

Fires in the home: findings from the 2000 British Crime Survey 13/01

England and Wales

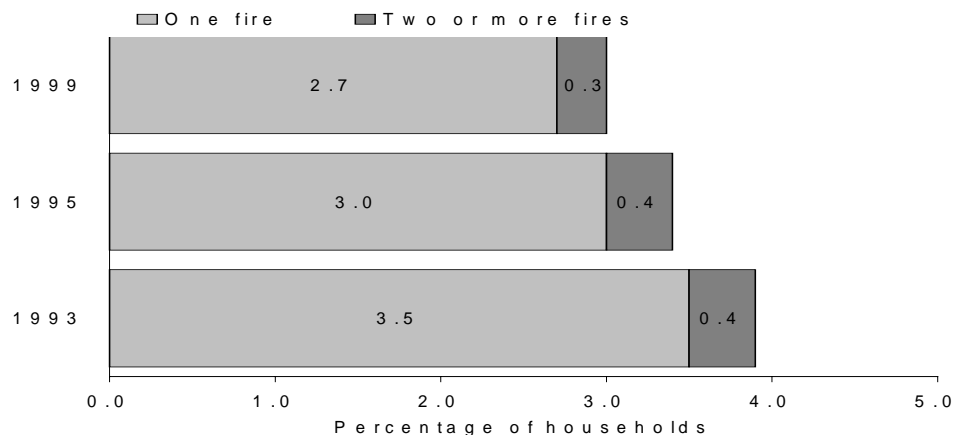
Rebecca Aust

02 August 2001

MAIN POINTS

- The 2000 British Crime Survey (BCS) shows that 3.0 per cent of households experienced a fire in 1999. The equivalent figure was 3.4 per cent in 1995 and 3.9 per cent in 1993.
- The BCS estimates that there were 664,000 domestic fires in 1999, representing a statistically significant fall of 11 per cent since 1995. Official brigade return statistics show a 4 per cent decrease over the same period.
- The BCS estimates that the brigade attended 13 per cent of all domestic fires that occurred in 1999. This is a marginal increase on the 1995 estimate of 12 per cent.
- The mean cost of financial damage caused by domestic fires according to the 2000 BCS was £790. However, two-thirds of all BCS respondents who experienced a fire claimed that it resulted in either no or very minimal financial loss.
- The BCS estimates gross losses to householders as a result of domestic fires in England and Wales in 1999 to be in the region of £375 million.
- Accidents whilst cooking account for 59 per cent of all fires, making the kitchen the most common location for fires.
- About one in ten fires began outside of the home. Those that did were more likely to spread.
- Households headed by someone aged 16 to 24 had the highest odds of experiencing a domestic fire.
- Single person households were least likely to own a smoke alarm.
- The BCS estimates that 89 per cent of all fires did not result in any injury.

Figure A Reported occurrences of domestic fires, 1993 to 1999



Thank you to all those who assisted in the preparation of this bulletin. Special thanks go to Stuart Deaton (DTLR), Joanna Mattinson (RDS), Pat Mayhew (RDS), Tracey Budd (RDS), Robert Schofield (DTLR), Chris Kershaw (RDS), Lorraine Watson (DTLR) and Lorraine Sims (Surrey University).

The Fire Service was transferred from the Home Office to the new Department for Transport, Local Government and the Regions (DTLR) in June 2001.

This bulletin has been produced by the Crime and Criminal Justice Unit, Research, Development and Statistics Directorate of the Home Office.

Copies of this and other BCS publications are available from the Information and Publications Group, Research, Development and Statistics Directorate, Communications Development Unit, Room 201, Home Office, 50 Queen Anne's Gate, London SW1H 9AT (Tel. 020 7273 2084).

For further information about the British Crime Survey please e-mail the Crime Survey Section, Crime and Criminal Justice Unit, at rds.ho@gt.net.gov.uk, or write to the Crime Survey Section at the above address.

Contents

	Page
Chapter 1	Introduction.....1
	• Measuring experiences of domestic fires..... 1
Chapter 2	Extent and trends of fire3
	• The extent of domestic fires in 1999.....3
	• Multiple fires.....3
	• Estimate of the total number of domestic fires4
	• BCS estimates of the total number of fires attended by brigades4
Chapter 3	Nature of fire7
	• Characteristics of the fire7
	• Detection of the fire..... 10
	• Extinguishing the fire..... 11
	• Consequences of fire..... 12
Chapter 4	Patterns of fire risk.....17
	• The role of the BCS 17
	• Unequal risks of fire: bivariate analysis 18
	• Unequal risks of fire: multivariate analysis.....20
	• Comparing the bivariate and multivariate results22
	• Comparing the 1996 and 2000 multivariate analysis results.....23
Chapter 5	Domestic fire safety measures.....25
	• Household fire equipment.....25
	• Smoke alarm ownership: bivariate analysis25
	• Smoke alarm ownership: multivariate analysis.....28
	• Comparing the bivariate and multivariate results29
Chapter 6	Arson31
	• Targets..... 32
	• Reporting arson to the police..... 32
	• Cost of arson..... 32
Chapter 7	Conclusion35
	• Preventative issues..... 35
Appendix A	Additional tables 37
Appendix B	Logistic regression..... 43
Appendix C	Survey design and methodology47
Appendix D	2000 BCS fire module51
References 61

FIGURES AND TABLES

Main points

Figure A Reported occurrences of domestic fires, 1993 to 1999 (1994, 1996 and 2000 BCS)

Chapter 1 Introduction 1

Chapter 2 Extent and trends of fire..... 3

Table 2.1 Reported occurrences of domestic fires (1994, 1996 and 2000 BCS)

Table 2.2 Number of fire experiences in 1993, 1995 and 1999 (1994, 1996 and 2000 BCS)

Table 2.3 BCS estimates of the number of domestic fires (1996 and 2000 BCS)

Chapter 3 Nature of fire..... 7

Table 3.1 Causes of domestic fire (2000 BCS)

Table 3.2 Where the domestic fire started (2000 BCS)

Table 3.3 How the fire was discovered (2000 BCS)

Table 3.4 Reasons why the smoke alarm did not go off (2000 BCS)

Table 3.5 Fire brigade attendance by cause of fire (2000 BCS)

Table 3.6 Injury by cause of fire (2000 BCS)

Table 3.7 Total cost of damage caused by the fire (2000 BCS)

Table 3.8 Mean cost of fires, by where they started (2000 BCS)

Table 3.9 Mean cost of fires, by their cause (2000 BCS)

Table 3.10 Cost of domestic fires, by how the fire was discovered (2000 BCS)

Table 3.11 Cost of the fire damage, by whether the damage was claimed for (2000 BCS)

Chapter 4 Patterns of fire risk 17

Table 4.1 Summary of the groups with the highest risk of experiencing a domestic fire (2000 BCS) (Bivariate analysis)

Table 4.2 Summary of the groups with the highest odds of experiencing a domestic fire (2000 BCS) (Multivariate analysis)

Table 4.3 Comparing the groups with the highest risks of experiencing a domestic fire (2000 BCS) (Bivariate & multivariate analysis)

Table 4.4 Comparing the groups with the highest odds of experiencing a domestic fire (1996 & 2000 BCS) (Multivariate analysis)

Chapter 5 Domestic fire safety measures 25

Table 5.1 Current levels of home fire safety measures (2000 BCS)

Table 5.2 Summary of the groups with the highest risks of not owning a smoke alarm (2000 BCS) (Bivariate analysis)

Table 5.3 Summary of the groups with the highest odds of not owning a smoke alarm (2000 BCS) (Multivariate analysis)

Contents

Table 5.4	Comparing the groups with the highest risks of not owning a smoke alarm (2000 BCS) (Bivariate & multivariate analysis)	
Chapter 6	Arson	31
Table 6.1	Extent of arson: a comparison of the fire module and the criminal victimisation counts of the BCS (1994, 1996, 1998 and 2000 BCS)	
Table 6.2	Targets of arson attacks (1994/1996 and 1998/2000 BCS)	
Table 6.3	Damage cost of arson attacks to victims (1998 and 2000 BCS)	
Appendix A	Additional tables.....	37
Chapter 3		
Table A3.1	Methods used to extinguish the fire, by brigade attendance (2000 BCS)	
Table A3.2	Injury caused by the fire (2000 BCS)	
Chapter 4		
Table A4.1	Percentage of households victim of fire, once or more between 1998 and 1999 (prevalence risks) (2000 BCS)	
Table A4.2	Percentage of households victim of fire, once or more between 1998 and 1999 by ACORN (17) (prevalence risks) (2000 BCS)	
Table A4.3	Percentage of households victim of fire, once or more between 1998 and 1999 by region (prevalence risks) (2000 BCS)	
Table A4.4	Percentage of households victim of fire, once or more between 1995 and 1999 by ACORN (54) (prevalence risks) (1996 and 2000 BCS)	
Chapter 5		
Table A5.1	Smoke alarm non-ownership, by household characteristics (prevalence risks) (2000 BCS)	
Table A5.2	Smoke alarm non-ownership, by ACORN (17) (prevalence risks) (2000 BCS)	
Table A5.3	Smoke alarm non-ownership, by region (prevalence risks) (2000 BCS)	
Appendix B	Logistic regression	43
Table B.1	Logistic regression model for risks of household fire (2000 BCS)	
Table B.2	Logistic regression model for smoke alarm non-ownership (2000 BCS)	

1. Introduction

The British Crime Survey (BCS) is a large, nationally representative survey, which is primarily concerned with measuring the extent and nature of crime against adults living in private households in England and Wales. However, in addition to collecting information on crime, the BCS also asks about other issues of Home Office concern, one of which is domestic fires.¹ The BCS has been conducted eight times to date, covering experiences of domestic fires in six sweeps of the survey. This bulletin reports the results from the most recent sweep: the 2000 BCS.²

The BCS data on domestic fires serves as a useful supplement to records kept by fire brigades.³ First, the BCS provides a fuller measure of the number of domestic fires in England and Wales. This is because many of the fires measured by the BCS result in little or no damage and consequently are often not brought to the attention of the fire brigade, thus escaping official recording. Even fires involving property damage or injury are not necessarily brought to the attention of the fire brigade. Second, the BCS collects a wide range of social and demographic information, which then enables those groups within the population who are at high risk of experiencing a domestic fire to be identified.

MEASURING EXPERIENCES OF DOMESTIC FIRES

The 2000 BCS first asked householders whether they had experienced a fire since the beginning of January 1999, and if so how many fires had occurred in that period. Interviews took place between January and July 2000; thus the average 'recall period' was just over 14 months. Respondents were then asked whether they had experienced a fire during the preceding year of 1998. The first question that was asked was:⁴

"I would now like to ask you about fires in the home. This means all sorts of fires, including chip pan fires and very minor fires and includes fires in sheds, garages or greenhouses. Has there been a fire of any sort in the place that you were living since the beginning of January 1999?"

The question was designed to capture as many experiences of domestic fire as possible. Even so, some very minor fires may have been forgotten or felt not worthy of reporting. It is difficult to accurately assess the extent to which this may have occurred, though reassuringly the majority of fires householders referenced were not attended by brigades, and as mentioned above, many resulted in little or no financial loss.

¹ Domestic fires refers to any fire that may have occurred on the householder's structural property, whether this be inside the house for example in the kitchen, or outside the house for example in the shed.

² Household fires were briefly touched upon in the first (1982) BCS. The third (1988) BCS covered them in more detail and results were reported in May, C (1990). Results from the 1992 BCS are reported in *Fire Statistics, United Kingdom, 1992* (Home Office, 1992), and those from the 1994 BCS are in *Fire Statistics, United Kingdom, 1993* (Home Office, 1995). Results from the sixth (1996) BCS were reported in Budd, T. and Mayhew, P. (1997).

³ The Home Office also collects statistics from reports on fires attended by local authority fire brigades. For details on the content of information gathered, see *Fire Statistics United Kingdom 1999* (Home Office, 2000).

⁴ For a complete list of the questions that were included in the 2000 BCS fire module see Appendix D.

Fires in the home: findings from the 2000 BCS

Those who reported experiencing a fire since January 1998 were asked details about the fire, for example its cause and location. Those who reported having more than one fire between January 1998 and the date of the interview were asked about the most recent fire.⁵

It is possible that some householders who experienced more than one fire may have given details of the most serious, rather than the most recent, simply because it was more salient to them. As a consequence some bias may have been introduced into the findings. However, given that only 11 per cent householders who had a fire reported having more than one fire since the beginning of January 1999, any bias is likely to be slight and consistent across all sweeps.

While questions within the 2000 BCS fire module cover the same broad topics as those included in the 1996 BCS, some improvements were made so as to make the responses more exhaustive. Despite the fact that these were only minor changes, an inherent consequence is that some data obtained cannot be compared to that from earlier sweeps.

The 2000 BCS fire module also included a number of topic areas not in the 1996 sweep:

- current fire safety measures within the home
- smoke alarm ownership and the role, if any, it played in detecting the fire
- injury caused as a result of the fire
- whether the household claimed from their insurance for the damage caused by the fire.

Methodological note

A nationally representative sample of just under 19,411 adults aged over 16 was interviewed between January and July 2000. A further 3,874 respondents were interviewed in an associated ethnic boost sample. The 2000 BCS achieved an overall response rate of 74%. In total 819 adults reported details on their 'last' fire. A more detailed discussion of the BCS methodology can be found in Appendix C.

⁵ No details are recorded on multiple fires in 1998.

2. Extent and trends of fire

This chapter firstly examines both the one and two year prevalence rates of domestic fires, comparing estimates from the 2000 BCS to those obtained from the 1994 and 1996 BCS.¹ Following this is a brief discussion about the number of households that have experienced a domestic fire more than once in the reference period, and again how this compares to previous BCS findings. This chapter concludes with an estimate of the total number of domestic fires that occurred in England and Wales in 1999, and an estimate of the percentage of those fires that were attended by the fire brigade.

THE EXTENT OF DOMESTIC FIRES IN 1999

The 2000 BCS shows that 3.0 per cent of households reported a fire in 1999.² The equivalent figure in 1995 (1996 BCS) was 3.4 per cent and in 1993 (1994 BCS) was 3.9 per cent.³

In the 2000 BCS, 1.6 per cent of householders reported having a fire in 1998. The lower figure for 1998 compared to 1999 is likely to reflect the fact that earlier fires will tend to have been forgotten. Over the two-year period, 4.4 per cent of households reported one or more fires. The equivalent two-year figure for the 1996 BCS was 4.8 per cent, and 5.4 per cent in the 1994 BCS, see Table 2.1.

