Department for Communities and Local Government

English Housing Survey
FIRE AND FIRE SAFETY 2012-13

ENGLISH HOUSING SURVEY

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Department for Communities and Local Government

English Housing Survey:
FIRE AND FIRE SAFETY

Annual report on England's households and housing stock, 2012-13

July 2014
Department for Communities and Local Government

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Department for Communities and Local Government
Eland House
Bressenden Place
London
SW1E 5DU
Telephone: 030 3444 0000

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Content

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- All the households who gave up their time to take part in the survey.
- NatCen who managed the English Housing Survey on behalf of the department and led the production of the 2012-13 Households Report.
- The Building Research Establishment (BRE) who managed the physical survey of properties and led the production of the 2012-13 Profile of English Housing Report, the 2012-13 Energy and Energy Efficiency Report and the 2012-13 Fire and Fire Safety Report.
- The NatCen interviewers who conducted the household interviews and the CADS Housing Surveys surveyors who carried out the visual inspections of properties.
- And finally, the team at DCLG who worked on the survey and who were involved in the production of this report.

Introduction

1. The English Housing Survey (EHS) is a national survey of people's housing circumstances and the condition and energy efficiency of housing in England. In its current form, it was first run in 2008-09. Prior to then, the survey was run as two standalone surveys: the English House Condition Survey and the Survey of English Housing. This report provides the latest findings on fire and fire safety.

2. This is the first time that findings on fire and fire safety have been presented in a standalone report, which will be included in the annual EHS reporting round from this point forward.

3. A number of questions relating to fire safety features are included every year. However, because some questions on fire and fire safety rotate in and out of the EHS, this report presents findings from several different survey years. The report focuses on the extent to which the existence of fire and fire safety features vary by household and dwelling type. It is split into three sections. The first provides an overview of the characteristics of people who had a working smoke alarm in 2012-13. The second section explores reasons for not having a working alarm and is based on 2010-11 data. The final section investigates the existence of fire hazards in different types of homes in 2012 and the characteristics of the people that live in dwellings with fire hazards.

4. Results in the first section of the report, on households, are presented for '2012-13' and are based on fieldwork carried out between April 2012 and March 2013 on a sample of 13,652 households. Throughout the report, this is referred to as the '2012-13 full household sample'. The smaller sample size (compared with previous waves of the survey) is the consequence of a cost review of the survey undertaken in 2010 to identify where efficiency savings could be made.

5. Results in the second section of the report, also on households, are presented for '2010-11' and are based on fieldwork carried out between April 2010 and March 2011 on a sample of 17,556 households. Throughout the report, this is referred to as the '2010-11 full household sample'.

6. Results in the final section of the report are presented for '2012' and are based on fieldwork carried out between April 2011 and March 2013 (a mid-point of April 2012). The sample comprises 12,763 occupied or vacant dwellings where a physical inspection was carried out. Throughout the report, this is referred to as the 'dwelling sample'.

7. In tables, where the numbers of cases in the sample are too small for any inference to be drawn about the national picture, the cell contents are replaced with an asterisk. This happens when the cell is based on sample of less than five cases. Where cell contents are in italics this indicates a total sample size of less than 30, and the results should be treated with caution.

8. Where comparative statements have been made in the text, these have been significance tested to a 95% confidence level. This means we are 95% confident that the statements we are making are true.

9. Additional annex tables, including the data underlying the figures and charts, are published on the DCLG website: https://www.gov.uk/government/organisations/department-for-communities-and-local-government/series/english-housing-survey alongside many supplementary tables, which are updated each year but are too numerous to include in our reports. Further information on the technical details of the survey, and information and past reports on the Survey of English Housing and the English House Condition Survey can also be accessed via this link.

10. This report complements fire statistics published by DCLG which are produced from records of all incidents attended by local authority fire and rescue services. Headline data from fire and rescue incident records can be found in the Fire Statistics Monitor: https://www.gov.uk/government/collections/fire-statistics-monitor. More detailed analyses including on the locations and causes of fire, and the effectiveness of smoke alarms can be found in Fire Statistics Great Britain: https://www.gov.uk/government/collections/fire-statistics-great-britain.

11. If you have any queries about this report – especially given that this is the first time EHS statistics have been presented in this way on the topic of fire and fire safety, would like any further information or have suggestions for analyses you would like to see included in future EHS reports, please contact ehs@communities.gsi.gov.uk

12. The responsible statistician for this report is: Jeremy Barton, English Housing Survey Team, Strategic Statistics Division, DCLG. Contact via ehs@communities.gsi.gov.uk

Key findings

In the last 10 years, there has been a significant increase in the proportion of households with at least one working smoke alarm

- Between 2002-03 and 2012-13, the proportion of households with a working smoke alarm increased from 76% to 88%.
- In particular, the last 10 years has seen large increases among private rented and local authority households, up from 66% and 71% respectively to 83% and 89%.
- Ownership of a working smoke alarm also increased among households living in flats (68% in 2002-03 to 85% in 2012-13), single households under 60 (65% to 81%) and multi-person households (70% to 85%).
- Ownership among ethnic minority households also increased: among black HRP households ownership rose from 63% to 83%, among Pakistani or Bangladeshi HRP households from 50% to 78% and among Indian HRP households ownership increased from 53% to 83%.

Despite improvements, private renters were less likely to have a working smoke alarm than owner occupiers and social renters

- In 2012-13, 83% of private renters had at least one working smoke alarm compared with 88% of owner occupiers, 89% of local authority tenants and 92% of housing association tenants.

Half of the estimated 744,000 households with a smoke alarm that did not work stated that this was because they had not got around to replacing the batteries

- 3% of households had a smoke alarm installed, but which was not working. Of these households, around half (52%) said that they did not have a working smoke alarm because they had not replaced the flat batteries, 14% had disabled their smoke alarm due to false alarms, and 4% had removed the batteries to be used elsewhere.

In 2010-11, an estimated 1.9 million households did not have a smoke alarm installed; reasons for not having a smoke alarm varied

- Of the 9% of households that did not have a smoke alarm installed, half (50%) stated that they did not have a smoke alarm because they had not got round to obtaining one yet while 14% of households felt it was the responsibility of their

landlord to install smoke alarms in their home. Some 9% of these households stated that they did consider themselves or their family to be at risk from a fire while 6% said that they did not have a smoke alarm because they were unsightly.

An estimated 975,000 homes had a significantly higher than average risk of fire

- In 2012, 4% of homes in England were assessed as having a higher risk of fire. Of these, 98,000 had the most serious Category 1 fire hazards such as poor electrical safety, poor means of escape and lack of working smoke alarm. The majority of these Category 1 hazards were in private sector dwellings (89%), in houses or bungalows (65%), and in homes built before 1919 (63%).

Chapter 1
Smoke alarms and fire safety measures in the home

Smoke alarms and other fire safety equipment that are correctly installed and maintained, play a vital role in reducing fire deaths and injuries in the home. For this reason, current building regulations (Part B) require that every new build and major refurbishment must allow for mains wired, interconnected smoke alarms to be installed.

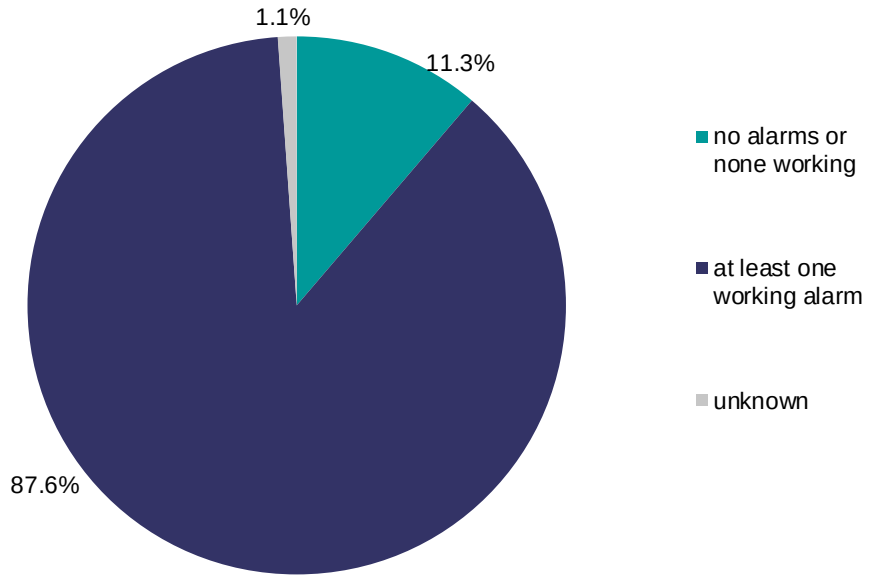
This chapter examines the characteristics of households who have a working smoke alarm in 2012-13 and whether these have changed since 2002-03[1]. Logistic regression analysis is used to illustrate the strongest predictors of working smoke alarm ownership. The chapter also provides information on the presence of other fire safety measures in the home and whether provision of these has changed over time.

Smoke alarm ownership

1.1 In 2012-13, 92% of all households in England had one or more smoke alarms installed in their home, Annex Table 1.7. However, not all of these alarms were working at the time of the survey. Overall, 88% of all households had at least one working smoke alarm in their home, 11% of households either did not have a smoke alarm or it was not working, whilst a small proportion (1%) did not know if their smoke alarm was working or not, Figure 1.1.

[1] The household's response to the presence and working order of their fire safety equipment was taken as correct. None of the fire safety measures have been checked as present or tested as working.

