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# The Cost of Poor Housing in England

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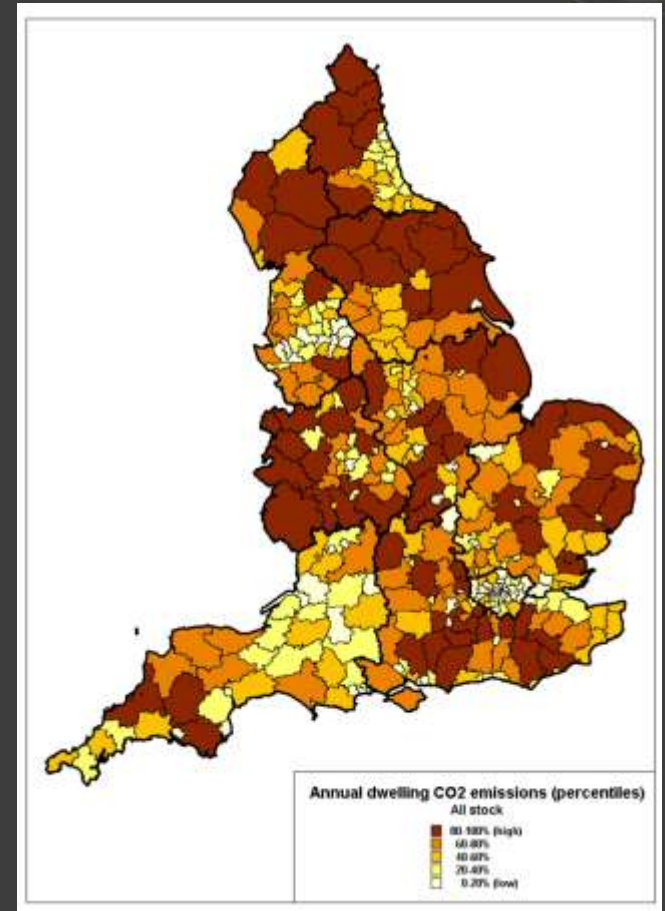
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# What we will cover

- Presentation in 2 parts:
  - The English Housing Survey
  - Using the EHS to quantify the cost of poor housing in England

# The English Housing Survey (EHS)

- Longest running national housing survey
- First EHCS in 1967. Continuous since 2002.
- Managed by DCLG, delivered by ONS, BRE and MMBL surveyors.
- Provides the Government with information for the development of housing policies directed at the repair, improvement, and energy efficiency of the housing stock of all tenures.
- Results published annually.
- Data available to all
- Other countries now undertaking similar surveys.



# The EHS – a Suite of Surveys

1. **Household interview** (CADI interview)
2. **Physical inspection** (survey form + digital pen)
3. **Valuation** (from photographs and valuation database)
4. **Occasional additional survey modules**
  - Survey of landlords
  - Energy follow-up survey (2010/11)

*This presentation will focus on the Physical Inspection*

# The EHS Physical Survey

- 8,000 homes
- 200 surveyors (~40 surveys each)
- Complete standard 26 page survey schedule
- Digital pen based data input
- Data returned and validated via internet
- Focus constantly changing. Now more about progress towards energy and health targets than the improvement of slum housing



# Why do we need the EHS?

- 22 million homes
- 48 million people
- 50% of homes over 50 years old, 20% over 100 years old
- 100,000 new homes provided each year, just 20,000 demolished.
- Homes will have to last 1,000 years at current rates of clearance.
- 99.9% are around from one year to the next

**WE ARE STUCK WITH THE HOUSING STOCK WE HAVE GOT SO WE MUST DO SOMETHING ABOUT IT!**

# The English housing stock - typology

Photograph 1: Typology of the dwelling stock



# England – dwelling types

- 80% of homes are houses mainly:
  - semi detached 1919-1964 (20% of homes)
  - terraced pre 1919 (12.5% of homes)
- 20% are flats – mainly in small blocks
- Only 120,000 flats in tower blocks.
- 80% of homes are privately owned.
- Currently building 100,000 homes per year, mainly:
  - Small flats
  - Larger houses



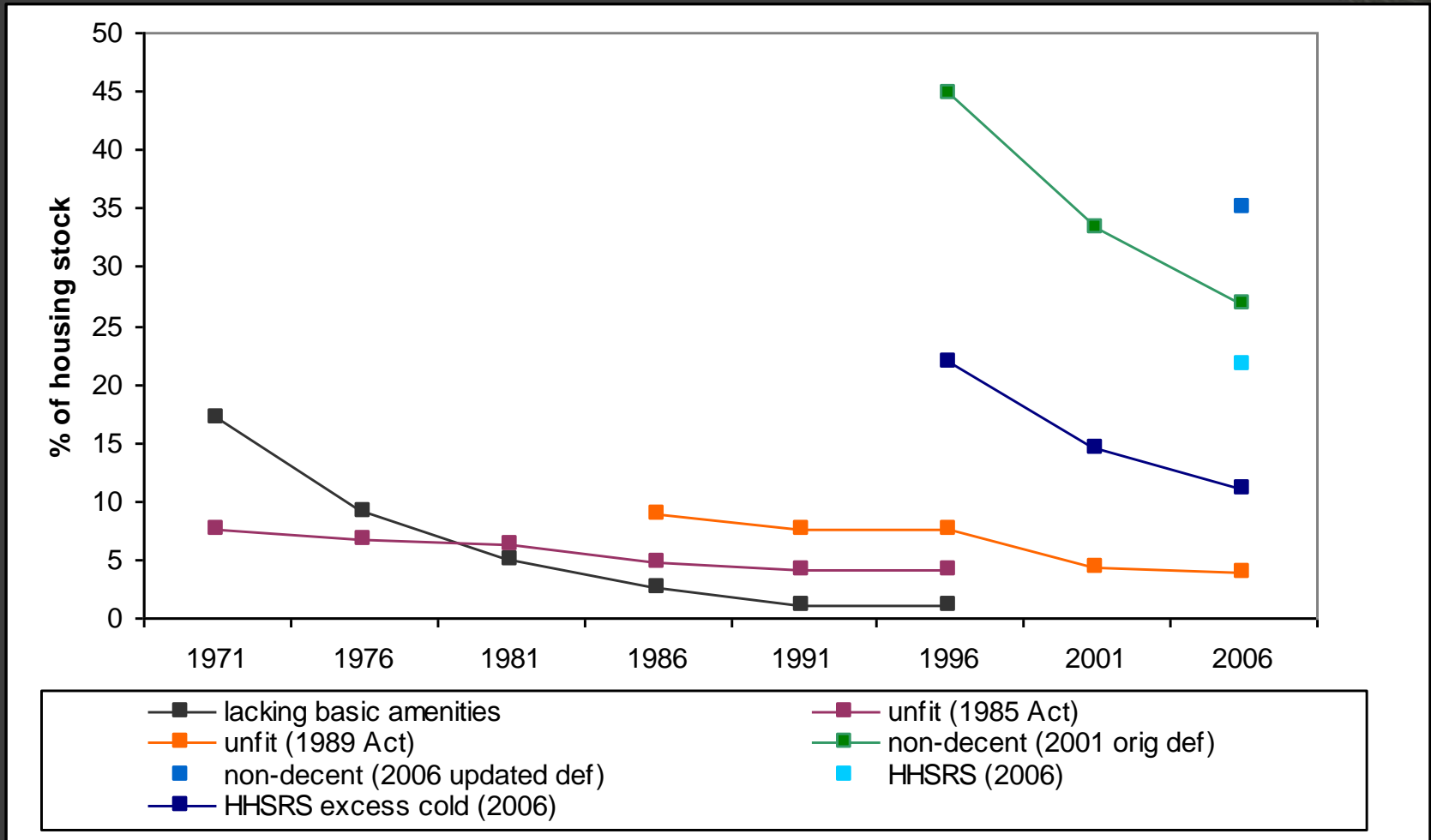
# Typical semi-detached house – the house of the future?



