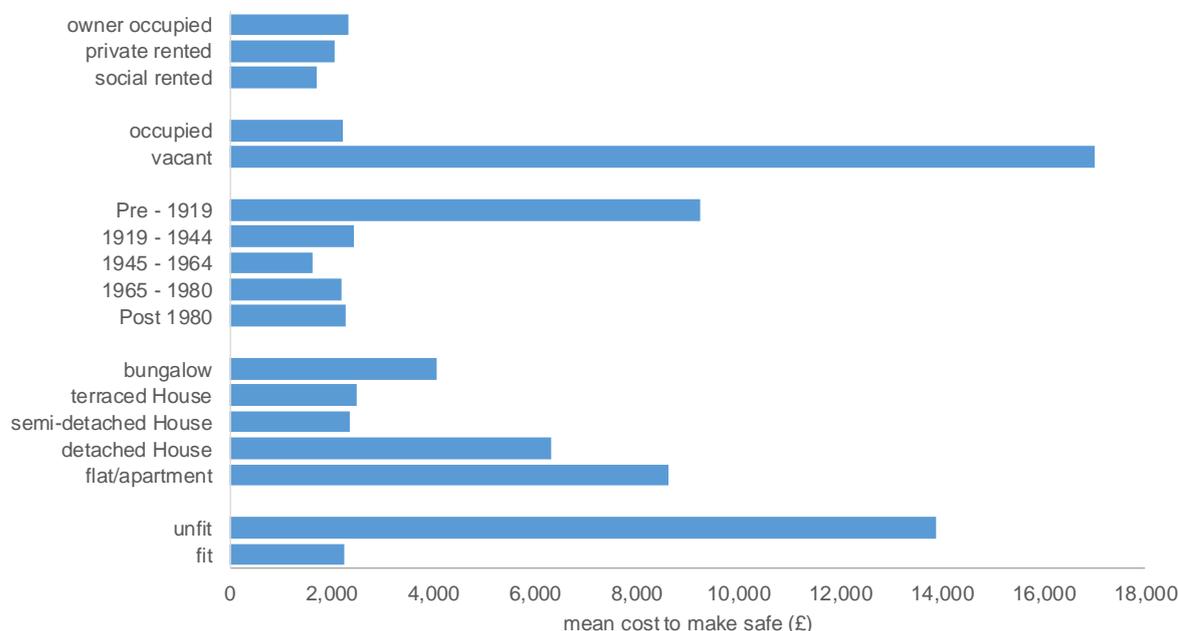
Base: all dwellings with a Category 1 hazard

Cost to make safe by dwelling characteristics

Figure 3 shows how the average (mean) cost to make safe varies by different dwelling characteristics. Highest average (mean) costs are for vacant and/or unfit homes with Category 1 hazards. **If these vacant and unfit homes are excluded, average (mean) costs to make safe would be around £2,200.**



Figure 3: Average cost to mitigate all Category 1 hazards, 2016



Note: data for owner occupied, private rented and social rented are for occupied homes only. Please use social rented and flat/apartment data with caution as numbers were small.

Base: all dwellings with a Category 1 hazard

Costs to make dwellings safe by tenure and occupancy

Average (mean) costs to make safe are highest among occupied owner homes and lowest among social rented homes. Median costs are more similar across the three tenures. Figure 4 illustrates how the distribution of costs for vacant homes compares to the distribution for the occupied stock. **Over half (56%) of the total cost to mitigate Category 1 hazards is required for mitigating Category 1 hazards in vacant homes.**

