

BRE: Housing Health Cost Calculator (HHCC) Excess Cold Calculator (XCC)

ALEO South East

Chris Johnes Housing & Health

Part of the BRE Trust

All profits from the BRE Group are used by the BRE Trust to fund new research and education programmes that will help to meet its goal of 'building a better world together'





In 2011/12 BRE Trust expenditure on research was £3.17 million, compared with £2.93 million the previous year. These funds support the three key elements of the Trust's activities: research, publications and five university centres of excellence



The Housing Health Cost Calculator



Linking Housing and Health



bre HHSRS Category 1 hazards (EHS 2011)

3.4 million (15%) of English homes have a Category 1 HHSRS hazard



Dre Typical HHSRS outcomes and 1st year treatment

	HHSRS Outcome				
Hazard	Class 1	Class 2	Class 3	Class 4	
Damp and mould growth	Not applicable -	Type 1 allergy (£2,034)	Severe asthma (£1,027)	Mild asthma (£242)	
Excess cold	Heart attack, care, death (£19,851)	Heart attack (£22,295)*	Respiratory condition (£519)	Mild pneumonia (£84)	
Radon (radiation)	Lung cancer, then death (£13,247)	Lung cancer, survival (£13,247)*	Not applicable -	Not applicable -	
Falls on the level	Quadriplegia (£92,490)*	Femur fracture (£39,906)*	Wrist fracture (£1,545)	Treated cut or bruise (£115)	
Falls on stairs and steps	Quadriplegia (£92,490)*	Femur fracture (£39,906)*	Wrist fracture (£1,545)	Treated cut or bruise (£115)	
Falls between levels	Quadriplegia (£92,490)*	Head injury (£6,464)*	Serious hand wound (£2,476)	Treated cut or bruise (£115)	
Fire	Burn ,smoke, care, death (£14,662)*	Burn, smoke, Care (£7,435)*	Serious burn to hand (£1,879)	Burn to hand (£123)	
Hot surfaces and materials	Not applicable -	Serious burns (£7,378)	Minor burn (£1,822)	Treated very minor burn (£123)	
Collision and entrapment	Not applicable -	Punctured lung £5,152	Loss of finger £1,698	Treated cut or bruise £115	

Not applicable = HHSRS class very rare or non existent * = Costs after 1 year are likely to occur, these are not modelled **Main source:** National Schedule of Reference Costs 2010-11 for NHS Trusts

DCPoor housing: NHS first year treatment costs 2011



bre Including all sub-standard housing

- 2010 report: Total cost of poor housing = **£600m**
- 2014 report: Total cost of poor housing (HHSRS Cat 1) = £1.4bn
- 2014: Add HHSRS Cat 2 housing = + £428m
- 2014: Add all sub-standard housing = + £160m
- The full cost (in terms of NHS first year treatment costs) of sub-standard housing = £2.0bn



Comparative cost burden to the NHS

Risk Factor	Total cost burden to the NHS
Physical inactivity	£0.9 billion – £1.0 billion
Overweight and obesity	\pounds 5.1 billion – \pounds 5.2 billion
Smoking	£2.3 billion – £3.3 billion
Alcohol intake	\pounds 3.2 billion – \pounds 3.2 billion
Poor housing	£1.4 billion – £3.5 billion?

Dre Payback example: Falls on stairs

- HHSRS Band C (Cat 1 hazard)
- Work = replace balustrades
- Cost of work = £314
- Annual benefit to $NHS = \pounds146$
- Payback = 2.1 years

The Housing Health Cost Calculator

- Helps quantify the extent to which improvements to housing takes pressure off health services
- Can assist in the targeting of resources towards actions with the greatest returns
- Can assist in bids for funding

What does the calculator do?

- Details of an HHSRS assessment can be added
- Website will calculate cost to NHS and to society
- Can add a post work assessment to measure savings
- Costs of doing work can also be added, enabling the calculator to work out a payback period



Methodology



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£1.000.000+

£500.000+

£100.000+

£0+

No data

As always, if you have any feedback or ideas for improvement please let us know at hhcc@bre.co.uk.