Figure 1.1: Smoke alarm ownership, 2012-13



Base: all households
Note: underlying data are presented in Annex Table 1.1
Source: English Housing Survey, full household sample

Working smoke alarm ownership

Tenure and dwelling type

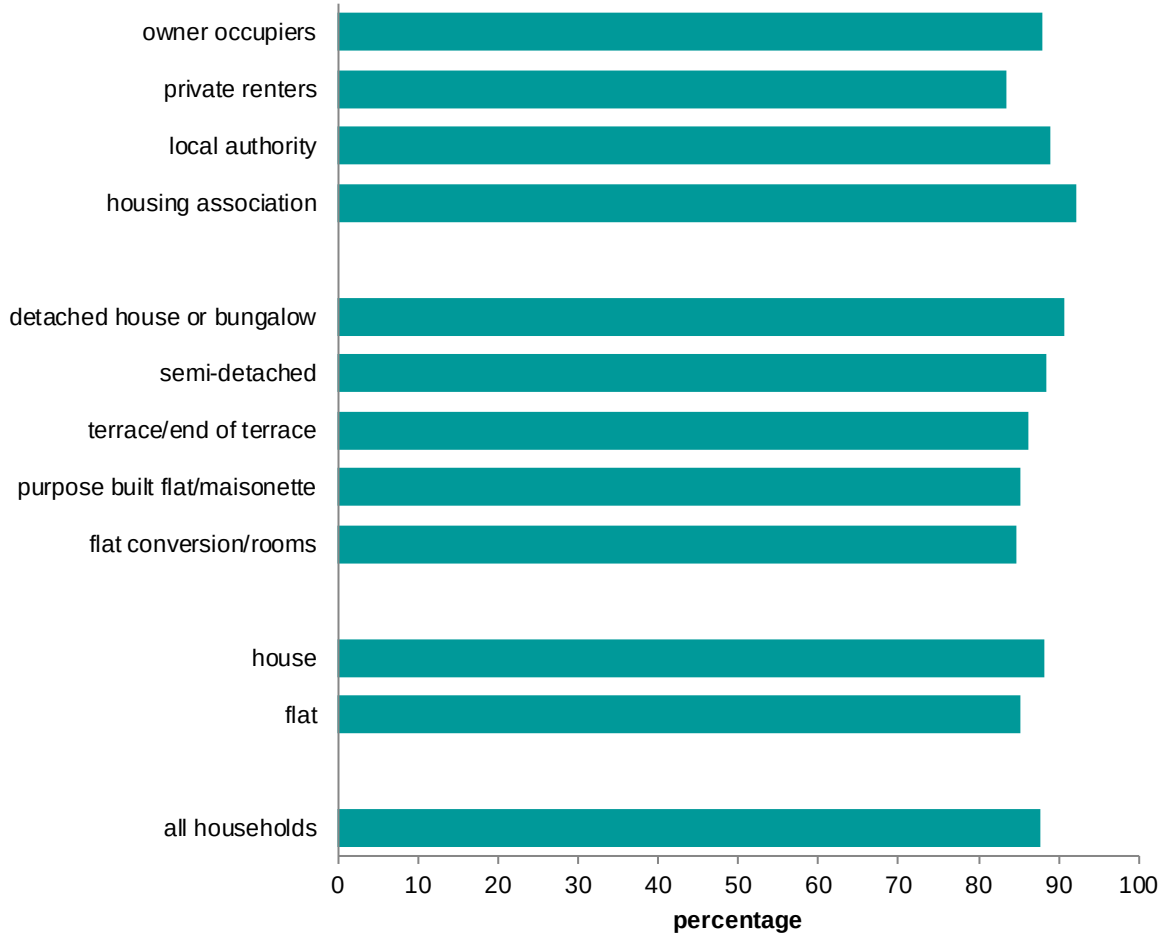
1.2 There is no legal requirement for owner occupiers to install a smoke alarm in their home or for landlords to provide smoke alarms in single occupation tenanted properties. However, DCLG's Fire Kills campaign advises that landlords ensure that at least one smoke alarm is installed on every level of the properties that they let.

1.3 Housing association households (92%) were most likely to have at least one working smoke alarm in their home. A similar proportion of owner occupiers (88%) and local authority tenants (89%) had at least one working smoke alarm. Private renters (83%) were the least likely to have this feature, highlighting the potential for improvement within this sector, Figure 1.2.

1.4 Houses (88%) were more likely to have a working smoke alarm than flats (85%). There was no difference in the proportion of households that had a working smoke alarm according to the type of flat (i.e. conversion or purpose built).

1.5 Households living in detached houses and bungalows were more likely to have a working smoke alarm (91%) than those households living in terrace and semi-detached houses (86-88%).

Figure 1.2: Households with at least one working smoke alarm, by tenure and dwelling type, 2012-13



Base: all households
Note: underlying data are presented in Annex Table 1.1
Source: English Housing Survey, full household sample

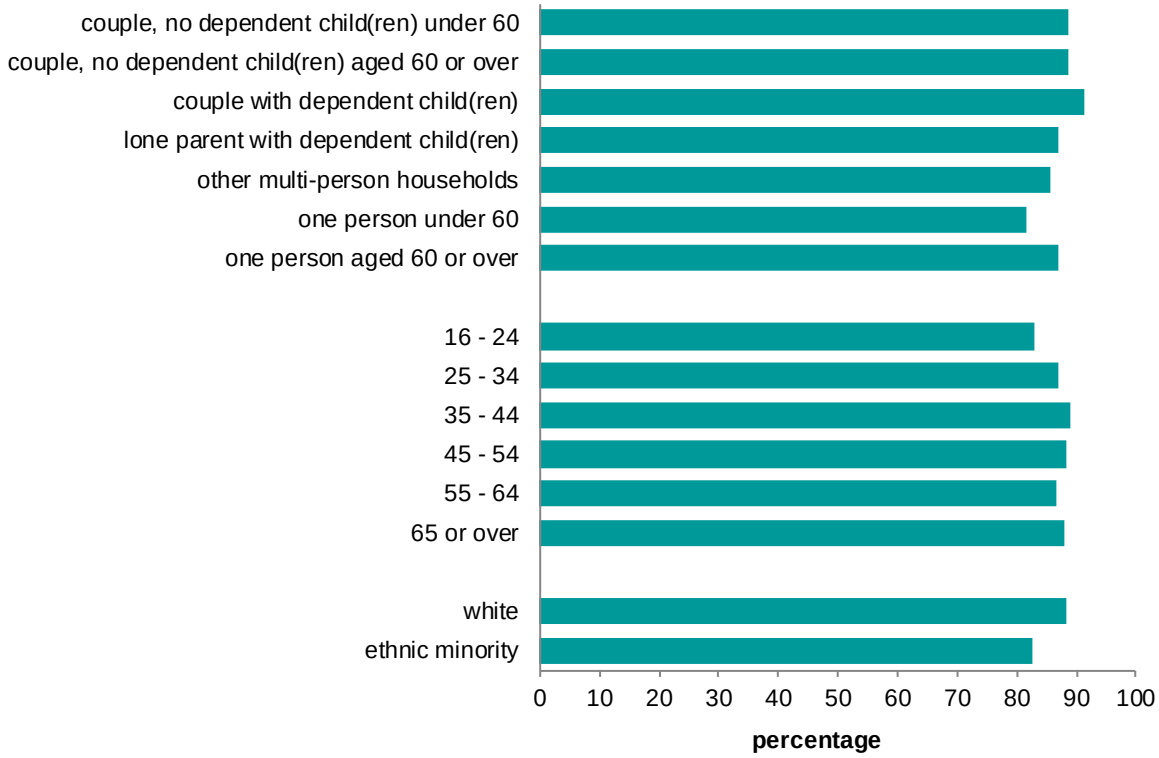
Household characteristics

1.6 The differences in working smoke alarm ownership between types of households were more noticeable than those that existed between different tenures and dwelling types.

1.7 Couples with dependent children were most likely to have a working smoke alarm (91%), whilst single households under 60 (81%) were least likely to have this feature. As over one quarter of households with a household reference person (HRP) aged 16-24 were single households, this group were less likely to have a working smoke alarm (83%) than other age groups, Figure 1.3.

1.8 Households with a HRP from an ethnic minority background were less likely than households with a white HRP to have a working smoke alarm (83% compared with 88%).

Figure 1.3: Households with at least one working smoke alarm, by household type, age and ethnicity, 2012-13

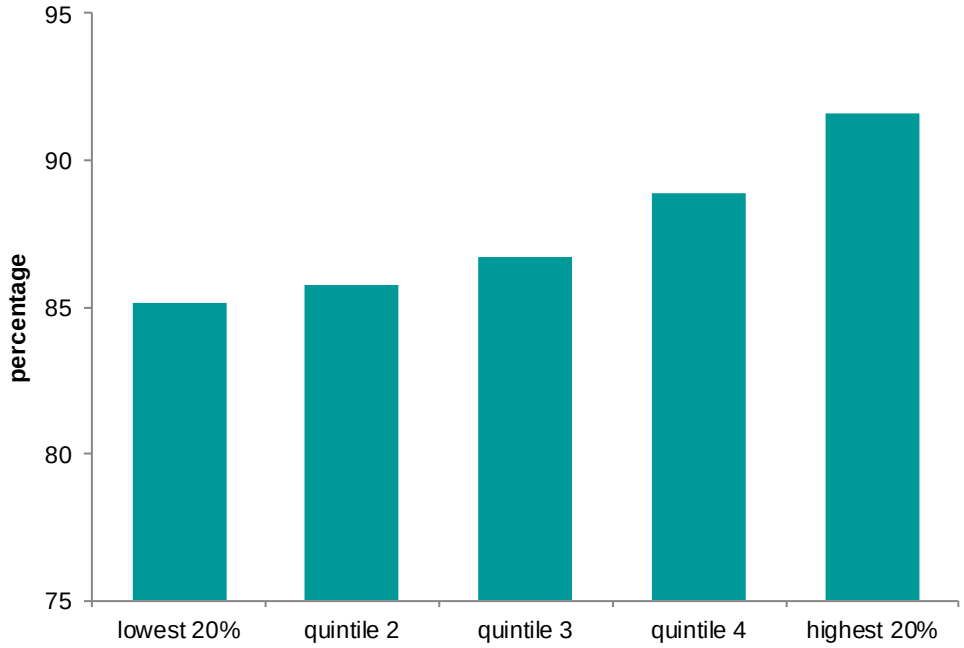


Base: all households
Note: underlying data are presented in Annex Table 1.2
Source: English Housing Survey, full household sample

1.9 Households where the HRP was either working full time (89%) or retired (88%) were more likely to have at least one working smoke alarm than student (81%) or unemployed households (82%), Annex Table 1.3.

1.10 The likelihood of having a working smoke alarm was also related to household income. Households in the highest 40% of household incomes were more likely to have this feature compared with lower income bands, Figure 1.4

Figure 1.4: Households with at least one working smoke alarm, by household income band, 2012-13



Base: all households
Note: underlying data are presented in Annex Table 1.3
Source: English Housing Survey, full household sample

1.11 Households were equally likely to have a working smoke alarm if they were registered disabled or were in receipt of means tested benefits or disability benefits compared with all other households, Annex Table 1.3.

Multivariate analysis

1.12 Multivariate analysis was conducted to identify those factors that were most likely to result in the ownership of a working smoke alarm/s. Logistic regression was used to assess which key factors (independent variables), outlined below, are statistically related to the ownership of at least one working smoking alarm (the dependent variable). Each individual factor is assessed assuming all other characteristics in the model are held equal. Although logistic regression can be used to explore associations between variables, it does not necessarily imply causation and results should be treated as indicative rather than conclusive. See Appendix A for further information on the methodology and table for this analysis.