Table 2: Costs (£) to mitigate Category 1 HHSRS hazards by tenure, 2016

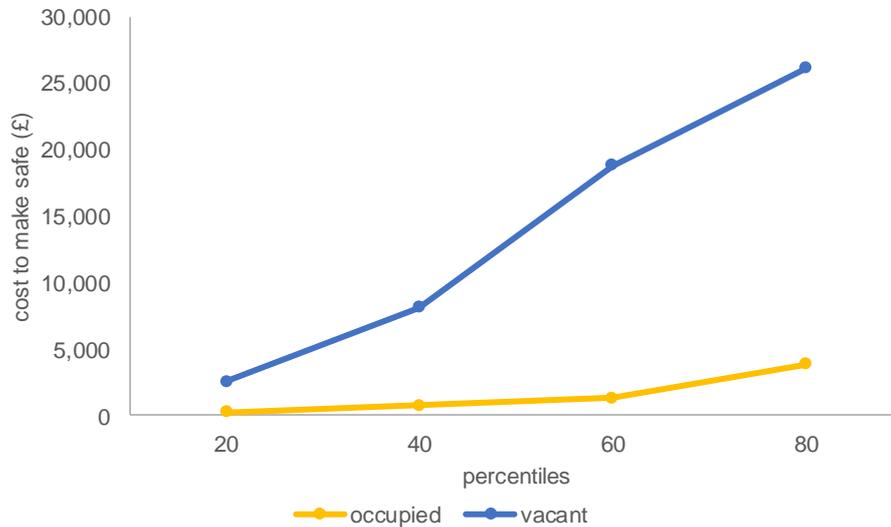
Tenure and occupancy	Number of Category 1 hazards	Minimum (£)	Maximum (£)	Mean (£)	Median (£)	Total costs (£)
Owner occupied	43,401	23	16,257	2,329	1,225	101,090,905
Private rented	11,084	75	8,221	2,065	1,026	22,886,247
Social	5,278	112	5,225	1,696	1,432	8,951,874
Vacant	10,116	225	77,715	17,015	15,776	172,125,023
Total	69,878	23	77,715	4,366	1,294	305,054,048

Note: data for owner occupied, private rented and social rented are for occupied homes only. Please use Social rented data with caution as numbers were small.

Base: all dwellings with a Category 1 hazard



Figure 4: Distribution of cost to make safe by occupancy, 2016



Base: all dwellings with a Category 1 hazard

Costs to make safe and dwelling age

Average (mean) and median costs to make safe are markedly higher among the oldest homes built before 1919. Although pre-1919 homes contain around a third (32%) of all Category 1 hazards in the stock, over two thirds (67%) of the total costs to make safe are required to mitigate the serious risks of harm in these homes.

Table 3: Costs (£) to mitigate Category 1 HHSRS hazards by dwelling age, 2016

Dwelling age	Number of Category 1 hazards	Minimum (£)	Maximum (£)	Mean (£)	Median (£)	Total costs (£)
Pre - 1919	22,049	23	77,715	9,248	2,748	203,909,097
1919 - 1944	11,237	23	18,778	2,447	1,026	27,492,826
1945 - 1964	12,722	75	8,634	1,612	1,128	20,504,464
1965 - 1980	11,378	117	8,142	2,182	1,294	24,825,978
Post 1980	12,491	120	8,950	2,267	1,074	28,321,684
Total	69,878	23	77,715	4,366	1,294	305,054,048

Base: all dwellings with a Category 1 hazard



Costs to make safe and dwelling type

Flats have the highest average (mean) and median costs to mitigate Category 1 hazards, but flats comprised just 4% of all Category 1 hazards and the sample size used to estimate costs is small. Almost one half (47%) of the total cost to make safe would be required to mitigate Category 1 hazards in detached houses.

Table 4: Costs (£) to mitigate Category 1 HHSRS hazards by dwelling type, 2016

Dwelling type	Number of Category 1 hazards	Minimum (£)	Maximum (£)	Mean (£)	Median (£)	Total costs (£)
Bungalow	18,241	112	46,584	4,060	1,294	74,049,346
Terraced House	13,563	75	17,055	2,489	1,294	33,761,311
Semi-Detached House	12,688	23	18,778	2,369	849	30,059,542
Detached House	22,485	23	77,715	6,322	1,294	142,157,696
Flat/Apartment	2,901	75	22,119	8,628	3,727	25,026,153
Total	69,878	23	77,715	4,366	1,294	305,054,048

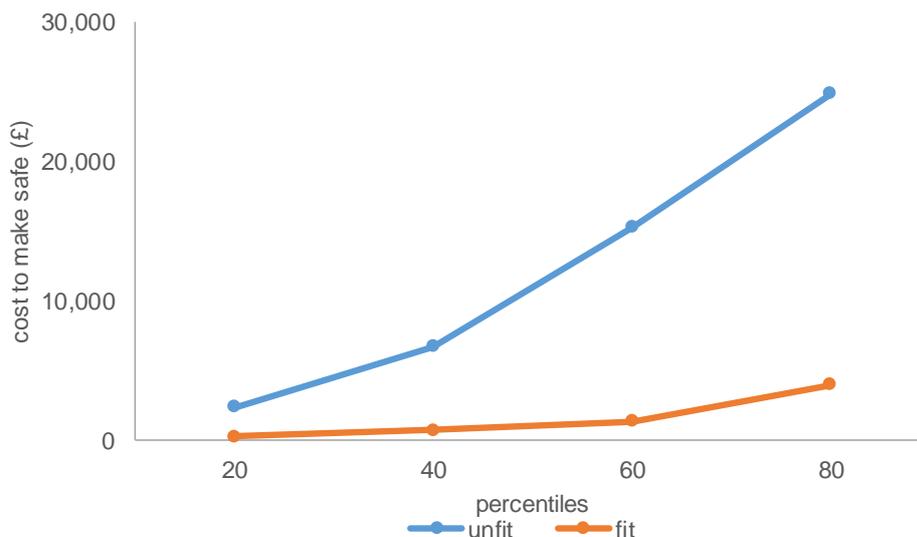
Note: Please use flat/apartment data with caution as numbers were small.