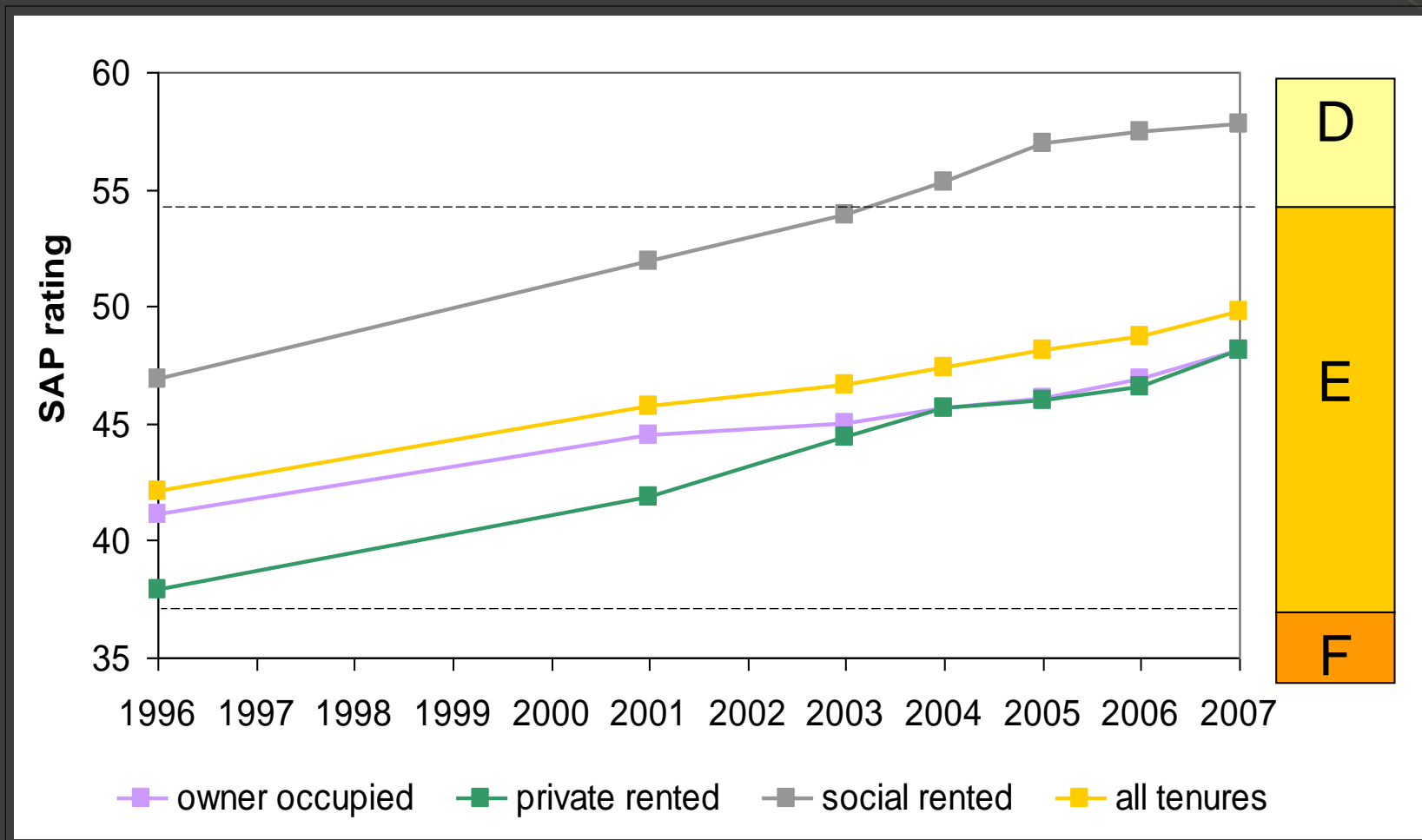
# Pre 1919 houses



# English housing stock: changing standards over time

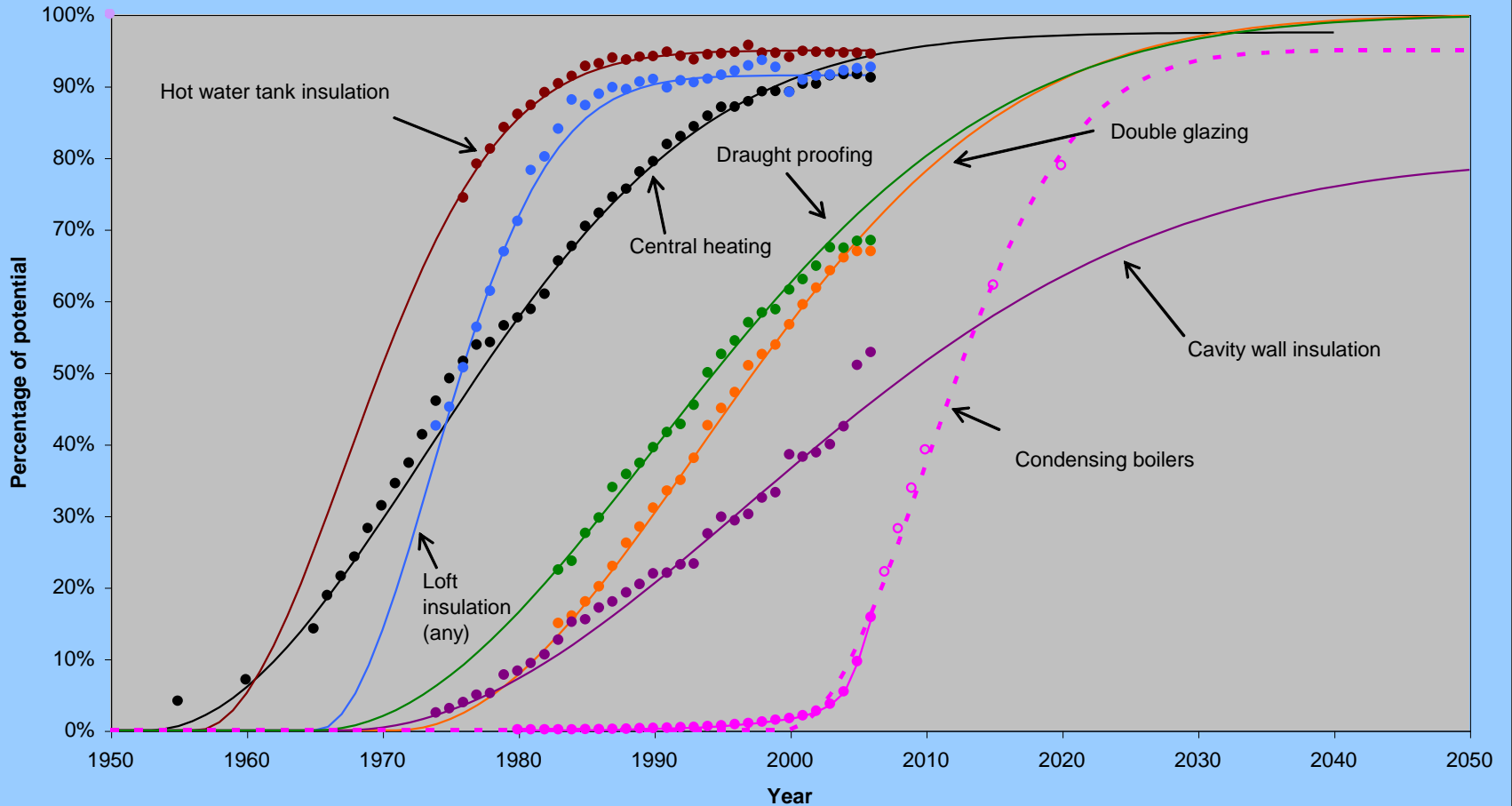


# Average SAP by tenure 1996 - 2007



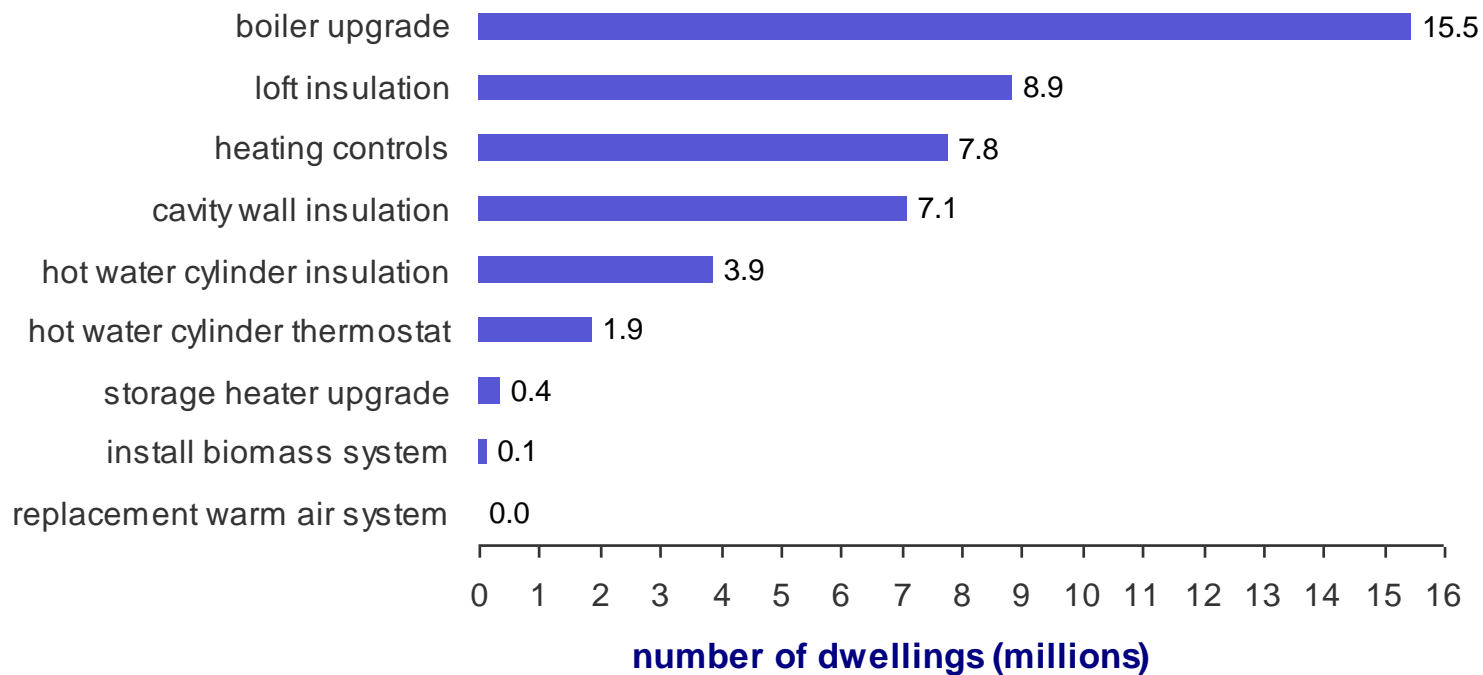
# Developing scenarios for future energy use and carbon emissions

