

# ACCIDENTAL DWELLING FIRES IN SANDWELL & DUDLEY (BLACK COUNTRY SOUTH)

Analysis of Fire and Casualty data to identify geographical areas and groups of the population most at risk of accidental dwelling fires in the Black Country South Command Area

April 2011 to March 2014



Data Intelligence Hub  
2014

## Introduction

The following document presents the results of the analysis of Accidental Dwelling Fires (ADF) in Black Country South (Sandwell & Dudley). Its aim is to assist in identifying geographical areas and groups of the population which are most at risk of ADF.

Three years of accidental dwelling fire and accidental dwelling fire casualty data were analysed: from April 2011 to March 2014.

In each section of this document, a box summarises the main features highlighted in the section.

The maps are also available in PDF format, including lower level maps focusing on the areas most at risk in the Data Hub Alfresco site's library.

The results of this analysis are also available as a 'mind map' linking all main features together. This is also available in the Data Hub Alfresco site's library.

## Day/Time analysis

Chart 1 illustrates the distribution of accidental dwelling fires in the Black Country South. It shows the number of occasions where groups of incidents occurred in a time period over the course of a week. The four hours between 15:00 and 19:00 are the busiest, with 28.2% of ADF occurring during this time frame.

Chart 1

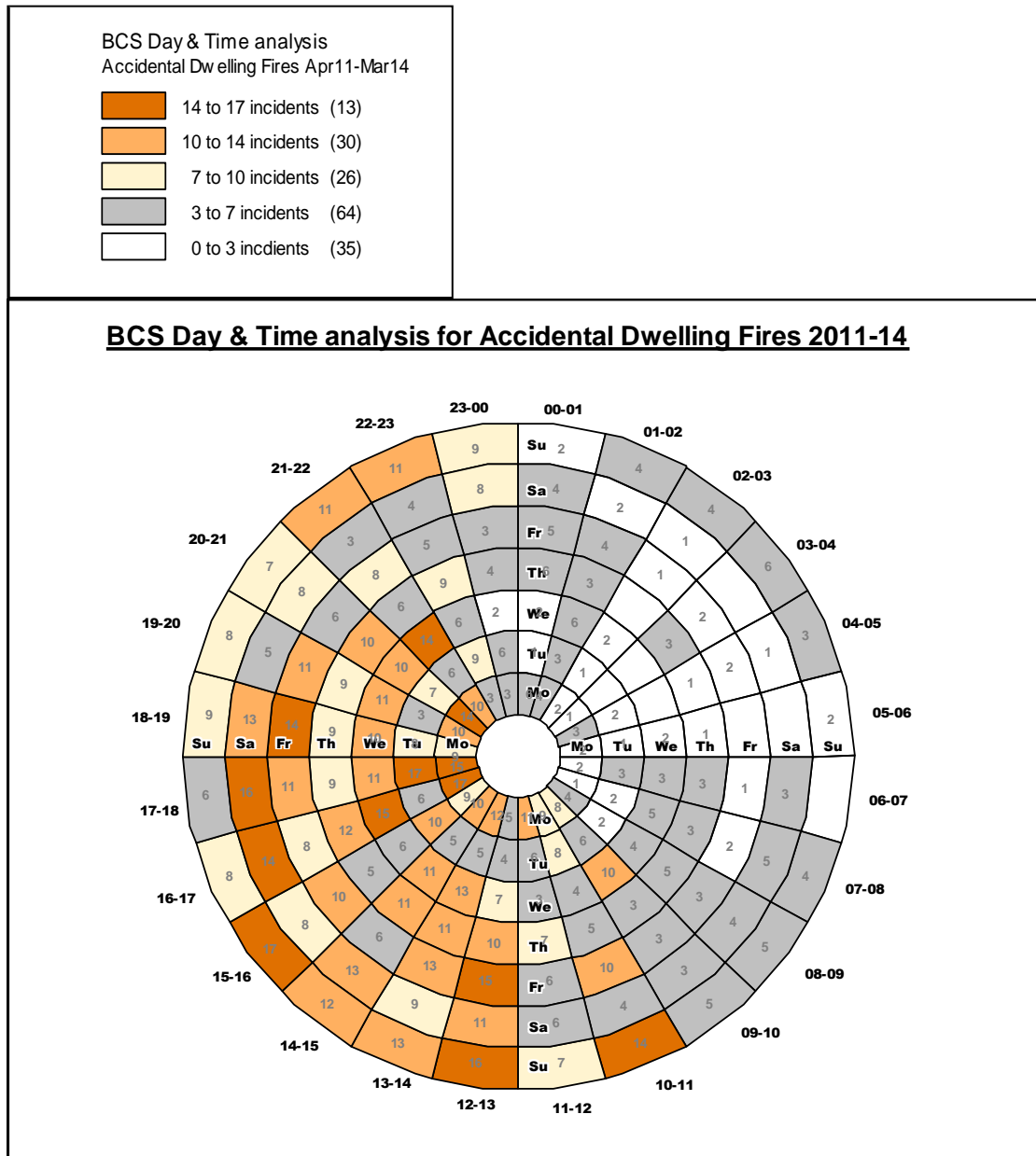
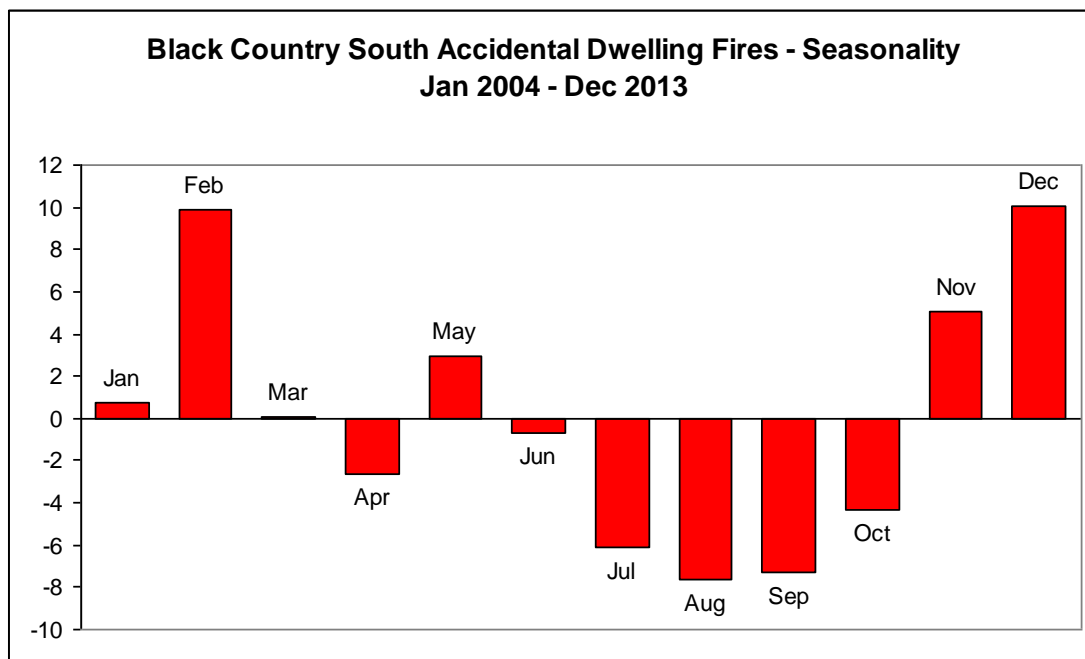