Base: all dwellings with a Category 1 hazard

Costs to make safe and fitness

Dwellings assessed as unfit for habitation comprise 2% of the surveyed stock, 18% of all Category 1 hazards but 58% of the total costs to make safe. Surveyors recommended that 12% of unfit homes be demolished (or replaced) and this should be considered when average and total costs to make safe are considered. Figure 5 shows the distribution of costs to make safe by fit and unfit dwellings.

Figure 5: Distribution of cost to make safe by fitness, 2016



Base: all dwellings with a Category 1 hazard



Comparison with England

There are methodological differences between the NIHCS and the English Housing Survey (EHS) for estimating the cost to make safe, particularly with regards to Standard Assessment Process⁵ (SAP) and Energy Performance Certificate⁶ (EPC) improvements for estimating and mitigating excess cold respectively.

For information only, the findings for Northern Ireland have been compared with the latest available EHS dataset for England (2014+2015 combined). It is important to bear in mind that some derelict/near derelict dwellings surveyed for the NIHCS would not be eligible for a survey for the EHS.

Table 6: Average costs (£) to mitigate Category 1 HHSRS hazards in Northern Ireland and England

	NI 2016	England 2015
Number of Category 1 hazards	69,878	2,918,228
Proportion of Category 1 hazards	9.0	12.4
Average costs to make safe (£)	4,366	2,908

⁵ The methodology used by the Government to assess and compare the energy and environmental performance of dwellings.

⁶ A certificate that shows how energy efficient a property is.



Appendix 1: Confidence intervals for costs to mitigate Category 1 HHSRS hazards

Note: The confidence intervals in Tables A1 to A4 are based on the assumption that the sample is a simple random sample. The confidence intervals do not account for all potential sources of error, e.g. surveyor variability.

Table A1: Costs (£) to mitigate Category 1 HHSRS hazards by tenure and occupancy, 2016

	Mean	Unweighted base	Standard Error	95% confidence interval	
				lower	upper
Owner occupied	2,329	119	296	1,749	2,909
Private rented	2,065	30	460	1,164	2,966
Social	1,696	16	351	1,008	2,384
Vacant	17,015	29	3,820	9,529	24,502

Base: all dwellings with a Category 1 hazard

Table A2: Costs (£) to mitigate Category 1 HHSRS hazards by dwelling age, 2016

	Mean	Unweighted base	Standard Error	95% confidence interval	
				lower	upper
Pre - 1919	9,248	57	2,221	4,895	13,600
1919 - 1944	2,447	29	733	1,010	3,883
1945 - 1964	1,612	36	369	888	2,335
1965 - 1980	2,182	33	365	1,467	2,897
Post 1980	2,267	39	413	1,459	3,076

Base: all dwellings with a Category 1 hazard



Table A3: Costs (£) to mitigate Category 1 HHSRS hazards by dwelling type, 2016

	Mean	Unweighted base	Standard Error	95% confidence interval	
				lower	upper
Bungalow	4,060	52	1,198	1,712	6,407
Terraced House	2,489	37	634	1,247	3,731
Semi-Detached House	2,369	35	613	1,167	3,571
Detached House	6,322	62	1,902	2,593	10,051
Flat/Apartment	8,628	8	2,536	3,657	13,599

Base: all dwellings with a Category 1 hazard

Table A4: Costs (£) to mitigate Category 1 HHSRS hazards by fitness, 2016

	Mean	Unweighted base	Standard Error	95% confidence interval	
				lower	upper
Unfit	13,883	37	3,098	7,810	19,955
Fit	2,238	157	224	1,799	2,676

Base: all dwellings with a Category 1 hazard



Appendix 2: User guide

Method

The cost to make safe data comprises of two stages;

1. Identification of Category 1 hazards using the Housing Health and Safety Rating System (HHSRS)

The NIHCS collects information on the presence of 26 of the 29 HHSRS hazards for each home sampled (the three hazards not collected – asbestos (and MMF), biocides, and volatile organic compounds – are uncommon in their extreme form and cannot be deduced from a non-intrusive survey).