Table 2.1 Reported occurrences of domestic fires (1994, 1996 and 2000 BCS)

<i>Fires in:</i>	1993 ¹ (1994 BCS)	1995 ¹ (1996 BCS)	1999 ¹ (2000 BCS)	1992 & 1993 ² 1994 (BCS)	1994 & 1995 ² (1996 BCS)	1998 & 1999 ² (2000 BCS)
<i>Percentage of households experiencing:</i>						
1 fire	3.5	3.0	2.7	n/a	n/a	n/a
2 or more fires	0.4	0.4	0.3	n/a	n/a	n/a
1 or more	3.9	3.4	3.0	5.4	4.8	4.4

Notes:

1. Based on a recall period of about 14 months, no adjustment.
2. Based on a recall period of about 26 months, no adjustment.
3. Source: 1994, 1996 and 2000 BCS (weighted data). Covers England and Wales.

MULTIPLE FIRES

While most of those who had experienced a fire in 1999 had only one fire, 11 per cent of households reported more than one. In 1995, 12 per cent of respondents who experienced a domestic fire reported more than one incident. Amongst all those that reported in the 2000 BCS to having a fire, 6 per cent experienced one in both 1998 and 1999. The equivalent estimate from the 1996 BCS was 5 per cent.

Akin to criminal victimisation, the risk of experiencing more than one fire in a year does not conform to 'normal' random statistical distribution, but rather strikes some people more often than if victimisation were evenly spread. As mentioned, 3 per cent of households experienced a

¹ Prevalence rates show the percentage of the BCS sample that experienced a domestic fire once or more during the year. Unlike incidence rates they take no account of the number of fires respondents may have experienced.

² In the 1996 BCS the exact recall period was 13.7 months, whereas in the 2000 BCS it was 14.3 months. Whilst this difference has not been accounted for when making the above estimates, any such provision would have only had the effect of exacerbating the difference between 1995 and 1999 and also 1994/5 and 1998/9.

³ Significance testing has not been applied here, as the estimates do not account for the variation in recall period across sweeps.

Fires in the home: findings from the 2000 BCS

domestic fire in 1999, of which 11 per cent had more than one. However, if fires were randomly distributed we would expect only 1-per cent of those households to have had more than one fire in 1999. Thus, the risk of multiple victimisation is greater than would be expected by chance.

As some households reported more than one fire, the *incidence* rate (i.e. the number of fires per 100 households) is higher than the *prevalence* rate (i.e. the percentage of households that had experienced at least one fire in the reference period). There were 3.6 fires per 100 households in 1999, against 4.0 in 1995 and 4.6 in 1993 (Table 2.2).

Table 2.2 Number of fire experiences in 1993, 1995 and 1999 (1994, 1996 and 2000 BCS)

	1993	1995	1999
<i>Percentage of households experiencing:</i>			
One fire	88.4	87.9	88.8
Two fires	8.9	8.3	7.8
Three fires	1.4	2.6	1.4
Four fires	0.7	0.7	0.4
Five or more fires	0.7	0.5	1.6
<i>Unweighted N</i>	283	563	560
Fires per 100 households¹	4.6	4.0	3.6

Notes:

1. Incidence rates assume that those who said that they had five or more fires in the year had five.
2. Based on a recall period of about 14 months, no adjustment.
3. Due to rounding, columns do not necessarily total to 100%.
4. Source: 1994, 1996 and 2000 BCS (weighted data). Covers England and Wales.

ESTIMATE OF THE TOTAL NUMBER OF DOMESTIC FIRES

The 2000 BCS estimates that there were 664,000 domestic fires in England and Wales in 1999.⁴ This figure gives the best estimate of the true number of fires, although as estimates are derived from a sample survey of the population it may differ from the true number. Nevertheless it is possible to calculate the range in which the true value is likely to fall. According to the 2000 BCS, and using a 95 per cent confidence level, the true value lies between 592,000 and 736,000.

The total number of BCS domestic fires has fallen significantly (by 11%) since 1995 when there were an estimated 748,000 incidents in England and Wales.⁵ The official brigade return statistic showed a 4 per cent decrease in domestic fires over the same period.

BCS ESTIMATES OF THE TOTAL NUMBER OF FIRES ATTENDED BY BRIGADES

There are two ways to assess the proportion of domestic fires that are attended by brigades. One is simply derived from asking householders who report having experienced a domestic fire to the BCS whether or not the brigade attended. In the 2000 BCS, 26 per cent of fire respondents said that the brigade attended the fire, the corresponding figure for 1995 was 22 per cent. To make these figures comparable to official fire brigade statistics, both 'garden' and 'otherwise

⁴ The total number of fires is derived by multiplying the incidence rate by 21,995,700 households in England and Wales (provisional estimate). The resultant figure is then down-weighted by a factor of 12/14.3. This takes account of the timing of fieldwork (most interviews took place between January and April 1999) so as to give an estimate for the calendar year of 1999.

⁵ Using a two-tailed significance test. The 11% decrease is significant at the 5% level.

outdoor' fires have to be excluded. The resultant estimates for the percentage of fires to which BCS respondents said that the brigade was called was 23 per cent in 1999 and 19 per cent in 1995 (Table 2.3). This 4-percentage point increase in reporting is statistically significant.⁶

An alternative estimate can be made by comparing the BCS estimate of the number of fires in England and Wales with the number of fires recorded by official fire brigade returns. In order to do this it is necessary to make several adjustments to the BCS data. First, the BCS incident rate is down-weighted to give an estimate for the calendar year of 1999. Second, to ensure comparability, outdoor fires are excluded from the BCS estimate as such fires are not classified as dwelling fires in official brigade statistics.^{7, 8} Then the percentage of BCS 'last' fire incidents said by respondents to have been attended by brigades is applied to the new grossed-up total. This results in an estimated 142,800 BCS fires having been attended by the brigade. The number of dwelling fires recorded by brigades in 1999 is lower, at 78,500, representing 13 per cent of the total number of fires estimated by the BCS. This figure represents a 1-percentage point increase on the 1995 estimate, suggesting that whilst the total number of domestic fires have decreased significantly, there has been a marginal increase in the proportion of fires that the brigade attended (Table 2.3). However, the BCS provides no evidence that the public are now calling the fire brigade to deal with less serious incidents.

Table 2.3 BCS estimates of the number of domestic fires (1996 and 2000 BCS)

	1995 ^{1,2}	1999 ²
BCS estimates of fires in England and Wales	748,200	663,900
BCS estimates of fires in England and Wales, less outdoor fires ³	689,300	616,100
Percentage of fires to which BCS respondents said that the brigade was called ⁴	19	23
Estimated BCS number of fires to which the brigade was called	128,200	142,800
Fires attended by the brigade occurring in dwellings, sheds and garages	81,700	78,500
Percentage of fires attended of BCS best estimate	12	13

Notes:

1. The figures for 1995 vary slightly to those published in Budd, T & Mayhew, P (1997). This is largely attributable to rounding differences caused by a change in the statistical package used to analyse the data.
2. BCS estimates include adjustments for (i) respondents who experienced a domestic fire more than once in 1999; and (ii) the recall period is in excess of 12 months.
3. Official brigade returns include figures on fires that began in garages and sheds.
4. These estimates exclude fires that were reported to have been located in the 'garden' or otherwise 'outdoors'.
5. Source: 1996 & 2000 BCS. Weighted data. Covers England and Wales.

The two methods for estimating the percentage of fires that were attended by brigades in 1999 elicit very different estimates (13% versus 23%). Several factors may account for the discrepancy:

- ◆ Sampling error on the BCS figures, both on the estimated number of fires and the proportion said to have been attended by brigades, may account for some of the variation.
- ◆ It is also possible that those who experienced more than one fire over the previous two years reported on the most serious fire, to which the chance of a brigade being called would be

⁶ Using a two-tailed significance test. The 4-percentage point increase is significant at the 10% level.

⁷ Fires in gardens, dustbins or elsewhere outside the house that do not involve any part of a dwelling are not counted as dwelling fires.

⁸ Also excluded from the BCS/official returns comparison are those fires classified within the BCS as 'dustbin fires'. This is because whilst BCS respondents are asked for details on the location of the fire and whether it spread, no information is collected on where the fire spread to, i.e. the house, shed or garage.

higher. The likelihood of this is given weight by the finding which shows that the financial damage incurred is higher for those fires where the brigade attends (see Chapter 3).

- ◆ The BCS estimate of the number of fires (and therefore the number said to have been attended by brigades) may be inflated as a result of respondents pulling forward in time some fires which actually happened earlier than the last year (a bias that will be constant across all sweeps).
- ◆ The fall in the number of domestic fires identified by the BCS may represent a fall in the number of less serious fires, which would not require brigade attendance.
- ◆ Finally, it may be that some respondents said the brigade was called when they were not, thinking this was a more 'responsible' answer.

3. Nature of fire

This section examines the nature of domestic fires, and covers the following areas:

- characteristics of the fire, i.e. the cause, location and spread
- detection of the fire, i.e. who discovered the fire, and by what means it was discovered, placing particular emphasis on smoke alarm presence and operation
- extinguishing the fire, i.e. brigade attendance at different causes of fire, and by whom and with what means the fire was put out
- consequences of domestic fire, i.e. personal injury, financial damage, and insurance coverage and claims.

From herein, all of the results are based on the full recall period unless otherwise stated ('last fire over the previous two years').¹ Whenever possible comparisons are made back to previous BCS data. However, improvements in the variety of responses available to respondents in the 2000 BCS mean that this is not always possible.

CHARACTERISTICS OF THE FIRE

The causes of household fires

The question on cause of 'last' fire was more exhaustive in terms of the responses available to respondents than that included in the 1996 BCS. This means that results are not always directly comparable. Nevertheless the causes of 'last' fire remains fairly consistent across sweeps.²

The 2000 BCS shows that over half (59%) of 'last' household fires were caused by cooking accidents. In most instances this was caused by a pan of fat/oil catching fire (24%). A household's risk of experiencing a chip pan fire according to the 2000 BCS was 1.1 per cent. The corresponding 1996 BCS estimate was 1.3 per cent. However, this 0.2-percentage point decrease was not statistically significant. Grill pans caused 13 per cent of all fires according to the 2000 BCS. A householder's risk of experiencing a grill pan fire according to the 2000 BCS was 0.6 per cent. The equivalent 1996 BCS estimate was 0.8 per cent, representing a statistically significant 0.2-percentage point decrease.³

A tenth of fires were caused by electrical appliances or wiring. Just under a tenth (9%) were caused by heating equipment, with chimney fires most often to blame. Of all fires that occurred, 6 per cent were deliberately caused (see Chapter 6 for more discussion on arson). Candles were also responsible for causing 5 per cent of all fires; the equivalent 1996 estimate was 3 per cent representing a statistically significant increase.⁴ Table 3.1 provides a more detailed breakdown on the specific causes of household fires according to the 2000 BCS.

¹ No adjustment has been made for the time taken to conduct the interviews, recall period of about 26 months.

² See Budd, T., and Mayhew, P. (1997) for 1996 BCS estimates.

³ Using a two-tailed significance test. The 0.2- percentage point decrease is significant at the 10% level.

⁴ Using a two-tailed significance test. The 2-percentage point increase is significant at the 10% level.

Fires in the home: findings from the 2000 BCS

Table 3.1 Causes of domestic fire (2000 BCS)

	%
Pan of fat/oil catching fire	24
Grill pan	13
Leaving something in the oven/on the hob for too long	7
Leaving something too close to the cooker	5
Toaster	4
Microwave	2
Catching clothing on cooker/hob	1
Other cooking accidents	4
All cooking fires	59
Electric wiring worn out or faulty	3
Television or video	1
Tumble-dryer/spin-dryer	1
Washing machine/washer-dryer	1
Dishwasher	<1
Electric blankets	<1
Lights (putting things by light bulbs/lights falling over)	<1
Other electrical accidents	4
All electrical fires	10
Chimney fires	5
Open hearth fires (e.g. coal on rug)	1
Things left too close to heaters/fires	1
Other heating accidents	2
All heating fires	9
Not discarding cigarettes or cigar safely	1
Someone falling asleep when smoking	<1
Other smoking accidents	<1
All smoking fires	2
Adults being careless with matches	<1
Children playing with a cigarette lighter	<1
Children playing with matches	<1
Other matches/lighter accidents	<1
All matches/lighter fires	1
Children playing with fire other than matches/cigarette lighters	1
Arson	6
Candles	5
Bonfires	1
Blow lamps	<1
Barbecue	<1
Fireworks	<1
Natural occurrences (lightening etc.)	<1
Vehicle fires (wiring etc.)	<1
Other	5
All other causes of fires	17
<i>Unweighted N</i>	816

Notes:

1. Figures are rounded and the components do not necessarily sum to the independently rounded totals.
2. In the 2000 BCS the responses to this question were more exhaustive, see Budd, T & Mayhew, P (1997) for 1996 estimates.
3. 'Last' fire over the previous two years.
4. Source: 2000 BCS (weighted data). Covers England and Wales.

Whilst there have been small decreases across nearly all causes of domestic fire between the 1996 and 2000 BCS very few of these falls are statistically robust. Thus, there is not one specific cause of fire that can be isolated and held accountable for the overall significant decrease of 11 per cent in the total number of domestic fires between 1995 and 1999.

Where fires started

All previous BCS analysis of household fires has shown that the majority of 'last' fires began in the kitchen. This trend is confirmed with the 2000 BCS data, with two-thirds of fires beginning there (66%). This finding is not too surprising given that accidents while cooking are the most common cause of fire. Again in line with 1996 BCS findings, the next most common location was the lounge/dining room. According to the 2000 BCS, 4 per cent of all domestic fires began in the bedroom. The corresponding 1996 BCS estimate was 7 per cent, representing a statistically significant fall.⁵ Identical to the 1996 BCS estimates, the 2000 data showed that few fires, about one in ten, started outside the home. Table 3.2 details where, inside and outside the house, the fire began.

Table 3.2 Where the domestic fire started (2000 BCS)

	2000 BCS
<i>Location:</i>	%
Kitchen	66
Lounge/dining room	15
Bedroom	4
Bedsitter (bedsitting room)	1
Hallway or landing	1
Other place in the house	3
All inside the house	90
Garage – free-standing not attached to house	1
Garage – built onto house	<1
Shed or greenhouse	1
Garden	3
Dustbin	1
Elsewhere outside the house	3
All outside the house	10
<i>Unweighted N</i>	819

Notes:

1. Due to rounding, column does not necessarily total to 100%.
2. The responses 'hallway or landing' and 'dustbin' were not included in the 1996 BCS fire module.
3. 'Last' fire over the previous two years.
4. Source: 2000 BCS (weighted data). Covers England and Wales.

Whether the fire spread

Fires that began in the kitchen rarely spread to another room, however just under a tenth of all fires that started in the lounge/dining room did. Fires that began outside of the house were more likely to spread (16%) than fires that began inside (5%). In total 6 per cent of all domestic fires

⁵ Using a two-tailed significant test. The 3-percentage point decrease is significant at the 5% level.

spread.⁶ Combined 1994 and 1996 BCS data estimates that 4 per cent of fires spread, representing a statistically significant 2-percentage point increase.⁷

DETECTION OF THE FIRE

Who discovered the fire and how

Of all BCS domestic fires, 60 per cent were discovered by the respondent, 29 per cent by another household member, and the remaining 13 per cent by someone from outside the household.^{8,9} Of all fires, a third were discovered by someone smelling smoke, and a further third by someone being in the room when it began. One in five fires 'just happened to be found' and 12 per cent were alerted by a smoke alarm going off (Table 3.3).

