Communities and Local Government

ENGLISH HOUSING SURVEY

Housing and neighbourhood conditions

English Housing Survey technical advice note

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December 2010
Department for Communities and Local Government

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Online via the website: www.communities.gov.uk

December 2010

ISBN: 978 1 4098 2698 9

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Introduction

1. This is one of a series of Technical Advice notes to give users further information about how EHS data is collected and quality assured and how some of the key derived measures are created. This Note describes how some of the more complex measures about the housing stock and the surrounding neighbourhood are derived.

2. The English Housing Survey (EHS) collects very detailed information about the overall condition and quality of the housing stock using a detailed physical inspection by trained surveyors. A number of the simpler measures and indicators e.g. presence of damp problems, age of kitchen etc. are either self-explanatory or covered in the glossary to the main reports. This note focuses on measures that are more complex to define and/or model:

    - The Housing Health and Safety Rating System
    - Decent Homes
    - Disrepair
    - Accessibility
    - Worst neighbourhood upkeep problems

3. Measures related to energy efficiency, carbon emissions and energy improvements are covered in a separate note

Housing Health and Safety Rating System

4. This section presents an overview of the Housing Health and Safety Rating System (HHSRS) and how the various hazards are measured and modelled using data from the English Housing Survey (EHS).
   It is divided into three sections:

    - What is the HHSRS?
    - How does the EHS measure and model Category 1 hazards?
    - Data quality and reliability

What is the HHSRS?

5. The Housing Health and Safety Rating System (HHSRS) is the government's evidence based risk assessment procedure for residential properties. It replaced the Housing Fitness Regime on 6 April 2006 in England. HHSRS also replaces the Fitness Standard as an element of the Decent Homes Standard. 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. Altogether 29 hazards are included (Table 1).

Table 1: The 29 hazards covered by HHSRS

Physiological Requirements	**Protection Against Infection**
dampness and mould growth	domestic hygiene, pests and refuse
excess cold	food safety
excess heat	personal hygiene, sanitation and drainage
asbestos (and MMF)	water supply
biocides	
carbon monoxide and fuel combustion products	**Protection Against Accidents**
lead	falls associated with baths etc
radiation	falling on level surfaces
uncombusted fuel gas	falling on stairs etc
volatile organic compounds	falling between levels
	electrical safety
Psychological Requirements	fire
crowding and space	flames, hot surfaces etc
entry by intruders	collision and entrapment
lighting	explosions
noise	position and operability of amenities etc
	structural collapse and falling elements

6. The HHSRS scoring procedure uses a formula to generate a numerical hazard score for each of the hazards identified at the property - the higher the score, the greater the severity of that 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 on stairs and falls on the level, the vulnerable group is defined as persons over 60 years, and for falls between levels it is children under five years old.

7. The hazard score formula requires the HHSRS inspector to make two judgements.

    - The likelihood of the occurrence which could result in harm to a vulnerable person over the following 12 months. The likelihood is to be given as a ratio – e.g., 1 in 100, 1 in 500, etc.
    - The likely health outcomes or harms which would result from the occurrence. From any occurrence there may be a most likely outcome, and other possible ones which may be more or less severe. For example, a fall from a second floor window could result in a 60 per cent chance of a severe concussion, but there may also be a 30 per cent chance of a more serious injury and a 10% chance of something less serious. The four classes of harms and the weightings given to them are listed in Table 2.

Table 2: Classes of harms and weightings used in the HHSRS

Class	Examples	Weightings
Class I	Death, permanent paralysis below the neck, malignant lung tumour, regular severe pneumonia, permanent loss of consciousness, and 80% burn injuries.	10,000
Class II	Chronic confusion, mild strokes, regular severe fever, loss of a hand or foot, serious fractures, very serious burns and 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 and 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 and regular serious coughs or colds.	10

8. From the judgements made by the HHSRS inspector, a hazard score can be generated for each hazard as illustrated below:

Class of Harm Weighting			Likelihood 1 in		Spread of Harm (%)		
I	10,000	÷	100	X	0	=	0
II	1,000	÷	100	X	10	=	100
III	300	÷	100	X	30	=	90
IV	10	÷	100	X	60	=	6
				Hazard Score		=	196

9. To provide a simple means for handling and comparing the potentially wide range of scores and avoid placing too much emphasis on the exact numbers, a series of ten hazard score bands have been devised as shown below. Bands A, B, and C are the most serious and grouped together as presenting a Category 1 hazard; local authorities have a statutory duty to consider some form of action where these are present.

Band	Equivalent Hazard Scores
A	5,000 or more
B	2,000 – 4,999
C	1,000 –1,999
D	500 – 999
E	200 – 499
F	100 – 199
G	50 – 99
H	20 – 49
I	10 – 19
J	9 or less

10. DCLG, and others, have published a number of guidance documents for HHSRS practitioners and private landlords. For guidance published by DCLG see: http://www.communities.gov.uk/documents/housing/pdf/142631.pdf

How does EHS measure and model Category 1 hazards?

11. The EHS is a multi-purpose national stock condition survey. Surveyors are required to collect a wide range of information in what is a relatively short and non-intrusive property inspection. The survey cannot therefore replicate in full the HHSRS assessment that would be carried out by a local authority environmental health practitioner. The approach used has been developed by the Building Research Establishment working in close co-operation with experts from the University of Warwick who were involved in the development of the HHSRS methodology.

12. Of the 29 HHSRS hazards only three (which occur very rarely in the stock) are not assessed by the EHS.

13. The EHS uses three different methods to assess the 26 hazards:

- Fully measured as part of the physical survey – the surveyor first assesses whether the risks presented for each of these 10 hazards are significantly worse than average for the age and type of dwelling concerned. If this is the case, they then score both a likelihood of an incident occurring and the expected range of outcomes. An actual HHSRS score is not computed in the field although surveyors obtain this later during validation of their survey data prior to submission.
- Flagged as an 'extreme' risk as part of the physical survey. This approach is used for some of the rarer hazards where surveyors are instructed that 'extreme risk' equates to a Category 1 hazard.
- Modelled post fieldwork from other data collected on the physical survey form.