Market penetration of home energy efficiency measures



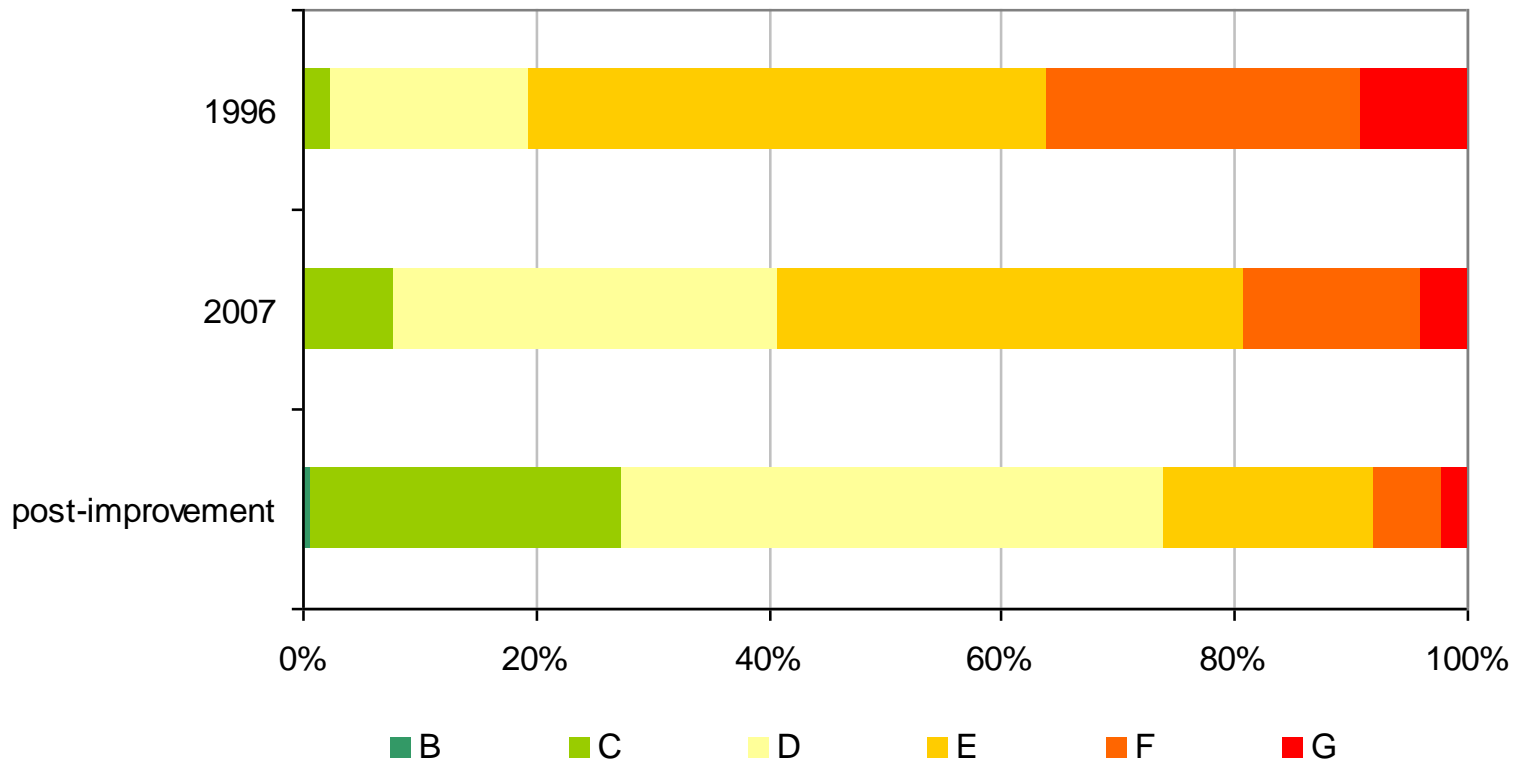
# Improvement potential 2007

**Number of dwellings that would benefit from the improvement measure, 2007**

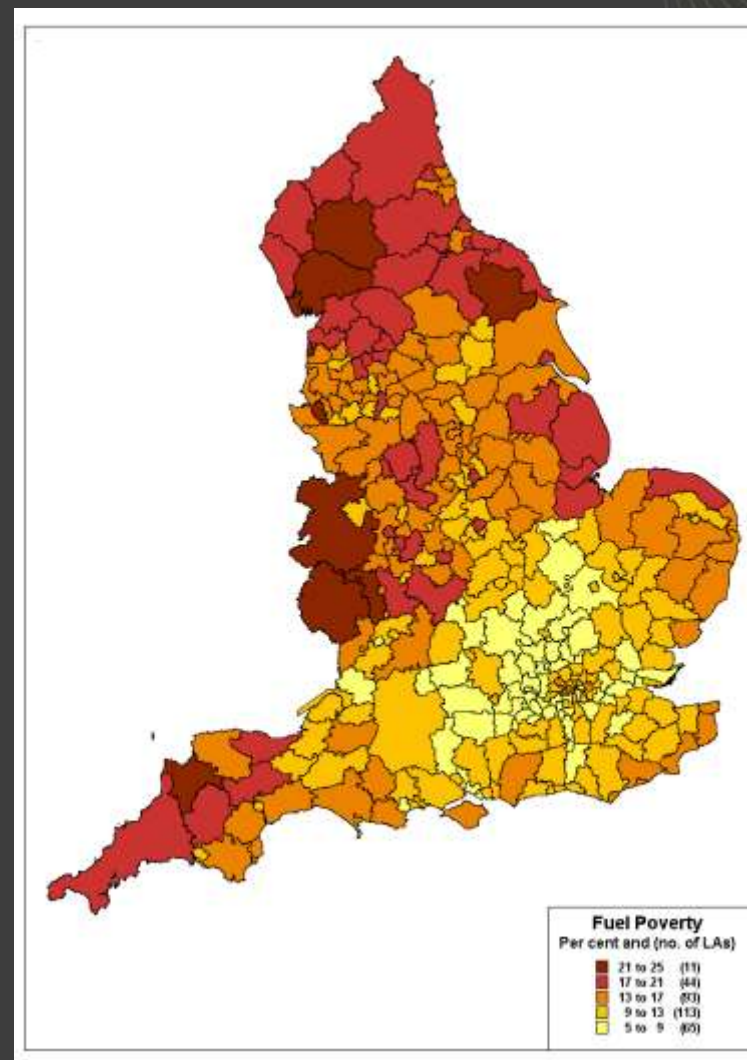
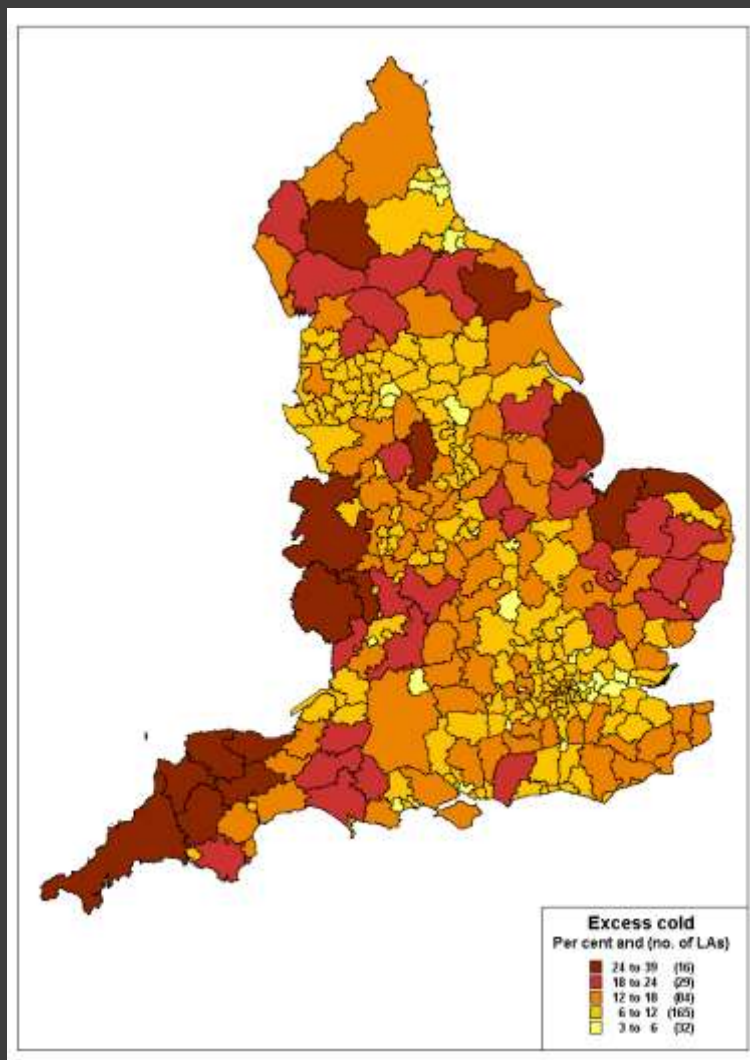


# Post improvement performance

Distribution of homes by EER Bands, 1996, 2006 and post-improvement scenario



# England – energy efficiency vs fuel poverty 2007

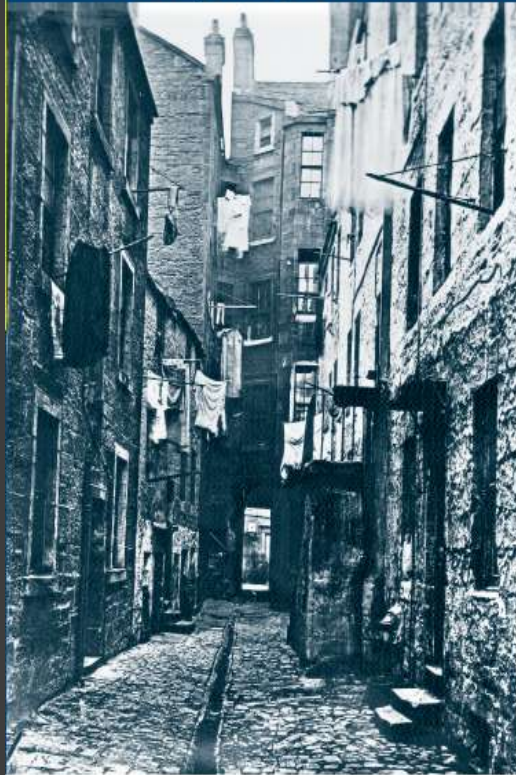


# Using the EHS to Quantify the Cost of Poor Housing in England

## THE REAL COST OF POOR HOUSING

Mike Roys, Maggie Davidson and Simon Nicol, BRE

David Ormandy, University of Warwick, and Peter Ambrose, University of Brighton



# Purpose of Research

- To quantify poor housing and estimate how much money could be saved by tackling the worst housing conditions in England