Table 1 on page 5 of this report lists the hazards considered. These hazards fall within four main groups: physiological requirements; psychological requirements; protection against infection and protection against accidents. Further information can be found in the House Condition Survey report on page 143, Appendix G: Modelling Housing Health and Safety Rating System Category 1 Hazards.

[Click here to view the House Condition Survey 2016 report](#)

2. Estimating the cost of repair work to remedy poor housing

As part of the NIHCS, surveyors identify remedial works required to reduce hazard risks that are significantly higher than average to an acceptable level; this level usually being the average for the type and age of dwelling (see the 'method' section on page 3 of this report).

There are methodological differences between the NIHCS and the EHS for estimating the cost to make safe, particularly with regards to SAP and EPC improvements for estimating and mitigating excess cold respectively. It should be noted that NIHCS Category 1 excessive cold has been modelled using the latest SAP2012 methodology; this is not directly comparable with either the SAP2012 (with previous U value assumptions) used for the 2016 and 2017 EHS or with SAP09, used for the 2011 NIHCS. The change in methodology means that time series analysis for the overall prevalence of Category 1 excess cold hazards should be treated with caution.

Quality information

The quality assurance of this modelling work focused on ensuring that the translation of data inputs to produce costs to make dwellings in Northern Ireland safe was carried out robustly and appropriately. The process of development, quality assurance and creation of results followed an internal procedure so the work undertaken could be reviewed and assessed by project managers.

Examples of the quality assurance undertaken to validate the costs to make dwellings safe in Northern Ireland included:

- Updating and revising the methodology using the latest assumptions for this area of work.
- Checking of transformations undertaken and mathematical formulae.
- Internal checks of data inputs to assure translation was completed correctly.
- Checks of correct units for calculations.
- Check correct and latest external data sources were used.
- Sense check of results.
- Internal review of results and reporting.



Surveyors working on the 2016 NIHCS received training and support to help ensure their collection of housing health and safety rating data were consistent and robust. A re-fresher training session in 2016 explained the principles, how the form should be completed as well as conducting practical exercises with feedback sessions. While these measures ensure a good level of consistency in judgements, some surveyor variability is to be expected.

Strengths and weaknesses

Strengths

- The 'Cost to make dwellings safe in Northern Ireland' uses data from the Northern Ireland House Condition Survey which has a number of processes in place to ensure the quality of the data. Quality assurance checks are carried out at various stages of data collection by surveyors, supervisors, staff in the Research Unit and BRE. Also, quality assurance checks are conducted by the producers/suppliers of the administrative data which is used within the HCS.
- A document setting out the quality assurance processes and how the survey meets the European Statistical System's five dimensions of quality are available on the Housing Executive's website: [Click here to view the House Condition Survey's quality information.](#)
- The model used was the most up to date model available. The model included the latest SAP2012 methodology⁷ and the new Energy Performance Certificate (EPC) Improvements model for the NIHCS. The types of energy efficiency improvement measures and the order in which these are applied changed under the new EPC Improvements model. This EPC model uses indicative costs from the Product Characteristics Database (PCDB). The database is maintained by BRE for the purpose of supporting UK building energy performance assessments (EPCs) that are produced using the National Calculation Methodologies for the energy rating of buildings. Where deviations from the EPC improvement methodology have occurred, cost equivalent prices have been used.
- The cost to make safe modelling process builds upon the NIHCS dimensions and repair costs models. This ensures consistency with other outputs from the HCS programme and consistency with previous iterations of the survey.
- The size of the sample for the NI House Condition Survey 2016 was 3,000 addresses. A weighting and grossing process translated the information gathered into figures that reflected the real world.⁸ This provided robust data at Northern Ireland level.

Weaknesses

- All surveys have limitations which can be caused by a number of factors such as budget. The sample size of 3,000 provides robust data at Northern Ireland level. However, where numbers are small care needs to be taken and notes of caution will be included in the report.

⁷ Following the release of version 9.93 of RdSAP 2012, U-values for solid brick, stone and cavity walls have been updated to more accurately reflect their thermal performance. As a result of these changes, SAP2012 was modelled for NIHCS 2016 data using the updated U-values.

⁸ Further information on the sampling, and weighting and grossing processes for the Northern Ireland House Condition Survey 2016 is available in the [report](#)