Chapter 3
Fire hazards

3.1 Fire and rescue authorities attended 170,000 fires (outdoor and indoor) in England in 2013-14. During this period, there were 3,614 non-fatal fire casualties and 275 fire fatalities of which 181 were from accidental dwelling fires[1]. Although occupier behaviour is a major reason for fires starting, the design and characteristics of a building will affect the potential for a fire to spread or to be undetected and, therefore, impact on the likelihood of the fire causing harm. The main sources of ignition attributable to dwellings are cooking appliances, space heating appliances and electrical distribution equipment (wiring and cabling).

3.2 This chapter examines the existence of fire hazards in different types of homes and households in England in 2013. For the purpose of this analysis, 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[2]. This chapter also investigates the risk of fire in relation to poor electrical safety. For ease of reporting, homes with a significantly higher than average risk of fire are termed as having a 'higher risk' of fire and all other dwellings as 'without a higher risk'.

Fire hazards

3.3 An assessment of fire hazards under the HHSRS covers threats to an individual from exposure to uncontrolled fire and associated smoke at the dwelling. It includes assessment of potential injuries caused by clothing catching alight from a controlled fire or flame, such as a flame from a gas cooker or open fire used for space heating.

3.4 Any impairment of mobility increases vulnerability to fire as it impacts on the ability to, and speed of, escape. For this reason people aged 60 years or over are considered to be the age group most at risk from fire hazards.

3.5 A number of factors are considered by EHS surveyors for the HHSRS assessment of each home, which impact on both the likelihood of any harm

[1] Source: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/325696/Fire_Statistics_Monitor_April_2013_to_March_2014_final__3_.pdf

[2] see Glossary and Chapter 5, Annex 5, 2012-13 English Housing Survey Technical Report for further details of the HHSRS.

arising from a fire and on the severity of this possible harm. The source of fire, the chances of fire spreading and means of escape are all components of the assessment. These relevant factors include[3]:

- heater/cooker position – inappropriate siting and or close proximity of flammable materials
- adequacy of the heating system to avoid the use of supplementary heaters, and any defects to the system
- electrical safety and the number/siting of sockets
- 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
- the presence of self-closing fire doors
- means of escape and adequate lighting

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

Notes:
1) above left: missing fire door to kitchen
2) above right: electrical wiring to cooker point positioned near flames. Cooking facilities are directly beneath the boiler
Sources: BRE photo library

3.6 In 2013, 4% of homes (one million dwellings) were assessed as having a higher risk of fire. Of these, 88,000 had the most serious Category 1 fire

[3] Further details on the fire hazards and the HHSRS can be found in the Housing Health and Safety Rating System Guidance, https://www.gov.uk/government/publications/housing-health-and-safety-rating-system-enforcement-guidance-housing-conditions

hazards such as the example shown in the case study at the end of this Chapter, Annex Table 3.1.

3.7 As the sample size of homes with Category 1 fire hazards was low, the following analysis will examine the profile of all the one million homes that were assessed as having a higher risk of fire.

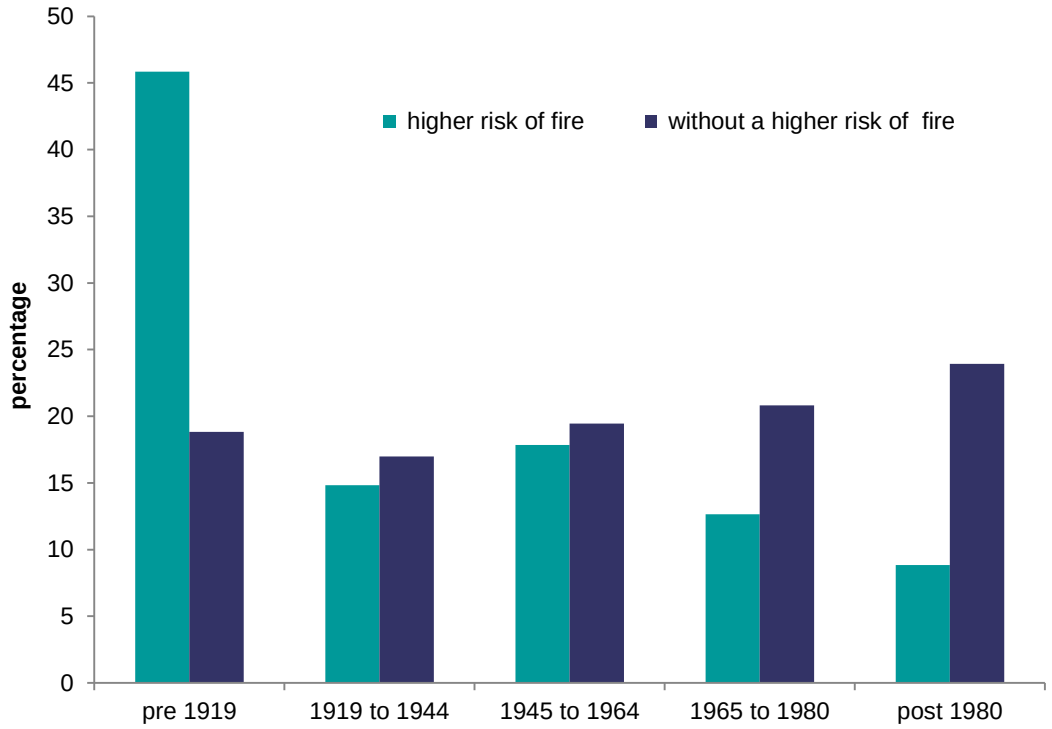
3.8 The profile of homes with a higher risk of fire looked different to the rest of the English stock (which had a lower risk of fire); the latter comprised the vast majority of all the English Housing stock (96%). Privately rented homes were overrepresented among dwellings with a higher risk of fire (29%) compared with other private rented homes in the housing stock (19%). Some 31% of homes in urban areas also had a higher risk of fire compared with 21% of such homes with a lower level of risk. Small terraced houses, medium sized terraced houses and converted flats were also more common among homes with a higher risk of fire (19%, 28% and 7% respectively) compared with the rest of the housing stock (9%,18% and 4% respectively), Annex Table 3.2