Household type

1.13 The logistic regression shows that, for households with the same characteristics apart from household type, households containing couples with dependent children had the highest likelihood of having a working smoke alarm. All other types of households were significantly less likely to have a working smoke alarm with households consisting of one person under 60 being the least likely.

Income

1.14 Households in the highest income band quintile were found to have the highest likelihood of having a working smoke alarm. All households not in the highest quintile had lower likelihood of owning a working smoke alarm, with those households in the lowest income quintile being the least likely.

Tenure

1.15 Housing association tenants were found to have the highest likelihood of having a working smoke alarm, most likely due to the higher proportion of newer homes in this sector. All other households had significantly lower likelihood of having a working smoke alarm, with private renters being the least likely.

Type of accommodation

1.16 Relative to households living in a detached house or bungalow, all households in other accommodation types had lower likelihood of having a working smoking alarm particularly converted flats.

Ethnicity

1.17 Compared to households where the HRP was white, households with a HRP from an ethnic minority background had lower likelihood of having a working smoke alarm in their home. Households with a Pakistani or Bangladeshi HRP had the lowest likelihood of having a working smoke alarm.

Employment status

1.18 Relative to households where the HRP worked full time, households with an unemployed HRP had the lowest odds of having a working smoke alarm.

Age

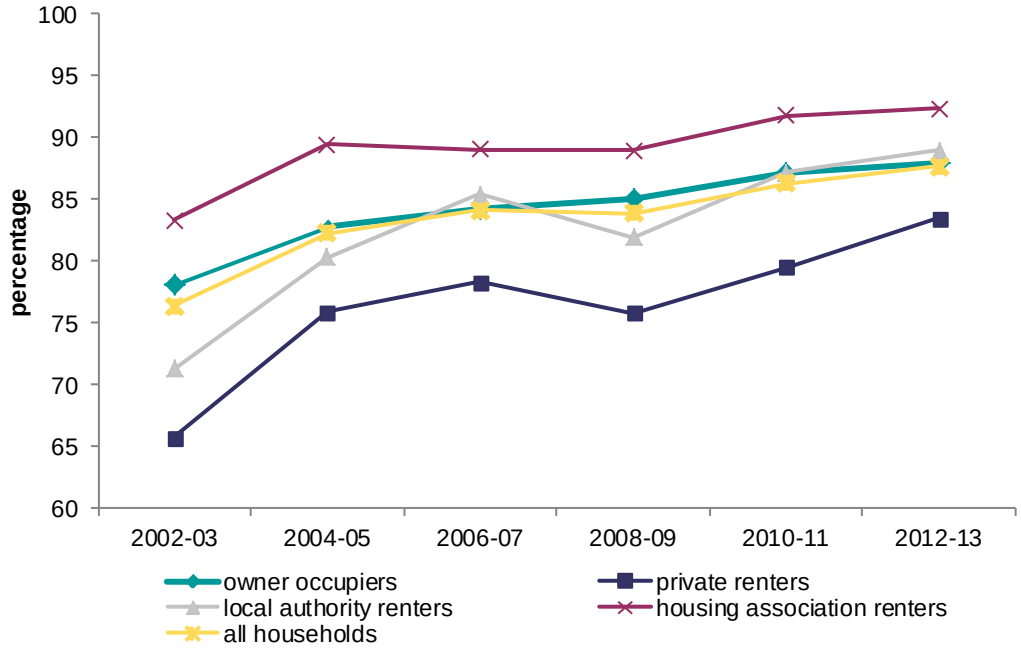
1.19 The age of the HRP had no impact on the likelihood of a household owning a working smoke alarm.

Trends in working smoke alarm ownership[2]

1.20 Between 2002-03 and 2012-03, there was a significant increase in the proportion of households with at least one working smoke alarm, from 76% to 88%. This increase occurred across all tenures and was likely to be partly due to factors such as the Fire Kills campaign and the Fire and Rescue Services community fire safety activities which include the installation of smoke alarms.

1.21 The most marked improvement over this period was for private renters (from 66% to 83%) and local authority tenants (from 71% to 89%).

Figure 1.5: Households with at least one working smoke alarm, by tenure, 2002-03 to 2012-13

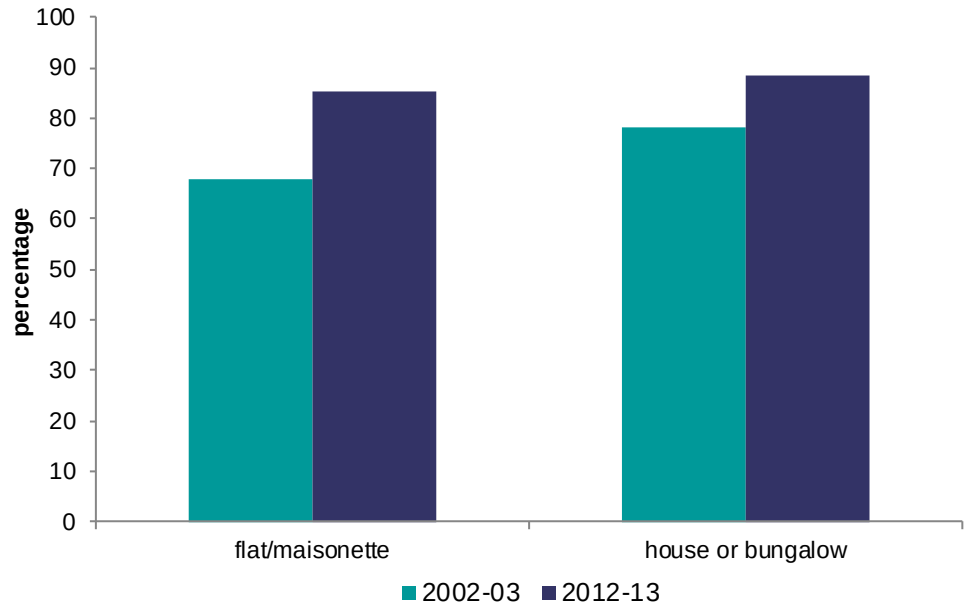


Base: all households
Note: underlying data are presented in Annex Table 1.4
Sources:
2002-03 to 2006-07: English House Condition Survey, household sub-sample;
2008-09 onwards: English Housing Survey, full household sample

1.22 Since 2002-03, the substantial increase in the proportion of households with more than one working smoke alarm was evident among all types of homes, but particularly among flats (up from 68% in 2002-03 to 85% in 2012-13), Figure 1.6.

[2] Questions on the presence and working order of smoke alarms were changed in 2008-09, so it is not possible to produce a fully consistent time series. For further details refer to *English housing survey: changes to survey form and questionnaire between 2008 and 2010*, https://www.gov.uk/government/publications/english-housing-survey-changes-to-survey-form-and-questionnaire-between-2008-and-2010

Figure 1.6: Households with at least one working smoke alarm, by dwelling type, 2002-03 and 2012-13

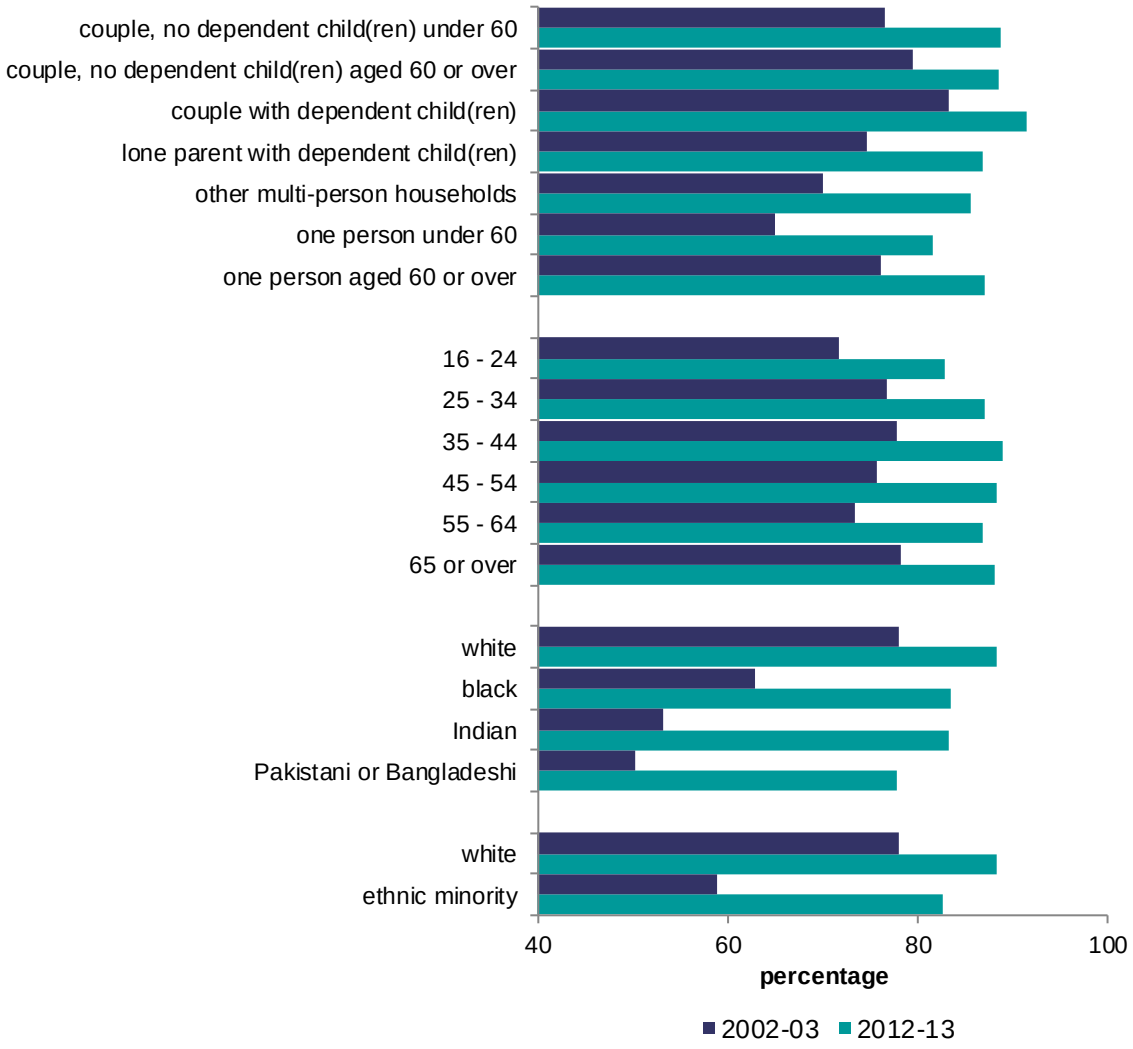


Base: all households
Note: underlying data are presented in Annex Table 1.1
Sources:
2002-03: English House Condition Survey, household sub-sample;
2012-13: English Housing Survey, full household sample

1.23 The significant increase in the proportion of households with at least one working smoke alarm between 2002-03 and 2012-13 occurred across all household types. The most notable improvement was among single person under 60 households (from 65% to 81%) and multi-person households (from 70% to 85%), Figure 1.7.