*The right time to do this as EHS HHSRS results have become available*

- To provide a tool for policy makers/deliverers to explore the impact of targeting improvements at different types of properties and different types of people

*Funded by BRE Trust and carried out by BRE in partnership with the Universities of Warwick and Brighton*

# What is poor housing?



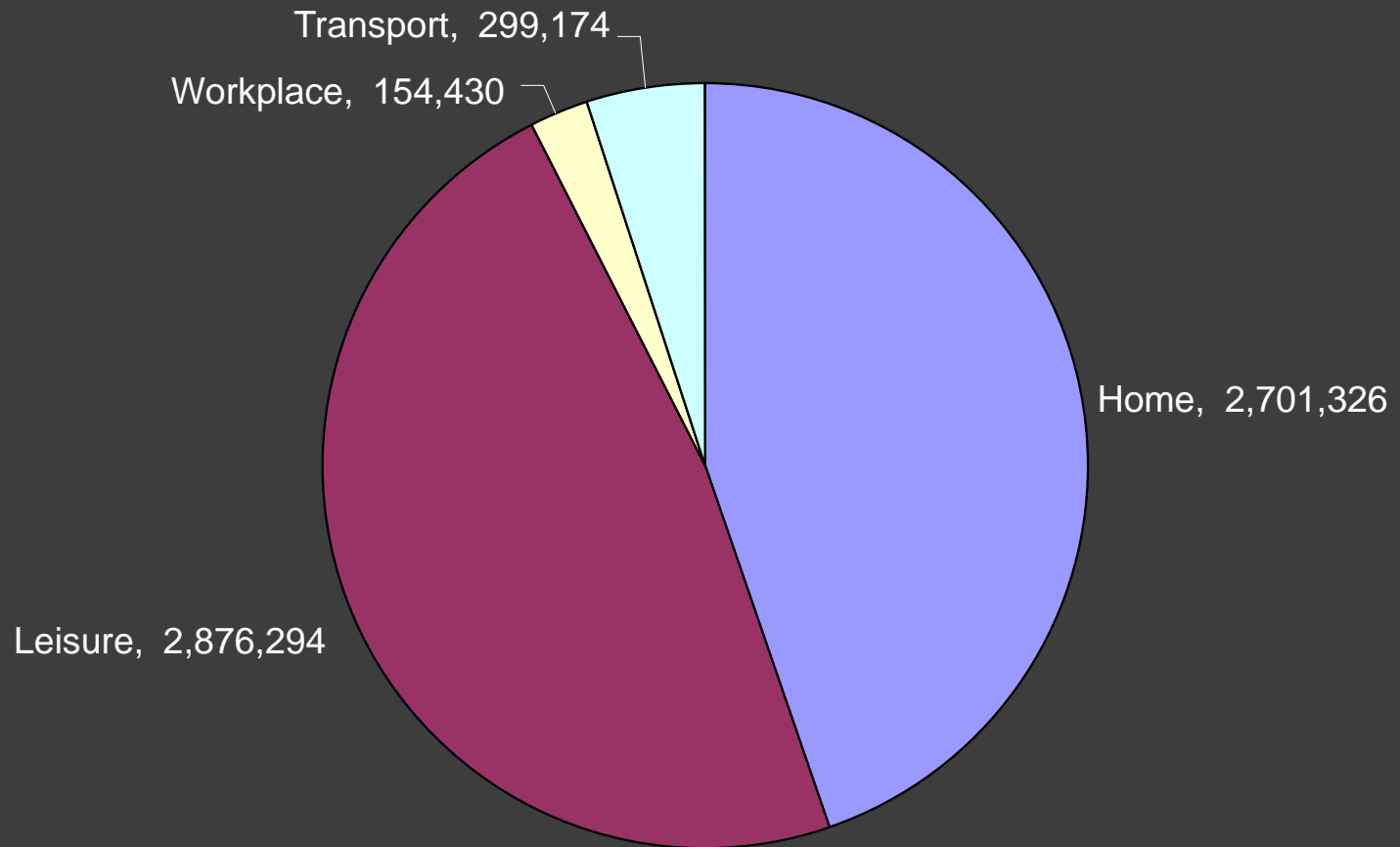
# What is the impact of poor housing?

- Large and growing body of evidence linking systematically adverse health effects with poor housing conditions.
- The evidence is particularly compelling for:
  - Home accidents
  - The effects of living in a cold home
  - Dampness
  - Noise
  - Insecurity
  - Overcrowding
  - Fire safety.



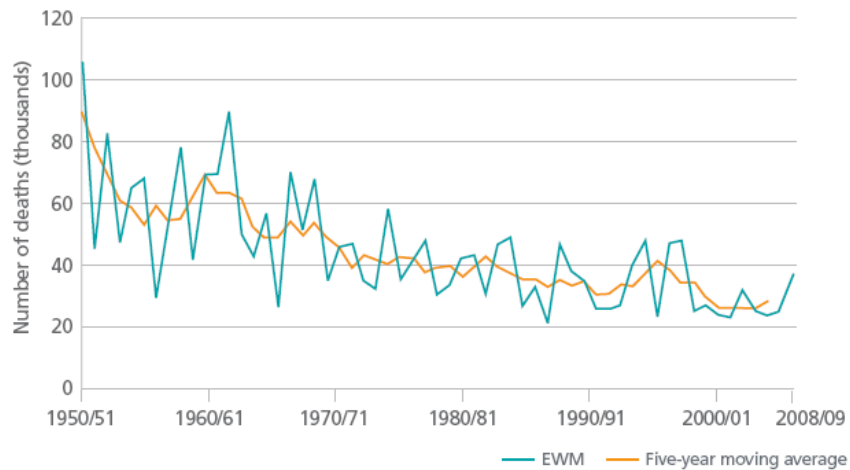
© Kerry Skarbakka

# Accidents - breakdown of injuries by location



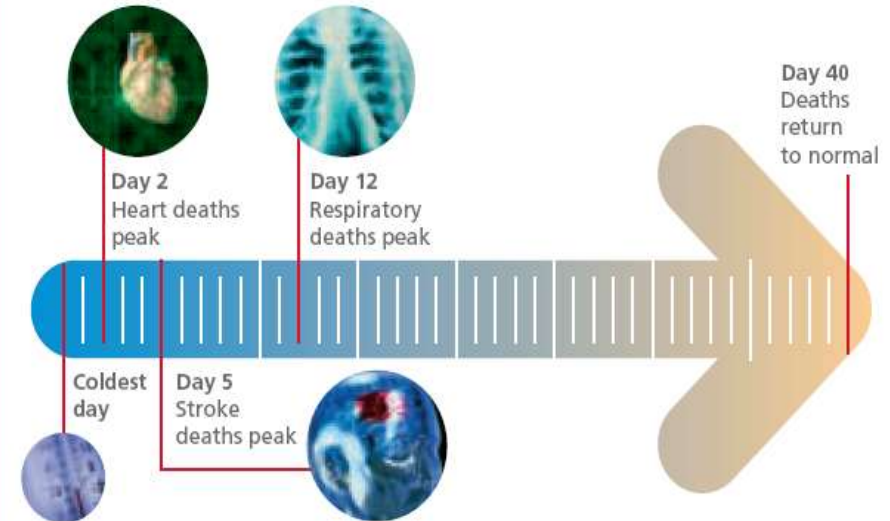
# Excess winter deaths (England and Wales)

Figure 1: Excess winter mortality (EWM) by year and five-year moving average, England and Wales