More information

outcomes following mitigation of HHSRS

hazards. The savings to society are

of Poor Housing

More information

calculated as two and a half times the

NHS savings as stated in The Real Costs

www.housinghealthcosts.org

How to add a case BRE HHCC RIAMS Home Data Forum Support Sign Out Housing Health Cost Calculator Search HHCC Click here to start Welcome BRE -Search by Search term Go adding cases one by one Home > Data How to get started? What is HHCC? My Database My Account 2016 New to the website? Click Click here for a guide to Chris Johnes here for an introduction. health cost calculations BRE 2015 2014 My account details 2013 My settings 2012 Help 2011 2010 Upload Bulk Data Add New Hazard My Contacts 2009 2008 Click here to enter data from Click here to load existing Primary Contact an inspection. data in bulk. Viv Mason 2007 MasonV@bre.co.uk 01923 664000 2006 View Senior Users How to get started How to get started video How we calculate data Local Aggregated data Download Data View Data My Links Local Yearly Aggregated data Click here to download the Click here to view individual UK housing professionals forum

data you have entered so

far.

Organisations' Data

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BRE

RIAMS

Administrator

Home Page Article

records or to look at a

summary.

How to add a case

BRE HHCC

- Cases can be added one by one
- You can identify dwellings by address, UPRN or both
- HHSRS system uses representative scale points
- Average values put in by default
- NHS costs and costs to society appear at the bottom of the screen

		Add new	uata				
		Home > Data >	2016 > Add				
My Database		Property	UPRN				Mv Account
,			Address				
2016			Postcode				Chris Johnes
> 2015			Easting				BRE
2014			Northing				My account details
2013			Dwelling age	Select from list		•	My settings
2012			Dwelling type	Select from list		-	Help
> 2011			HMO?				
> 2010							My Contacts
> 2009		Survey	Date				
2008			Hazard type	Select from list		-	Primary Contact
> 2007			Description	N/A			Viv Mason MasonV@bre.co.uk
▶ 2006			Project				01923 664000
How to get starte	d						View Senior Users
How to get starte	d video	Ratings		Before work	After work		
How we calculate	e data		Likelihood	Select	 Select 	•	
Local Aggregate	d data		C1*	Select	 Select 	-	My Links
Local Yearly Agg	regated data		C2*	Select	 Select 	-	
			C3*	Select	 Select 	-	UK housing professionals forum
			C4*	Select	 Select 	-	BRE
			Reset				RIAMS
			Score	N/A	N/A		
Ratings guide			Rating	N/A	N/A		Administrator
A			Rating	N/A	DVA		
в		Costs	Work Completed?	? 🔲			Home Page Article
с			Repair (mitigation	n)			Organisations' Data
D			Payback period		N/A		
E			Warnings	N/A			
F							
G							
н			Cost to NHS	N/A	N/A		
1			Cost to society	N/A	N/A		
J	I						
		Back	Save	Cancel	Next		

Data

2016

Add now data

Housing Health Cost Calculator

RIAMS

Support

Search HHCC

Search by

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Sign Out

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Forum



ow to add	a case		
Background i	nformation about tl	ne property	
Property	UPRN		
	Address		
	Postcode		
	Easting		
	Northing		
	Dwelling age	Select from list	-
	Dwelling type	Select from list	-
	HMO?		

How to add a case

- Select survey date
- Select hazard type
- Add project name (if relevant)

Survey

Ratings

- HHSRS averages will be added
- Likelihood can be altered via dropdown box
- To alter spread of harms click 'reset' and then select relevant scale points
- Score and rating will be calculated

	Date					
	Hazard type	Select from list				
	Description	N/A				
	Project					
		Before work		After work		
	Likelihood	Select	•	Select	•	
	C1*	Select	•	Select	•	
	C2*	Select	•	Select	•	
	C3*	Select	-	Select	•	
	C4*	Select	-	Select	•	
	Reset	Reset		Reset		
	Score	N/A		N/A		
	Rating	N/A		N/A		

How to add a case

- If the work is complete repair costs can be added
- Payback period will be calculated
- Cost to NHS and Society will be displayed

