
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) assessment¹. 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



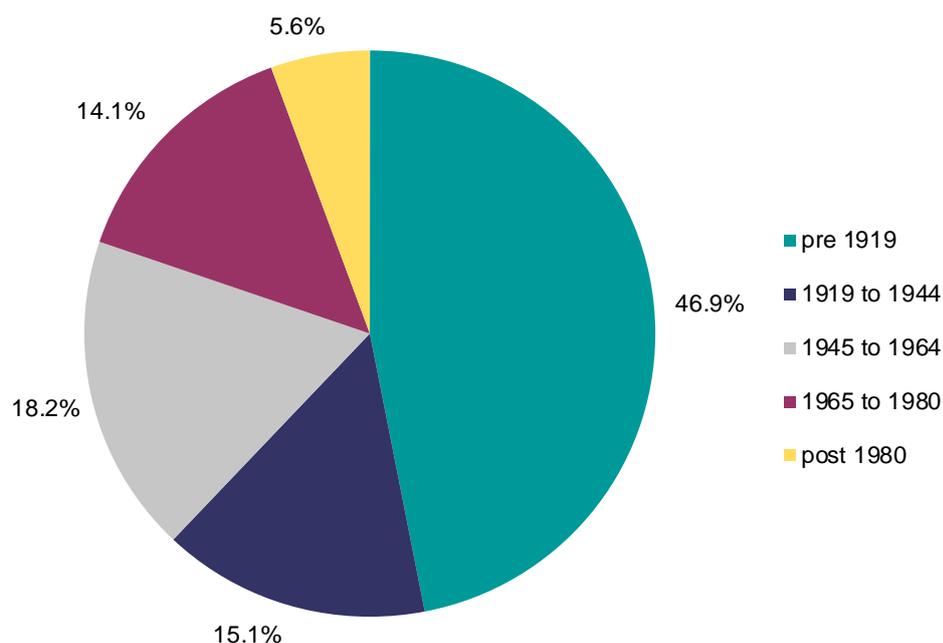
Notes:

- 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 surfaces², 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).

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- 3.9 Around 22% of households who lived in homes with a higher risk of fire had no working smoke alarm³. 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 protection⁴). 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