Source: Office for National Statistics

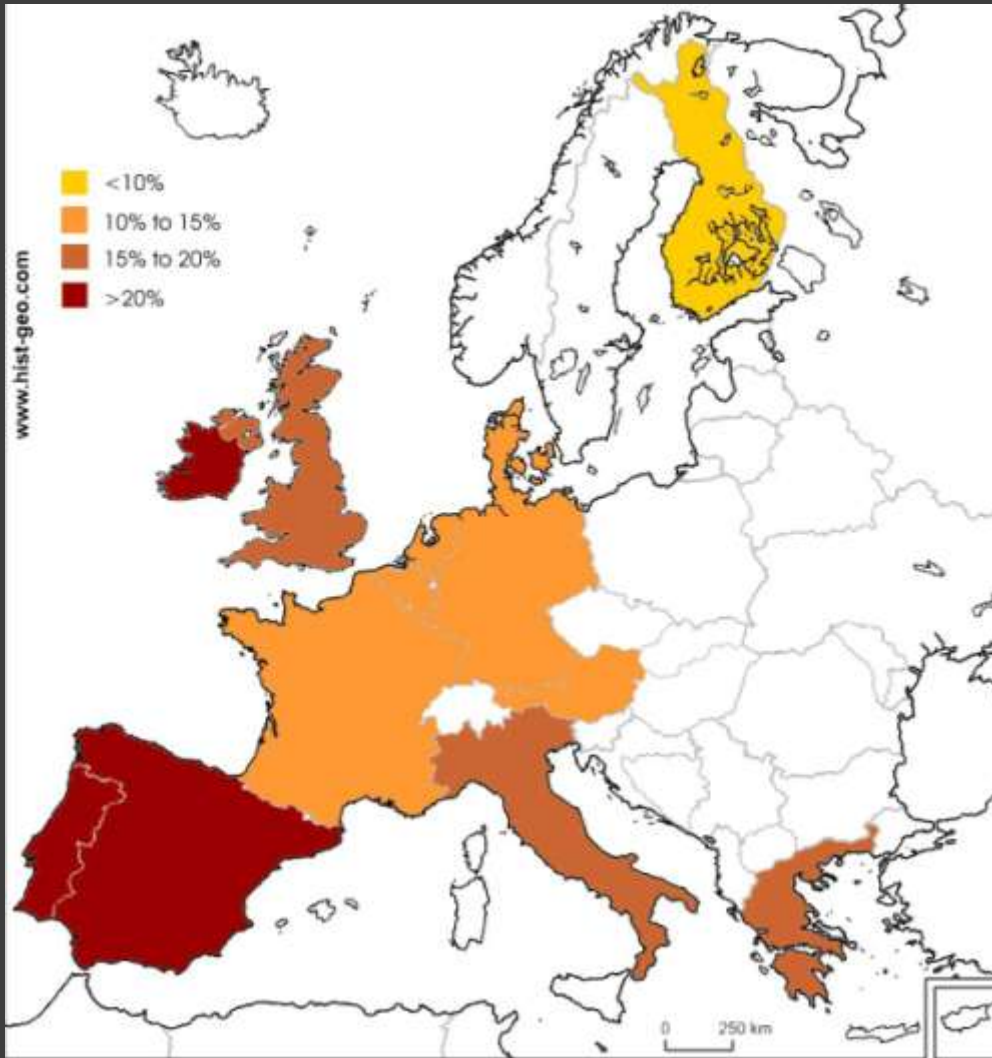
Box 3: Cold weather death sequence



Source: Adapted from Donaldson GC, Keatinge WR. Early increases in ischaemic heart disease mortality dissociated from and later changes associated with respiratory mortality after cold weather in south east England. *Journal of Epidemiology and Community Health* 1997; 51(6): 643-8.

In 2008/09: 36,700 extra winter deaths, 700 per million pop.

# Excess winter deaths



Excess winter mortality as the percentage increase over non-winter deaths

“The UK is insufficiently prepared for cold weather”

# Housing Health and Safety Rating System (HHSRS)

## Category 1 hazard = 'Poor Housing'

### Physiological Requirements

- Damp and mould growth etc
- Excessive cold
- Excessive heat
- Asbestos etc
- Biocides
- CO and fuel combustion productions
- Lead
- Radiation
- Uncombusted fuel gas
- Volatile organic compounds

### Psychological Requirements

- Crowding and Space
- Entry by intruders
- Lighting
- Noise

### Protection Against Infection

- Domestic hygiene, pests and refuse
- Food safety
- Personal hygiene, sanitation and drainage
- Water supply

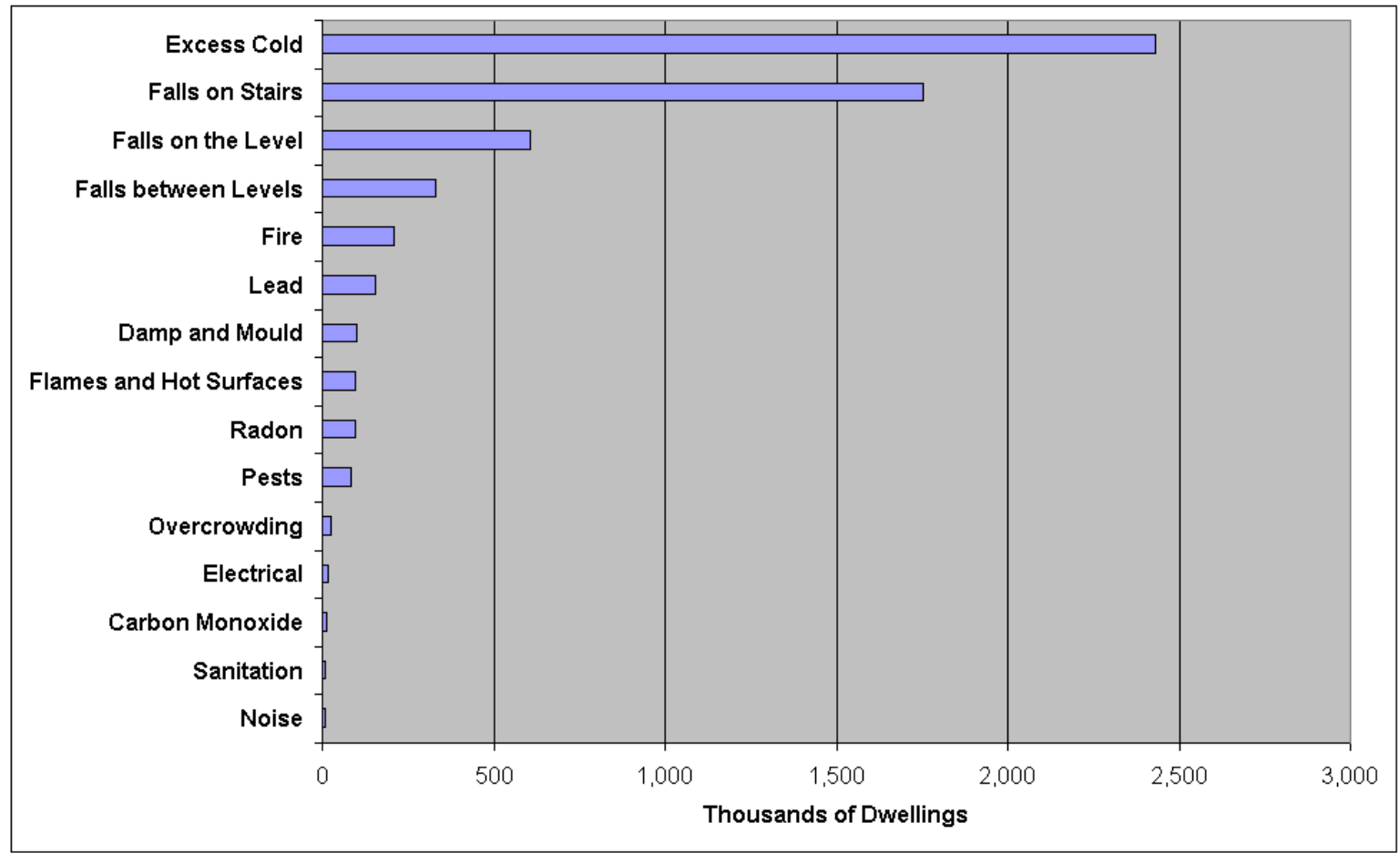
### Protection Against Accidents

- Falls associated with baths etc
- Falling on level surfaces
- Falling on stairs etc
- Falling between levels
- Electrical hazards
- Fire
- Flames, hot surfaces etc
- Collision and entrapment
- Explosions
- Position and operability of amenities etc
- Structural collapse and falling elements



# Occurrence of HHSRS Cat 1 hazards - 2006 EHCS

4.8 million homes (22%) have category 1 hazards

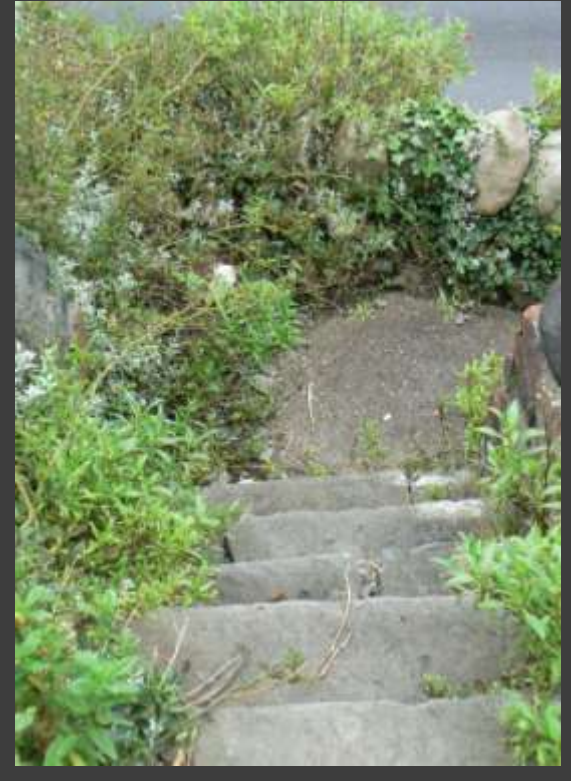


# Physiological - Excess Cold

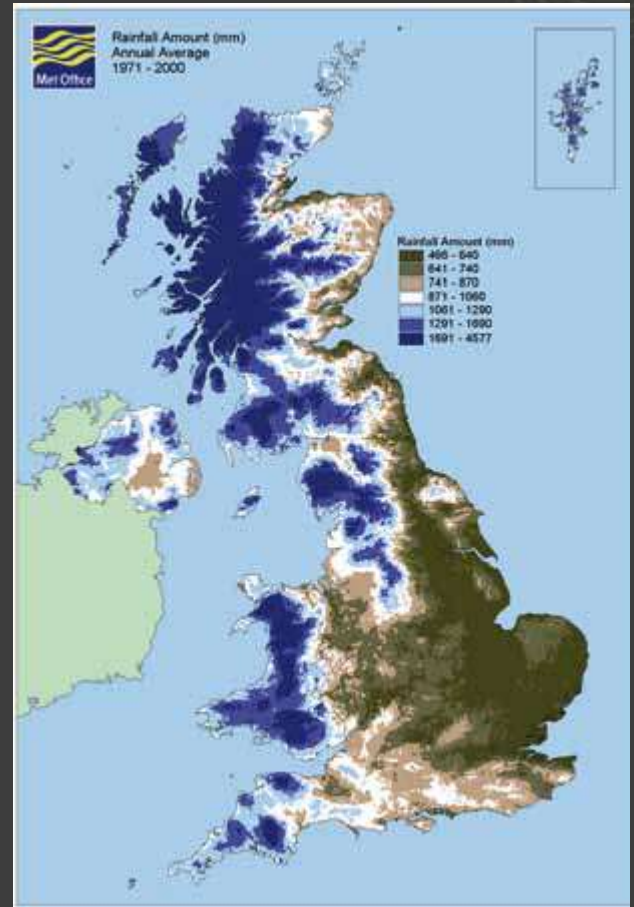


Poor fabric of building (solid walls)  
single glazing and no loft insulation  
poor efficiency heating system with expensive fuel (e.g. open coal fires)  
detached and rambling layout leads to higher heat loss.  
**SAP rating of 1.**