Table 3.3 How the fire was discovered (2000 BCS)

	%
Smoke alarm went off	12
Smelt smoke	33
Pet alerted them (e.g. barking)	1
In the room when it started	33
Just happened to find it	20
Other	9
<i>Unweighted N</i>	815

Notes:

1. Total sums to more than 100% as respondents were allowed to state more than one way in which the fire was discovered.
2. 'Last' fire over the previous two years.
3. Source: 2000 BCS (weighted data). Covers England and Wales.

Smoke alarm presence and operation

Sixty-five per cent of households who had a fire reported having a smoke alarm installed at the time of the 'last' fire. Of all those that did have a smoke alarm, 42 per cent of them were triggered by the fire.

The most common reason given for the smoke alarm not going off was that it was too far away from the fire (mentioned by 48% of those who had an alarm that did not go off). A further 30 per cent had already put out the fire before the smoke alarm was triggered. Worryingly though, in 14 per cent of cases the smoke alarm did not trigger because it either had no batteries installed or was broken. Table 3.4 outlines the estimates from the 2000 BCS on why the smoke alarm failed to be triggered at the time of the fire. This is the first time this topic has been included in the BCS; thus there is no comparable data from previous BCS sweeps.¹⁰

⁶ No breakdown is provided on those fires that spread by individual locations, as the numbers are too small to give precise estimates with any confidence.

⁷ Using a two-tailed significance test. The 2-percentage point increase is significant at the 10% level.

⁸ It is very probably, given the high percentage of respondents who stated that they discovered the fire, that this question was affected by some response bias.

⁹ Total sums to more than 100% as respondents could state more than one person who discovered the fire.

¹⁰ See Chapter 5 on 'Home fire safety measures' for a detailed discussion on smoke alarm ownership.

Table 3.4 Reasons why the smoke alarm did not go off (2000 BCS)

	%
No battery installed/not working	14
Fire too far away from the smoke alarm	48
Fire put out before the smoke alarm triggered	30
Don't know	9
<i>Unweighted N</i>	316

Notes:

1. 'Last' fire over the previous two years.
2. Source: 2000 BCS (weighted data). Covers England and Wales.

EXTINGUISHING THE FIRE

Fire brigade attendance at the fire

As mentioned in Chapter 2, there are two ways to estimate the proportion of domestic fires that are attended by brigades. The estimate based on directly asking householders whether or not the brigade attended is explored further below.

To reiterate, of all domestic fires that occurred, respondents claimed that the fire brigade attended 26 per cent of them. The comparable estimate from the 1996 BCS was 22 per cent.¹¹ Thus, whilst there has been a decrease in the total number of fires, there has been an increase in the proportion which are reported to the fire brigade. This fall in number of fires may in part be attributable to community fire safety initiatives, while increased awareness of fire service activity may encourage people to seek brigade assistance more frequently.

The fire brigade was most likely to attend when the fire occurred outside. The brigade attended 72 per cent of all BCS 'outdoor' fires compared to 21 per cent of all 'indoor' fires. The comparable estimates from the 1996 BCS were 57 per cent and 17 per cent respectively. The smaller proportion of 'indoor' fires attended by the brigade is most likely explained by the high number of fires caused by cooking accidents – the least likely of all causes of domestic fires to be attended by the brigade (13%).

Those fires that were deliberately caused were most likely to be attended by the brigade (76%). See Table 3.5 for a breakdown of fires the brigade attended by the various causes of domestic fires.

¹¹ Note that the estimates presented in Table 2.3 are lower as adjustments were made to the data in order to make the figures comparable with brigade statistics.

Table 3.5 Fire brigade attendance by cause of fire (2000 BCS)

	% of fires attended
<i>Cause of fire:</i>	
Arson	76
Children playing with fire (not matches/cigarette lighters)	61
Heating appliances/equipment and fires (including chimney fires)	46
Electrical equipment/wiring (including electric blankets)	39
Accidents with matches or cigarette lighters	37
Cigarettes, cigars, pipes	24
Accidents while cooking (including using toasters and microwaves)	13
Other	36
<i>Overall percentage of fires that were attended</i>	<i>26</i>

Notes:

1. 'Last' fire over the previous two years.
2. Source: 2000 BCS (weighted data). Covers England and Wales.

Methods of extinguishing the fire

There are three options when it comes to extinguishing the fire, depending on whether or not the fire brigade attended. Firstly, the fire brigade alone could have tackled the fire (16% of all BCS fires). Secondly, someone other than the fire brigade, for example the respondent, could have tackled the fire (74% of all BCS fires). Or lastly, both the fire brigade and someone else could have attempted to extinguish the fire (10% of all BCS fires).

In cases where both the fire brigade and someone else attempted to put out the fire, 52 per cent of fires were actually extinguished by the brigade.

Of those fires that the brigade attended, water was the most common method used to extinguish the fire (33%). For those fires where the brigade did not tackle the fire, the most popular method used to put out the fire were cloths/blankets/tea towels (40%) (see Table A3.1 for a detailed breakdown of the methods used to extinguish the fire according to whether or not the brigade attends).

CONSEQUENCES OF FIRE

Personal injury as a result of the fire

The 2000 BCS asked those respondents who had experienced a fire, whether or not they or anyone in the household had been injured as a result of the fire. The 2000 BCS estimates that 89 per cent of all fires resulted in no injury. The most common types of injury sustained were smoke inhalation (59%) and burns (41%). A detailed breakdown of the type of injury caused by the fire is given in Table A3.2.

Fires caused by electrical equipment/wiring were most likely to cause injury (19%). Just over a tenth of all fires caused by cigarettes, cigars or pipes resulted in injury to either the respondent or other household member, as did fires caused by cooking accidents. Table 3.6 details the percentage of injury caused by different types of domestic fires.

Table 3.6 Injury by cause of fire (2000 BCS)

	% of all fires that resulted in injury
<i>Cause of fire:</i>	
Electrical equipment/wiring (including electric blankets)	19
Cigarettes, cigars, pipes	12
Accidents while cooking (including using toasters and microwaves)	11
Children playing with fire (not matches/cigarette lighters)	9
Arson	9
Heating appliances/equipment and fires (including chimney fires)	3
Accidents with matches or cigarette lighters	-
Other	10
<i>Total percentage that were injured</i>	<i>11</i>

Notes:

1. 'Last' fire over the previous two years.
2. Source: 2000 BCS (weighted data). Covers England and Wales.

Of all BCS fires, 4 per cent resulted in someone from the household having to receive medical attention. Similarly, 3 per cent of all household fires necessitated someone having to receive hospital treatment. The BCS cannot provide any estimate of the number of fire-related deaths.

Financial damage caused by the fire

Respondents were asked the total cost of the damage caused by the 'last' fire. In line with previous BCS estimates, more than four in ten BCS respondents who experienced a fire said that there was no financial loss as a result of the fire (42%). This rather high figure suggests that they may have discounted the negligible cost of any ruined food, blackened paintwork, and so on. A further quarter of fires (23%) resulted in minimal loss of less than £25 (Table 3.7). These findings suggest that the BCS 'screener' question successfully elicits many minor fires.

Any analysis of the cost of household fires must be taken as indicative rather than conclusive. Firstly, the numbers on which the estimates are based are relatively small. Secondly, estimates on the mean cost of fire can be greatly skewed by a small number of very costly fires. Lastly, examining the cost of a fire by for example its location ignores other important factors that may influence the resultant financial damage, such as how the fire was discovered, and how long it was before the fire was detected and extinguished. Inferences must therefore be made with care. Table 3.7 shows a breakdown of the cost of damage caused by the fire.

Table 3.7 Total cost of damage caused by the fire (2000 BCS)

	%
£0	42
£1 - £24	23
£25 - £99	11
£100 - £499	13
£499 - £1,000	3
£1,000 +	7
<i>Unweighted N</i>	<i>757</i>

Notes:

1. Cases where the cost of the fire was unknown are excluded.
2. Mean costs are rounded to the nearest £10.
3. 'Last' fire over the previous two years.
4. Source: 2000 BCS (Weighted data). 'Last' fire over previous two years. Covers England and Wales.

Fires in the home: findings from the 2000 BCS

According to the 1996 BCS the mean cost of financial damage caused by a fire was £470, the equivalent 2000 BCS estimate was £790. Fires that began inside the house were more costly (mean cost £820) than those that began outside the house (mean cost £440). This variation in cost was not evident in 1996 BCS estimates (£470 and £490 respectively). There is also a considerable amount of variation within categories; for example the mean cost of fires that started in the kitchen was £200, compared to £2,390 for fires that began in the lounge/dining room. Table 3.8 below details the mean cost of fires according to their location. Due to the small number of incidents in certain locations it is not possible to present robust estimates of the mean cost by all locations.

Table 3.8 Mean cost of fires, by where they started (2000 BCS)

	Mean cost (£)	Unweighted N
<i>Location:</i>		
Kitchen	200	503
Lounge/dining room	2,390	122
Elsewhere inside the house ¹	2,800	68
All inside the house	820	693
All outside the house²	440	64

Notes:

1. Due to the small number of fires that occurred in the bedroom, bedsitter and hallway/landing have been included in 'elsewhere inside the house'.
2. Due to the small numbers, no reliable breakdown of mean costs can be provided for each separate location outside the house.
3. Mean cost is rounded to the nearest £10.
4. 'Last' fire over the previous two years.
5. Response categories vary from those available in previous sweeps; thus data cannot be combined.
6. Source: 2000 BCS (weighted data). Covers England and Wales.

The cost of household fires also varies according to their cause. Those fires caused by electrical equipment and wiring were the most costly. This follows the same pattern as results from previous sweeps of the BCS. However, the mean cost has increased from £1,650 to £4,280 between 1994/5 to 1998/9 (though inflation will account for some of this difference). Whilst cooking fires were most common, they were on the whole the least expensive of all fires. This again follows previous BCS estimates. Table 3.9 details the estimates of the mean cost of fires, according to their cause.

Table 3.9 Mean cost of fires, by their cause (2000 BCS)

	Mean (£)	Unweighted N
<i>Cause:</i>		
Accidents while cooking	120	442
Heating appliances/equipment and fires	1,150	77
Electrical equipment/wiring	4,280	80
Other ¹	850	157

Notes:

1. Due to the small number of incidents, no reliable estimates of the mean cost can be provided for certain causes of fire and are therefore grouped in the 'other' category.
2. Mean cost is rounded to the nearest £10.
3. 'Last' fire over the previous two years.
4. Source: 2000 BCS (weighted data). Covers England and Wales.

The cost of household fires also varied according to how the fire was discovered. Table 3.10 outlines the mean cost of household fires according to how the fire was discovered.

Table 3.10 Cost of domestic fires, by how the fire was discovered (2000 BCS)

	Mean cost (£)	Unweighted N
<i>How discovered:</i>		
Smoke alarm went off	210	64
Smelt smoke	280	231
Just happened to find it	500	243
Was in the room when it began	770	149
Other ¹	4,070	63

Notes:

1. Due to their infrequency no reliable estimates could be provided for the mean cost of fires alerted to by a pet. Fires that were discovered in this way are classified as other.
2. 'Last' fire over the previous two years.
3. Source: 2000 BCS (weighted data). Covers England and Wales.

The mean cost of fire damage when the fire brigade was called exceeded £3,100; the equivalent cost when the brigade was not called was under £100. This reflects the fact that the fire brigade is most likely to attend when the fire is serious. However, this in part may be attributable to forward telescoping or the increased likelihood of respondents to report to the BCS on more serious fires.

Applying the mean cost of fires to the grossed-up estimate of the total number of domestic fires in England and Wales in 1999 puts gross losses to householders in the region of £375 million.¹² The equivalent BCS estimate for 1995 is £260 million.¹³ However, this gross cost is a broad estimate only, it takes no account of insurance premiums, or possible loss of earnings in serious fires for instance. The small numerical base of fires should also be borne in mind.

Covered by and claiming from insurance companies

At the time of 'last' fire, 60 per cent of households were covered by household insurance. Of all households who had a fire and who were covered by insurance, 22 per cent made a claim on their household insurance for the damage it caused.

The mean cost of fire damage when the household claimed from insurance companies exceeded £5,100; the equivalent cost when no claim was made was just over £210 (Table 3.11).

Table 3.11 Cost of the fire damage, by whether the damage was claimed for (2000 BCS)

	£0	< £25	£25- £99	£100- £499	£500 - £999	£1000+	Mean (£)	Unweighted N
<i>Percentages:</i>								
Made claim	1	-	7	32	13	47	5,100	93
No claim	48	26	11	10	2	2	210	664

Notes:

1. 'Last' fire over previous two years.
2. Mean cost rounded to the nearest £10.
3. Source: 2000 BCS (weighted data). Covers England and Wales.

¹² Gross financial loss caused by domestic fires is calculated by multiplying the mean cost of fire in 1999 by the estimate of total number of fires in England and Wales in 1999. The estimate of the total number of fires is down-weighted to take account for the timing of the interview. However, the mean cost of fires is not down-weighted, thus the average recall period is just over 14 months.

¹³ In Budd, T. & Mayhew, P. (1997) the net financial loss was estimated to be in the region of £355 million. However, this estimate is calculated by multiplying the number of fires in 1996 with the mean cost of fire over *both* 1995 and 1996, thus giving a higher estimate.

4. Patterns of fire risk

This chapter considers the risk of domestic fires for different types of households and for different groups in the community. It begins by examining the role of the BCS in identifying those who are at disproportionate risk of experiencing a domestic fire.¹ The results show that, as is the case with criminal victimisation, there is considerable variation in risk among different groups of the population. Identification of those groups at higher risk is necessary for effective policy targeting and resource allocation.

THE ROLE OF THE BCS

The BCS is an important source of information in assessing risks of domestic fire. Fire brigade records do not routinely include personal or social information about the households that have been attended. In contrast the BCS collects a wealth of information about the characteristics of both those who have experienced a fire and those who have not. This allows the survey to identify how risks of fire vary across different types of households.

There are, however, some limitations. Firstly, the BCS is primarily concerned with measuring criminal victimisation, and many of the household level characteristics measured are devised with this in mind. Some factors which are likely to be associated with fire risk are not measured in this survey, for example, details on the type of cooking and heating fuel used, the main sources of heating, and the floor space within the house. Furthermore, some relevant information is also only collected at an individual level (alcohol consumption, for instance), whereas risk of fire may be more affected by the behaviour patterns of the household as a whole. Finally, while the BCS is a large survey, the relatively small number of domestic fires identified means that it is not possible to identify what types of fire different groups are most at risk from.