14. Table 3 below shows how information on each hazard is collected. In making their HHSRS assessments surveyors are instructed to ignore the current occupancy and assume a member of the group most vulnerable to the particular hazard occupies the property. A worked example is attached at annex A.

Table 3: Summary of how EHS collects and models information about HHSRS hazards

Hazard	How assessed	Average score	Specified vulnerable age group
Excess cold*	Modelled	926	Age 65 or over
Falling on level surfaces*	Fully measured	181	Age 60 or over
Falling on stairs etc*	Fully measured	134	Age 60 or over
Radiation*	Modelled	91	None
Collision and entrapment	Fully measured	57	Age under 5

Flames, hot surfaces etc*	Fully measured	42	Age under 5
Crowding and space*	Modelled	19	None
Fire*	Fully measured	17	Age 60 or over
Dampness and mould growth*	Fully measured	11	Age under 14
Entry by intruders	Fully measured	11	None
Falls associated with baths	Fully measured	7	Age 60 or over
Noise*	Fully measured	6	None
Falling between levels*	Fully measured	4	Age under 5
Food safety	Flagged if an extreme risk	2	None
Electrical safety*	Flagged if an extreme risk	2	Age under 5
Carbon monoxide and fuel combustion products*	Flagged if an extreme risk	1	Age 65 or over
Personal hygiene, sanitation and drainage*.	Flagged if an extreme risk	1	Age under 5
Explosions	Flagged if an extreme risk	1	None
Position and operability of amenities etc	Flagged if an extreme risk	1	Age 60 or over
Structural collapse and falling elements	Flagged if an extreme risk	1	None
Excess heat	Flagged if an extreme risk	0	Age 65 or over
Asbestos (and MMF)	Not assessed	0	None
Biocides	Not assessed	0	None
Lead*	Modelled	0	Age under 3
Uncombusted fuel gas	Flagged if an extreme risk	0	None
Volatile organic compounds	Not assessed	0	None
Lighting	Flagged if an extreme risk	0	None
Domestic hygiene pests and refuse.*	Flagged if an extreme risk	0	None
Water supply	Flagged if an extreme risk	0	None

Note:
(1) Average scores are for all dwellings and taken from Version 2 of the guidance
(2) the 15 hazards which were scored or modelled for 2006 and 2007 are identified by an asterisk. This group is used in the decent homes HHSRS criterion.

15. In the 2006 and 2007 English House condition Survey (EHCS), fewer hazards were fully scored and some of the hazards that are now measured or flagged were modelled using other data (see the EHCS technical report from 2007 for full details: http://www.communities.gov.uk/publications/housing/ehcstechnicalreport2007).

16. From 2008 reporting of HHSRS covers all of the 26 hazards covered by EHS. The 2006 and 2007 EHCS reports included just 15 hazards so figures are not strictly comparable. Reporting on Decent Homes, continues to use the ‘old’

(15 hazards) version of HHSRS for continuity (see Decent Homes section later in this note) to ensure consistency over time.

17. Table 4 summarises the assumptions and data used for four hazards that are modelled from other data.

Table 4: Methods used to model HHSRS hazards using EHS data

Hazard	Category 1 hazard defined as:
Excess Cold	The dwelling has a SAP rating of less than 31.49 under SAP 2005 methodology (equivalent to SAP 35 under the 2001 methodology). This threshold was based on modelling carried out by BRE based on the likelihood of a retired household on means-tested benefits being in fuel poverty.
Radiation	The dwelling is located in one of the 16 post code sectors critical based on radon exposure map of England AND was a house built before 1980.
Lead	The dwelling is located in one of 4 post codes with very soft water (based on the drinking water quality map of England) AND built before 1945 AND with lead piping present either before or after the mains stop cock
Crowding and space	The occupants per habitable room ratio was calculated. If this exceeds 2 the dwelling has a category 1 hazard regardless of size. If it is equal to 2 and the number of habitable rooms is 2 or more the dwelling also has category 1 hazard.

Data quality and reliability

18. Surveyors working on the EHS have received extensive training and support to help ensure their HHSRS assessments are consistent and robust. This includes an initial two days of residential training involving classroom and field exercises. Refresher programmes are provided annually together with manuals providing benchmark examples for reference when making their judgements. New surveyors are accompanied in the field and there is on-going close supervision throughout fieldwork. Calibration exercises are being implemented to monitor variability in surveyors' HHSRS assessments over time.

19. While these measures will ensure a good level of consistency in judgements, the HHSRS is still relatively new and some variability is to be expected in the early years as surveyors become fully conversant with the methodology. The EHS approach to the HHSRS is now fixed and this will give surveyors the opportunity to fully consolidate their skills over the next few years.

Decent homes

20. This section gives a detailed definition of the four criteria that a decent home is required to meet, and explains how they are applied to the EHS data. A dwelling must meet all of the four criteria listed below to be classed as decent:

- be above the current statutory minimum standard for housing
- be in a reasonable state of repair
- provide reasonably modern facilities and services
- provide a reasonable degree of thermal comfort

Criterion A: the dwelling meets the current statutory minimum standard for housing

21. The current minimum standard for housing is the Housing Health and Safety Rating System (HHSRS). To be decent, the dwelling must be free from Category 1 hazards (see previous section).

Applying the criterion in the EHS

22. The presence of Category 1 hazards is assessed as described in the previous section. For this criterion only the 15 hazards which have been assessed since 2006 are included to ensure consistency over time.

Criterion B: the dwelling is in a reasonable state of repair

23. A dwelling satisfies this criterion unless:

- one or more key building components are old and, because of their condition, need replacing or major repair; or
- two or more other building components are old and, because of their condition, need replacement or major repair.

24. Key building components are those which, if in poor condition, could have an immediate impact on the integrity of the building and cause further deterioration in other components. They are the external components plus internal components that have potential safety implications and include:

- external walls
- roof structure and covering
- windows/doors
- chimneys
- central heating boilers
- gas fires
- storage heaters
- electrics

25. If any of these components are old and need replacing, or require immediate major repair, then the dwelling is not in a reasonable state of repair and remedial action is required.