Costs	Work Completed?		
	Repair (mitigation)		
	Payback period		N/A
	Warnings	N/A	
	Cost to NHS	N/A	N/A
	Cost to society	N/A	N/A
Dock	Sava	Concol	Novt



Example



Ratings

Date	9 July 2015
Hazard type	02
Description	Excess cold
Project	N/A

	Before work	After work
Likelihood	32	560
C1*	31.6	31.6
C2*	4.6	4.6
C3*	21.5	21.5
C4*	42.3	42.3
Score	10234	585
Rating	A	D

Costs	Work Completed?	No	
	Repair (mitigation)	£3,000	-
	Payback period	-	40 Months
	Warnings	N/A	
	Cost to NHS	£946	£54
	Cost to society	£2,365	£135

Reviewing your data

BRE HHCC

My Database

2016

2015 2014

2013

2012

2011 2010

2009 2008

2007

2006

How to get started

How we calculate data Local Aggregated data

 Shows a summary of data entered so far



..... Administrator

RIAMS

Home Page Article

Organisations' Data

Reviewing your data

- Can order data by rank, hazard, or savings
- Savings can be broken down by calendar year

Home > Data

Yearly savings for BRE

Year	Savings to NHS	Savings to society
2015	£375,358	£938,395
2014	£99,102	£247,755
2013	£3,267	£8,168
2012	£61,890	£154,725
2011	£17,032	£42,580
2010	£30,204	£75,510
Total for BRE	Savings to NHS	Savings to society
	£586,853	£1,467,133

Home > Data

Show project Show all

Sort data by Rank

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Hazards for BRE

Rank	Hazard	Savings to NHS	Savings to society
01	Excess cold	£131,348	£328,370
02	Falling on stairs etc	£8,858	£22,145
03	Structural collapse and fallin	£2,129	£5,323
04	Electrical hazards	£1,983	£4,958
05	Damp and mould growth	£268,746	£671,865
06	Collision and entrapment	£560	£1,400
07	Excess heat	£68,019	£170,048
08	Falling on level surfaces etc	£4,050	£10,125
09	Carbon monoxide	£90,580	£226,450
10	Fire	£1,566	£3,915
11	Lead	£891	£2,228
12	Personal hygiene, Sanitation a	£840	£2,100
13	Falling between levels	£481	£1,203
14	Entry by intruders	£204	£510
15	Crowding and space	£405	£1,013
16	Biocides	£5,125	£12,813
17	Position and operation of amen	£0	£0
18	Flames, hot surfaces etc	£5	£13
19	Food safety	£140	£350
20	Radiation	£0	£0
21	Uncombusted fuel gas	£497	£1,243
22	Noise	£146	£365
23	Domestic hygiene, Pests and Re	£134	£335
24	Water supply	£146	£365
Total fo	or BRE	Savings to NHS	Savings to society
		£586,853	£1,467,137

Loading data in bulk

- If you have existing data you can upload it in bulk
- You will need to format your data correctly to do this
- A template Excel file is available on the site

Housing Health Cost Calculator 2016 Upload data

Home > Data > 2016 > Upload

How to upload your bulk data



Download the import template workbook. Dake a copy of the workbook to keep safe, and a copy to work on and add data to. The workbook makes use of macros, so you may need to enable macros in order to use the workbook's features.

- In the working copy, add your data into the datasheet in the correct columns (see the column headings provided).
- Using the interface you can check some of the key parts of your data to ensure that it is in the correct format.
- 4. Once you have checked your data, save it as a .csv file in Save As.
- 5. Click on the 'Browse' button below and locate the.csv file.
- Click 'Upload' and you will receive a confirmation message if it has been successful. If there is an error with the data it will be displayed below.

Why upload your data?