The BCS findings are presented below. First the results of bivariate analysis are given. This technique examines a series of relationships between fire victimisation and various personal, household and community characteristics. However, because many of the risks overlap it is difficult to judge their unique contribution to the risk of household fire. To address this, the results obtained from multivariate analysis, a statistical technique used to ascertain each characteristic's unique contribution to the risk of fire, are then presented.

This section then concludes with a brief look at the variables that were identified by bivariate analysis as being at high risk from experiencing a domestic fire, but did not come up when the data was subjected to multivariate techniques (and vice versa). This is then followed by a comparison of the variables isolated by multivariate analysis in both the 1996 and 2000 sweeps of the BCS.

¹ See Department of the Environment, Transport and the Regions (1998) *The English House Condition Survey 1996* for additional discussion on high-risk fire groups.

UNEQUAL RISKS OF FIRE: BIVARIATE ANALYSIS

Nationally, 4.4 per cent of households experienced a domestic fire in the two-year period of 1998 and 1999.² This average provides the benchmark against which the risks of victimisation among different sub-groups can be compared. Those most at risk within each category have been listed below; prevalence risks are given in brackets.³

Household structure

Households most at risk are those where:

- the **head of household is young** - aged between 16 and 24 (12.9%), and 25 and 44 (5.6%)
- the **household contains children** - one adult lives alone with children (7.3%), or more than one adult living with children (5.9%).

Socio-economic circumstances

Generally, economically disadvantaged households are at higher risk. Most at risk households are those where:

- the household **income is low** - between £2,500 and £4,999 per annum (6.4%), or £2,499 or under (6.0%)
- the household is **financially unstable** - 'getting into difficulties' (7.3%), 'just getting by' (5.2%).⁴

Locality

Households located in the following areas were most at risk:

- in the **inner city** (5.4%)⁵
- on a **council estate** (5.2%)
- in the **eastern part of England** (5.1%), or **Wales** (5.0%)⁶

Risks were also higher in areas with the following characteristics:

- **better-off executives, inner city areas** (11.5%)
- **council estates, greatest hardship** (7.2%)

² Due to the timing of the interviews the average recall period here is about 26 months.

³ For a full breakdown of the prevalence risks for all groups within each category see Appendix A, Tables A4.1 to A4.3.

⁴ Respondents were asked how well their household is managing on the total household income at the moment. Respondents could answer (i) managing quite well, able to save or spend on leisure, (ii) just getting by, unable to save if wanted to, or (iii) getting into difficulties.

⁵ Inner city areas are defined at the sampling stage as those postcode sectors with high population density, low owner occupation, and low proportion of professionals.

⁶ Eastern part of the country comprises of Cambridgeshire, Norfolk, Suffolk, Bedfordshire, Essex and Hertfordshire.

- **council estates, better off homes** (5.7%)
- **council estates, high unemployment** (5.0%).

These areas are based on ACORN – ‘A Classification of Residential Neighbourhoods’ (CACI Ltd). The ACORN classification assigns each house in the country to one of the 17 neighbourhood groups according to the social and housing characteristics of its immediate area, as measured by the 1991 census.^{7,8}

Type of property

Properties with the following characteristics are at high risk:

- **converted flat** (9.4%), or a **purpose built flat** (5.8%)
- the **physical condition of the house is bad** (7.1%)⁹
- the house is **rented - privately** (7.4%), or **socially** (5.9%).

Other household factors

Also at high risk are properties where:

- the head of household is a **professional** (5.3%), or **partly skilled** (5.0%)
- the respondent of the household has a **limiting disability** (5.1%)
- somebody in the household **smokes** (5.8%)
- the respondent **drinks heavily** (6.8%)¹⁰
- the respondent of the household has **qualifications of A-Level or above** (5.0%)
- the property **does not have a smoke alarm** installed (4.6%)
- the household had been a **victim of crime** (5.7%).¹¹

⁷ ACORN is ‘A Classification of Residential Neighbourhoods’. It classifies households according to the demographic, employment and housing characteristics of the surrounding neighbourhood. ACORN was developed by CACI Ltd, through the use of cluster analysis of variables from the 1991 census. ACORN is most useful in determining the social environment in which houses are located. There are a total of 54 ACORN types, though these can be grouped together into 17 or 6 more broad groups.

⁸ Analysis here was based on the 17 ACORN breakdown. See Appendix A for the 54 ACORN breakdown based on the 2000 BCS data, and also the 54 ACORN breakdown based on 1996 and 2000 sweeps combined.

⁹ Based on the interviewer’s assessment of the condition of the property in the area, and the condition of the respondent’s home relative to other local properties.

¹⁰ Based on both the frequency and typical level of alcohol consumption. Heavy drinking consists of consuming six or more units of alcohol on three or more separate days of the week. Moderate drinking refers to consuming less than six units of alcohol or less separate days of the week, but more often than three times per month. Light drinking refers to drinking once a month or less and when drink does not exceed six units of alcohol.

¹¹ During the recall period of the beginning of January 1999 to the date of the interview, the average recall period was 14.3 months.

Table 4.1 Summary of the groups with the highest risk of experiencing a domestic fire (2000 BCS) (Bivariate analysis)

The head of household is aged between 16 and 24
The household contains one adult living alone with children
The household income is between £2,500 and £4,999 per annum
The household is getting into financial difficulties
The property is located in the inner city
The property is located on a council estate
The property is located in the eastern part of England
The property is located in a better-off executive, inner city area
The property is a converted flat
The physical condition of the property is bad
The property is rented privately
The head of household is a professional
The respondent of the household has a limiting disability
Somebody in the household smokes
The respondent drinks heavily
The respondent has A-level qualifications or above
The property does not have a smoke alarm installed
The household has been a victim of crime

Notes:

1. Based on 'last' fire.
2. Source: 2000 BCS. Covers England and Wales.

UNEQUAL RISKS OF FIRE: MULTIVARIATE ANALYSIS

Results from the bivariate analysis can often show a somewhat contradictory picture. For example, those households where the head has a professional occupation are exposed to a higher than average risk of being a victim of domestic fire, however those households with a low income are also at a higher than average risk. In addition to this some of the identified 'risk' factors overlap, for example living on a council estate may be linked to having a low income, which may then in turn be correlated to their financial instability.

By subjecting the data to multivariate analysis, it is possible to isolate the particular importance of different factors in predicting a household's overall risk from domestic fire. Logistic regression is the technique used here.

The factors independently associated with domestic fires are discussed below.¹² The most intuitive way to interpret the results is to consider two households identical in every way, except in terms of the factor under consideration. The figures given below show the value of EXP (β) or the *odds ratio*. This figure represents the change in the odds of experiencing a domestic fire if we increase the value of the variable under consideration by one unit (controlling for all other independent variables). If the value of EXP (β) is greater than one, then the odds are increased; if the value of EXP (β) is less than one, then the odds of experiencing a domestic fire are decreased.

As the odds ratio increases, the relative risk of the event also increases. However, the *change in odds* should not be interpreted as the *change in the relative risk* (e.g. an *odds ratio* of 2 does not

¹² For further details of the logistic regression procedure and the full results see Appendix B.

mean that the relative risk of an event is doubled). For example, if two groups, having respective risks of 75 per cent and 60 per cent for a particular outcome, both have an odds ratio equal to 2 (i.e. the respective odds are 3:1 and 6:4 and the odds ratio is $(3/1)/(6/4)=2$). Similarly two groups with respective risks of 33 per cent and 20 per cent also have an *odds ratio* equal to 2 (i.e. the respective odds are 1:2 and 1:4 and the odds ratio is $(1/2)/(1/4)=2$). The value of EXP (β) should therefore be interpreted as a multiplicative increase.

Whether the variables entered into the model are binary (i.e. has only two possible outcomes, for example whether the respondent smokes or not) or categorical (i.e. has three or more exclusive outcomes, for example tenure) it is necessary to identify one of the outcomes as a *reference or base category*, for example owner-occupiers. This means that when interpreting the odds of experiencing a domestic fire for people privately renting their property, their odds are always relative to owner-occupiers.

The variables below are presented in order of 'predictiveness', i.e. what is the most important factor in explaining a household's high odds of experiencing a domestic fire:

- **Age of head of household:** Relative to those households headed by someone aged 75+ (*base*), the odds of experiencing a domestic fire decreases as the age of head of household increases (with the exception of those aged 45 to 64 who had lower odds). Those households headed by someone aged 16 to 24 had the highest odds of 1.72.
- **Financial stability:** Relative to those households that were managing 'quite well' (*base*), both households that were 'just getting by' and 'getting into difficulties' had higher odds of experiencing a domestic fire (1.27 and 1.45 respectively).
- **Disability:** Disability is strongly associated with higher risks of fire. Relative to those households where the respondent has no disability (*base*), the odds of experiencing a domestic fire increase by a factor of 1.51 for those households where the respondent has a limiting disability, and by 1.16 when the disability is non-limiting.
- **Smoking:** Relative to non-smoking households (*base*), the odds of experiencing a domestic fire increase by a factor of 1.34 when someone in the household smokes.
- **Education:** Relative to those households where the respondent has no educational qualifications (*base*), the odds of experiencing a domestic fire increase for both those with below A-levels and above A-levels (1.45 and 1.70 respectively).
- **Household structure:** Relative to those households where one adult resided alone (*base*), all household structures had higher odds of experiencing a domestic fire (the only exception was when the head of household was aged 60+). The odds of experiencing a domestic fire increased when children were present in the household. In lone parent households, the odds of having a domestic fire increased by a factor of 1.17, however, the odds were highest for households with both more than one adult and children (1.47). This suggests that living with someone else, especially a child, increases the chances of a domestic fire. This does not mean that children *directly* cause fires. A more likely explanation is that having children at

home means that more cooking facilities are more frequently in use, or that adults may be more distracted whilst they are cooking.

- **Income:** Relative to households in the highest income category of £20,000 or more annually (*base*), households with an annual income of £9,999 or less had higher odds of being a victim of domestic fire. Within this, those who earned between £2,500 and £4,999 per annum had the highest odds of 1.34. Households with an income between £15,000 and £19,999 had the lowest odds (0.69).
- **Tenure:** Relative to owner-occupier householders (*base*), those who reside in any form of rented accommodation had higher odds of experiencing a domestic fire. Those householders who rented privately had odds of 1.22; however, those who were renting in the social sector (i.e. from local authorities or housing associations) had the highest odds (1.36).

Table 4.2 summarises those groups within each category who had the highest risk of being a victim of domestic fire.

Table 4.2 Summary of the groups with the highest odds of experiencing a domestic fire (2000 BCS) (Multivariate analysis)

The head of household is aged between 16 and 24
The household is getting into financial difficulties
The respondent has a limiting disability
Someone in the household smokes
The respondent has A-level and above qualifications
The household is occupied by one adult with children
The household income is between £5,000 and £4,999
The household is rented socially

Notes:

1. Based on 'last' fire.
2. Variables are in order of 'predictiveness'.
3. Source: 2000 BCS. Covers England and Wales.

COMPARING THE BIVARIATE AND MULTIVARIATE RESULTS

All variables included in the bivariate analysis were included in the multivariate analysis.¹³ Table 4.3 compares the variables that were identified from bivariate analysis as being 'at risk' from experiencing a domestic fire to those identified by the multivariate analysis as being 'at risk'.

¹³ All variables were checked for multi-colinearity i.e. that they were not statistically related to each other.

Table 4.3 Comparing the groups with the highest risks of experiencing a domestic fire (2000 BCS) (Bivariate & multivariate analysis)

The head of household is aged between 16 and 24	✓✓
The household is getting into financial difficulties	✓✓
The respondent has a limiting disability	✓✓
Someone in the household smokes	✓✓
The respondent has A-level qualifications or above	✓✓
The household contains one adult living alone with children	✓✓
The household income is between £2,500 and £4,999 per annum	✓✓
The property is rented socially	✓
The property is located in the inner city	✗
The property is located on a council estate	✗
The property is located in the eastern part of England	✗
The property is located in a better-off executive, inner city area	✗
The property is a converted flat	✗
The physical condition of the property is bad	✗
The property is rented privately	✗
The head of household is a professional	✗
The respondent drinks heavily	✗
The property does not have a smoke alarm installed	✗
The household has been a victim of crime	✗

Notes:

1. Based on 'last' fire.
2. ✓✓ indicates that the variable came out in both bivariate and multivariate analysis, ✓ indicates that the variable came out in multivariate analysis but not bivariate analysis, ✗ indicates that the variable came out in bivariate analysis but not multivariate analysis.
3. The first eight variables are presented in order of 'predictiveness' according to multivariate analysis. The following variables are in no order.
4. Only those groups with the highest risks from bivariate analysis are presented.
5. The bivariate variables are weighted.
6. Source: 2000 BCS. Covers England and Wales.

COMPARING THE 1996 AND 2000 MULTIVARIATE ANALYSIS RESULTS

Whilst all of the variables identified by multivariate analysis on the 1996 BCS came out in the 2000 BCS bivariate analysis, not all of them came out when the data was subjected to multivariate analysis. Table 4.4 compares the results from multivariate analysis based both on the 1996 and 2000 sweeps of the BCS.

Table 4.4 Comparing the groups with the highest odds of experiencing a domestic fire (1996 & 2000 BCS) (Multivariate analysis)

	1996	2000
The head of household is aged between 16 and 24	✓	✓
The household is getting into financial difficulties	✓	✓
The respondent has a limiting disability	✓	✓
Someone in the household smokes	✓	✓
The respondent has A-level and above qualifications	X	✓
The household is occupied by one adult with children	✓	✓
The household income is between £5,000 and £9,999	X	✓
The household is rented socially	✓	✓
Respondent drinks heavily	✓	X
Respondent is Asian	✓	X

Notes:

1. Based on 'last fire'.
2. Variables are not in any order.
3. ✓ indicates that the variable was identified in multivariate analysis as having high odds of experiencing a domestic fire, X indicates that the variable did not.
4. For more details on the results from multivariate analysis based on the 1996 BCS see Budd, T. & Mayhew, P. (1997).
5. Source: 1996 & 2000 BCS. Covers England and Wales.

5. Domestic fire safety measures

This chapter begins by examining ownership of various domestic fire safety measures; both those used to detect and those used to tackle fire. The remainder of this section will then focus on smoke alarm ownership, identifying those groups least likely to own an alarm. As shown in chapter 3, 65 per cent of all fire victims had a smoke alarm installed at the time of the 'last' fire. In 42 per cent of these fires, the smoke alarm was triggered.¹

The question on fire safety measures, whilst placed at the end of the fire module, is asked of all respondents regardless of whether or not they have experienced a domestic fire. Thus despite 79 per cent of all households owning a smoke alarm the sample size is sufficiently large to permit detailed analysis on those households that do not have a smoke alarm fitted. As in the analysis presented in chapter 4, the results of bivariate analysis are presented first, examining a series of relationships between non-smoke alarm ownership and various personal, household and community characteristics. Then the results of multivariate analysis are presented to indicate which factors are more predictive in explaining why a household does not have a smoke alarm fitted. Identification of those households least likely to own a smoke alarm is important, so as to target policy and allocate resources effectively.