26. Other building components are those that have a less immediate impact on the integrity of the dwelling. Their combined effect is therefore considered, with a dwelling not in a reasonable state of repair if 2 or more are old and need replacing or require immediate major repair.

The terms 'old' and 'in poor condition' are also quite tightly defined as below:

- 'old' - the component is older than its expected or standard lifetime. The component lifetimes are listed later Table 5.
- 'in poor condition' - the component needs need major work, either full replacement or major repair. The definitions used for different components are as listed in Table 6.

Applying the criterion in the EHS

27. Establishing whether dwellings in the EHS meet this criterion depends on the assessment both of the ages of key and other building components and of their condition.

28. The EHS surveyors record the ages of the main external building elements together with key services and amenities. They are also given the shortcut option of recording whether elements are original i.e. the same as the building itself. Where the age of a component is unknown, it is assumed to be original i.e. the same age as the dwelling. In the relatively small proportion of cases where components are recorded as the 'same age as dwelling', it is necessary to calculate the probability that they have exceeded their lifetime. This is because age of dwelling is recorded in relatively wide bands rather than as a single year.

29. For example, windows in houses are assumed to have exceeded their lifetime if they are more than 40 years old (see Table 1 below). Where dwellings were built between 1965 and 1974 and still had the original windows, some of these would have windows that were over 40 years old by 2008. A simple and robust approach is used, assuming that roughly equal numbers of dwellings were built in each year of this age band. Dwellings built between 1965 and 1967 represent three years out of the 10 year age band, so all original windows in dwellings built in 1965-1974 are given a probability of 0.3 of being over 40 years old in 2008.

30. For most dwellings, the assessment of whether or not they satisfy the disrepair criterion is clear cut. For the remainder, for each building component which is in poor condition, the probabilities of being beyond the normal lifetime are combined to give a total probability, taking into account the

split into major and minor elements. If this total is greater than 0.5, the dwelling is classed as non-decent due to disrepair.

31. Table 5 shows the lifetimes of building components used to assess whether the components are 'old' in the terms of the disrepair criterion. These lifetimes are used to construct the national estimates of the number of dwellings that are decent and those that fail.

Table 5: Component lifetimes used in the disrepair criterion

Building components (key components marked *)	Houses and bungalows	All flats in blocks of below 6 storeys	All flats in blocks of 6 or more storeys
Wall structure *	80	80	80
Lintels *	60	60	60
Brickwork (spalling) *	30	30	30
Wall finish *	60	60	30
Roof structure *	50	30	30
Roof finish *	50	30	30
Chimney *	50	50	N/A
Windows *	40	30	30
External doors *	40	30	30
Kitchen	30	30	30
Bathrooms	40	40	40
Heating - central heating gas boiler *	15	15	15
Heating - central heating distribution system	40	40	40
Heating - other *	30	30	30
Electrical systems *	30	30	30

Table 6 sets out the definitions used within the disrepair criterion to identify whether building components are 'in poor condition'. For more detailed information on how surveyors are instructed to record disrepair see the disrepair section of this note.

Table 6: Definition of 'poor condition' used in disrepair criterion

	Definition of 'in poor condition' used in EHCS
Wall structure	Replace 10% or more, or repair 30% or more
Wall finish	Replace/ repoint/ renew 50% or more
Chimneys	1 chimney needing partial rebuilding or more
Roof structure	Replace 10% or more or strengthen 30% or more
Roof covering	Replace or isolated repairs to 50% or more
Windows	Replace at least one window or repair/ replace sash or member to at least two (excluding easing sashes, reglazing, painting)
External doors	Replace at least one
Kitchen	Major repair or replace 3 or more items out of 6 (cold water drinking supply, hot water, sink, cooking provision, cupboards, worktop)
Bathroom	Major repair or replace 2 or more items (bath, wash hand basin, WC)
Electrical system	Replace or major repair to system
Central heating boiler	Replace or major repair
Central heating distribution	Replace or major repair
Storage heaters	Replace or major repair

Criterion C: The dwelling has reasonably modern facilities and services

32. A dwelling is considered not to meet this criterion if it lacks three or more of the following facilities:
    - a kitchen which is 20 years old or less
    - a kitchen with adequate space and layout
    - a bathroom which is 30 years old or less
    - an appropriately located bathroom and wc
    - adequate noise insulation
    - adequate size and layout of common entrance areas for blocks of flats

33. The ages used to define the 'modern' kitchen and bathroom are lower than those for the disrepair criterion. This is to take account of the modernity of kitchens and bathrooms, as well as their functionality and condition.

34. There is some flexibility inherent in this criterion, in that a dwelling has to fail on three of these tests to be regarded as failing the modernisation criterion itself. Such a dwelling does not have to be fully modernised for this criterion to be passed: it would be sufficient in many cases to deal with only one or two of the facilities that are contributing to the failure.

Applying the criterion in the EHS

35. The two criteria for age of bathroom and kitchen are relatively straightforward to apply using EHS data. The method of assigning age probabilities described above is also used to determine whether kitchens and bathrooms have exceeded their lifetimes as specified in the modernisation criterion. The probabilities of being non-decent on these two components are added to results on the other modernisation measures in to determine whether the dwelling should be classed as non-decent.

36. There is some ambiguity inherent in terms such as 'adequate' and 'appropriate' used for the other four criteria. The EHS (and its predecessor the EHCS) defines these operationally as below:

    - a kitchen failing on adequate space and layout would be one that was too small to contain all the required items (sink, cupboards, cooker space, worktops etc) appropriate to the size of the dwelling
    - an inappropriately located bathroom or wc is one where the main bathroom or wc is located in a bedroom or accessed through a bedroom (unless the bedroom is not used or the dwelling is for a single person). a dwelling would also fail if the main wc is external or located on a different floor to the nearest wash hand basin, or if a wc without a wash hand basin opens on to a kitchen in an inappropriate area, for example next to the food preparation area
    - inadequate insulation from external airborne noise would occur where there are problems with, for example, traffic (rail, road or aeroplanes) or factory noise. Reasonable insulation from these problems should be ensured through installation of double glazing

- inadequate size and layout of common entrance areas for blocks of flats would occur where there is insufficient room to manoeuvre easily, for example where there are narrow access ways with awkward corners and turnings, steep staircases, inadequate landings, absence of handrails, low headroom etc.