1.24 Over this period, there was also an increase in the proportion of ethnic minority households with a working smoke alarm. Ownership among black HRP households rose from 63% to 83%, ownership among Pakistani or Bangladeshi HRP households rose from 50% to 78% and ownership among Indian HRP households increased from 53% to 83%. Meanwhile, the proportion of white HRP households with at least one working smoke alarm in their home increased from 78% to 88%, Figure 1.7.

Figure 1.7: Household ownership of at least one working smoke alarm, by household type, age and ethnicity, 2002-03 and 2012-13



Base: all households
Note: underlying data are presented in Annex Table 1.2
Sources:
2002-03: English House Condition Survey, household sub-sample;
2012-13: English Housing Survey, full household sample

1.25 Although the proportion of households with at least one working smoke alarm has improved for all income and working status categories over this period, the most noticeable increase has been for those households in the 20% lowest income category (from 71% to 85%). Households who were economically inactive, unemployed or in full time education were less likely to have at least one working smoke alarm in their homes throughout this period, compared with households that were in part-time or full time work, or retired, Annex Table 1.3.

1.26 Between 2002-03 and 2012-13, there was an increase in the number of smoke alarms a household had installed. In 2002-03, 49% of households with a working smoke alarm had only one smoke alarm installed. By 2012-13, this proportion had fallen to 30% of households. However, the proportion of

households with two smoke alarms increased from 40% to 49%, and the proportion of households with three or more smoke alarms installed increased from 12% to 20% over this period, Annex Table 1.5.

How smoke alarms are powered

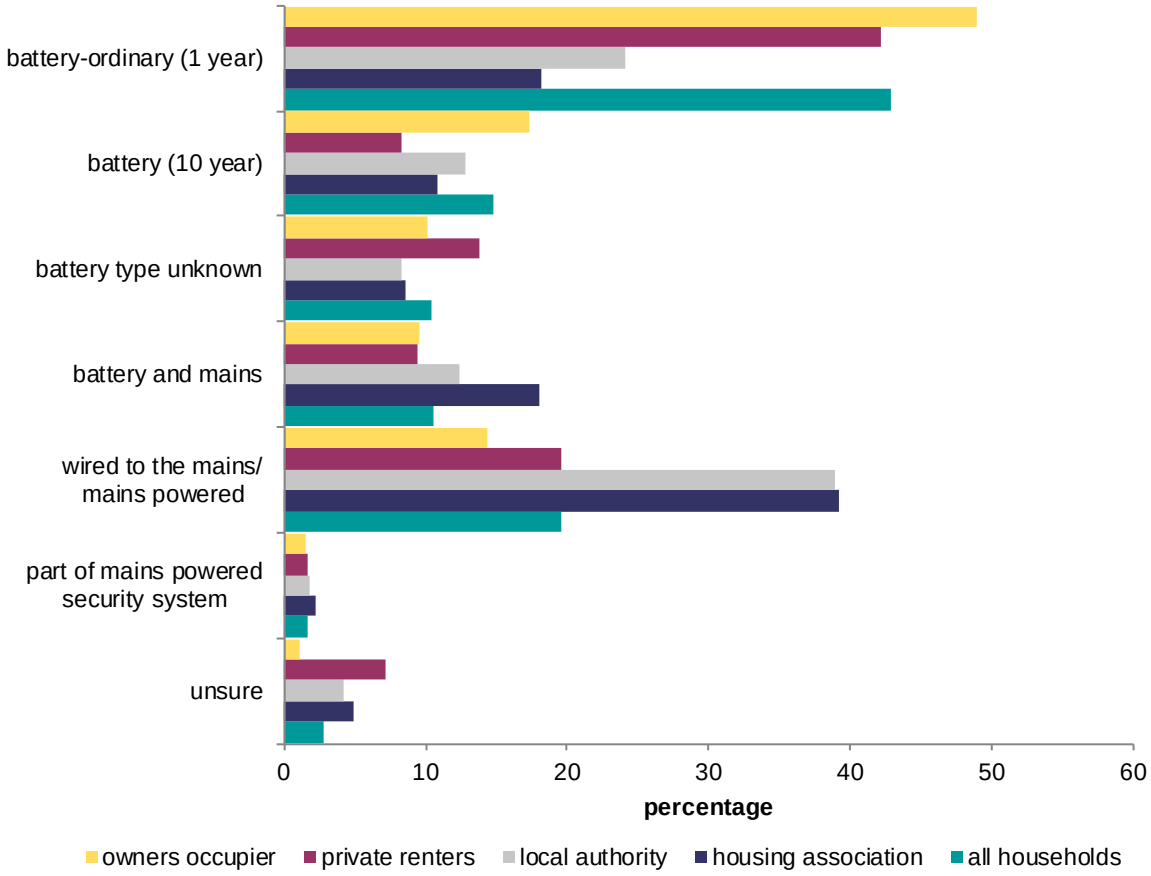
1.27 Households with working smoking alarms were also asked how these alarms were powered. Multiple responses were allowed for cases where more than one smoke alarm was owned since each alarm may have been powered differently.

1.28 In 2012-13, around two thirds (68%) of working smoke alarms were powered by battery only (43% with a 1 year battery, 15% with a 10 year battery and 10% with an unknown battery type). A fifth (20%) of working smoke alarms were mains only powered while 11% were powered by a combination of both battery and mains. A very small proportion (2%) of smoke alarms were part of the mains security system, Figures 1.8 and 1.9.

1.29 Social renters had a much higher proportion of their smoke alarms powered by mains power, including that to any mains powered security system, or by a combination of mains and battery power (53-59%) compared with both private renters (31%) and owner occupied households (26%), Annex Table 1.6.

1.30 Owner occupiers were much more likely to have smoke alarms powered by batteries only (76%) than by other means. The same was true for private renters, 64% of whom had a smoke alarm powered by batteries only. However, private renters were more likely than owner occupiers to have a smoke alarm powered by mains power only (20% compared with 14%), Figure 1.8.

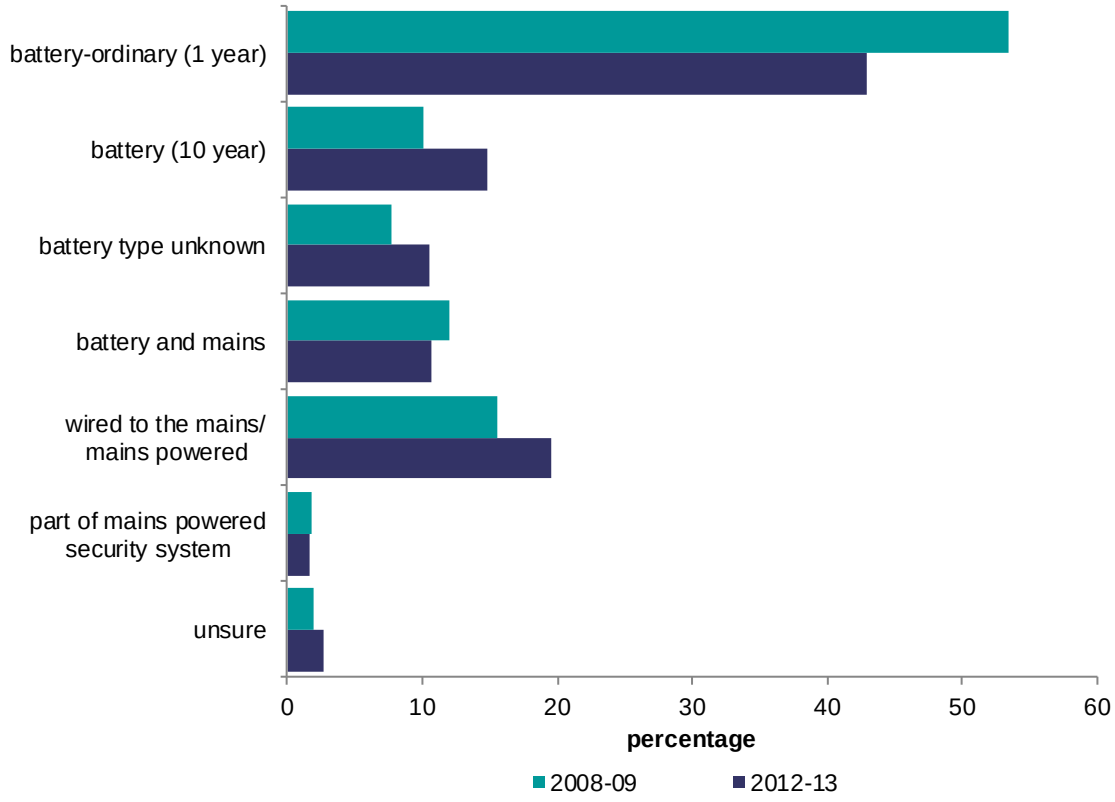
Figure 1.8: How working smoke alarms are powered, by tenure, 2012-13



Base: all households with at least one working smoke alarm
Notes:
1) multiple responses allowed for households with more than one smoke alarm
2) underlying data are presented in Annex Table 1.6
Source: English Housing Survey, full household sample

1.31 Between 2008-09 and 2012-13, there was a decrease in the number of smoke alarms that are powered by a 1 year ordinary battery (from 53% to 43%) but an increase in smoke alarms that are powered by a 10 year battery (10% to 15%) or that are mains powered only (from 16% to 20%), Figure 1.9.