Upload





XCC

- The Excess Cold Calculator was created by BRE with support and advice from the CIEH
- The heating cost and adequacy calculations used by the tool are underpinned by BRE's long experience of measuring and modelling the energy consumption of buildings to support government programmes and for industry
- It has been designed to provide reliable estimates of running costs and heating adequacy based on a relatively small number of inputs
- The result is a tool that is considerably quicker and easier to use than most energy modelling software and focussed specifically on the assessment of cold in properties.

https://www.excesscold.com/

XCC

- Designed to assist the assessment of the hazard of excess cold in UK dwellings
- The user provides details about the dwelling and its occupants and XCC provides an estimate of the likely running costs and an assessment of the adequacy of the heating system
- Additional tool to provide heat loss calculations for individual rooms
- Data collection sheet for use during inspections available for download
- New updates being trialled to make the tool much more straightforward to use



Welcome to BRE XCC BRE Excess Cold Calculator

<u>Now available to download: Real life case studies of the XCC in action and printable data sheets to aid collection of property details. Follow this link to read more.</u>

This website provides support for the use of a tool designed to assist Environmental Health Practitioners and Technical Officers in the assessment of the hazard of Excess Cold in UK dwellings. When provided with details about the dwelling and its occupants the Calculator provides an estimate of the likely running costs and an assessment of the adequacy of the heating system provided. The tool can then be re-run with modifications to test scenarios for possible improvement measures, such as packages of insulation and heating system improvements, in order to consider suitable remedial action and to assist in the calculation of its cost-effectiveness. This information will be useful as supporting evidence for Officers' decisions on the presence of Excess Cold hazards and in justifying any requirement for mitigation measures.

The Excess Cold Calculator was created by BRE with support and advice from the Chartered Institute of Environmental Health, who advised that its members would find it helpful if we could supply a tool to provide supporting evidence for their decisions. The heating cost and adequacy calculations used by the tool are underpinned by BRE's long experience of measuring and modelling the energy consumption of buildings to support government programmes and for industry. The Excess Cold Calculator was designed to provide reliable estimates of running costs and heating adequacy based on a relatively small number of inputs in order to limit the time and effort required to collect dwelling data. The result is a tool that is considerably quicker and easier to use than most energy modelling software and focussed specifically on the assessment of an Excess Cold hazard.

breinnovation park GreenGuide DUP

To start using the tool, please log in to read the user guide from the download section and then add dwellings to assess.

SMARTWASTE*

Sign up now to BRE's XCC!

If you have already registered, please log in to access your account.

Otherwise, in order to use the Excess Cold Calculator users must be registered. To begin the registration process please <u>click here</u>.

If you have any difficulty with the registration process please <u>click here</u> for help. If you have any more general questions about the Excess Cold Calculator please visit the <u>Frequently</u> <u>Asked Questions</u> page in the first instance, or click on the 'Contact us' link at the top of this page if your question is not already answered.

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Excess cold tool Developed by BRE.			
Home			
Welcome to BRE XCC BRE Excess Cold Calculator			łome
Increased comfort or reduced energy costs? Use XCC to asso a given level of fuel cost. Follow this link to read more.	ess the temperature that a househo	Id could achive for	Assessor details
This website provides support for the use of a tool designed to as Officers in the assessment of the hazard of Excess Cold in UK dw	sist Environmental Health Practitioners ellings. When provided with details ab	s and Technical nout the dwelling	ly Cases
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	Secondary: Closed fires (wood)	Secondary: Electric fires	Secondary: None / not used			

General Parameters

Allow sharing of this case?	Yes	•
-	Sharing allows this project to be recrea	ated by other
	Please see FAQ 8 for further details	
Case name	New Test Case 1	
Address Line 1	Insert a valid address line	
Address Line 2		
Address Line 3		
Post Town	Insert a valid Post Town	
Post Code		
	Insert a valid Post Code	
Weather Region	UK average	•
Related Party Disclosure	Select valid option from list	▼ No in the list
	insert a valid option nom those availab	
Inspection date	in the following format: yyyy-mm-dd Insert the	inspection date
Property Type	House - semi-detached	•



He	leating patterns and temperatures [+/-]									
	Heating pa	itterns								
	Weekday					Weekend				
	On Time		Off Time			On Time		Off Time		
	07 💌	00 -	09 💌	• 00]	07 💌	00 -	23 💌	00 -	
	16 🔻	00 -	23 💌	• 00]	-	-	-	-	
	-	-		•]	-	-	-	-	
	-	-	-	-]	-	-	-	-	
	Temperatu	ire living ro	om heated t	to	21	°C				