Criterion D: the dwelling provides a reasonable degree of thermal comfort

37. The definition requires a dwelling to have both:

    - efficient heating; and
    - effective insulation

38. Both of these are defined very precisely in terms of what is present rather than by the overall energy performance of the dwelling.

39. Under this definition, efficient heating is defined as any gas or oil programmable central heating or electric storage heaters / programmable solid fuel, or communal heating or LPG central heating or similarly efficient heating systems. Heating sources which provide less energy efficient options do not meet this criterion.

40. Because of the differences in efficiency between gas/oil heating systems and the other heating systems listed, the level of insulation that is appropriate also differs:

    - for dwellings with gas/oil programmable heating, cavity wall insulation (if there are cavity walls that can be insulated effectively) or at least 50mm loft insulation (if there is loft space) is an effective package of insulation
    - for dwellings heated by electric storage heaters/programmable solid fuel or LPG central heating a higher specification of insulation is required to meet the same standard: at least 200mm of loft insulation (if there is a loft) and cavity wall insulation (if there are cavity walls that can be insulated effectively)

Applying the criterion in the EHS

41. Assessing whether the EHS sample dwellings pass or fail the decent homes thermal comfort criterion is complex because it involves an array of survey information related to insulation, heating and structural properties. The data collected on the form and the modelling assumptions have been changed and refined since the original 'baseline' figures were published in 2001 but have remained the same since 2006. For more information on how these have changed over time see the EHCS 2007 Technical Report (http://www.communities.gov.uk/publications/housing/ehcstechnicalreport2007).

42. The EHS assessment of thermal comfort uses the key heating and insulation variables for type of heating, fuel, and loft insulation. Precisely how these are defined and modelled is described in the technical note on Energy efficiency. However, there are three main differences and complications:

- Establishing whether dwellings have 'cavity walls that can be insulated effectively'
- Dealing with flats on the ground or middle floors of blocks
- Dealing with relatively new energy efficient homes that might technically fail a strict interpretation of the standard.

43. Each of these is dealt with in more detail below.

Establishing whether dwellings have 'cavity walls that can be insulated effectively'

44. Not all dwellings that have cavity walls as calculated for the purposes of energy modelling can be easily or effectively insulated. The assessment of whether walls are 'cavity' is based on the visible external walling and takes no account of the building structure. The definition of 'cavity walls' and determining whether these require insulation for thermal comfort purposes is therefore subtly different to that used generally in the energy modelling. Only dwellings classed as 'masonry boxwall cavity' in the construction type and where at least 50 per cent of the total external wall area is cavity brickwork are classed as having 'cavity walls' for thermal comfort modelling. Having examined the technical issues, feasibility and costs for non-traditional types of construction, the model assumes that none of these can be classed as having cavity walls for the purposes of thermal comfort.

Dealing with flats on the ground or middle floors of blocks

45. Where these flats have gas central heating, the standard requires them to have either cavity wall insulation or loft insulation. However, they have no loft, so the issue is whether they should have to have cavity wall insulation to pass. These homes are typically energy efficient so it is assumed that the presence of another flat above provides adequate insulation and therefore cavity wall insulation would not be additionally necessary to meet the criterion. Further discussion with social landlords suggested that most would agree with the approach.

Dealing with relatively new energy efficient homes that might technically fail a strict interpretation of the standard

46. Analysis of 1996 EHCS data indicated a few serious anomalies in applying the thermal comfort criterion (as written in the original guidance) to newer homes. Some 56 per cent of RSL flats built after 1980 appeared to fail the thermal comfort criterion in 1996. After more detailed consideration of the technical issues and Building Regulations, the model automatically sets

dwellings built after 1990 to pass. This is because it was only in the 1990s that Building Regulations took a more holistic approach to energy conservation (i.e. specified the heat loss to be achieved rather than precisely how this should be done in terms of insulating roofs, floors etc.). Installing 200mm of loft insulation also did not become standard practice until the 1990s. Throughout most of the 1980s 50mm or 100mm loft insulation was most commonly used.

47. For houses, this is relatively straightforward. They key thing to note is that where houses have gas or oil central heating and non-cavity walls, they must have at least 50mm of loft insulation to pass.

Disrepair

48. This section presents an overview of how repair costs are derived from the EHS and is divided into three sections:

    1 The different repair cost measures used

    2 What types of work are excluded and included

    3 An outline of how the raw data is used to generate the costs.

Repair cost measures

49. Information about repair costs is used for two basic purposes:

- To assess how much it would cost to carry out the specified work to the dwelling to give some idea of the likely level of investment needed. This is termed 'required expenditure' or 'actual costs'.
- To assess whether parts of the stock are in a better or worse state of repair than others. This is measured through 'standardised costs'.

50. These two different cost measures are constructed as follows:

51. Required expenditure – This is an estimate of what the specified work to the individual dwelling would actually cost. These costs therefore take account of regional variations in prices and assume different project sizes for work to houses in different tenures. In the owner occupied and private rented sector, the contract size for work to houses is taken to be one. In the social rented sector, the contract size is taken as the number of dwellings on the estate unless the house is not on an estate and therefore assumed to be a street property with a contract size of one. For flats, the contract size for exterior works is the size of the block regardless of tenure. This measure assumes that all work is carried out by contractors who operate in accordance with health and safety regulations. The costs do not include any VAT or mark up for profit. These costs should not be used for assessing differences in condition between different tenures or dwelling types because they vary

according to dwelling size, tenure and location (note on the EHS data base these costs are shown as ‘actual costs’.