Figure 1.9: How working smoke alarms are powered, 2008-09 and 2012-13



Base: all households with at least one working smoke alarm
Notes:
1) multiple responses allowed for households with more than one smoke alarm
2) underlying data are presented in Annex Table 1.6
Sources: English Housing Survey, full household sample

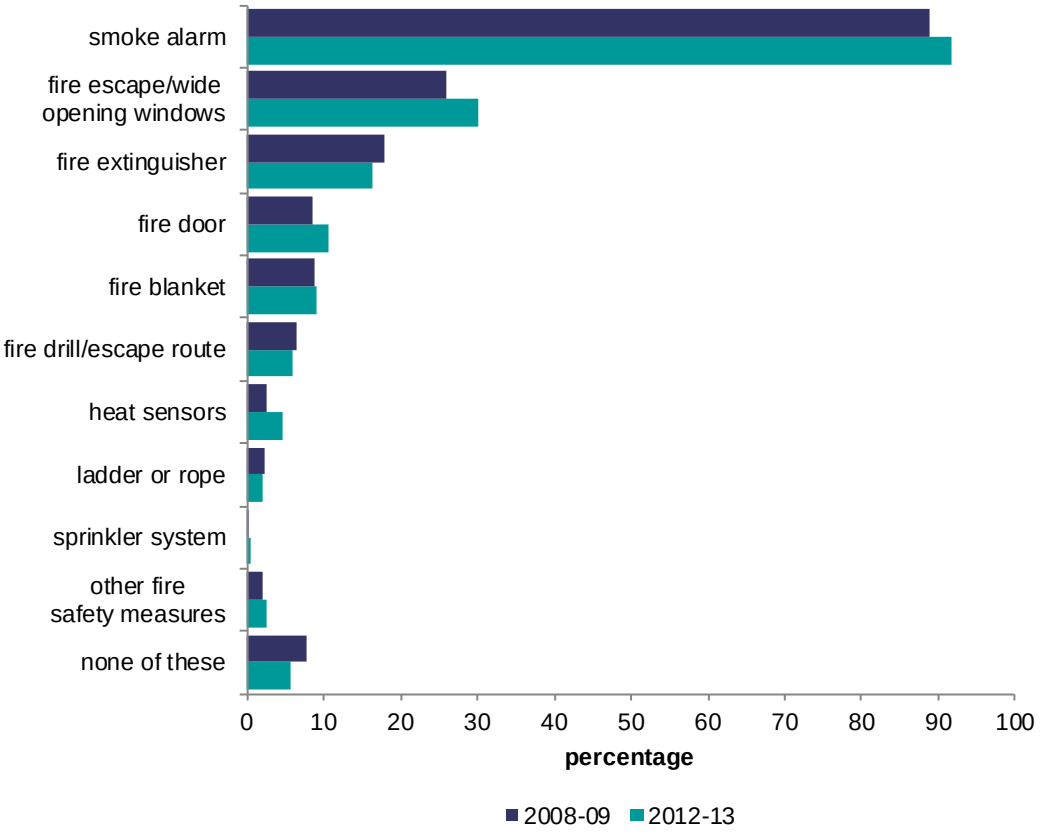
Other fire safety measures in the home

1.32 All households were asked which fire safety measures were present in their home. The fire safety measures were only included if they were located in a habitable part of their home, for example, items kept in a garage or shed were excluded.

1.33 The most common reported fire safety measures were: one or more smoke alarms (92%), a fire escape/wide opening window/s (30%) and a fire extinguisher (16%). Smaller proportions of households had a fire door (11%) or a fire blanket (9%). Some 6% of households reported having no fire safety measures present in their home, Figure 1.10.

1.34 Between 2008-09 and 2012-13, there was a reduction in the percentage of households with no fire safety measures in their home (from 8% to 6%). Over the same period, there was an increase in the proportion of households with smoke alarms fitted (from 89% to 92%), fire escapes (from 26% to 30%), and a fire door (8% to 11%), but a reduction in the percentage of households with fire extinguishers (from 18% to 16%).

Figure 1.10: Fire safety measures, 2008-09 and 2012-13



Base: all households
Note: underlying data are presented in Annex Table 1.7
Source: English Housing Survey, full household sample

Chapter 2
Reasons for not having a working smoke alarm

This chapter examines the characteristics of households that do not have a working smoke alarm. It is based on data from the 2010-11 EHS[1] and explores the various reasons for not having a working smoke alarm by household characteristics, dwelling type and tenure. It also explores whether these characteristics have changed since 2008-09.

No working smoke alarm

2.1 In 2010-11, 12% of households did not have a working smoke alarm either because their installed smoke alarm(s) was not working (3%) or because they did not have a smoke alarm installed (9%), Annex Table 2.1. This compares with 11% of households who did not have a working smoke alarm in 2012-13.

2.2 Some 2% of households had a smoke alarm installed, but did not know if it was working. These households have been excluded from the following analysis, which examines the profile of those households who stated that they had no working smoke alarms in their home.

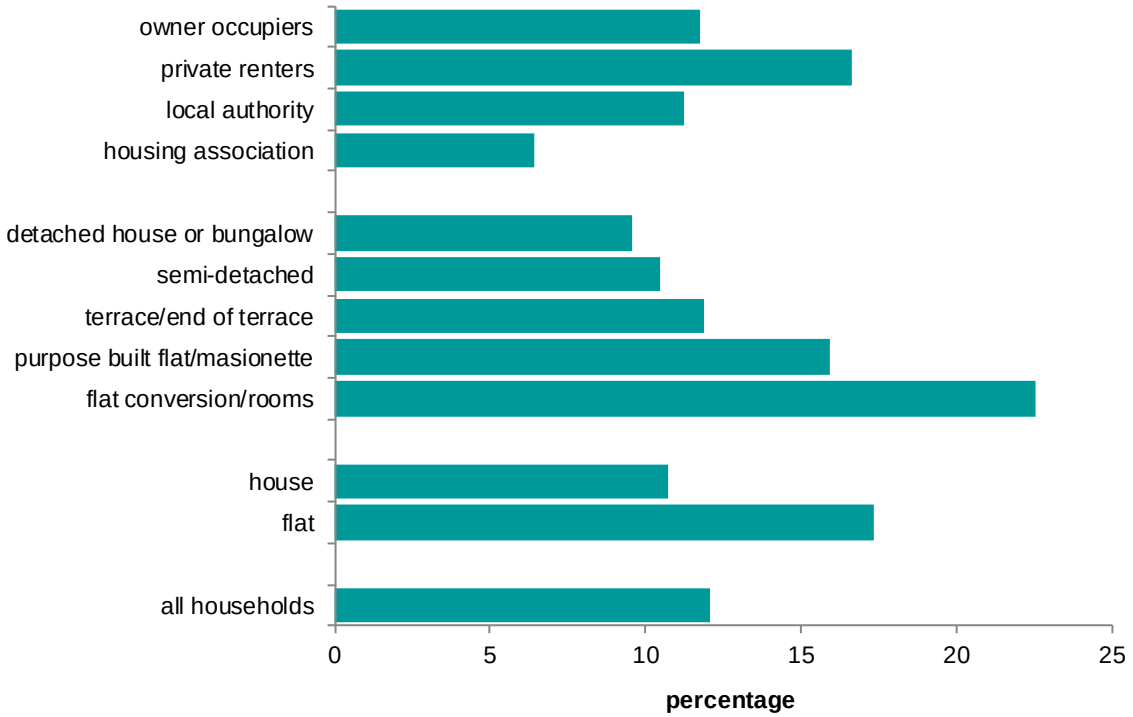
Tenure and dwelling type

2.3 Households that lived in private rented accommodation were more likely to be without a working smoking alarm (17%) than owner occupiers (12%) and social renters (11% of local authority and 6% of housing association households), Figure 2.1 and Annex Table 2.2.

2.4 Households that lived in flats, particularly converted flats, were more likely not to have a working smoke alarm (17% and 22% respectively) than those households living in houses (11%). This is also likely to be linked to tenure – the private rented sector has a higher proportion of converted flats than the social and owner occupied sectors.

[1] Because questions on fire and fire safety rotate in and out of the EHS, this report presents findings from several different survey years (see introduction for further details). This chapter reports 2010-11 findings as this was the last time the relevant fire and fire safety questions were included in the interview questionnaire.

Figure 2.1: Households with no working smoke alarm, by tenure and dwelling type, 2010-11



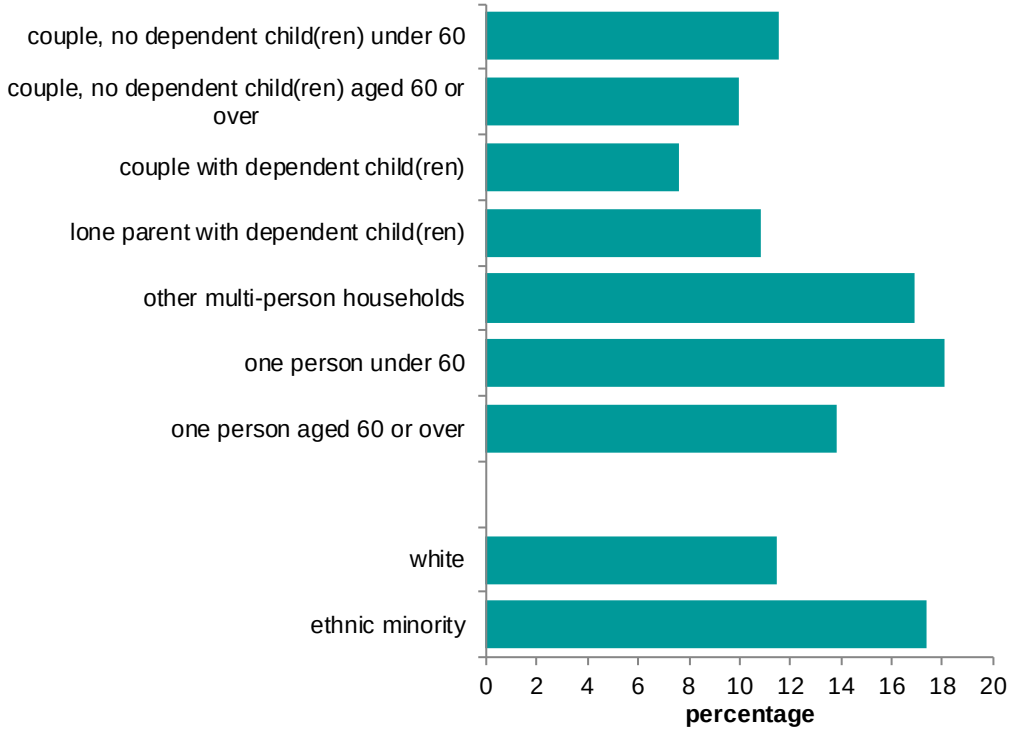
Base: all households
Note: underlying data are presented in Annex Table 2.2
Source: English Housing Survey, full household sample

Household type

2.5 Households with a household reference person (HRP) from an ethnic minority background were more likely to not have a working smoke alarm than households with a white HRP (17% compared with 11%), Figure 2.2 and Annex Table 2.3.