3.9 Private rented homes, terraced houses, converted flats and homes in urban areas all contained a higher proportion of older homes, which were more likely to have a higher risk of fire.

3.10 Dwelling age was closely related to the risk of fire; just under half (46%) of homes with a higher risk of fire were built before 1919, compared with only 19% of the rest of the total stock. The poor design of some of these older homes, for example, inadequate means of escape in older converted flats, and the greater numbers of non-decent homes[4] are key 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 without this level of risk. However, homes with a higher risk of fire were less likely to be built after 1964 compared with the remaining housing stock, Figure 3.2.

[4] see Live Tables https://www.gov.uk/government/statistical-data-sets/dwelling-condition-and-safety

Figure 3.2: Dwelling age profile of homes with and without a higher risk of fire, 2013



Base: all dwellings with a higher risk of fire/without a higher risk of fire
Note: underlying data are presented in Annex Table 3.2
Source: English Housing Survey, dwelling sample

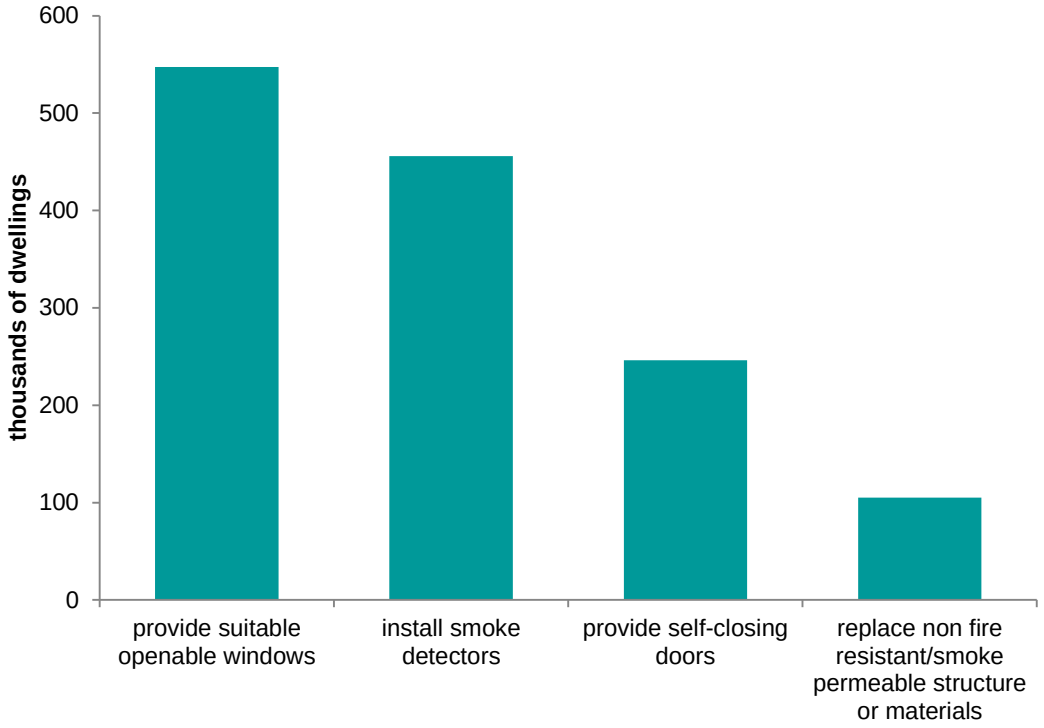
Remedial action for homes with higher risks of fire

3.11 Where a higher risk of fire exists, surveyors identify appropriate remedial action(s) to limit the chances of any fire occurring, limit the spread of a fire, however caused, and provide safe and ready means of escape.