52. Standardised repair costs - this is an index of disrepair, that expresses costs in pounds per square metre (£/m2) based on prices for the East Midland region (where prices can be regarded as a mid point in the range of regional prices). The same assumptions about contract size are made for houses in all tenures (contract size = 5 dwellings) and are then divided by the total floor area of the dwelling. It is therefore an ‘index of disrepair’ that can be used to compare the relative levels in disrepair for dwellings of different sizes, in different tenures and different locations.

53. The extent of work required to a dwelling depends on the judgements made by the surveyor about the urgency of that work. The two different measures of required expenditure and standardised costs are therefore presented with a reference to three different time scales.

54. Urgent repairs: This is a measure of serious and immediate problems in the dwelling and includes all interior work. Where surveyors record that work is needed to an exterior building element, they indicate whether work specified was urgent. To be classed as ‘urgent’, the problem must meet at least one of the following criteria:

    - it threatens the immediate safety of occupants or passers-by or is a health hazard
    - it is currently promoting noticeable and rapid deterioration in other parts of the building
    - it is at present causing difficulty or discomfort to the occupants (or would do so if the dwelling were occupied)
    - the security of the building is threatened

    (variables on data base = cstactux and cststdux)

55. Basic repairs: This is all works that the surveyor has identified as necessary to carry out within five years, including any urgent work as described above. These do not include replacement of building elements nearing the end of their life where the surveyor has recorded that this action could be delayed by more than five years; often by short term patch repairs (variables on data base = cstactbx and cststdbx).

56. Comprehensive repairs: This includes all repairs as specified above together with any replacements that the surveyor has assessed as being needed in the next 10 years. For all exterior elements, whether repairs are needed or not, surveyors record the number of years before the element needs replacing either following specified repair work or simply as the remaining life expectancy. This measure provides a better basis for identifying work which would form part of a planned programme of repair by landlords (variables on data base = cstactcx and cststdcx).

What types of work are included and excluded?

57. The costs described above include all of the following types of work:

- all work to the external fabric of the building - chimneys, roof, roof and soil drainage, windows, doors, dormers, bays, porches, balconies, damp proof course and treatment of inappropriate gradients/levels of ground adjacent to the dwelling
- additional work to deal with structural instability: e.g. underpinning, tying in of walls, treatment of fungal or insect infestation, replacement of cavity wall ties, etc
- work to the internal fabric - ceilings, floors, internal and partition wall surfaces, internal doors and stairs
- work to amenities and services inside the dwelling - kitchen, bathroom, WC, electrical wiring, plumbing, gas pipes, heating, and water heating
- work to common areas and access ways in blocks of flats - floors, walls, ceilings, doors, screens, windows, lighting and balustrades
- work to shared facilities on estates - stores and common rooms, communal parking facilities, surfaces and fences and common services. Note that this only covers any shared facilities that might be used by the occupants of the survey dwelling and which, for large estates, are located within 100 metres of the survey module.

58. The costs **exclude** the following:
- work to fences and boundary walls
- work to underground drainage
- hidden work to structure or foundations
- work to plant associated with shared facilities, e.g. lift motors, communal boilers, washing machines in laundry rooms, etc
- shared facilities not used/useable by the dwelling itself
- VAT, professional fees, overheads or profit.

59. It is also important to remember that repair costs are based on a snapshot of the housing stock at the time of the survey and no provision is made for any routine regular maintenance that would (or should) be carried out e.g. servicing of boilers, lifts etc. or clearing of gutters.

Calculating repair costs

60. The EHS uses four types of information to calculate base repair costs:

1 The surveyors' assessments of the type of repair needed and its extent

2 The surveyor's description of the materials from which the element is constructed (for external elements only)

3 Building dimensions and configuration derived from surveyors' measurements and observations

4 Unit prices for different types of job from the 1996 National Schedule of Rates (NSR), adjusted for inflation using the Building Cost Information Service (BCIS) national price index.

61. The surveyor assesses each element in turn; usually surveying the interior first, and then the exterior of the dwelling. Internally an assessment of the main rooms is made (the main living room, main bedroom plus hall, kitchen and bathroom. The work identified as needed in the sample of rooms is scaled up to reflect the total number of rooms in the dwelling. All of the internal amenities and services are surveyed individually.

62. For the common areas in blocks of flats, surveyors select only part of the common areas to survey – the main entrance, stairway and corridor/deck used by the survey dwelling. These are assumed to be representative of the whole of the common areas and scaled up accordingly.

63. Externally the surveyor assesses each element in turn looking at the building from two vantage points ('views') which between them encompass the whole building.

64. In assessing the type and extent of work needed, surveyors follow a sequence of decisions that are made explicit on the survey form:

- identify whether there is a fault
- determine the nature of the action
- determine the scale of the action
- determine the timing of the action (for exterior elements only)

65. These assessments will depend on a large number of factors. What standard of repair should be aimed for? Will the work be spread over time or is it all to be done straightaway? How long must the building remain in good condition once the work is done? How much is it worth spending on the building? According to how these questions are answered, the final repair cost can vary considerably. EHS therefore sets fairly stringent ground rules and assumptions for surveyors to follow.

66. In making their assessments, surveyors are instructed to assume that dwellings have an indefinite life – repairs are recorded even where it is felt to be uneconomic.

67. When determining the nature of the action required, they are instructed to treat the work as a programme of actions stretching into the future which means to repair rather than replace unless:

- this is impossible
- it means that the element will still need replacing within five years
- the element needs replacing for other reasons, e.g. it is unsuitable for its intended purpose. Here, the standard of work should result in the

element being fully functional without any allowance for modernisation, upgrading or purely cosmetic improvements

68. In deciding how much of the element requires the specified action, they are instructed not to employ economies of scale. The quantity of work required is recorded in different ways for different types of elements:

    - in tenths, for elements treated as areas, e.g. walls, roofs, or lengths e.g. roof features. The building measurements and other information enable us to calculate the total number of square metres of each element in each view or room e.g. external walling at the rear, ceiling in the kitchen etc. and these are then multiplied by the proportions indicated by the surveyor to obtain an actual quantity
    - in number of units needing work, for elements which can be treated as individual entities, e.g. doors, windows, baths
    - in square or linear metres for work to elements where there is insufficient data to estimate the total quantity within the building e.g. flooring in common areas

69. For the last two the quantity given is multiplied by the unit cost for the job specified. For the elements where the work is specified as a proportion, this is first converted to a quantity (m^2 or linear metres)from the dimensions taken of the dwelling/building and then this quantity is multiplied by the unit price (per m^2 or per m) for the type of work specified. In all cases it is assumed that a like for like replacement is undertaken and the costs selected reflect the materials from which the element is currently constructed, e.g. a slate roof is always replaced with a slate roof.