2.6 Single person under 60 and multi-person households were also more likely not to have a working smoke alarm (18% and 17% respectively). Couples with dependent children were least likely to be without a working smoke alarm (8%), although lone parents with dependent children were equally likely to not have a working smoke alarm as couples without dependents.

Figure 2.2: Households with no working smoke alarm, by household type and ethnicity, 2010-11



Base: all households
Note: underlying data are presented in Annex Table 2.3
Source: English Housing Survey, full household sample

2.8 There was no correlation between the age of the HRP and not having a working smoke alarm.

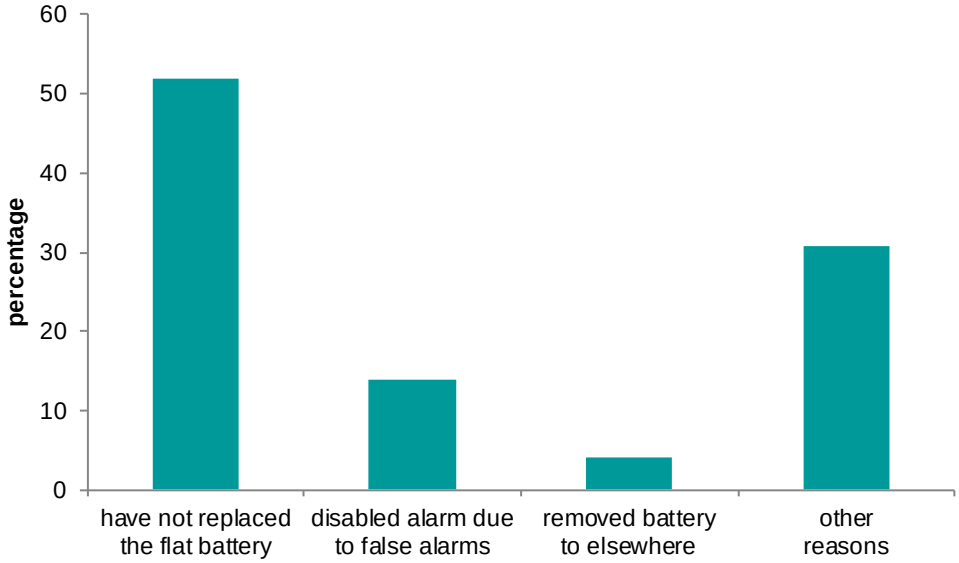
2.9 Households with an unemployed HRP were more likely to be without a working smoke alarm (16%) than households with either a retired HRP (11%) or a HRP in full time employment (12%).

2.10 There were also strong connections between income and not having a working smoke alarm; 9% of households in the highest income band did not have a working smoke alarm compared with 15% of households in the lowest income band, Annex Table 2.3.

Smoke alarm not working

2.11 In 2010-11, 3% of households (744,000) had a smoke alarm installed, but which was not working, Annex Table 2.1. Of these households, around half (52%) said that they did not have a working smoke alarm because they had not replaced the flat batteries, 14% had disabled their smoke alarm due to false alarms, and 4% had removed the batteries to be used elsewhere. The remaining third (31%) of households had 'other reasons' for not having a working smoke alarm, Figure 2.3. The same pattern was observed in 2008-09, Annex Table 2.5.

Figure 2.3: Reasons for smoke alarm not working, 2010-11

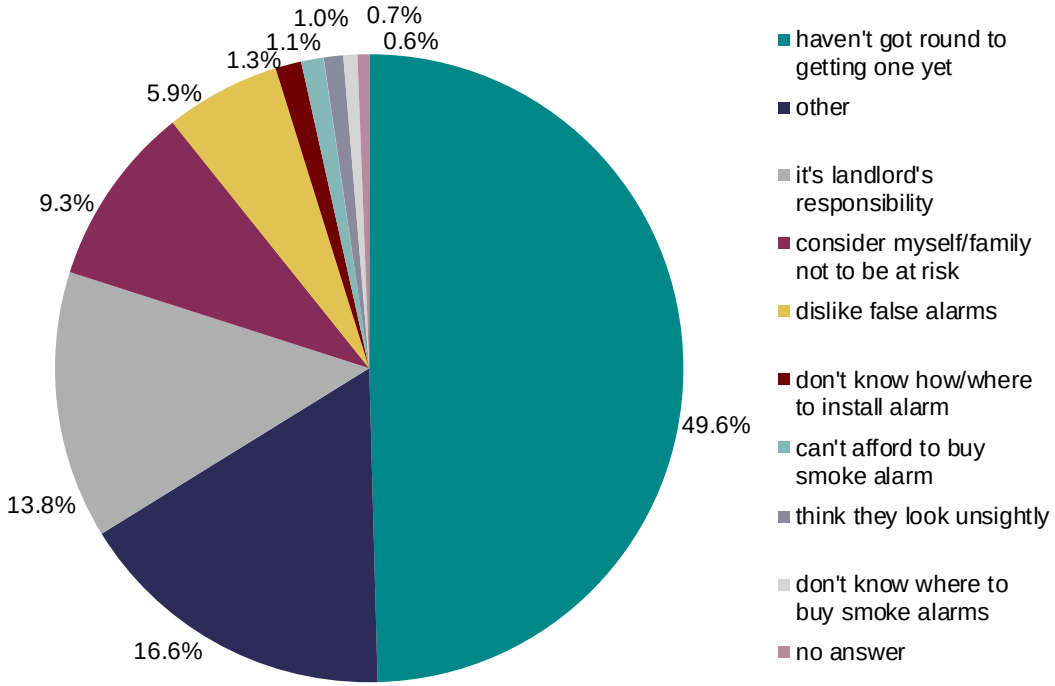


Base: all households with a no working smoke alarm/s
Note: underlying data are presented in Annex Table 2.5
Sources: English Housing Survey, full household sample

Smoke alarm not installed

2.12 In 2010-11, 9% of households (1.9 million) did not have a smoke alarm installed, Annex Table 2.1. Of these households, half (50%) stated that they did not have a smoke alarm because they had not got round to obtaining one yet while 14% of households felt it was the responsibility of their landlord to install smoke alarms in their home. Some 9% of these households stated that they did consider themselves or their family to be at risk from a fire while 1% said that they did not have a smoke alarm because they were unsightly. The second largest response category to this question was 'other', (17%) but the details of these other reasons were not recorded as part of the survey, Figure 2.4. The same pattern was observed in 2008-09, Annex Table 2.6.

Figure 2.4: Reasons for smoke alarm not installed, 2010-11



Base: all households with a no smoke alarm installed
Note: underlying data are presented in Annex Table 2.6
Sources: English Housing Survey, full household sample

Chapter 3
Fire hazards

This chapter examines the existence of fire hazards in different types of homes and households in England in 2012. Although fires are likely to start independently of building characteristics, for example, as a result of occupier behaviour, the design and characteristics of a building will affect the potential for the fire to spread or to be undetected, increasing the likelihood of the fire causing harm.
For the purpose of this chapter, a fire hazard exists where the risk of fire is determined to be significantly higher than average as part of the Housing Health and Safety Rating System (HHSRS) assessment[1]. The chapter also investigates the risk of fire in relation to poor electrical safety.

For ease of reporting, throughout this chapter homes with a significantly higher than average risk of fire are termed as having a 'higher risk' of fire and other dwellings without a significantly higher than average fire risk are termed as 'without a higher risk'.

Fire hazards

3.1 An assessment of fire hazards under the HHSRS covers threats from exposure to uncontrolled fire and associated smoke at the dwelling. People aged 60 years or over are considered to be the age group most at risk from fire hazards since any impairment of mobility will increase vulnerability as it impacts on the ability to, and speed of, escape.

3.2 During the HHSRS assessment, EHS surveyors identify relevant factors that impact on both the likelihood of any harm arising from a fire to occupants or their visitors, and the severity of this possible harm. The source of fire, the chances of fire spreading and means of escape are, therefore, all components of the assessment. Relevant factors include:

- heater/cooker position – inappropriate siting/proximity of flammable materials
- adequacy of the heating system to prevent the use of supplementary heaters, and any defects to the system
- electrical safety and the number/siting of sockets

[1] See Glossary and Chapter 5 of the 2012-13 English Housing Survey Technical Report for further details of the HHSRS.

- disrepair to the fabric of the dwelling (walls, ceilings and floors) and internal doors which may allow smoke or fire to spread
- fire safety equipment including smoke alarms/heat detectors
- means of escape and adequate lighting

Figure 3.1: Examples of features that may contribute towards homes having a higher risk of fire

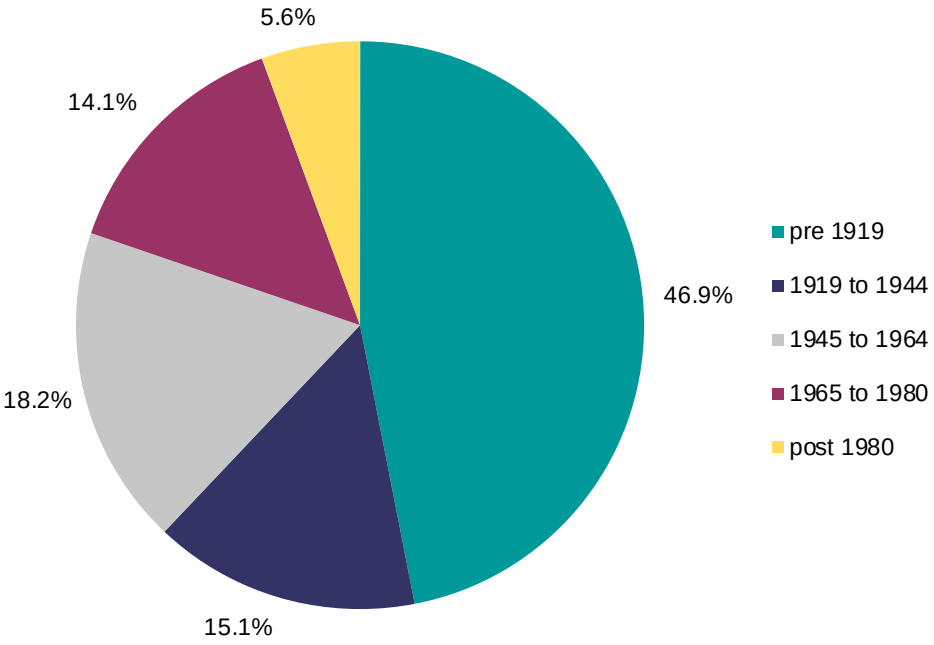
Notes:
1) left: overcrowded home with personal belongings next to the heater present a risk of fire developing and spreading. Obstacles in overcrowded homes may also hinder speed and means of escape
2) right: open fireplace with no barrier to prevent hot coal and ashes falling onto the carpet
Source: BRE photo library

3.3 In 2012, 4% of homes (975,000 dwellings) in England were assessed as having a higher risk of fire. Of these, 98,000 had the most serious Category 1 fire hazards such as the example shown in the case study at the end of this chapter, Annex Table 3.1. The majority of these Category 1 hazards were in private sector dwellings (89%), in houses or bungalows (65%), and in homes built before 1919 (63%), Annex Table 3.2.