Heat Loss Information

[+/-]

U-value help

Conduction Heat losses Fill in to estimate Wall U-values: U-value Area Dwelling age Wall type Uvalue (m^{2}) (W/m^2K) Select Opl Select Option Ŧ Wall type 1 Wall type 2 Fill in to estimate Roof U-values: Ins. thickness (mm) Roof type Uvalue Floor type 1 Select Opt • Floor type 2 Roof type 1 Fill in to estimate Flat Roof U-values: Roof type 2 Age of roof Uvalue Party wall ? Select Option • Window type 1 Window type 2 Fill in to estimate Floor U-values: Roof windows Description Uvalue Select Option Ŧ Doors Doors to unheated internal spaces Other external 1 Fill in to estimate Party Walls U-values: Description Uvalue Other external 2 Select Option Ŧ Heat loss to internal (unheated) Fill in to estimate Window U-values: Wall type 1 area and U-value must be filled in Window type Uvalue Select Option • ach Insert a valid numeric value between 0.5 and 5. Air change rate (ach) Fill in to estimate Door U-values: If Unknown enter 0.75. Description Uvalue Select Option ? •

Heating	g Systems Information			[+/-]	
Main	n heating fuel	Electricity		•	
Main	n heating type	New electric storage	heaters	•	
SED	BUK 2009 Efficiency	Click <u>here</u> to access Database	the UK Boiler Efficiency		
Seco	ondary heating type	None / not used		•	
Wate	er heating type	Select valid option fr	om list	•	
Hot v	water insulation	Insert a valid option f Not applicable	rom those available in the	e list	Tiered tariff help
Fuel Pr	rices price information		[+/-]		Fill in to convert to Standing charge:Units in first tierunits1st tier unit pricep/kWh2nd tier unit pricep/kWhStanding Charge?
		Standing Charge (GBP/yr)	Unit Price (p/kWh)		
Main LPG	ns gas				Fuel units converter
Oil Coal Woo Elect Elect Elect	l tricity (standard rate) tricity (off peak) tricity (on peak)				Fill in to convert to p/kWh: Fuel and units of sale Select Option Units purchased Total price paid (£)
Cheo	ck FAQ with default fuel prices <u>he</u>	ere			Price in p/kWh ? p/kWh
1					



Room Data assessment

filled [+/-]

Enter data in the following sections for each room where you wish to assess the adequacy of the heating system provided. It is not necessary to supply data for every room unless you also wish to assess whether the total heat requirement of the dwelling can be met by a central system (e.g. is a 15kW boiler large enough?). If not, you only need to enter data for those rooms you wish to assess. Data entered in this section of the calculation does not affect the fuel cost calculation above and can be left completely blank if not required.

Cho	oose one of these Expand all	options or fill in Room Data: Collapse all	Add another room	n	
Roo	om data			[+/-]	,
I	Living Room [+/-]				
	Tick to include the	his room in the analysis: 🗹			
	Room name	Living Room			
	Volume (m ³)				
	Air infiltration	heat loss			
	Air change rate	(air changes per hour)			
	Infiltration heat	loss (W/K)	?		
	Heat loss alon	onte hordering the externs	l environment		
	Flement			11	
	Wall	Area (m ⁺)	0-value (w/m ⁻ K)	Heat loss (w/m ⁻)	
	Roof				
	Floor				
	Other1				
	Other2				
	Window				
	Door				
	TOTAL			U	

BRE XCC Report

Case name:test_5 Big old detachedDwelling Type:Not HMODwelling area:280 m²Current system:Pre 98 oil non-condensing boilerAddress 1:63 Pheasant WayAddress 2:Post Town:Post Code:GL7 1BJ

Annual Energy Costs with Pre 98 oil non-condensing boiler and alternative systems:



Space heating Secondary heating Water heating Pumps+fans Lights+appliances Cooking Standing charge

The dashed lines on the above graph indicate 10% of pensioner income for a single person and a couple respectively.