70. The cost calculated is for the individual dwelling. Therefore for flats the cost of works to the common areas and exterior, recorded for the whole building, is divided by the number of flats and this is added on to the interior, amenities and services costs for the individual dwelling.

Dealing with missing data

71. The cases included in the physical survey database are those where a full survey was conducted, but even where the form was completed fully the surveyor may have omitted to provide some information needed to calculate repair costs. Such omissions are, however, increasingly rare, particularly after the introduction of the digital pen technology.

72. Where data is missing costs are imputed using data for dwellings of a similar age and type:

    - If the surveyor has clearly indicated that repairs are needed to an element, but not what those repairs are, then an average cost for that element is taken from dwellings of a similar age and type where repairs are needed to that same element.

- If the surveyor has not indicated whether repairs are needed to an element, then an average cost for that element is taken from all dwellings of a similar age and type.

Add-ons, uplifts, preliminaries and modifications to base costs

73. Once the 'base' costs have been calculated as above, additional sums are added to account for preliminaries and access equipment:

    - preliminaries – this covers items required before the work can commence e.g. site hut, security fencing
    - access equipment – this includes the costs for scaffolding, cradles and other equipment needed to work safely at height

74. There are also factors added to account for 'uplifts' or economies of scale which are calculated differently for the 'required expenditure' and 'standardised costs' versions as described above. Finally, regional price factors are used to further refine the 'required expenditure' costs.

75. It is important to remember that costs do not include any VAT, professional fees, overheads or profit.

Accessibility

76. EHS collects a good deal of information on whether dwellings possess certain features or attributes to make them more accessible and useable for people with disabilities. In reporting, it focuses on the four aspects that roughly equate with the requirements of part M of the Building Regulations:

    1 **Level access to main entrance** - there are no steps between the pavement (or any gate) and the entrance door.
    2 **Flush threshold to main entrance** - the threshold to the main entrance door has no obstruction greater than 15mm. This prevents the threshold from being a trip hazard and allows a wheelchair user to easily enter through the main door.
    3 **Width of internal doorways and circulation space conforms to Part M** - complies with requirements of Building Regulations.
    4 **WC at entrance level** – this is any WC at entrance level as EHS does not indicate whether it is wheelchair accessible.

77. A home is considered to be fully 'visitable' if it has all of the four features listed above. All of these four features are assessed directly by the surveyors during the physical survey according to a set of detailed guidelines which are detailed in the table below.

<table>
<tr><th>Criterion</th><th>Definition</th></tr>
<tr><td>Level access to main entrance</td><td>Surveyors record the number of steps from the front gate / pavement to the entrance to the dwelling. A ‘step’ is any planned change in level, excluding the width of the cill at the bottom of the door. Surveyors will only record level access where there are no steps between the gate / pavement and the entrance door to the dwelling for a wheelchair to negotiate. The path must also have a gradient of less than 1 in 20.</td></tr>
<tr><td>Flush threshold</td><td>This is only recorded as present if a wheelchair can be wheeled straight into a dwelling with no step to negotiate or obstruction higher than 15mm. For houses, this will usually be a specified adaptation. For flats, it is the entrance door into the flat itself that is assessed. Purpose-built flats are much more likely to have been built with a flush threshold to the entrance door or the flat. Flats on upper or basement floors can have a flush threshold if the journey from the entrance to the module to the inside of the dwelling can be negotiated using a suitable lift and there is no step or obstruction higher than 15mm. If the lift is not working, the flat will still have a flush threshold.</td></tr>
<tr><td>The width of internal doorways and hallways conforms to Part M</td><td>This is only recorded as present if the doors and circulation space serving habitable rooms, kitchen bathroom or WC comply with Part M regulations, as follows:
<table>
<tr><th>Doorway clear opening width (mm)</th><th>Corridor/passageway width (mm)</th></tr>
<tr><td>750 or wider</td><td>900 (when approach head-on)</td></tr>
<tr><td>750</td><td>1200 (when approach not head-on)</td></tr>
<tr><td>775</td><td>1050 (when approach not head-on)</td></tr>
<tr><td>800</td><td>900 (when approach not head-on)</td></tr>
</table>
</td></tr>
<tr><td>WC at entrance level</td><td>The WC must be located on the same level as the entrance to the house or flat and must be located inside the dwelling.</td></tr>
</table>

78. The survey also collects a range of additional data relevant to the accessibility of the dwelling:

- Car parking – size and proximity to dwelling

- Living room at ground floor or entrance level or space to provide one
- Bedroom at ground floor or entrance level or space to provide one
- Space for turning wheelchairs in kitchens, dining areas and living rooms
- Bath/shower at entrance level
- Main entrance illuminated
- Main entrance covered

79. This information was analysed and reported on in the EHCS 2007 Annual Report and technical details can be found in Chapter 11 of the EHCS 2007 Technical Report (http://www.communities.gov.uk/publications/housing/ehcstechnicalreport2007).

Poor quality environments

80. 'Neighbourhood' or 'local environment' problems from the survey are based on the professional surveyors' assessments of problems in the immediate environment of the home on a scale of 1 ('no problems') to 5 ('major problems'). These assessments are based on observed problems (in some cases verified with the resident) rather than any specialised measurement instruments or recourse to other environment data.