This question was not included in the 1996 BCS fire module; thus there is no current comparable BCS data.²

HOUSEHOLD FIRE EQUIPMENT

In total, 80 per cent of households own some form of fire safety equipment. Smoke alarms are the most widespread household fire safety measure, with 79 per cent of all households owning one. Fire extinguishers were the next popular fire safety device (20%), though worryingly 20 per cent of households failed to have any fire preventative or tackling equipment (Table 5.1).

Table 5.1 Current levels of home fire safety measures (2000 BCS)

	%
Smoke alarm	79 ¹
Fire blanket	8
Fire extinguisher	20
Other fire safety measures	2
None	20
<i>Unweighted N</i>	19,380

Notes:

1. Respondents were also asked how their smoke alarm was operated. This 79% is made up of 69% having battery-operated alarms, 9% being mains operated, and 1% were unsure how they were operated.
2. Total sums to more than 100% as respondents were allowed to state more than one type of fire safety equipment.
3. Source: 2000 BCS (weighted data). Covers England and Wales.

SMOKE ALARM OWNERSHIP: BIVARIATE ANALYSIS

Smoke alarm ownership is not spread evenly throughout all sections of society. Whilst the percentage of respondents who owned a smoke alarm was 79 per cent, due to the nature of the question, respondents could state owning up to three smoke alarms (one battery operated, one

¹ For further information on this, including details on instances where the smoke alarm failed to go off see Chapter 3.

² See The Department of the Environment, Transport and the Regions (1998) *The English House Condition Survey 1996*, for additional discussion on those households least likely to own a smoke alarm.

mains operated, and one unsure). Thus, disregarding how many smoke alarms of varying operation that the respondent had, the actual percentage of households who did *not* own a smoke alarm in 2000 was 23 per cent. Those households least likely to own a smoke alarm within each category are presented below; percentages not owning a smoke alarm are given in brackets.³

Household structure

Households most likely not to own a smoke alarm were those where:

- **one adult is living alone** (33%)
- the **head of household is young**, aged between **16 and 24** (28%)
- the respondent is **Asian** (42%) or **Black** (36%).⁴

Socio-economic circumstance

Smoke alarm ownership is least likely where:

- the household **income is low**, under £2,500 (31%)
- the household is **financially unstable**; they are 'getting into difficulties' (32%), or 'just getting by' (26%).⁵

Locality

Households located in the following areas were least likely to own a smoke alarm:

- in the **inner city** (27%)⁶
- located in **London** (33%).

Properties located in the following ACORN areas were least likely to own a smoke alarm:⁷

- **multi-ethnic, low income areas** (50%)
- **council estates, high unemployment** (37%)
- **affluent urbanites, town and city** (33%)
- **better off executives, inner city areas** (32%)
- **prosperous professionals, metropolitan areas** (31%).

³ For a full breakdown of the prevalence risks for all groups within each category, see Appendix A, Tables A5.1 to A5.3.

⁴ The ethnic booster sample was used to improve reliability of the estimates.

⁵ See footnote 4, Chapter 4.

⁶ See footnote 5, Chapter 4.

⁷ See footnote 7, Chapter 4.

Type of property

The following types of property were least likely to own a smoke alarm:

- the property is **privately rented** (32%)
- the property was **built pre 1944** (27%)
- the property is a **converted flat** (31%), or a **purpose built flat** (29%).

Other household factors

Other characteristics, both household and individual, have also been found to be associated with low levels of smoke alarm ownership. These include:

- the head of household is **unskilled** (27%)
- if somebody in the household **smokes** (28%)
- the respondent **drinks heavily** (28%)⁸
- the respondent has **no qualifications** (26%).

Table 5.2 Summary of the groups with the highest risks of not owning a smoke alarm (2000 BCS) (Bivariate analysis)

The household contains one adult living alone
The head of household is aged between 16 and 24
The respondent is Asian
The household income is £20,000 or more
The household is getting into financial difficulties
The property is located in the inner city
The property is located in London
The property is located in a multi-ethnic, low income ACORN
The property is privately rented
The property was built pre 1944
The property is a converted flat
The head of household is unskilled
Somebody in the household smokes
The respondent drinks heavily
The respondent has no qualifications

Notes:

1. Based on 'last' fire.
2. Source: 2000 BCS. Covers England and Wales.

⁸ See footnote 10, Chapter 4.

SMOKE ALARM OWNERSHIP: MULTIVARIATE ANALYSIS

Again, bivariate analysis shows a somewhat contradictory picture about which households are least likely to have a smoke alarm installed. For instance, those ACORN neighbourhoods defined as 'prosperous professionals' are most likely not to have a smoke alarm installed, yet a high percentage of households located in areas deemed 'council estates, high unemployment' also do not own a smoke alarm. In addition to this, some of the 'risk' factors overlap. For instance, being financially unstable may be attributable to being in an unskilled profession, both of which are high-risk groups for not owning a smoke alarm. Bivariate analysis therefore makes it difficult to isolate which of these is then the underlying factor responsible for non-smoke alarm ownership. Also, is residing in a flat a better predictor of non-smoke alarm ownership or living in an inner city, given that the two are often found together.

It is for these reasons that the application of a multivariate analysis, logistic regression, is necessary. Again, the most intuitive way to interpret the results is to consider two households identical in every way, except in terms of the factor under consideration. The figures given below show the change in *odds* for a household *not* owning a smoke alarm compared to another household that is identical except for the specified factor.⁹

- **Household structure:** Relative to those households headed by someone aged 60+ (*base*), the odds of non-smoke alarm ownership were highest where one adult resides alone (1.39). Households with either more than one adult or where there are children also residing in the property, all have lower odds of non-ownership (i.e. more likely to own a smoke alarm).
- **Tenure:** Relative to owner occupied households (*base*), respondents who privately rent their property were most likely to not own a smoke alarm (1.25). Those respondents who rented their property from a local authority or Housing Association had lower odds (0.67) (i.e. more likely to have a smoke alarm installed than owner-occupiers). This may be attributable to various local authorities' housing policies.
- **Accommodation type:** Relative to those who resided in a converted flat (*base*), all forms of housing structures had higher odds of non-ownership, with those residing in a purpose built flat having the highest odds of 1.59. This may be because people converting property into flats to either sell or rent may have to abide by certain building regulations.
- **Smoking:** Relative to non-smoking households (*base*), the odds of not owning a smoke alarm increase by a factor of 1.44 for those households where somebody smokes, this is despite them being at higher risk of experiencing a domestic fire. It may be that both smoking and low levels of alarm ownership are associated with willingness to take risk.
- **ACORN category:** Relative to those households in areas classified as 'affluent suburbs and rural' (*base*), those living in areas deemed 'affluent urban' had increased odds by a factor of 1.28 of not owning a smoke alarm. All other ACORN categories were more likely to own an alarm.¹⁰

⁹ For further details of the logistic regression procedure and the full results see Appendix B.

¹⁰ Based on the six category ACORN classification.

- **Financial stability:** Relative to those households that are ‘managing quite well’ (*base*), both those households that are ‘just getting by’ and ‘getting into difficulties’ had higher odds of non-ownership (1.20 and 1.33 respectively).
- **Age of property:** Relative to ‘modern’ properties i.e. those that were built during or after 1985 (*base*), all older properties had higher odds of non-smoke alarm ownership. Building regulations again may account for this disparity.
- **Education:** Relative to those households where the respondent had qualifications of A-level and above (*base*), both those respondents with below A-level qualifications and no qualifications had higher odds of non-ownership, with the latter group having the highest odds of 1.12.
- **Ethnicity:** Relative to those households where the respondent was white (*base*), both those respondents who were either black or Asian had higher odds of not owning a smoke alarm (1.91 and 2.89 respectively).
- **Physical condition of the house:** Relative to households whose properties were classified as being in good condition (*base*), all other properties had higher odds of non-ownership, with those termed as ‘bad’ having the highest odds (2.34).¹¹

Table 5.3 summarises those groups within each category who had the highest odds of non-smoke alarm ownership.

Table 5.3 Summary of the groups with the highest odds of not owning a smoke alarm (2000 BCS) (Multivariate analysis)

The household contains one adult residing alone
The property is privately rented
The property is a purpose built flat
Somebody in the household smokes
The property is located in an affluent urban area
The household is getting into financial difficulties
The property was built pre 1984
The respondent of the household has no educational qualifications
The ethnicity of the respondent for the household is Asian
Physical condition of the property is classified as bad

Notes:

1. Results obtained from logistic regression.
2. Based on ‘last’ fire.
3. Source: 2000 BCS.

COMPARING THE BIVARIATE AND MULTIVARIATE RESULTS

Again, all of the variables included in the bivariate analysis were included in the multivariate analysis.⁹ Table 5.4 compares the variables that were identified from bivariate analysis as having high odds of non-smoke alarm ownership to those identified by the multivariate analysis as having high odds.

¹¹ See footnote 9, Chapter 4.

⁹ All variables were checked for multi-collinearity, i.e. that they were not statistically related to each other.

Table 5.4 Comparing the groups with the highest risks of not owning a smoke alarm (2000 BCS) (Bivariate & multivariate analysis)

The household contains one adult living alone	✓✓
The property is privately rented	✓✓
The property is a purpose built flat	✓✓
Somebody in the household smokes	✓✓
The household is getting into financial difficulties	✓✓
The respondent has no qualifications	✓✓
The respondent is Asian	✓✓
The physical condition of the house is bad	✓
The property was built pre 19844	✓
The property was built pre 1944	X
The property is located in an affluent urban area	X
The head of household is aged between 16 and 24	X
The property is located in a multi-ethnic, low income area	X
The property is located in the inner city	X
The property is located in London	X
The household income is £20,000 or more	X
The property is a converted flat	X
The head of household is unskilled	X
The respondent drinks heavily	X

Notes:

1. ✓✓ indicates that the variable came out in both bivariate and multivariate analysis, ✓ indicates that the variable came out in multivariate analysis but not bivariate analysis, X indicates that the variable came out in bivariate analysis but not multivariate analysis.
2. The first ten variables are presented in order of 'predictiveness' according to multivariate analysis. The following variables are in no order.
3. Only those groups with the highest odds from bivariate analysis are presented.
4. The bivariate variables are weighted.
5. Source: 2000 BCS. Covers England and Wales.

6. Arson

This section explores in more detail those fires caused by arson. Arson was chosen for further analysis primarily because it is a criminal offence.

The BCS measures arson in two ways. First, as mentioned in Chapter three; the domestic fire module asks all those who experienced a fire in the home during the recall period what the cause of the fire was. In the 2000 BCS fire module 4.7 per cent of fire victims in 1999 said that their last fire was deliberately started (in 1995, 4% said this was the case).¹ In terms of the full sample, this means that 0.14 per cent reported a fire that was deliberately started (the corresponding 1995 estimate was also 0.14%).²

The second estimate of arson is based in the criminal victimisation element of the BCS.³ The survey, as part of its standard crime count, includes the offence of arson. This measures all arson incidents against households and their private property, showing that in 1999 0.41 per cent of households were victims of arson (Table 6.1). It is not unexpected that the figure is higher than in the fire module, principally because the victimisation count covers thefts of vehicles in which the vehicle was later found burnt out.⁴

Table 6.1 Extent of arson: a comparison of the fire module and the criminal victimisation counts of the BCS (1994, 1996, 1998 and 2000 BCS)

	1993 ¹	1995 ¹	1997 ¹	1999 ¹
<i>Fire module count:</i>				
Proportion of 'last fires' deliberately started	0.10%	0.14%	n/a ²	0.14%
<i>Criminal victimisation count:</i>				
Proportion of households that fell victim to arson	0.41%	0.50%	0.39%	0.42%

Notes:

1. Based on one-year estimates. The extent of arson in 1993 is based on data obtained from the 1994 BCS, in 1995 on the 1996 BCS, in 1997 on the 1998 BCS and in 1999 on the 2000 BCS.
2. There was no fire module in the 1998 BCS.
3. Weighted data. Covers England and Wales.

In terms of examining the nature of arson incidents from the fire module, there are too few cases of domestic arson identified for any reliable analysis. However, the number of incidents from the criminal victimisation element of the survey is slightly larger and also it is possible to combine consecutive sweeps of the survey, thus allowing for some exploratory analysis.⁵

This section looks at the results from the combined 2000 and 1998 BCS and where possible draws comparisons with the combined 1994 and 1996 sweeps. The findings should be taken as indicative rather than definitive.

¹ Based on one-year estimates.

² The 2000 BCS core sample had 19,411 respondents. The 1998 BCS had a core sample of 14,947 respondents, the 1996 BCS had 16,348 and the 1994 BCS had 14,520.

³ Questions on criminal victimisation are asked in the victim form section of the survey. See Hales et al. (2000) for specific details on the methodology used in this section of the questionnaire.

⁴ The estimated rate of *incidents* per 100 households is 0.72. This is higher than the *prevalence rate* since some victims reported more than one fire. However, given the small numerical base, the incidence rate will not be robust.

⁵ Data on the number of arsons from the two different sections of the questionnaire cannot be combined as those asked in the fire module if they have been a victim of domestic fire can mention any incidents that they have reported in the criminal victimisation section. This means that some fires could be counted twice.

TARGETS

Motor vehicles have consistently been the most common target of arson attacks; this usually follows the theft of the vehicle. Outside premises, such as sheds, are the next most popular targets, followed by fences and gardens. Table 6.2 outlines the different targets of arson, comparing combined 1993 and 1995 data with combined 1997 and 1999 data. Because of small numbers, it is hazardous to draw any conclusions from differences in the figures.

Table 6.2 Targets of arson attacks (1994/1996 and 1998/2000 BCS)

	% of arson incidents	
	1994/6	1998/2000
Motor vehicles	42	35
Other outside premises	15	26
Fences or gardens	15	14
Premises	7	10
Inside premises	13	11
Specific items	11	4
Other damage	10	11
Unweighted N	124	134

Notes:

1. Based on three victim forms.
2. Not restricted to the calendar year.
3. Totals sum to more than 100% as more than one target could be involved in one incidence.
4. Source: 1994, 1996, 1998 and 2000 BCS. Weighted data.

REPORTING ARSON TO THE POLICE

Reporting arson to the police was relatively high; this is likely to be a direct result of the large proportion of arson incidents that involved stolen cars. The 2000 BCS estimates that 72 per cent of all arsons were reported to the police.

COST OF ARSON

The value of damage resulting from arson incidents varies greatly from negligible costs for the more minor incidents, such as those involving fences or dustbins, to more substantial amounts for incidents in which motor vehicles were burnt out. Analysis based on combined 1998 and 2000 BCS data shows that the highest cost that was incurred as a result of arson was £12,000.

As in most forms of analysis of this type, mean values must be interpreted with caution as a small number of very costly arson fires can skew the average considerably. However, combined 1998 and 2000 BCS data gives a mean cost of £910, this is significantly lower than the combined 1994 and 1996 BCS estimate of £2,440. Table 6.3 shows the distribution of costs for arson incidents.