[+/-]

	Estimated annual running costs for this dwelling with alternative heating systems							
Fuel costs (GBP/yr)	Current system	Gas boiler	Oil Boiler	Electric storage	Electric direct	LPG	Coal fires	
Space heating	2530	1260	1954	1584	3319	2713	3852	
Secondary heating	197	0	0	483	0	0	0	
Water heating	386	168	242	184	455	320	455	
Pumps+fans	42	25	32	0	0	25	0	
Lights+appliances	618	618	618	680	618	618	618	
Cooking	54	40	54	59	54	55	54	
Standing charge	0	116	0	20	0	70	0	
TOTAL	3827	2226	2901	3010	4446	3801	4979	
Approx. SAP rating	27	56	45	36	8	27	4	
Approx. SAP band	F	D	E	F	G	F	G	

CO2 Emissions with Pre 98 oil non-condensing boiler and alternative systems:



Space heating Secondary heating Water heating Pumps+fans Lights+appliances Cooking

Estimated annual emissions for this dwelling with alternative heating systems

CO2 emissions (kg/yr)	Current system	Gas boiler	Oil Boiler	Electric storage	Electric direct	LPG	Coal fires
Space heating	11651	6495	9000	13648	12239	8037	30672
Secondary heating	1567	0	0	1516	0	0	0
Water heating	1743	812	1083	1322	1677	974	1677
Pumps+fans	155	90	119	0	0	90	0
Lights+appliances	2280	2280	2280	2280	2280	2280	2280
Cooking	199	167	199	199	199	182	199
TOTAL	17594	9844	12682	18967	16395	11563	34828



Heat losses from this dwelling



Heat loss element	Heat transfer coefficient (W/K)
Walls	364
Floors	96
Roofs	180
Windows & doors	120
Thermal bridges	74
Air infiltration	349
TOTAL	1183

Summary of heating data for individual rooms

Room	Design Heat Loss (Watts)	Installed radiator/heater output (Watts)	Required storage heater capacity (kWh)
Living Room	2688	2022	48.6
Bedroom 1	1883	1707	36.5
Bedroom 2	1229	870	26.6
Total for rooms assessed	5800	4599	111.7

Case Study – 'Typical 3 bed semi

- Storage heaters £288 more expensive per year than gas
- On peak electric heaters £800 more expensive per year than gas
- As loft insulation is good, most heatloss is through the walls
- Approximate SAP rating of 29 (F) with on peak electric heaters and 66 (D) with gas



Main uses

- A tool that can be used for both proactive and enforcement work
- Useful in determining and supporting the most appropriate course of action
- Can be used to determine if remedial actions are cost-effective
- Results can be re-run with modifications to test scenarios of insulation and heating system improvements
- Additional data covering CO₂ emissions and modelled internal temperatures

Main uses

- Allows assessment of heat loss from individual rooms if it is felt that existing heating is inadequate
- The calculator produces information that would usually take a lot more time to put together. And it does it specifically for the dwelling

Case creation from postcode BRE Excess Cold Calculator



λ_{N}

selected property:

Mid Terrace House

1976-1982





Project Results BRE Excess Cold Calculator

CASE RESULTS

Choose one of the following actions:

Back to Case detail

create new PDF report

BRE XCC Report

Case name:	28 SHIRLAND MEWS_1472199315
Dwelling Type:	Not HMO
Dwelling area:	60.17 m ²
Current system:	Post 98 mains gas non-condensing boiler
Address 1:	28 SHIRLAND MEWS
Address 2:	LONDON
Post Town:	LONDON
Post Code:	W9 3DY

Annual Energy Costs with Post 98 mains gas non-condensing boiler and best current Electricity and Gas tariff:

Electricity:	0
EDF Energy	E
EDF Energy Simply Fixed May17	E
£363.86	£

Gas: EDF Energy EDF Energy Simply Fixed May17 £298.81

Total cost = £662.67 View more tariffs

[+/-]

https://uat.excesscold.com/



Costs

Type of subscription	Small	Medium	Large
Dwelling totals	<40,000	40,000–90,000	>90,000
Annual subscription	£500	£1,000	£1,500
Users	Unlimited	Unlimited	Unlimited



Any Questions?

Christopher.Johnes@bre.co.uk