81. The survey assesses three types of problems contributing to a poor quality environment:

    Upkeep: the upkeep, management or misuse of the private and public space and buildings (specifically, the presence of: scruffy or neglected buildings, poor condition housing; graffiti; scruffy gardens or landscaping; litter, rubbish or dumping; vandalism; dog or other excrement; nuisance from street parking; condition of road/pavements and street furniture);

    Traffic and transport: road traffic and other forms of transport (specifically the presence of: intrusive motorways and main roads; railway or aircraft noise; heavy traffic; and ambient air quality);

    Utilisation: abandonment or non residential use of property (specifically, vacant sites; vacant or boarded up buildings; intrusive industry; or non conforming use of a residential area).

82. A home is regarded as having a significant problem of a given type if it is assessed to have codes 4 or 5 of the scale in respect of any of the specific environmental problems assessed and grouped under that type.

Worst neighbourhood upkeep problems

83. 'Poor quality environments' identifies three types of problems in the immediate environment of the dwelling: 'upkeep', 'traffic' and 'utilisation' problems. For 'worst neighbourhood problems' the focus is on upkeep

problems in the immediate environment and these are identified on the basis of factor scores which are used to identify the 10 per cent of households with 'worst' problems. EHS reporting uses this 10 per cent as one measure of living conditions when assessing disparities between different types of households.

84. The starting point for identifying these households is surveyor assessment of sixteen potential problems in the immediate environment of the sample dwelling. The assessments are made on a rating scale of 1 (no problems) to 5 (major problems) for each of the sixteen. An overall score for 'upkeep' problems for each dwelling in the sample is created using factor analysis (based on principal components analysis).

85. To illustrate this using 2008 data, Table 7 below sets out the problems assessed by surveyors and how they contribute to the overall score for upkeep problems. The individual problems are also listed in the order of their relative weight (given by the factor coefficient). Negatively weighted problems are correlated with other types of environmental problem ('traffic' and 'utilisation' problems in the poor quality environments classification).

Table 7: Worst neighbourhood problems: upkeep problems and derivation of an upkeep factor score for each dwelling, 2008

				example case		
problem assessed:	factor coefficient	mean rating	standard deviation	actual rating	z score	factor score
Litter, rubblish or dumping	**0.259**	1.594	0.726	3	1.937	0.502
Scruffy gardens or landscaping	**0.257**	1.630	0.778	5	4.332	1.113
Condition of road, pavements and street furniture	**0.241**	1.780	0.805	4	2.758	0.665
Condition of dwellings	**0.203**	1.530	0.702	3	2.094	0.425
Dog or other excrement	**0.193**	1.440	0.629	1	-0.700	-0.135
Graffiti	**0.162**	1.320	0.600	3	2.800	0.454
Vandalism	**0.160**	1.320	0.617	2	1.102	0.176
Scruffy or neglected buildings	**0.158**	1.440	0.694	2	0.807	0.127
Ambient air quality	-0.019	1.490	0.752	2	0.678	-0.013
Railway or aircraft noise	-0.062	1.370	0.699	1	-0.529	0.033
Vacant or boarded-up buildings	-0.064	1.150	0.481	2	1.767	-0.113
Heavy traffic	-0.071	1.500	0.838	2	0.597	-0.042
Vacant sites	-0.095	1.160	0.490	1	-0.327	0.031
Intrusion from motorways or main roads	-0.098	1.510	0.833	2	0.588	-0.058
Non-conforming uses	-0.145	1.110	0.390	1	-0.282	0.041
Intrusive industry	-0.180	1.190	0.536	1	-0.354	0.064
illustrative upkeep factor score						**3.270**

Notes:

The factor coefficient is obtained from a factor analysis (principal component based) of the surveyor ratings for each dwelling and indicates the weighting given to of each assessed problem in determining 'upkeep' problems.

The mean value and standard deviation is based on those surveyor ratings.

The actual score is based on one illustrative dwelling.

The z score is a standardised score for the illustrative dwelling and derived from the mean rating minus the actual rating divided by the standard deviation for each assessed problem.

The factor score is the z score multiplied by the factor coefficient. The upkeep score used to identify worst problems is the total factor score.

86. The actual rating provided by the surveyor for a given problem is transformed into a standardised ('z') score and then multiplied by the factor coefficient to derive a factor score for that problem. The overall upkeep score is the sum of the factor scores for the sixteen assessed problems. For analysis of disparities in living conditions, the overall upkeep score is used to rank each dwelling and identify the 10 per cent of households with the highest score. In 2008, the threshold upkeep score for the 10 per cent with worst neighbourhood problems was 1.374 and the highest score found was 5.962. The example case above has an upkeep score of 3.270. Note: actual values for Table 7 and the threshold for 'worst neighbourhood problems' will vary year to year.

Annex A: Sample worked example for HHSRS assessments taken from EHS surveyor training manual

FALLS ON STAIRS ETC

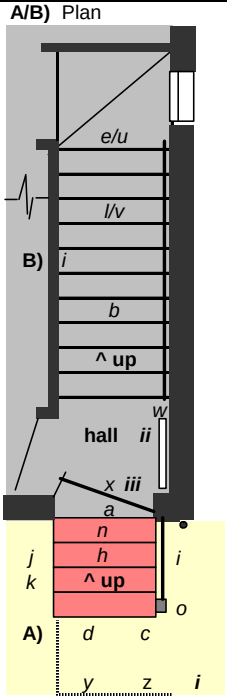
HHSRS VERSION 2

Vulnerable group Persons aged 60 years or over
Related hazards None

Multiple locations **Yes** No
Secondary hazards **Yes** No

A) Front door steps

A/B) Plan



B) Main stairs

C) Steps at gate

DESCRIPTION OF HAZARD/S

Dwelling: 1930s, Semi-detached house

A) **Front door steps:** These are of smooth painted concrete and have no top 'landing'. The bottom riser is high and uneven (300 mm max). There is a wobbly tubular steel handrail on one side but no guarding at all, despite the narrow width. There is no external porch light and little street lighting.