Arson

Table 6.3 Damage cost of arson attacks to victims (1998 and 2000 BCS)

	% of arson incidents
£0	12
£1 - £49	35
£50 - £99	5
£100 - £499	19
£500 - £999	11
£1,000 - £4,999	12
£5,000 - £12,000	6
Mean cost	£910

Notes:

1. Rounded to the nearest £10.
2. Based on three victim forms.
3. Base number is 113.
4. Source 1998 & 2000 BCS. Weighted data. Covers England and Wales.

7. Conclusion

The 2000 BCS screener question remained identical to that which existed in both the 1996 and 1994 sweeps of the BCS. This means that the fall in the number of domestic fires registered can be relied upon.

To reiterate, the 2000 BCS estimates a statistically significant fall of 11 per cent in the total number of domestic fires in England and Wales between 1995 and 1999. However, as already mentioned this decrease cannot reliably be attributable to one specific cause of fire. Instead there have been consistent, albeit small, decreases across nearly all causes of domestic fire.

PREVENTATIVE ISSUES

Despite the number of domestic fires declining, the BCS still indicates that an appreciable minority of households are likely to experience a fire at some time. This endorses the increasing value being placed on fire prevention publicity and public education.

The BCS is useful in being able to show where the fire preventative initiatives would be best targeted. Broadly, the results suggest that the focus should be on young-headed households, especially so if they are also lone parents, and/or who rent their property from the Local Authorities or Housing Associations. Those households who are getting into financial difficulties also warrant particular attention, especially those households with an annual income of between £2,500 and £4,999. Households in which someone has a limiting disability also merit focus. Smokers should also be alerted to their greater likelihood of having a fire.

Whilst the BCS shows that ownership of fire safety equipment is now relatively high, there is still room for improvement. The BCS shows that non-ownership of smoke alarms does not fall evenly throughout the population, but instead some people are more likely not to own one than others. Identification of these high-risk groups is then invaluable for effective targeting. According to the BCS, one-person households are the primary group that should be targeted, and this need is exacerbated for those who are also privately renting and/or residing in a purpose built flat, especially if the property was built during or after 1944. Again those households containing someone who smokes merit particular focus, especially given their predisposition to experiencing a fire in the first place. Those households located in areas deemed 'affluent urban areas' would also benefit, especially so if their property is in bad physical condition. Those households who are getting into financial difficulties also warrant particular consideration, especially as they are also at high risk from experiencing a domestic fire. Those households with no educational qualifications should also be targeted. Finally, Asian households would also benefit from a targeted campaign to raise levels of smoke alarm ownership.

The attention paid in fire prevention to cooking fires is sound. They remain by far the most common cause of domestic fires. However, whilst cooking fires were most likely to be dealt with by householders (more than nine out of ten were), 11 per cent of them resulted in someone being injured. Advice therefore needs to be given clearly on, if respondents are going to tackle cooking fires, how this can be done safely and in which circumstances this should never be attempted.

Appendix A Additional tables

Table A3.1 Methods used to extinguish the fire, by brigade attendance (2000 BCS)

	Brigade attended	Brigade not attended
	%	%
Water	33	18
Cloths/blankets/tea towel	29	40
Fire extinguisher	18	3
Turned power off	13	22
Put outside	10	13
Fire blanket	6	6
Stamped/stubbed out	4	4
Earth or sand	3	<1
Went out by itself	-	6
Other	6	9
<i>Unweighted N</i>	77 ¹	602

Notes:

1. Whilst numbers are small, due to an additional response category in previous sweeps data could not be combined. Combining sweeps would have had the effect of making the estimates more robust.
2. Columns do not total to 100% as respondents were allowed to state more than one method that they used to extinguish the fire.
3. 'Last' fire over the previous two years.
4. Source: 2000 BCS (weighted data). Covers England and Wales.

Table A3.2 Injury caused by the fire (2000 BCS)

	Of those injured	Of all incidents
Type of injury	%	%
Smoke inhalation	59	6
Burns	41	4
Scalds	6	1
Bruises	4	<1
Cuts	3	<1
Scratches	2	<1
Other injuries	1	<1
No one in household injured	-	89
<i>Unweighted N</i>	89 ¹	832

Notes:

1. Whilst numbers are small, this question was not included in the 1996 BCS, thus there is no comparable data.
2. Respondents allowed to state more than one injury caused by the fire.
3. 'Last' fire over the previous two years.
4. Source: 2000 BCS (weighted data). Covers England and Wales.

Table A4.1 Percentage of households victim of fire, once or more between 1998 and 1999 (prevalence risks) (2000 BCS)

Proportion of households victim, once or more, of fire by household characteristics			
Accommodation type	%	Disability	%
Detached	4.0	None	4.3
Semi-detached	3.9	Yes – not limiting	3.8
Terraced	4.4	Yes – limiting	5.1
Maisonette	3.0	Financial stability²	
Purpose built flat	5.8	Quite well	3.7
Converted flat	9.4	Just getting by	5.2
Household income		Getting into difficulties	7.3
£20,000 +	4.7	Tenure	
£15,000 to £19,999	3.3	Owners	3.5
£10,000 to £14,999	3.5	Social rent	5.9
£5,000 to £9,999	4.7	Private rent	7.4
£2,500 to £4,999	6.4	Respondent drinking³	
Under £2,500	6.0	Light	4.2
Age of head of household		Moderate	4.3
16 – 24	12.9	Heavy	6.8
25 – 44	5.6	Area type⁴	
45 – 64	3.7	Inner city	5.4
65 – 74	2.7	Urban	4.4
75 +	2.5	Rural	3.9
Council estate		Physical condition of house⁵	
Yes	5.2	Good	4.0
No	4.2	Fair	6.3
Household structure		Bad	7.1
One adult no children	5.2	Qualifications	
2 + adults no children	4.5	A-levels & above	5.0
Adults and children	5.9	Below A-levels	4.9
Lone parent	7.3	None	3.4
Aged 60 +	2.6	Ethnicity⁶	
Social class		White	4.4
Professional	5.3	Black	4.3
Managerial/technical	4.3	Asian	3.3
Skilled non-manual	3.5	Age of property⁷	
Skilled manual	4.7	Pre 1944	4.7
Partly skilled	5.0	Post 1944	4.1
Unskilled	4.8	1985 onwards	3.9
Victim of household crime¹		Smoke alarm ownership	
Yes	5.7	Yes	4.4
No	3.9	No	4.6
Household smoking habits			
Smoking household	5.8		
Non-smoking	3.6		
Overall risk			4.4

Notes:

1. See footnote 11, Chapter 4.
2. See footnote 4, Chapter 4.
3. See footnote 10, Chapter 4.
4. See footnote 5, Chapter 4.
5. See footnote 9, Chapter 4.
6. Using the ethnic boost sample.
7. Source: 2000 BCS (weighted data). Covers England and Wales.

Table A4.2 Percentage of households victim of fire, once or more between 1998 and 1999 by ACORN (17) (prevalence risks) (2000 BCS)

Percentage of households victim, once or more, of fire by ACORN	
Affluent suburbs and rural areas	3.8
Wealthy achievers, suburban areas	3.9
Affluent greys, rural communities	4.8
Prosperous pensioners, retirement areas	2.6
Affluent family areas	3.6
Affluent executives, family areas	3.7
Well-off workers, family areas	3.6
Affluent urban areas	7.6
Affluent urbanites, town and city	4.8
Prosperous professionals, metropolitan areas	3.7
Better-off executives, inner city areas	11.5
Mature home-owning areas	4.0
Comfortable middle-agers, mature home-owning areas	4.2
Skilled workers, home-owning areas	3.8
New home-owning areas	4.2
New home owners, mature communities	4.3
White collar workers, better off multi-ethnic areas	4.0
Council estates and low income areas	5.0
Older people, less prosperous areas	2.7
Council estates, better off homes	5.7
Council estates, high unemployment	5.0
Council estates, greatest hardship	7.2
Multi-ethnic, low income areas	3.9
Overall risk	4.4

Notes:

1. ACORN is 'A Classification of Residential Neighbourhoods'. Based on 17 breakdown. For further details see footnote 7, Chapter 4.
2. Source: 2000 BCS (weighted data). Covers England and Wales.

Table A4.3 Percentage of households victim of fire, once or more between 1998 and 1999 by region (prevalence risks) (2000 BCS)

Percentage of households victim, once or more, of fire by ACORN	
Region	%
North East	3.7
North West	4.9
Yorkshire/Humberside	4.2
East Midlands	4.4
West Midlands	3.5
South West	4.4
Eastern	5.1
London	4.1
South East	4.6
Wales	5.0
Overall risk	4.4

Notes:

1. Based on Government Office Region (GOR).
2. Source: 2000 BCS (weighted data). Covers England and Wales.

Table A4.4 Percentage of households victim of fire, once or more between 1995 and 1999, by ACORN (54) (prevalence risks) (1996 & 2000 BCS)

Percentage of households victim, once or more, of fire by ACORN					
	%	N		%	N
AFFLUENT SUBURBS AND RURAL AREAS					
Wealthy achievers					
Wealthy suburbs, large detached houses	3.9	843			
Villages with wealthy commuters	6.0	1149			
Mature affluent home-owning areas	3.2	1047			
Affluent suburbs, older families	4.9	1359			
Mature, well-off suburbs	3.7	1081			
Affluent greys, rural communities					
Agricultural villages, home-based workers	6.2	510			
Holiday retreats, older people, home-based workers	3.6	233			
Prosperous pensioners, retirement areas					
Home-owning areas, well-off residents	3.1	549			
Private flats, elderly people	3.9	478			
AFFLUENT FAMILY AREAS					
Affluent executives, family areas					
Affluent working families with mortgages	4.4	681			
Affluent working couples with mortgages—new homes	4.7	588			
Transient workforces living at their place of work	8.4	86			
Well-off workers, family areas					
Home-owning family areas	3.7	867			
Home-owning family areas, older children	3.2	883			
Families with mortgages, younger single people	4.0	664			
AFFLUENT URBAN AREAS					
Affluent urbanites, town and city areas					
Well-off town and city areas	3.7	312			
Flats and mortgages, singles and young couples working	3.0	278			
Furnished flats and bed-sits, younger single people	6.2	115			
Prosperous professionals, metropolitan areas					
Apartments, young professionals singles and couples	4.5	418			
Gentrified multi-ethnic areas	5.8	397			
Better off executives, inner city areas					
Prosperous enclaves, high qualified executives	9.9	183			
Academic centres students and young professionals	7.4	143			
Affluent city centre areas, tenements and flats	6.9	137			
Partially gentrified multi-ethnic areas	4.8	236			
Converted flats and bed-sits, single people	11.0	315			
MATURE HOME-OWNING AREAS					
Comfortable middle agers, mature home-owning areas					
Mature established home-owning areas	4.1	1401			
Rural areas, mixed occupations	5.6	1105			
Established home-owning areas	3.9	1612			
Home-owning areas, council tenants, retired people	3.8	1056			
Skilled workers, home-owning areas					
Established home owning areas, skilled workers	3.3	1758			
Home-owners in older properties, younger workers	3.7	1168			
Home-owning areas with skilled workers	4.8	1148			
NEW HOME-OWNING AREAS					
New home-owners, mature communities					
Council areas, some new home-owners	4.8	1243			
Mature home-owning areas, skilled workers	3.7	1302			
Low rise estates, older workers, new home-owners	3.9	1313			
White collar workers, better off multi-ethnic areas					
Home-owning multi-ethnic areas, younger families	1.8	309			
Multi-occupied town centres, mixed occupations	5.3	692			
Multi-ethnic areas, white collar workers	4.8	399			
COUNCIL ESTATES AND LOW INCOME AREAS					
Older people, less prosperous areas					
Home owners, small council flats, single pensioners	4.0	715			
Council areas, older people, health problems	3.6	644			
Council estate residents, better off homes					
Better off council areas, new home owners	4.8	555			
Council areas, young families, some new home owners	6.9	999			
Council areas, young families, many lone parents	7.1	536			
Multi-occupied terraces, multi-ethnic areas	6.1	255			
Low rise council housing, less well off families	5.8	684			
Council areas, residents with health problems	5.4	829			
Council estate residents, high unemployment					
Estates with high unemployment	4.2	458			
Council flats, elderly people, health problems	5.3	250			
Council flats, very high unemployment, singles	7.9	264			
Council estate residents, greatest hardship					
Council areas, high unemployment, lone parents	7.2	650			
Council flats, greatest hardship, many lone parents	8.8	152			
People in multi-ethnic, low income areas					
Multi-ethnic, large families, overcrowding	4.6	168			
Multi-ethnic, severe unemployment, lone parents	6.0	325			
Multi-ethnic, high unemployment, overcrowding	4.7	94			
Overall risk 4.6 Unweighted N 35,631					

Notes:

1. ACORN is 'A Classification of Residential Neighbourhoods'. For further details see footnote 7, Chapter 4. Based on 54 breakdown.
2. In 1996 prevalence risk of fire refers to 1994/5.
3. In 2000 prevalence risk of fire refers to 1998/9.
4. Total excludes those neighbourhoods that could not be classified.
5. Source: 1996 and 2000 BCS (weighted data). Covers England and Wales.

Table A5.1 Smoke alarm non-ownership, by household characteristics (prevalence risks) (2000 BCS)

Proportion of households who do not have a smoke alarm			
Accommodation type	%	Disability	%
Detached	20.7	None	22.9
Semi-detached	21.0	Yes – not limiting	23.7
Terraced	25.2	Yes – limiting	25.0
Maisonette	24.5	Household smoking habits	
Purpose built flat	29.3	Smoking household	27.9
Converted flat	30.7	Non-smoking	20.7
Household income		Financial stability²	
£20,000 +	19.6	Quite well	20.8
£15,000 to £19,999	22.6	Just getting by	26.0
£10,000 to £14,999	24.3	Getting into difficulties	31.8
£5,000 to £9,999	26.6	Tenure	
£2,500 to £4,999	28.3	Owners	22.1
Under £2,500	30.9	Social rent	23.2
Age of head of household		Private rent	32.1
16-24	28.4	Respondent drinking³	
25-44	20.8	Light	25.0
45-64	25.2	Moderate	22.1
65-74	22.9	Heavy	28.0
75 +	25.2	Area type⁴	
Council estate		Inner city	27.2
Yes	23.5	Urban	22.7
No	23.4	Rural	22.9
Household structure		Physical condition of house⁵	
One adult no children	33.3	Good	20.9
2 + adults no children	24.0	Fair	31.1
Adults and children	15.0	Bad	42.5
Lone parent	23.1	Qualifications	
Aged 60 +	25.0	A-levels & above	22.5
ACORN category¹		Below A-levels	21.7
Affluent suburbs and rural areas	23.0	None	25.6
Affluent family areas	17.5	Ethnicity⁶	
Affluent urban areas	32.0	White	22.4
Mature home-owning areas	22.5	Black	36.1
New home-owning areas	23.2	Asian	41.7
Council estates and low income areas	25.4	Age of property	
Social class		Pre 1944	27.2
Professional	20.4	Post 1944	23.1
Managerial /technical	22.1	1985 onwards	11.9
Skilled non-manual	23.2	Level of physical disorder	
Skilled manual	22.7	High	22.6
Partly skilled	24.8	Low	30.1
Unskilled	26.5		
Overall percentage who do not have a smoke alarm			23.4%

Notes:

1. See footnote 7, Chapter 4. Based on the 6 ACORN breakdown.
2. See footnote 4, Chapter 4.
3. See footnote 10, Chapter 4.
4. See footnote 5, Chapter 4.
5. See footnote 9, Chapter 4.
6. Using the ethnic boost sample.
7. Source 2000 BCS (weighted data). Covers England and Wales.