# HHSRS Cat 1 Fall hazards



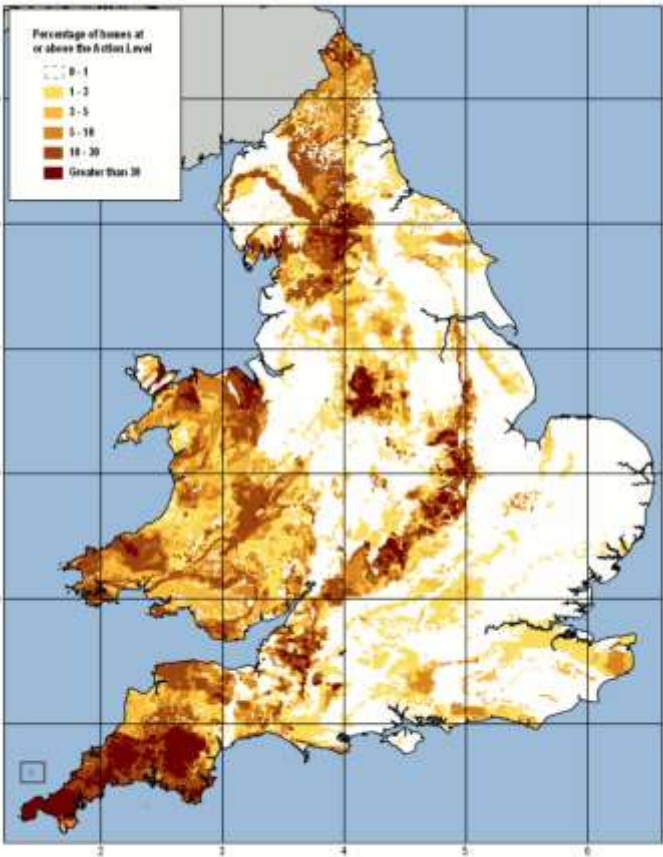
# Dampness



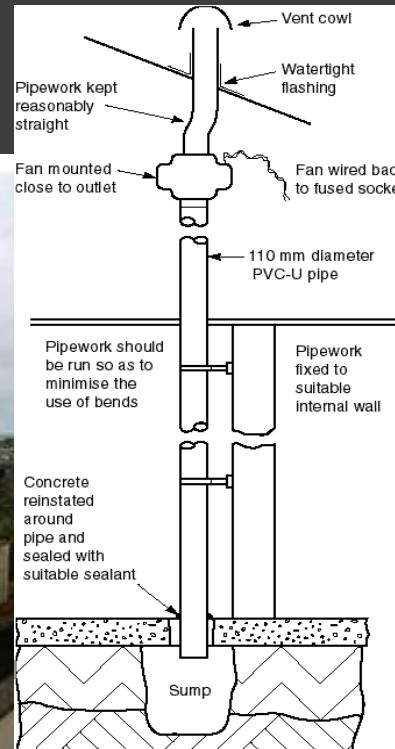
# Flames, hot surfaces fire



# Radiation



Overall map of radon Affected Areas in England and Wales (axis numbers are the 100-km coordinates of the national grid)  
 © Crown copyright. All rights reserved. Health Protection Agency [1000169-00] (2007)  
 Radon potential classification © Health Protection Agency and British Geological Survey copyright [2007]