B) **Main stair:** The main internal stairs have two winders at the top and are moderately steep. There is a handrail only along the outside wall of the straight flight. There is a projecting radiator in the small hall and some glass in the front door close to the foot of the stairs.

C) **Steps at gate:** The steps close to the front gate are of rough spalling concrete. They have high uneven risers and a narrow tread. There is a crude rotten timber handrail but no guarding.

LIST OF RELEVANT MATTERS

LIKELIHOOD		**A**	**B**	**C**
a	Tread lengths	1	1	2
b	Riser heights	3	1	2
c	Variation in T&Rs	3	1	2
d	Nosing length	-	-	-
e	Poor friction quality	3	-	1
f	Openings - in stairs	-	-	-
g	Alternating treads	-	-	-
h-i	Lack/height handrails	3	2	2
j-l	Lack/height guarding	3	-	1
m	Stair width	2	-	-
n	Length of flight	-	1	-
o-q	Inadequate lighting etc	3	-	3
r	Door/s onto stairs	-	-	-
s	Inadequate landing	3	-	-
t	Construction/repair	2	-	3
u	Thermal efficiency	2	-	1

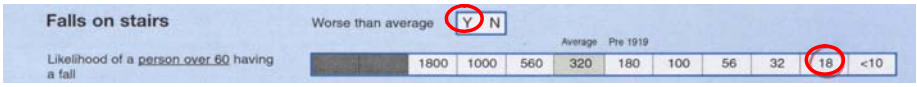
OUTCOMES		**A**	**B**	**C**
a	Length of flight	-	1	-
b	Pitch of stairs	-	2	-
c	Projections etc #	-	2	3
d	Hard surfaces #	2	1	2
e	Construction/repair	2	-	3
f	Thermal efficiency	3	-	2

# **Secondary hazards**		**A**	**B**	**C**
i	Concrete kerb	2	-	-
ii	Projecting radiator	-	2	-
iii	Glass in front door	-	1	-
iv	Condition of paths	3	-	2

Key 3 Seriously defective 1 Not satisfactory
2 Defective - Satisfactory/NA

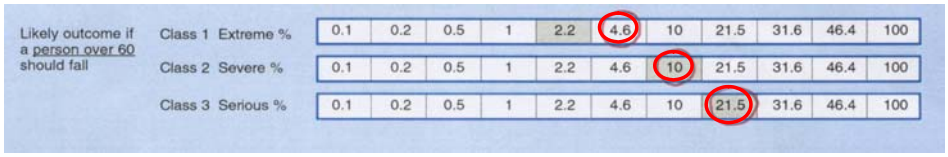
COMPLETION OF SECTION 23 OF EHCS FORM

LIKELIHOOD

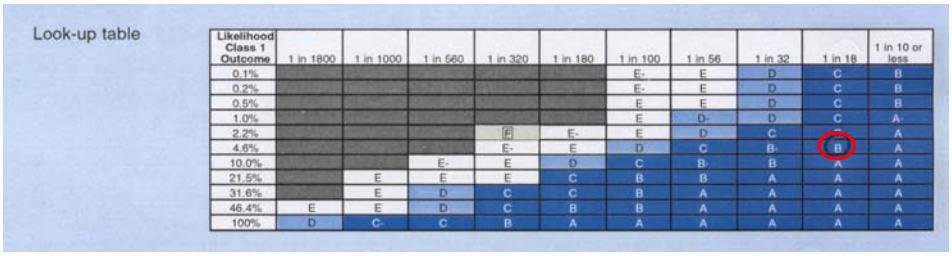


Justification The main stairs are assessed as giving the same likelihood of a major fall as the average for inter-war houses, (i.e. around 1 in 320), the limited handrail provision cancelling out any benefits of the broad winders. However, the added presence of the front access steps - particularly dangerous in icy weather and at night - substantially increases the overall annual probability of such a fall - to 1 in 18.

OUTCOMES

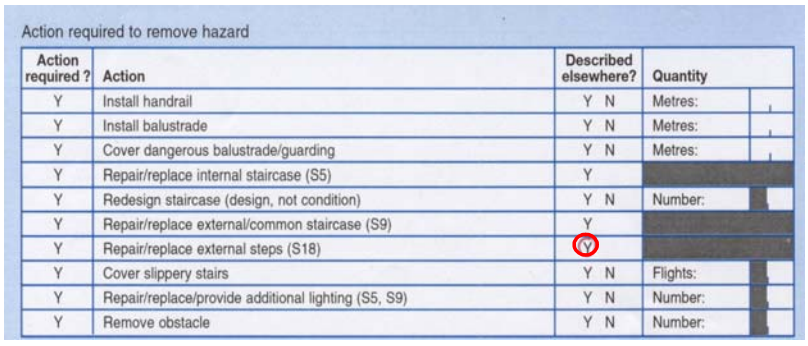


Justification The stairs are designed to be carpeted but the resulting lower harms are offset by the small hall, projecting radiator and single glazing in the door, albeit this is not at low level. However, the presence of the external front door steps and steps near the front gate, both flanked by rough tarmac and a concrete kerb, significantly increase the risk of a fatal or severe fall occuring, particularly in cold weather or at night.



ACTION REQUIRED

Justification Replacing the steps to the front door and at the gate will be picked up under Section 18. This will bring the property's rating back to average for its age and type.



Action required ?	Action	Described elsewhere?	Quantity
Y	Install handrail	Y N	Metres:
Y	Install balustrade	Y N	Metres:
Y	Cover dangerous balustrade/guarding	Y N	Metres:
Y	Repair/replace internal staircase (S5)	Y	
Y	Redesign staircase (design, not condition)	Y N	Number:
Y	Repair/replace external/common staircase (S9)	Y	
Y	Repair/replace external steps (S18)	(Y)	
Y	Cover slippery stairs	Y N	Flights:
Y	Repair/replace/provide additional lighting (S5, S9)	Y N	Number:
Y	Remove obstacle	Y N	Number:

Department for Communities and Local Government

ISBN: 978 1 4098 2698 9