Table A5.2 Smoke alarm non-ownership, by ACORN (17) (prevalence risks) (2000 BCS)

Proportion of households who do not have a smoke alarm	
	%
Affluent suburbs and rural areas	23.0
Wealthy achievers, suburban areas	21.9
Affluent greys, rural communities	27.8
Prosperous pensioners, retirement areas	25.6
Affluent family areas	17.5
Affluent executives, family areas	15.8
Well-off workers, family areas	18.4
Affluent urban areas	32.0
Affluent urbanites, town and city	32.8
Prosperous professionals, metropolitan areas	31.3
Better-off executives, inner city areas	31.9
Mature home-owning areas	22.5
Comfortable middle-agers, mature home-owning areas	21.4
Skilled workers, home-owning areas	24.0
New home-owning areas	23.2
New home owners, mature communities	21.4
White collar workers, better off multi-ethnic areas	28.5
Council estates and low income areas	25.4
Older people, less prosperous areas	21.3
Council estates, better off homes	21.5
Council estates, high unemployment	36.5
Council estates, greatest hardship	25.2
Multi-ethnic, low income areas	50.2
Overall percentage who do not have a smoke alarm	23.4

Notes:

1. ACORN is 'A Classification of Residential Neighbourhoods'. Based on 17 breakdown. For further details see footnote 7, Chapter 4.
2. Source: 2000 BCS (weighted data). Covers England and Wales.

Table A5.3 Smoke alarm non-ownership, by region (prevalence risks) (2000 BCS)

Percentage of households victim, once or more, of fire by ACORN	
Region	%
North East	25.1
North West	24.5
Yorkshire/Humberside	26.3
East Midlands	21.6
West Midlands	20.9
South West	21.4
Eastern	21.2
London	32.8
South East	20.4
Wales	17.2
Overall risk	23.4

Notes:

1. Based on Government Office Region (GOR).
2. Source: 2000 BCS (weighted data). Covers England and Wales.

Appendix B Logistic regression

Logistic regression allows one to assess which of a selection of relevant independent variables are statistically related to a given dependent variable when all the other variables under consideration have been taken into account.¹

Logistic regression is used in this report, as the response variable is binary (victim of fire versus non-victim of fire; owner of a smoke alarm versus non-owner). The logistic regression models are based on data from the 2000 BCS. Weights are not used in the modelling procedure.² For simplicity, only the main effects models are presented in the main body of this report.³ The full sets of relevant independent variables included in the modelling procedure are listed below.

INTERPRETATION OF MODELS

The results presented here only include those variables that are statistically related either experiencing a domestic fire or not owning a smoke alarm, after the other factors have been controlled for. The tables present the exponential of the coefficients, EXP (β), and significance levels.

- EXP (β): interpreted as the change in the odds of victimisation associated with a one unit change in the independent variable, controlling for all other independent variables. The most appropriate way to interpret EXP (β) is to think of two households that are identical except in respect of the factor under consideration. If EXP (β) is greater than one, this means the odds of victimisation are increased, if EXP (β) is less than one, the odds are decreased. For categorical variables the coefficients indicate the effect of being in the category compared to being in the pre-defined base category. The coefficients can be interpreted as the percentage increase/decrease in the odds of victimisation compared to the base category.
- Significance: all coefficients are tested to see if they are statistically different to zero. *** Indicates the factor is significant at the 1% level and ** at the 5% level.
- The model chi-square is also given. This tests the null hypothesis that the coefficients for all of the terms in the model, except the constant, are 0. If the significance is less than 0.05 the null hypothesis is rejected – i.e., all the coefficients are non-zero.
- All independent variables were checked for multi-collinearity i.e. that they were not statistically related to each other.
- For ease of interpretation those factors significantly associated with increased risk are shaded.

¹ Multivariate techniques allow one to explore the association between variables. However, evidence of an association does not necessarily imply a causal relationship. The results presented here therefore identify factors associated with both high risk of fire victimisation, and separately, non-smoke alarm ownership, but these should not be interpreted as indicating a causal link.

² To account for this, those variables used in the construction of the weights can be included in the model. Inner city was included in the model, however it was felt necessary to exclude police force area (PFA) because the large number of categories included in this variable served only to increase the degrees of freedom in the model, and therefore decrease its overall predictiveness.

³ Main effect models assume that the effect of a given model is the same for all cases. No account is taken of the possible variations in how a factor may operate for different sub-groups. It is possible to test for interactions between the risk factors to see if they operate differently for various sub-groups, but interaction models are often difficult to interpret.

Further details on logistic regression can be found in Dobson, A. (1990) and Demaris, A. (1992).

INDEPENDENT VARIABLES FOR FIRE RISK⁴

- Age of head of household (16-24, 25-44, 45-64, 65-74, 75+)
- Financial stability ('quite well', 'just getting by', 'getting into difficulties')
- Disability (none, non-limiting disability, limiting disability)
- Household smoking habits (smoking, non-smoking)
- Education (none, below A-level, above A-level)
- Household structure (one adult with no children, two or more adults with no children, adults and children, lone parent, head of household aged 60+)
- Income (less than £2,500, £2,500 to £4,999, £5,000 to £9,999, £10,000 to £14,999, £15,000 to £19,999, £20,000+)
- Tenure (owners, private rent, social rent)

INDEPENDENT VARIABLES FOR NON-SMOKE ALARM OWNERSHIP⁵

- Household structure (one adult with no children, two or more adults with no children, adults and children, lone parent, head of household aged 60+)
- Tenure (owners, private rent, social rent)
- Accommodation type (detached, semi-detached, terraced, maisonette, purpose built flat, converted flat)
- Household smoking habits (smoking, non-smoking)
- ACORN (affluent suburbs and rural areas, affluent family areas, affluent urban areas, mature home-owning areas, new home-owning areas, council estates and low income areas)
- Financial stability ('quite well', 'just getting by', 'getting into difficulties')
- Age of property (pre 1944, post 1944, 1984 onwards)
- Education (none, below A-level, above A-level)
- Ethnicity (white, black, Asian)
- Physical condition of the property (good, bad, neither)

⁴ All variables listed in Tables A4.1 to A4.3 were subjected to multivariate analysis. Only those listed below came out in the final model i.e. are predictors of a household's risk of fire.

⁵ All variables listed in Tables A5.1 to A5.3 were subjected to multivariate analysis. Only those listed below came out in the final model i.e. are predictors of a household's smoke alarm non-ownership.

Table B.1 Logistic regression model for risks of household fire (2000 BCS)

Factor	EXP (β)	Significance
Age of head of household		
75 + (BASE)	1.00	
16 – 24	1.72	*
25 – 44	1.1	
45 – 64	.88	
65 – 74	1.02	
Financial stability		
Quite well (BASE)	1.00	
Just getting by	1.27	**
Getting into difficulties	1.45	**
Disability		
No (BASE)	1.00	
Yes – limiting	1.51	***
Yes – non-limiting	1.16	
Household smoking habits		
Non-smoking household (BASE)	1.00	
Smoking household	1.34	***
Education		
No qualifications (BASE)	1.00	
A-levels and above	1.70	***
Below A-levels	1.45	***
Household structure		
One adult no children	1.00	
2 + adults no children	1.08	
Lone parent	1.17	
Adults and children	1.47	**
Head of household aged 60 +	.61	**
Income		
£20,000 +	1.00	
Less than £2,500	1.15	
£2,500 to £4,999	1.34	*
£5,000 to £9,999	1.18	
£10,000 to £14,999	.89	
£15,000 to £19,999	.70	**
Tenure		
Owners (BASE)	1.00	
Social rent	1.36	**
Private rent	1.22	
N = 16,987	Model Chi square = 231.12 ***	

Notes:

- Variables are ordered according to their level of predictiveness in the model.
- Shaded factors are those with statistically significant higher risks.
- Exp (β) rounded to two decimal points.
- Exp (β) greater than one indicates risks are higher relative to the base category; Exp (β) less than one indicates risks are lower relative to the base category.
- *** Indicates statistical significance at the 1% level, ** indicates significance at the 5% level, * indicates significance at the 10% level.
- Source: 2000 BCS.

Table B.2 Logistic regression model for smoke alarm non-ownership (2000 BCS)

Factor	EXP (β)	Significance
Household structure		
Aged 60 + (BASE)	1.00	
One adult no children	1.39	***
2 + adults no children	.89	**
Lone parent	.78	***
Adults and children	.45	***
Tenure		
Owners (BASE)	1.00	
Social rent	.67	***
Private rent	1.25	***
Accommodation type		
Converted flat (BASE)	1.00	
Detached	1.43	**
Semi-detached	1.24	
Terraced	1.32	**
Maisonette	1.35	
Purpose built flat	1.59	***
Household smoking habits		
Non-smoking (BASE)	1.00	
Smoking household	1.44	***
ACORN category		
Affluent suburbs and rural areas (BASE)	1.00	
Affluent family areas	.91	
Affluent urban areas	1.28	***
Mature home-owning areas	.93	
New home-owning areas	.92	
Council estates and low income areas	.94	
Financial stability		
Quite well (BASE)	1.00	
Just getting by	1.20	***
Getting into difficulties	1.33	***
Age of property		
Modern (BASE)	1.00	
Post 1944	2.40	***
Pre 1944	2.07	***
Education		
A-levels and above (BASE)	1.00	
Below A-levels	1.00	
No qualifications	1.12	**
Ethnicity		
White (BASE)	1.00	
Black	1.91	***
Asian	2.89	***
Physical condition of house		
Good (BASE)	1.00	
Neither	1.46	***
Bad	2.34	***
N = 16,986		Model Chi square = 1011.68 ***

Notes:

1. Variables are ordered according to their level of predictiveness in the model.
2. Shaded factors are those with statistically significant higher risks.
3. Exp (β) rounded to decimal points.
4. Exp (β) greater than one indicates risks are higher relative to the base category; Exp (β) less than one indicates risks are lower relative to the base category.
5. *** Indicates statistical significance at the 1% level, ** indicates significance at the 5% level.
6. Source: 2000 BCS.

Appendix C Survey design and methodology

The 2000 British Crime Survey (BCS) was conducted in the first half of 2000 (most interviews were in January to April) by the National Centre for Social Research and the Social Survey Division of the Office for National Statistics. The design of the survey was shared between the Home Office Research, Development and Statistics Directorate and the two research organisations.

The 2000 BCS is in the eighth sweep of the survey and is the largest in the series, with a core sample of almost 20,000 and an additional sample of almost 4,000 ethnic minority respondents.¹ Previous sweeps were in 1982, 1984, 1988, 1992, 1996 and 1998.

THE COVERAGE OF THE SURVEY

The principal purpose of the BCS is to provide an alternative measure to crime than that provided by the police recorded crime statistics. The BCS asks adults in private households about their experiences of criminal victimisation since the beginning of the previous year, regardless of whether or not they reported the incident to the police. In addition to measuring crime, the BCS also covers a number of other issues on an ad hoc basis, such as domestic fires. The BCS also collects demographic and lifestyle information about both the household and the respondents.

THE INTERVIEW

Interviews were carried out during the first six months of the survey year. Respondents were interviewed in their own home by a professional survey interviewer.

Since 1994 the BCS has been a CAPI (Computer Assisted Personal Interviewing) survey. The questionnaire is a computer program that specifies the questions, the range and the structure of permissible answers, and the routing instructions. Responses to the questions are entered directly onto the laptop by the interviewer. CAPI improves the quality of the data.

The module on domestic fires came towards the end of the interview and followed questions about criminal victimisation and attitudes about crime and the criminal justice system. The questions that were in the fire module can be found in Appendix D.

SAMPLING

The 2000 BCS core sample was designed to give, after appropriate weighting, both a representative cross-section of private households in England and Wales, and of individuals aged 16 and over living in them.²

Since 1992 the BCS has used the Small Users Postcode Address File (PAF) as the sampling frame. The PAF, listing all postal delivery points in the country, represents the fullest available register of household addresses.

¹ For full details on the BCS content and methodology, including information on the victim form section of the survey, see the 2000 BCS Technical Report (2000) or the 2000 BCS main report, Kershaw *et al.* (2000).

² The 2000 BCS contained an ethnic booster sample of 3,874. Whilst this increased the number of ethnic minorities in the sample to beyond that of their actual proportion in the general population, it serves to enable separate, more robust, analysis of the victimisation of these groups. All analysis in this bulletin, with the exception of the logistic regression and any analysis by ethnicity, is based on the core sample only.

A stratified multi-stage random probability design was used to select the sample of addresses. Where one address had more than one household, a single household was selected using random selection procedures. One adult in each selected household was then isolated for interview, again using random-selection procedures. No substitution of respondents was allowed.³

RESPONSE RATE

The BCS has consistently achieved a relatively high response rate. In 1998 the response rate was 79 per cent and in 2000 was 74 per cent. The main reasons for non-response at eligible addresses were (i) refusal either by the selected person or by the household before a respondent was selected and (ii) non-contact.

WEIGHTING

Data is weighted in a number of ways for analysis. Weighting serves two purposes, one to correct for different sampling rates, and secondly to take account of 'series' of similar incidents. In the 2000 BCS the components were:

- an **inner city weight** to correct for lower response rates in inner city areas
- a **police force area weight** to correct for disproportionate sampling by police force area
- a **dwelling unit weight** to correct for cases where more than one household was at the address on the PAF file
- an **individual weight** to correct for the under-representation of individuals living in households with more than one adult (the chance of an adult being selected is inversely related to the number of individuals in the household).

Analysis based on households requires the use of the inner city, police force and dwelling unit weights. That based on persons additionally requires the use of the individual weight.

METHODOLOGICAL ISSUES

As a sample survey the BCS estimates are subject to sampling error and a range of other methodological issues. These are summarised below.

- **Sampling error**

As only a sample of the population is questioned, findings are subject to sampling error. That is, the results may differ from those that may have been obtained if the whole population had been interviewed. The error depends on the size and design of the sample, and the size of the estimate. Although the BCS is large by the standards of

³ Further details on the BCS sampling procedure can be found in the technical report (for 2000 BCS see Hales, J, Henderson, L, Collins, D & H, Becher).

most surveys, its estimates will be imprecise, particularly for rare offences such as arson.