3.4 Of dwellings that had a higher risk of fire, 29% were in the private rented sector, despite only 18% of the total stock being private rented. Social rented homes were under represented; 8% had a higher risk of fire, despite making up 17% of the stock, Annex Table 3.3.

3.5 Age of dwelling showed a strong correlation with fire risk. Just under half (47%) of dwellings with a higher risk of fire were built before 1919, highlighting that age and design are important factors. The proportion of homes built between 1919 and 1964 with a higher risk of fire was similar to the proportion of homes of this age in the whole stock. However, homes built after 1964, were relatively less likely to contain a higher fire risk, Annex Table 3.3.

Figure 3.2: Higher risk of fire, by dwelling age, 2012



Base: all dwellings with a higher risk of fire
Note: underlying data are presented in Annex Table 3.3
Source: English Housing Survey, dwelling sample

3.6 Terraced houses and converted flats, and homes in city and urban areas, which contain a relatively higher proportion of the oldest homes, were also over represented among homes with a higher risk of fire. Converted flats in particular exhibited increased risks, with the likelihood of a risk from fire in these homes being four times the stock average (12% compared with 4% for the whole stock). The poor design of some converted flats also adds to these risks, for example, through inadequate provision of escape routes, Annex Table 3.3.

3.7 Dwellings with a higher risk of fire were also more likely to have other Category 1 hazards present, with 13% having another Category 1 hazard compared with only 2% for homes without higher risks, Annex Table 3.3. Of those homes with higher risks of fire, around 10% also had a higher risk of harm from flames and hot surfaces[2], Annex Table 3.4.

3.8 Single households and those in relative poverty were over represented amongst dwellings with a higher risk of fire. However vulnerable groups such as households aged 60 years and over, households with a child under 5, long term sick/disabled households, and those with an ethnic minority HRP were not over represented in these higher risk homes, Annex Table 3.5.

[2] Assessed under the HHSRS section of the EHS physical survey, this hazard covers threats of burns (injuries caused by contact with a hot flame or fire, and contact with hot objects/hot non-water based fluids) and scalds (injuries caused by contact with hot liquid and vapours).

3.9 Around 22% of households who lived in homes with a higher risk of fire had no working smoke alarm[3]. However, 11% of households in homes without a higher risk also had no smoke alarm, highlighting the potential for lowering the risks of fire in these 'safer' homes, Annex Table 3.6.

Electrical hazards and fire safety

3.10 Fires in electrical wiring systems and electrical equipment are often the result of arcing or overheating associated with electrical conductors. Therefore, any defects to the electrical supply, meters, fuses, wiring, sockets or switches add to the risk of a fire occurring. Electrical appliances and supply systems contain considerable amounts of plastic materials so when arcing or overheating occurs adjacent to any insulation, combustion can occur.

3.11 Of those dwellings assessed as having a higher risk of fire, less than half (46%) had all 5 electrical safety features present (modern PVC wiring, modern earthing, a modern consumer unit, overload protection and personal protection[4]). This compared with 55% for the stock as a whole, Annex Table 3.7.

3.12 Among dwellings with a higher risk of fire, remedial action such as repairing, replacing or extending the electrics was needed in 12% of these dwellings. The most common remedial actions to remedy these risks were providing suitable openable windows (47%), and the installation of smoke detection measures (45%).

[3] The presence or absence of a smoke alarm forms part of the HHSRS fire risk assessment.
[4] See Glossary for further details or chapter 3 of the EHS Profile of English Housing Report, 2012.

Figure 3.3: Examples of inadequate electrical safety that increase the risk of fire in homes

Notes:

1) top left: insufficient electrical sockets requiring multiple extension leads can overload the sockets

2) top right: single electric socket in the room can cause overload if additional appliances are added alongside the existing high powered appliance

3) bottom left: old electrical system in need of replacement

4) bottom right: broken electrical socket – added risk of fire and electrocution

Sources: BRE photo library

Category 1 fire risk case study

3.13 This semi-detached home has a steep winding staircase to the second storey, with an open fire to the living room and no central heating system. The dwelling has been assessed as a Category 1 fire risk due to the following factors:

- electrical system requires repair and there are insufficient sockets to provide portable heating appliances without risk
- the lack of central heating encourages the use of supplementary heating and the open fire that provides the main source of heating
- no fire precautions or smoke detectors in the building. The absence of these allows a fire to spread quickly with a possibility that the occupiers will not be aware of the fire
- poor means of escape within the dwelling. The means of escape from the second storey is via two sets of stairs and the living room (containing an open fire)
- the windows to the second storey are secondary glazed. There is a reduced chance of escape or rescue from these windows

3.14 To remedy the Category 1 fire hazard, the dwelling requires:

- repair to the electrical system and the provision of additional sockets
- a self-closing fire door to the base of the second storey stairs
- the installation of smoke detectors

Figure 3.4: Category 1 fire risk case study

Notes:
1) top left: poor means of escape from top floor window
2) top right: open fire unprotected
3) bottom centre: poor means of escape via two sets of steep stairs, one of which leads to directly to the living room with the unprotected fire (and no additional intervening door)
Source: BRE photo library

Appendix A
Logistic regression

Methodology

4.1. Logistic regression has been used to assess which key factors (independent variables) are statistically related to households/landlords having carried out energy efficiency improvements in the last 12 months (the dependent variable).

4.2. Logistic regression has been used to assess which key factors (independent variables) are statistically related to the ownership of at least one working smoking alarm (the dependent variable).

4.3. As all of the independent variables considered are categorical variables, the regression analysis provides an insight into which categories or groups of households within these key factors are more or less likely to have a working smoke alarm/s. When using categorical variables in regression analysis one of the groups needs to be specified as the baseline group. The odds ratio, EXP (β) of the baseline group, is set as 1 (labelled as 'Reference category in Table 1). The odds ratios of the other groups are then calculated relative to the baseline group. Where the odds ratio is greater than 1, this group is more likely to have a working smoke alarm compared with the baseline group. Alternatively, where the odds ratio is less than 1 this group is less likely to have a working smoke alarm compared with the baseline group, Table A1.

4.4. The independent variables below are presented in order of their 'predictiveness' (based on the R squared value of the model) with the most important factors in explaining a household's ownership of at least one working smoke alarm listed first. This mirrors the order of the textual information provided in this chapter.

4.5. The logistic regression used standardised weighted data, (by weighting the weights by the overall mean weight) so that any relationships found would not be biased to the over-sampled groups or the very large weighted data sample size.

4.6. Although logistic regression can be used to explore associations between variables, it does not necessarily imply causation and results should be treated as indicative rather than conclusive.

Table A1: Logistic regression model for ownership of a working smoke alarm, 2012-13

all households

Independent variables	Odds ratios	*Significance*
household composition		
couple with dependent child(ren)	*Reference category*	
couple, no dependent child(ren) under 60	0.735	0.00 *
couple, no dependent child(ren) aged 60 or over	0.695	0.00 *
lone parent with dependent child(ren)	0.622	0.00 *
other multi-person household	0.552	0.00 *
one person under 60	0.417	0.00 *
one person aged 60 or over	0.626	0.00 *
income band		
highest 20%	*Reference category*	
lowest 20%	0.550	0.00 *
quintile 2	0.570	0.00 *
quintile 3	0.600	0.00 *
quintile 4	0.748	0.00 *
tenure		
housing association	*Reference category*	
owner occupiers	0.574	.000 *
private renters	0.428	.000 *
local authority	0.655	.006 *
accommodation type[1]		
detached house or bungalow	*Reference category*	
semi-detached	0.753	0.00 *
terrace/end of terrace	0.627	0.00 *
purpose built flat/maisonette	0.602	0.00 *
flat conversion/rooms	0.548	0.00 *
ethnicity		
white	*Reference category*	
black	0.673	0.01 *
Indian	0.643	0.01 *
Pakistani or Bangladeshi	0.472	0.00 *
other Asian	0.935	0.82
Chinese	1.293	0.61
mixed	0.873	0.62
other	0.800	0.38
all BME households	0.668	0.00 *

continued

all households

Independent variables	Odds ratios	*Significance*
employment status of hrp		
full-time work	*Reference category*	
part-time work	0.821	0.04 *
retired	1.006	0.93
unemployed	0.644	0.00 *
full-time education	0.654	0.06
other inactive	0.749	0.00 *
age of HRP		
35-44	*Reference category*	
16-24	0.710	0.02 *
25-34	0.853	0.10
45-54	0.936	0.47
55-64	0.819	0.03 *
65 or over	0.908	0.25
sample size	*13,652*	

Base: all households
Note: 'other' types of accommodation were excluded from the analysis e.g. boats or caravans, therefore note the 'sample size' column will not add up to the number of 'all households'.
Significance: * the result is significant at (or below) the .05 level
Source: English Housing Survey, full household sample

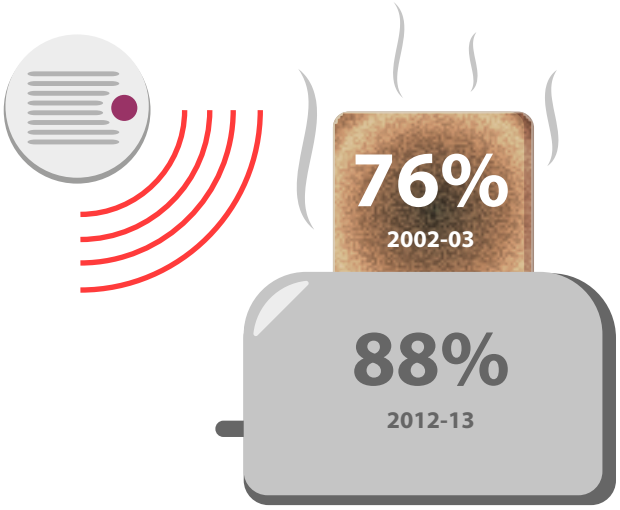
Appendix B
Infographics

Department for Communities and Local Government

NatCen Social Research bre

Fire and Fire Safety

Between 2002-03 and 2012-13, the proportion of households with a **working** smoke alarm increased from 76% to 88%



Households with a **working** smoke alarm

83% Private renters

88% Owner occupiers

89% Local Authority tenants

92% Housing association tenants

In 2010-11, 744,000 households (3%) had a smoke alarm that did not work, of these:

52% Not replaced the flat batteries

14% Disabled due to false alarms

4% Batteries removed to use elsewhere

In 2010-11, an estimated 1.9 million households (9%) did not have a smoke alarm installed, of these:

50% Not got round to obtaining one yet

14% Feel it's the responsibility of the landlord

Please see the main report for more information: https://www.gov.uk/government/collections/english-housing-survey

Glossary

Dependent children: Includes persons aged under 16 and persons aged 16 to 18 and in full time education.