3.12 Figure 3.3 shows the most common actions required to reduce the risk of a fire causing harm in these one million dwellings to an acceptable level. These were:

- provide suitable opening windows and/or doors for improved means of escape (547,000 homes)
- install smoke detectors (456,000 homes).
- provide self-closing fire doors (246,000 homes)
- replace any non-fire resistant or any smoke permeable materials that may be found, for example, in doors. This would also include the removal of any polystyrene tiles that may be present (105,000 homes)

Figure 3.3: Most common actions to remedy higher risks fire, 2013



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

3.13 A small proportion of homes with a higher risk of fire (6%) were also assessed as having a higher risk of harm from flames and hot surfaces[5], Annex Table 3.4. Figure 3.4 below is a room within a house in multiple occupation where the tenant sleeps in the kitchen, beneath a boiler and next to two cookers used by many of the 10 occupants. The proximity of the cookers to the occupants bedding provides both an added risk of a fire starting and of any fire spreading quickly. The lack of adequate workspace and overcrowded conditions also increase the risk of burns and scalds from the cooker.

[5] 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).

Figure 3.4: Dwelling with a higher than average risk of fire and harm from flames and hot surfaces

Note: bedding adjacent to the cooker adds to the risks of a fire starting and spreading quickly. The lack of adequate workspace also increases the risk of burns and scalds
Source: BRE photo library

Households living in homes with a higher risk of fire

3.14 In 2013 around 944,000 households were living in the one million dwellings[6] with a higher risk of fire. Younger households where the HRP was aged 16-24, and those in poverty were over represented in occupied homes with a higher risk of fire. Households where the HRP was aged 60 years and over, households with a child under 5 years and those containing someone who had a long term sickness or disability were no more likely to live in a dwelling with a higher risk of fire than a dwelling with a lower risk, Annex Table 3.5.

3.15 Just under a quarter (23%) of households who lived in homes with a higher risk of fire had no working smoke alarm[7]. However, 11% of households in homes without a higher risk of fire also lacked a working smoke alarm, demonstrating the potential for reducing the fire risk in these 'safer' homes, Annex Table 3.6.

Electrical hazards and fire safety in dwellings

3.16 To reduce the risks of fire, the electrical installation in a home (distribution board, wiring etc.) should meet the current building requirements, be properly installed and maintained, and be regularly checked and tested. The provision of sufficient and appropriately sited electric sockets helps reduce the need for extension leads and overloaded sockets. Defects to socket outlets or switches increase the risk of fire. RCDs (residual current devices) can reduce the incidence and severity of fire associated with earth faults in electrical systems,

[6] the larger number of dwellings compared with households is because some dwellings were vacant
[7] the presence or absence of a smoke alarm forms part of the HHSRS fire risk assessment. The data on the presence of a smoke alarm is from the EHS household interview survey

equipment and components. They do this by cutting the electrical current when it senses a 'leakage' of electric current from a circuit, for example, when a cable is damaged.

Figure 3.5: Examples of inadequate electrical safety which increase the risk of fire in homes

Notes:
1) top left: overloading the electrical sockets with too many appliances and inadequate adaptors
2) top right: old and dangerous electrical wiring in a recently vacated home
Sources: BRE photo library

3.17 Of those one million dwellings assessed as having a higher risk of fire, around 425,000 (42%) had all five electrical safety features present (modern PVC wiring, modern earthing, a modern consumer unit, overload protection and personal protection (RCD)[8]). This compared with 57% for the stock with a lower risk, Annex Table 3.7.

3.18 Surveyors assessed that some remedial work to the electrical system (including the addition of electrical sockets) was required in around 119,000 homes with a higher risk of fire (12% of these homes), Annex Table 3.7.

Case study – Mid terrace property with a Category 1 fire risk[9]

3.19 This privately rented mid terraced home has two floors plus a third attic bedroom. The staircase is internal and accessed from the kitchen. The home has no central heating. Gas fires heat the ground floor rooms with heating for the bedrooms provided by portable electric heaters. The main bedroom windows only open at the top, making them impossible to use as a means of

[8] see Glossary for further details or chapter 3 of the EHS Profile of English Housing Report, 2013
[9] the home in this case study is not a property surveyed for the English Housing Survey

escape, Figure 3.6. There are no smoke detectors. The dwelling has been assessed as a Category 1 fire risk due to the following factors:

- the lack of central heating means that there is a reliance on room heaters
- no fire precautions or smoke detectors in the home. The absence of these allows a fire to spread quickly with the possibility that the occupiers would not be aware of the fire
- poor means of escape. There is no means of escape from the bedrooms without passing through the kitchen where a fire is most likely to start. Occupiers in the bedroom on the third floor would have a reduced chance of an early escape
- there are no fire escape windows

Figure 3.6: Example of a mid-terrace property with a Category 1 fire risk

Notes:
1) left: poor means of escape from upper storey windows
2) right: (top and bottom): reliance on room heaters
Sources: BRE photo library

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

- Installation of additional electrical sockets to the bedrooms
- replacing the heaters in the living rooms; ideally central heating should be provided
- installation of smoke detectors
- provision of windows allowing means of escape to the main bedrooms.