- **Non-response**

As in any sample survey, it is difficult to represent the population adequately. Some respondents are impossible for interviewers to locate at home, and others refuse to be interviewed. Non-response has implications on the measurement of offence rates, if non-respondents have different experiences of victimisation to respondents.

- **Recall**

The BCS asks respondents to recall their experiences of fire since 1st January of the preceding year – a period of about 14 months.⁴ BCS measures are thus dependent on respondents' ability to accurately remember their experiences in the reference period. There are several problems that could prevent accurate recall:

- respondents could simply forget a relevant incident
- respondents could remember an incident, but think it happened before the reference period and therefore not report it in the interview; conversely, respondents may remember an earlier incident as happening within the reference period and thus erroneously report it⁵
- it is possible that some householders who experienced more than one fire may have details of the most serious, rather than the most recent, simply because it was more salient to them.

⁴ Respondents are also asked about any fires that they may have experienced in the previous year as well. The purpose of this is to try and increase the numbers in the sample.

⁵ The full 'recall period' in the BCS is from 1st January of the year preceding the interview until the date of the interview – about 14 months. In calculating the number of incidents within a given year, only those incidents that happened in the previous calendar year are counted.

Appendix D 2000 BCS fire module

AnyFire [ASK ALL]

I would now like to ask about fires in the home. This means all sorts of fires, including chip pan fires and very minor fires and includes fires in sheds, garages or greenhouses. Has there been a fire of any sort in the place where you were living since the beginning of January 1999?

1. Yes
2. No

NumFires [ASK IF AnyFire = Yes]

How many fires have there been since the beginning of January 1999?

1. One
2. Two
3. Three
4. Four
5. Five or more

HomeFire [ASK ALL]

Has there been a fire in the place you were living in the year before that, that is between the first of January 1998 and the first of January 1999?

1. Yes
2. No

[IF NO FIRES GO TO Firesafe]

CausFire [ASK IF YES TO AnyFire OR HomeFire]

CARD F1

Thinking about the last two years, that is since the first of January 1998, what was the cause of the last fire you had? Please answer from this card.

1. Arson
2. Accidents while cooking (including using toasters and microwaves)
3. Accidents with matches or cigarette lighters
4. Cigarettes, cigars, or pipe
5. Children playing with fire other than matches or cigarette lighters
6. Electrical equipment/wiring (including electric blankets)
7. Heating appliances/equipment and fires (including chimney fires)
8. Other

Fires in the home: findings from the 2000 BCS

CookAcc [ASK IF CausFire = Cooking]

You say that the cause of the last fire you had was a cooking accident. Could you describe to me in a little more detail what happened?

1. Pan of fat/oil catching fire
2. Grill pan
3. Leaving something too close to the cooker (e.g. tea towel)
4. Catching clothing on the cooker/hob
5. Microwave
6. Toaster
7. Leaving something in the oven/on the hob for too long
8. Other

XcookAcc [ASK IF CookAcc = Other]

INTERVIEWER RECORD THE 'OTHER' ANSWER GIVEN

MatchAcc [ASK IF CausFire= Accidents with matches]

You say that the cause of the last fire you had was an accident with matches or cigarette lighters. Could you describe to me in a little more detail what happened?

1. Children playing with matches
2. Children playing with a cigarette lighter
3. Adults being careless with matches
4. Adults being careless with a cigarette lighter
5. Filling a cigarette lighter
6. Other

XmatchAc [ASK IF MatchAcc = Other]

INTERVIEWER RECORD THE 'OTHER' ANSWER GIVEN

SmokMat [ASK IF CausFire = Smoking]

You say that the cause of the last fire you had was an accident with cigarettes, cigars, or a pipe. Could you describe to me in a little more detail what happened?

1. Someone falling asleep when smoking
2. Not discarding cigarettes or cigar safely
3. Other

XsmokMat [ASK IF SmokMat = Other]

INTERVIEWER RECORD THE 'OTHER' ANSWER GIVEN

Chilfire [ASK IF CausFire = Children]

You say that the cause of the last fire you had was children playing with fire. Could you describe to me in a little more detail what happened?

RECORD RESPONSE

Electric [ASK IF CausFire = Electrical]

You say that the cause of the last fire you had was electrical equipment or wiring. Could you describe to me in a little more detail what happened?

1. Electric blankets
2. Electric wiring worn out or faulty
3. Washing machine/washer-dryer
4. Tumble-dryer/spin-dryer
5. Dishwasher
6. Television or video
7. Lights (putting things by light bulbs/lights falling over)
8. Other

Xelectri [ASK IF Electric = Other]

INTERVIEWER RECORD THE 'OTHER' ANSWER GIVEN

Heating [ASK IF CausFire = Heating]

You say the last fire you had was caused by a heating appliance or equipment or a fire. Could you describe to me in a little more detail what happened?

1. Chimney fires
2. Open hearth fires (e.g. coal on rug)
3. Things left too close to heaters/fires
4. Other

Xheating [ASK IF Heating = Other]

INTERVIEWER RECORD THE 'OTHER' ANSWER GIVEN

Fires in the home: findings from the 2000 BCS

Otherfir [ASK IF CausFire = Other]

Could you describe to me in a little more detail what the cause of the last fire was?

1. Blow lamps
2. Candles
3. Vehicle fires (wiring etc)
4. Natural occurrences (lightning etc)
3. Bonfires
4. Fireworks
5. Barbecue
6. Other

Xotherfi [ASK IF Otherfir = Other]

INTERVIEWER RECORD THE 'OTHER' ANSWER GIVEN

FirStar1 [ASK IF YES TO AnyFire OR HomeFire]

Did the fire first start inside or outside the house?

1. Inside the house
2. Outside the house

InsidFi1 [ASK IF FirStar1 = **INSIDE** home]

Where inside the house did the fire begin?

1. Kitchen
2. Lounge, living room, dining room
3. Bedroom
4. Bedsitter (bedsitting room)
5. Hallway or landing
6. Elsewhere in house

XInsidF1 [ASK IF ELSEWHERE IN InsidFi1]

INTERVIEWER: RECORD 'OTHER' ANSWER GIVEN

- OutSidH1 [ASK IF Firstar1 = **OUTSIDE** home]
- Where outside the house did the fire begin?
1. Garage - freestanding not attached to house
 2. Garage - built onto house
 3. Shed or greenhouse
 4. Garden
 5. Dustbin
 6. Elsewhere outside house
- XOutSid1 [ASK IF ELSEWHERE IN OutSidH1]
- INTERVIEWER: RECORD 'OTHER' ANSWER
- FirSpr1a [ASK IF INFORMANT STATED WHERE **INSIDE** THE HOUSE THE FIRE STARTED, BUT NOT IF THEY SAID OTHER IN InsidFi1]
- Did the fire spread beyond the \$InSidFi1?
1. Yes
 2. No
- FirSpr1b [IF INFORMANT SAID OTHER IN InsidFi1, ASK...]
- Did the fire spread beyond the \$XInsidF1?
1. Yes
 2. No
- FirSpr1c [ASK IF INFORMANT STATED WHERE **OUTSIDE** THE HOUSE THE FIRE STARTED, BUT NOT IF THEY SAID OTHER IN OutSidH1]
- Did the fire spread beyond the \$OutSidH1?"
1. Yes
 2. No
- FirSpr1d [IF INFORMANT SAID OTHER IN OutSidH1, ASK...]
- Did the fire spread beyond the \$XOutSid1?
1. Yes
 2. No

WhoDisc1-

Whodisc3 [ASK IF YES IN AnyFire OR HomeFire]

Who first discovered the fire?

CODE ALL THAT APPLY

1. Respondent
2. Someone else living in the/your household
3. Another person

HowDisc1-

Howdisc6 [ASK IF Whodisc 1 to 3]

How did they discover the fire? SHOW CARD F2

CODE ALL THAT APPLY

1. Smoke alarm went off
2. Smelled smoke
3. Pet alerted them (e.g. barking dog)
4. They were in the room when it started
5. Just happened to find it
6. Other

XhowDisc [ASK IF HowDisc= Other]

INTERVIEWER RECORD 'OTHER' ANSWER GIVEN

Smkalar[ASK IF NOT Smoke alarm at HowDisc]

Was there a smoke alarm installed at the time of the last fire?

1. Yes
2. No

SmkAlar2 [ASK IF Smkalar=1]

Did the smoke alarm go off at all because of the fire?

1. Yes
2. No

- Smkalar3 [Ask IF Smkalar2=2]
- Why didn't the smoke alarm go off?
1. No battery installed/not working
 2. Fire too far away from the smoke alarm
 3. Fire put out before smoke alarm triggered
 4. Don't know
- FBrigCal [ASK IF YES TO AnyFire OR Home Fire]
- Was the Fire Brigade called?
1. Yes
 2. No
- FireFig [ASK IF YES TO FBrigCal]
- Did anyone other than the Fire Brigade fight the fire?
1. Yes
 2. No
- [ASK IF FBrigCal=No OR FireFig=YES]
- ExtFire1- (Apart from any used by the Fire Brigade) What methods were used to try to put out the fire?
- ExtFire9 CODE ALL THAT APPLY
1. Fire extinguisher
 2. Fire blanket
 3. Other blanket, cloths, tea towel
 4. Earth or sand
 5. Water
 6. Put outside
 7. Turned power off
 8. Stamped/stubbed out
 9. Went out by itself
 10. Other
- XExtFire [ASK IF OTHER IN ExtFire]
- INTERVIEWER: RECORD THE 'OTHER' ANSWER GIVEN

Fires in the home: findings from the 2000 BCS

[ASK if someone other than the Brigade tackled the fire and it did not go out by itself ie ASK IF (Fbrigal=No or FireFig=Yes) and (ExtFire WAS **NOT** WENT OUT BY ITSELF)]

ActExFi0- Who actually put the fire out?

ActExFi3 CODE ALL THAT APPLY

1. Fire Brigade
2. Respondent
3. Someone else living in the/your household
4. Someone from outside the home
5. Went out by itself

[ASK if only the Brigade tackled the fire Firefig=No]

ActEx2 Did the Fire Brigade actually put the fire out or did it go out by itself?

1. Fire Brigade
2. Went out by itself

MainExt

[ASK IF RESPONDENT, OTHER HH MEMBER OR SOMEONE FROM OUTSIDE THE HOME IN ANY ActExFi0-3 AND MULTICODED AT EXTFIRE]

What was the main thing that put the fire out?

1. Fire extinguisher
2. Fire blanket
3. Other blanket, cloths, tea towel
4. Earth or sand
5. Water
6. Put outside
7. Turned power off
8. Stamped/stubbed out
9. Other

XMainExt [ASK IF OTHER IN MainExt]

INTERVIEWER: RECORD 'OTHER' ANSWER GIVEN

Fireinj1-

Freinj8 [ASK IF YES TO AnyFire OR HomeFire] Show card F3.

Did you or anyone else in your household suffer any of these injuries as a result of this fire? Please include injuries that were caused in trying to put the fire out or in trying to escape from the fire.

SHOW CARD F3 CODE ALL THAT APPLY

1. Bruises
2. Scratches
3. Cuts
4. Broken bones
5. Scalds
6. Burns
7. Smoke inhalation
8. Other injuries
9. No one in household injured

Firedoc [ASK IF Fireinj= 1 to 8]

Can I just check, did you or anyone else in your household have attention from a doctor or nurse as a result of the fire?

1. Yes
2. No

Firehosp [ASK IF YES TO Firedoc]

Did you or anyone else in your household go to hospital for treatment?

1. Yes
2. No

HhdInsur [ASK IF YES TO AnyFire OR HomeFire]

At the time of the last fire did you have household insurance that covered the cost of the fire damage?

1. Yes
2. No

Fires in the home: findings from the 2000 BCS

Claimfir [ASK IF YES TO Hhdinsur]

Did you or anyone else in your household make a claim for damage caused by the fire?

1. Yes
2. No

FirDamag [ASK IF YES TO AnyFire OR HomeFire]

What was the total cost of the damage done by the fire?

0..9999999

FireSaf1-

FireSaf5 [ASK ALL] SHOW CARD F4

Thinking about fire safety in the home, do you currently have any of these fire safety measures in your home? CODE ALL THAT APPLY

1. Smoke alarm – battery operated
2. Smoke alarm – mains/electricity operated
3. Smoke alarm – unsure how operated
4. Fire blanket
5. Fire extinguisher
6. Other fire safety measures
7. None of these

Xfiresaf ASK IF OTHER IN FireSafe]

INTERVIEWER: RECORD 'OTHER' ANSWER GIVEN

References

Budd, T. and Mayhew, P (1997) *Fires in the Home in 1995: Results from the British Crime Survey*. Home Office Statistical Bulletin Issue 9/97. London: Home Office.

Demaris, A. (1992) *Logit Modelling: Practical applications*. Sage University on Quantitative Applications in Social Science. Newbury Park, California: Sage Publications.

Department of the Environment, Transport and the Regions (1998) *English House Condition Survey 1996*. London: Stationery Office.

Dobson, A. (1990) *An Introduction to Generalised Linear Models*. London: Chapman and Hall.

Home Office (2000) *Fire Safety Attitude and Behaviour Monitor*. London: Home Office.

Hales, J., Henderson, L., Collins, D. and Becher, H. (2000) *2000 British Crime Survey Technical Report*. London: Social and Community Planning Research.

Home Office (1994) 'Household fires in England and Wales: Information from the 1992 British Crime Survey'. Chapter 7 in *Fire Statistics, UK, 1992*. London: Home Office.

Home Office (1995) 'Household fires in England and Wales: Information from the 1994 British Crime Survey'. Chapter 7 in *Fire Statistics, UK, 1993*. London: Home Office.

Kershaw, C., Budd, T., Kinshott, G., Mattinson, J., Mayhew, P. and Myhill, A. (2000) *The 2000 British Crime Survey, England and Wales*. Home Office Statistical Bulletin 18/00. London: Research and Statistics Directorate.

May, C (1990) *Household Fires: Findings from the British Crime Survey 1988*. Research and Planning Unit Paper No. 57. London: Home Office Research and Planning Unit.

Watson, L., Gamble, J. and Schofield, R. (2000) *Fire Statistics United Kingdom*, Home Office Statistical Bulletin Issue 20/00. London: Home Office.

**RESEARCH, DEVELOPMENT AND STATISTICS DIRECTORATE
MISSION STATEMENT**

RDS is part of the Home Office. The Home Office's purpose is to build a safe, just and tolerant society in which the rights and responsibilities of individuals, families and communities are properly balanced and the protection and security of the public are maintained.

RDS is also a part of the Government Statistical Service (GSS). One of the GSS aims is to inform Parliament and the citizen about the state of the nation and provide a window on the work and performance of government, allowing the impact of government policies and actions to be assessed.

Therefore -

Research, Development and Statistics Directorate exists to improve policy making, decision taking and practice in support of the Home Office purpose and aims, to provide the public and Parliament with information necessary for informed debate and to publish information for future use.