# Food safety, domestic hygiene



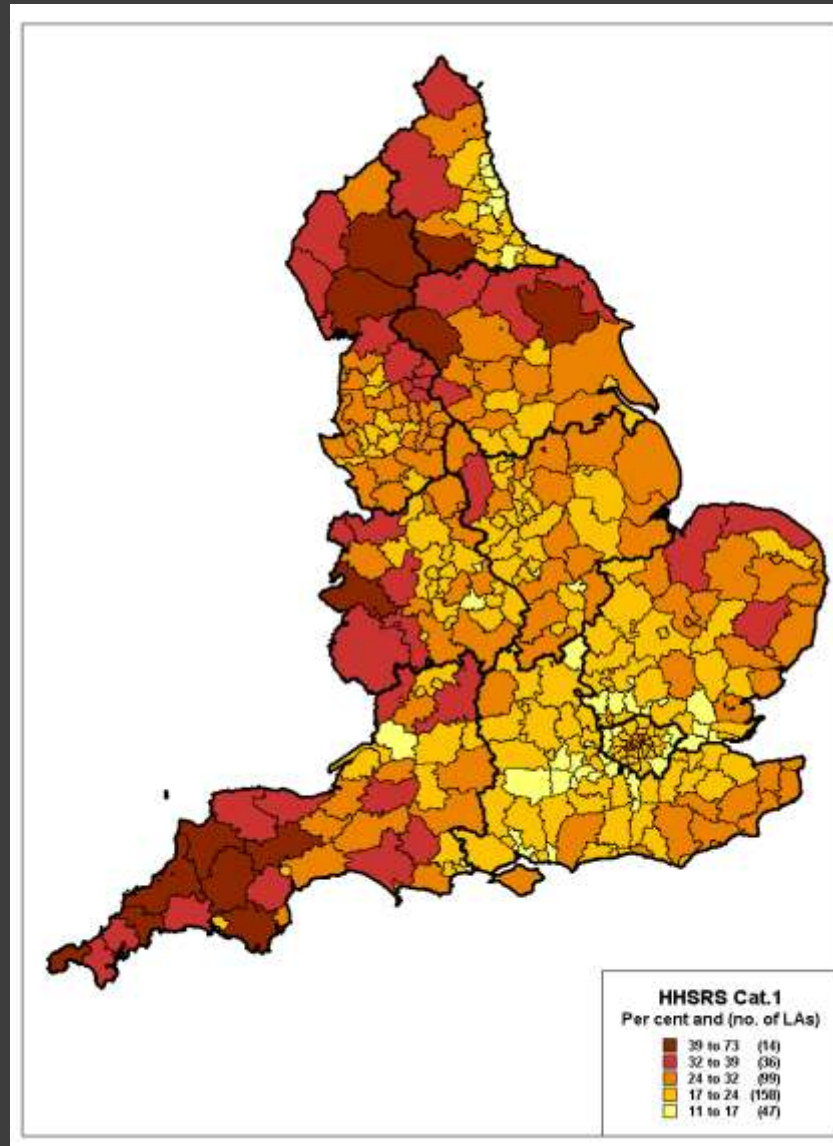
# Psychological – Poor Lighting



# Entry by intruders



# Distribution of HHSRS Category 1 hazards across England

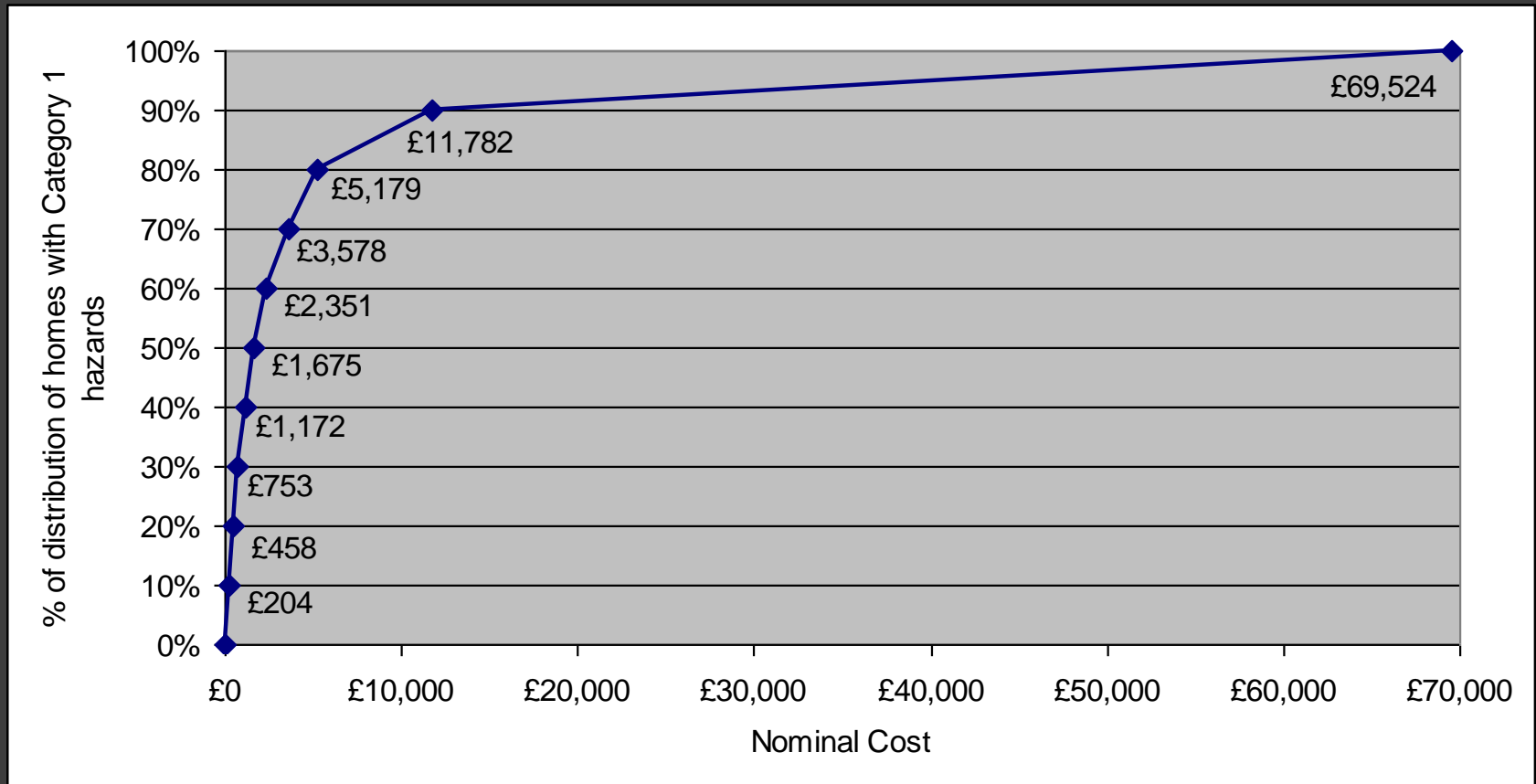


# Estimates of costs of remedial work (2006 EHCS)

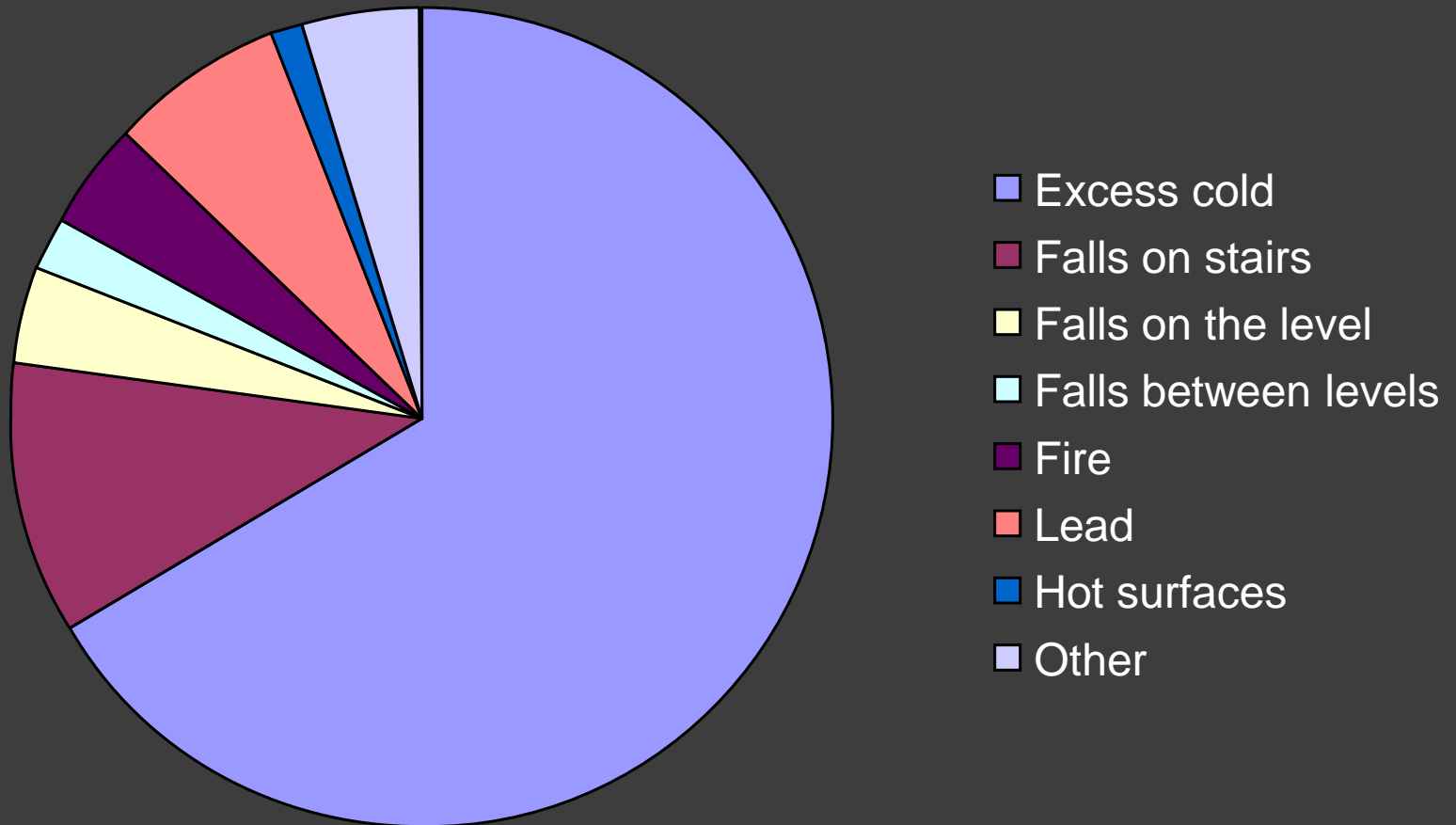
	No. Cat 1 HHSRS	Average cost per dwelling £	total cost £
falls between levels	332,000	£1,276	£423,715,000
excess cold	2,346,500	£4,994	£11,717,151,475
carbon monoxide	12,000	£1,000	£12,000,000
overcrowding	23,000	£700	£16,100,000
dampness	99,000	£5,000	£495,000,000
electrical problems	15,000	£4,000	£60,000,000
fire	210,000	£1,756	£368,900,000
flames and hot surfaces	98,000	£2,200	£215,551,000
lead	154,000	£8,000	£1,232,000,000
noise	9,000	£4,000	£36,000,000
falls on the level	607,000	£1,050	£634,673,130
domestic hygiene	82,000	£1,400	£114,800,000
radon	96,000	£800	£76,800,000
falls on stairs	1,755,000	£1,084	£1,902,420,000
Personal hygiene	9,000	£1,300	12,600,000
<b>Any</b>	<b>4,752,000</b>	<b>£3,710</b>	<b>£17,644,252,905</b>

# How much would it cost to reduce these hazards to an acceptable level?

Average cost is £3,710.... BUT considerable variation:



# Total cost to repair (£17.6 Billion)



# Costs to society of living with HHSRS hazards

Residents Costs	External Costs
High annual loss of asset value if property owned (H)	High annual loss of asset value if property rented (H)
Poor physical health (H – M)	Higher Health Service costs (H – NQ)
Poor mental health (M – NQ)	Higher Health Service costs (H – NQ)
Social isolation (NQ)	Higher care services costs (M)
High home fuel bills (H)	High building heating costs (H)
High insurance premiums (H)	High insurance payments (H)
Uninsured contents losses (M)	
Spending on security devices (H)	Spending on building security (H)
Living with repairs needed (NQ)	High housing maintenance costs (H)
Under-achievement at school (NQ)	Extra costs on school budgets (H)
	Homework classes at school (H)
Loss of future earnings (M)	Loss of talents to society (NQ)
Personal insecurity (NQ)	High policing costs (H – M)
More accidents (M)	High emergency services costs (H)
Poor hygienic conditions (NQ)	High environmental health costs (H)
Costs of moving (M)	Disruption to service providers (M)
Adopting self-harming habits (M)	Special health-care responses (H)
	Government and EU programmes, SRB, New Deal etc (H)

# What types of outcomes have we costed?

- Direct costs of medical treatment and aftercare only
- Why?
  - Transparent method of selecting a typical outcome for each level of harm for each hazard
  - Robust data available to estimate medical and care costs for the above
  - Cannot be accused of overstating the case
- How far does this underestimate full cost of poor housing?
  - These costs probably account a maximum of 40% of the total costs