Dwelling: A unit of accommodation which may comprise one or more household spaces (a household space is the accommodation used or available for use by an individual household). A dwelling may be classified as shared or unshared. A dwelling is shared if:

- the household spaces it contains are 'part of a converted or shared house', or
- not all of the rooms (including kitchen, bathroom and toilet, if any) are behind a door that only that household can use, and
- there is at least one other such household space at the same address with which it can be combined to form the shared dwelling.

Dwellings that do not meet these conditions are unshared dwellings.

The EHS definition of dwelling is consistent with the Census 2011.

Dwelling type: Dwellings are classified, on the basis of the surveyor's inspection, into the following categories:

- **terraced house:** a house forming part of a block where at least one house is attached to two or more other houses.

- **semi-detached house:** a house that is attached to just one other in a block of two.

- **detached house:** a house where none of the habitable structure is joined to another building (other than garages, outhouses etc.).

- **bungalow:** a house with all of the habitable accommodation on one floor. This excludes chalet bungalows and bungalows with habitable loft conversions, which are treated as houses.

- **converted flat:** a flat resulting from the conversion of a house or former non-residential building. Includes buildings converted into a flat plus commercial premises (such as corner shops).

- **purpose built flat/maisonette:** a flat or maisonette in a purpose built block. Includes cases where there is only one flat with independent access in a building which is also used for non-domestic purposes.

- **rooms:** e.g. bedsit or flatlet

- **other:** none of the above

Economic status: Respondents self-report their situation and can give more than one answer.

- **working full time/part time**: full-time work is defined as 30 or more hours per week. Part time work is fewer than 30 hours per week. Where more than one answer is given, 'working' takes priority over other categories (with the exception that all those over State Pension Age (SPA) who regard themselves as retired are classified as such, regardless of what other answers they give).

- **unemployed**: this category covers people who were registered unemployed or not registered unemployed but seeking work.

- **retired**: this category includes all those over the state pension age who reported being retired as well as some other activity. For men the SPA is 65 and for women it is 60 if they were born before 6th April 1950. For women born on or after the 6th April 1950, the state pension age has increased incrementally since April 2010[1].

- **full-time education**: education undertaken in pursuit of a course, where an average of more than 12 hours per week is spent during term time.

- **other inactive**: all others; they include people who were permanently sick or disabled, those looking after the family or home and any other activity.

Electrical safety:

- **wiring**: this is the cabling from the input electrical supply point, which runs through the meters and consumer units and leading out into the dwelling. The earliest types of wiring used lead or black rubber sheathings to enclose the wires. The danger with this type of cable is the degrading of the rubber: any failure of the insulation can cause the outer covering to become live. Modern wiring is PVC sheathed.

- **earthing**: these are the wires joining the components at the electrical distribution centre. The early forms of earthing wires were unsheathed then later covered with green rubber, then green plastic. In 1977 the colour convention changed and all wires had to be coloured green and yellow.

[1] For further information see: www.gov.uk/browse/working/state-pension

- **consumer unit arrangement (fuse boxes)**: in older systems, each individual electrical circuit was fed through an individual switch and fuse box. From 1960s through to the 1980s, fuses were collected together into a small number of smaller boxes, normally with a switch on the front which controlled all the circuits leading to the box. These boxes were normally fitted with a cover, the removal of which gave access to the fuses hidden inside. From the early 1980s, the newly named consumer unit (some dwellings have two) catered for the whole dwelling and was also designed to accommodate modern safety measures namely circuit breakers and residual current devices.

- **overload protection / miniature circuit breakers (MCBs):** these provide the most modern form of electrical current overload protection, replacing cartridge fuses and the original wire fuses (these simply melt when overheated) which formed the earliest form of protection.

- **Residual current devices (RCDs)**: these are designed to break an electrical current very easily by detecting any abnormality in the circuit, for example, through someone touching a live wire. They are normally located in the consumer unit but a separate RCD may exist to protect an additional circuit, for example, an electrical circuit used in the garden.

Gross annual income: The annual income of the household reference person and (any) partner. This includes income from private sources (regular employment, self-employment, government schemes, occupational pensions, private pensions and other private income), state benefits/allowances and tax credits, as collected on the EHS survey (this includes housing benefit/Local Housing Allowance but excludes council tax benefit and Support for Mortgage Interest) and interest from savings. It is a gross measure i.e. income before Income Tax or National Insurance deductions.

Household: One person living alone, or a group of people (not necessarily related) living at the same address who share cooking facilities and a living room or sitting room or dining area. The EHS definition of household is consistent with the Census 2011.

Household groups

- **child under 5**: the youngest person in the household is aged 4 or under.
- **ethnic minority**: where the respondent defines their ethnicity as something other than white.
- **in poverty:** A household where their before housing cost equivalised income is less than 60% of the overall median income. The overall median income is derived from the EHS equivalised income data using a person level weighting factor derived by multiplying the household grossing factor by the number of people in the household.
- **registered disabled:** where any physical or mental health conditions or illnesses has lasted or is expected to last for 12 months, and where

registered as a disabled person (or as visually impaired) with the local council/ social services.

- **long term illness or disability**: a household where at least one person in the household has a long-term illness or disability. The respondent assesses this and long-term is defined as anything that has troubled the person, or is likely to affect them, over a period of time.
- **older people 60+**: a household that includes at least one person aged 60 or over.

Household reference person (HRP): The person in whose name the dwelling is owned or rented or who is otherwise responsible for the accommodation. In the case of joint owners and tenants, the person with the highest income is taken as the HRP. Where incomes are equal, the older is taken as the HRP. This procedure increases the likelihood that the HRP better characterises the household's social and economic position. The EHS definition of HRP is not consistent with the Census 2011, in which the HRP is chosen on basis of their economic activity. Where economic activity is the same, the older is taken as HRP, or if they are the same age, HRP is the first listed on the questionnaire.

Household type: The main classification of household type uses the following categories:

- married/cohabiting couple under 60 with no dependent children or with non-dependent child(ren) only.
- married/cohabiting couple age 60 or over with no dependent children or with non-dependent child(ren) only.
- married/cohabiting couple with dependent child(ren) – may also include non-dependent child(ren).
- lone parent family (one parent with dependent child(ren) – may also include non-dependent child(ren)).
- other multi-person household (includes flat sharers, lone parents with non-dependent children only and households containing more than one couple or lone parent family).
- one person aged under 60.
- one person aged 60 or over.

The married/cohabiting couple and lone parent household types (the first four categories above) may include one-person family units in addition to the couple/lone parent family.

Housing Health and Safety Rating System (HHSRS): A risk assessment tool used to assess potential risks to the health and safety of occupants in residential properties in England and Wales. It replaced the Fitness Standard in April 2006.

The purpose of the HHSRS assessment[2] is not to set a standard but to generate objective information in order to determine and inform enforcement decisions. There are 29 categories of hazard, each of which is separately rated, based on the risk to the potential occupant who is most vulnerable to that hazard. The individual hazard scores are grouped into 10 bands where the highest bands (A-C representing scores of 1,000 or more) are considered to pose Category 1 hazards. Local authorities have a duty to act where Category 1 hazards are present, and may take into account the vulnerability of the actual occupant in determining the best course of action.
For the purposes of the decent homes standard, homes posing a Category 1 hazard are non-decent on its criterion that a home must meet the statutory minimum requirements.

The EHS is not able to replicate the HHSRS assessment in full as part of a large scale survey. Its assessment employs a mix of hazards that are directly assessed by surveyors in the field and others that are indirectly assessed from detailed related information collected. For 2006 and 2007, the survey (the then English House Condition Survey) produced estimates based on 15 of the 29 hazards. From 2008, the survey is able to provide a more comprehensive assessment based on 26 of the 29 hazards. See chapter 5 of the EHS Technical Report for a list of the hazards covered.

Income/equivalised income: Household incomes have been 'equivalised', that is adjusted (using the modified OECD scale) to reflect the number of people in a household. This allows the comparison of incomes for households with different sizes and compositions.

The EHS variables are modelled to produce a Before Housing Cost (BHC) income measure for the purpose of equivalisation. The BHC income variable includes: Household Reference Person and partner's income from benefits and private sources (including income from savings), income from other household members, housing benefit, winter fuel payment and the deduction of net council tax payment.

Tenure: Four categories are used for most reporting purposes, and for some analyses these four tenure categories are collapsed into two groups:

- **private sector**: includes:
    - *owner occupied*: includes all households in accommodation which they either own outright, are buying with a mortgage or are buying as part of a shared ownership scheme.
    - *private rented*: includes all households living in privately owned property which they do not own. Includes households living rent free, or in tied dwellings and tenants of housing associations that are not registered.
- **social sector**: includes:

[2] https://www.gov.uk/government/organisations/department-for-communities-and-local-government/series/housing-health-and-safety-rating-system-hhsrs-guidance

- *local authority*: includes Arms Length Management Organisations (ALMOs) and Housing Action Trusts.
- *housing association*: mostly Registered Social Landlords (RSLs), Local Housing Companies, co-operatives and charitable trusts.

A significant number of Housing Association tenants wrongly report that they are Local Authority tenants. The most common reason for this is that their home used to be owned by the Local Authority, and although ownership was transferred to a Housing Association, the tenant still reports that their landlord is the Local Authority. There are also some Local Authority tenants who wrongly report that they are Housing Association tenants. Data from the EHS for 2008-09 onwards incorporate a correction for the great majority of such cases in order to provide a reasonably accurate split of the social rented category.

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