# Typical HHSRS outcomes and first year treatment costs

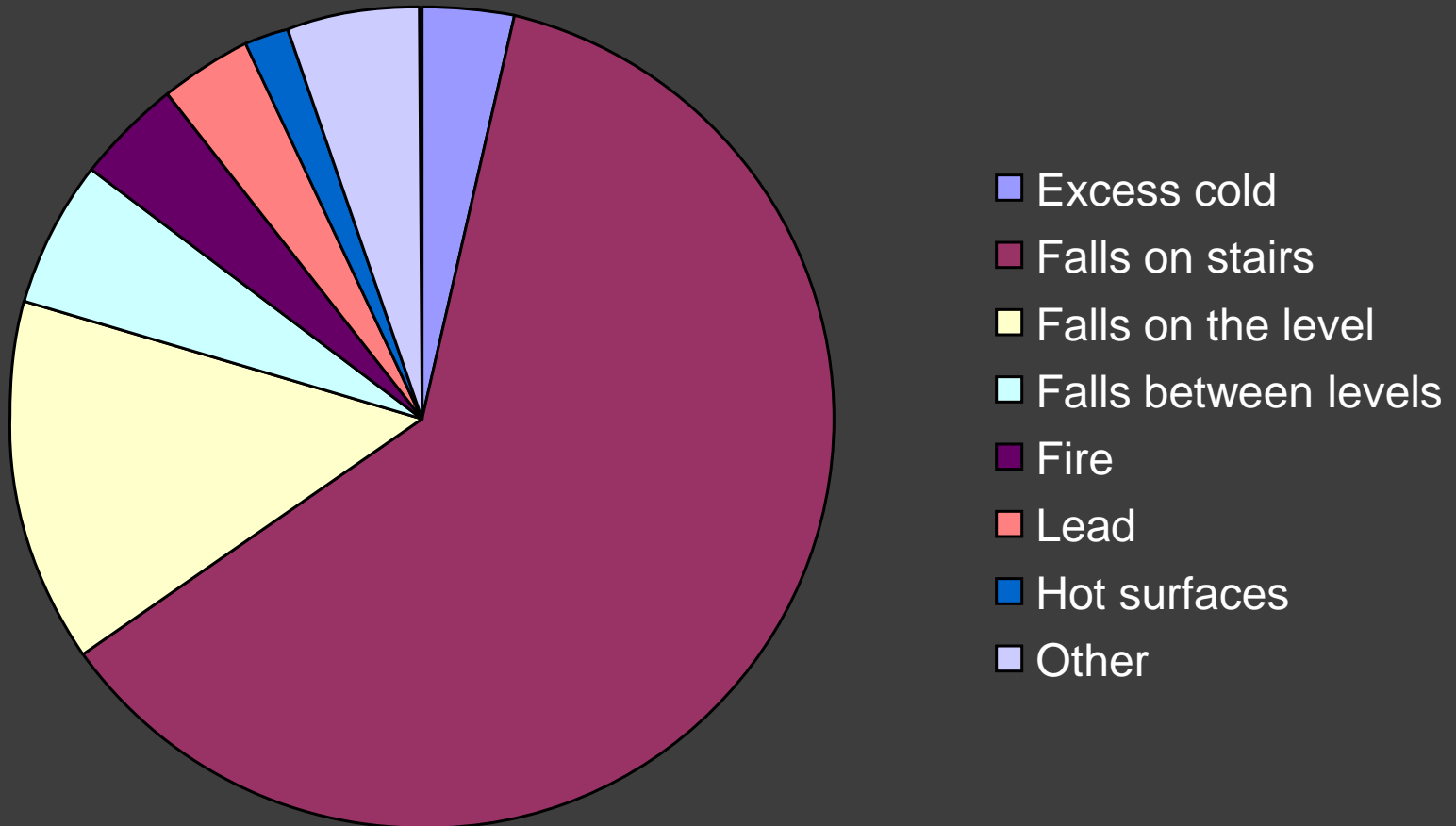
<b>Outcome Hazard</b>	<b>Class 1</b>	<b>Class 2</b>	<b>Class 3</b>	<b>Class 4</b>
Damp and mould growth	Not applicable -	Type 1 allergy (£1,998)	Severe asthma (£1,120)	Mild asthma (£180)
Excess cold	Heart attack, care, death (£19,851)	Heart attack (£22,295)*	Respiratory condition (£519)	Mild pneumonia (£84)
Radon (radiation)	Lung cancer, then death (£13,247)	Lung cancer, survival (£13,247)*	Not applicable -	Not applicable -
Falls on the level	Quadraplegic (£59,246)*	Femur fracture (£25,424)*	Wrist fracture (£745)	Treated cut or bruise (£67)
Falls on stairs and steps	Quadraplegic (£59,246)*	Femur fracture (£25,424)*	Wrist fracture (£745)	Treated cut or bruise (£67)
Falls between levels	Quadraplegic (£59,246)*	Head injury (£6,464)*	Serious hand wound (£1,693)	Treated cut or bruise (£67)
Fire	Burn ,smoke, care, death (£11,754)*	Burn, smoke, Care (£7,878)*	Serious burn to hand (£2,188)	Burn to hand (£107)
Hot surfaces and materials	Not applicable -	Serious burns (£4,652)	Minor burn (£1,234)	Treated very minor burn (£107)
Collision and entrapment	Not applicable -	Not applicable -	Punctured lung -	Treated cut or bruise -

Not applicable = HHSRS class very rare or non existent

\*Costs after 1 year are likely to occur, these are not modelled

# Cost to the NHS of 'poor housing' est. = **£600m** pa

Broken down by hazard, as follows:

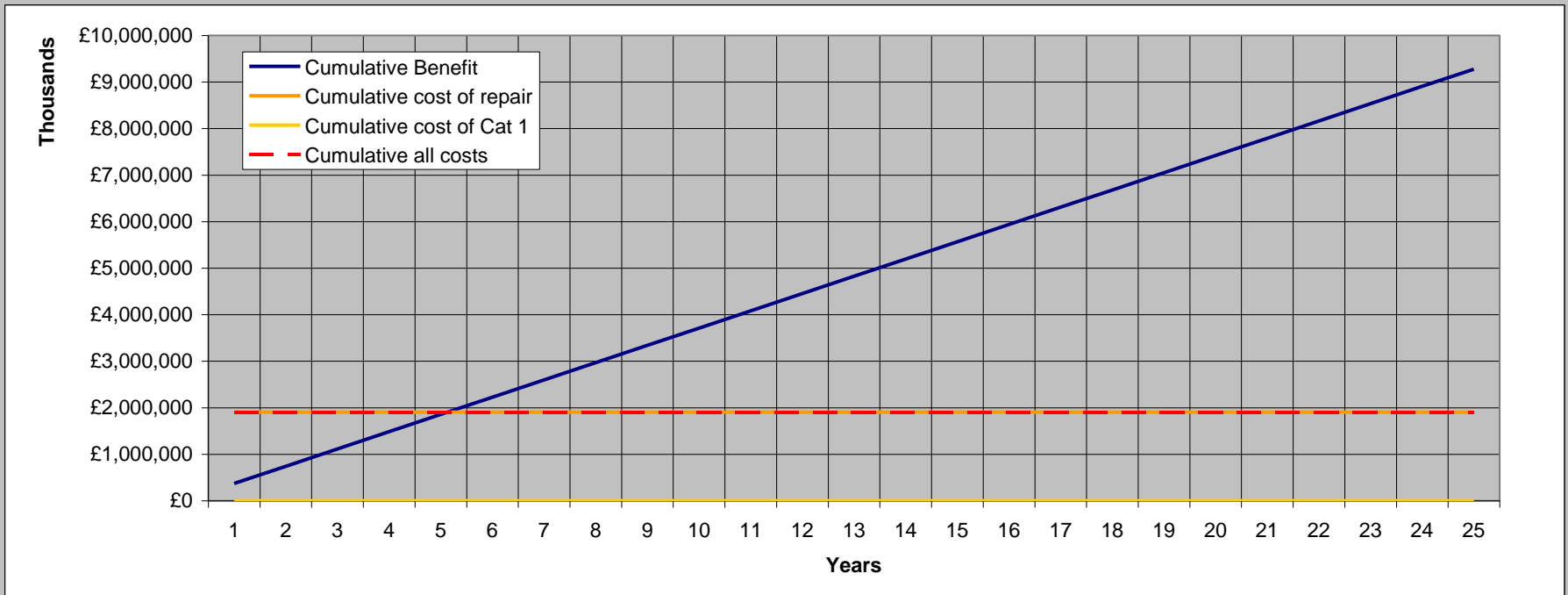


## Cost benefit tool

- We cannot find £17.6bn and go out and fix every HHSRS Category 1 hazard in the home tomorrow and save the NHS £0.6bn pa.
- So the cost-benefit tool uses the costs provided through the research to develop different scenarios for action:
  - Different investment over time
    - *(none, all at start, over 5 years, over 10 years etc.)*
  - Number of homes to be repaired
  - How far repairs are targeted at cheaper solutions or ‘quick wins’
  - Impact of different discount rates for NPV calculations
  - Differences in costs and benefits (if data updated or local circumstances vary)

# Falling on stairs and steps – all investment in year 1

Hazard Scenario	Fall on Stairs All up front	Cost	equal	each year	Number of category 1 hazards in England	1,755,000
		Benefit	equal	each year	Average <b>Cost</b> to repair	£ 1,084
Total number of properties to repair					Total cost to repair in England	£ 1,902,420,000
Time period for repair	10 years				Probability of <b>Category 1</b> hazardous event	32
Proportion to repair	All				Probability of <b>Population Average</b> hazardous event	245
Time period	1 years				Average <b>Benefit</b> to NHS by repairing	£ 211
Annual budget for repair	£ 1,902,420,000				Payback period	5.1 years
Annual number of properties to repair	1,755,000				Cumulative payback period	6 years
Average cost to repair	£ 1,084				Total All Cost over 25 years	£ 1,902,420,000
					Total Benefit over 25 years	£ 9,276,244,453
					At 7% discount rate: Period for NPV to become positive	7 years



# Payback example: Falls on stairs 1

- Work - replace balustrades
- Cost of work = £314
- Annual benefit to NHS = £146
- Payback = 2.1 years



## Payback example: Falls on stairs 2

- Work – re-design staircase
- Cost of work = £3,829
- Annual benefit to NHS = £864
- Payback = 4.4 years



# Payback example: Fire safety

- Work – install 2 hard wired smoke detectors
- Cost of work = £178
- Annual benefit to NHS = £102
- Payback = 1.7 years



# Payback example: small improvement scheme

- Works include: HHSRS excess cold, falls on stairs, damp, security
- Cost of work = £165,333
- Annual benefit to NHS = £18,613
- Payback = 8.9 years



## Case study: the cost-benefit of energy improvements



**Before:** solid, un-insulated stone walls, partial double glazing, small amount of roof insulation, off peak storage radiators, electric immersion heater.

- Cost of upgrade = £0
- SAP = 22
- Annual fuel cost = £965
- CO2 emissions = 8,972 kg pa
- HHSRS Band = A

**After:** condensing gas boiler and radiators for space and water heating, top-up loft insulation, full double glazing.

- Cost of upgrade = £3,528
- SAP = 59
- Annual fuel cost = £461
- CO2 emissions = 4,666 kg pa
- HHSRS Band F
- Cost savings to NHS pa = £528
- Payback to NHS = 5.1 years

# Key messages

It is clear that:

- Poor housing can seriously damage people's physical and mental health and affect their future wellbeing and prosperity;
- If all the worst housing in England was fixed tomorrow there would be benefits to the NHS of some £600m a year in saved treatment costs;
- Tackling poor housing conditions is not always expensive and has clear cost benefits;
- Good sense for the Government to invest in improving housing rather than pay for the consequences of poor housing through the NHS.