Chart 2 is the seasonality chart for accidental dwelling fires in the Black Country South. If the column is a positive number (above the 0) then the number of incidents in that month is higher than expected, if the column is a negative number then the number of incidents in that month is lower than expected (the values on the vertical (y) axis are relative values).



**Chart 2. Seasonality - Accidental Dwelling Fires in the Black Country South**

It shows that, overall, accidental dwelling fires are most likely in February, November and December.

**Mosaic**

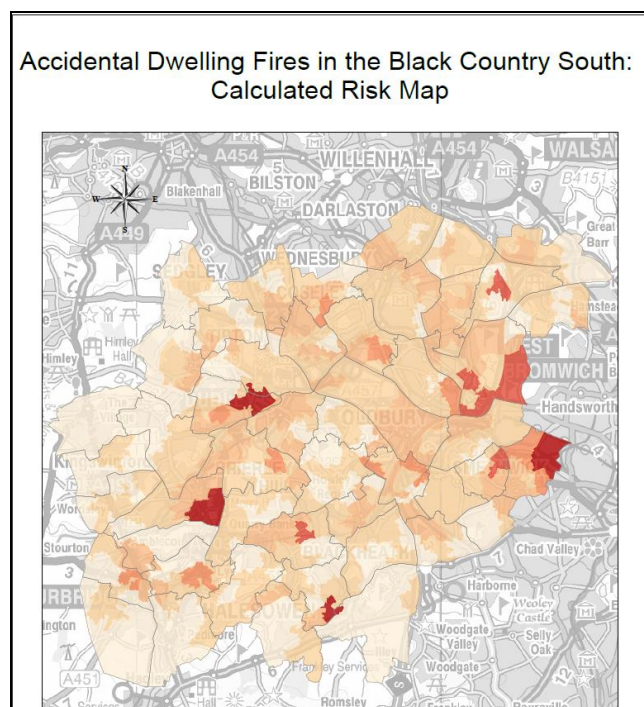
Mosaic groups the UK population into 15 broad groups and 69 more detailed types according to their demographic and lifestyle traits

The Mosaic types below incurred the greatest number of Accidental Dwelling Fires in Black Country South:

ADF Mosaic Types
J45 Low income communities reliant on low skill industrial jobs
K50 Older families in low value housing in traditional industrial areas
O69 Vulnerable young parents needing substantial state support
M56 Older people living on social housing estates with limited budgets

## Location

In the map below, LSOAs (Lower Super Output Areas) are highlighted according to a calculated risk score based on the correlation between the number of accidental dwelling fires in each LSOA and various other datasets (please see Appendix A for a list of datasets used): the darker the LSOA, the greater the score and therefore the risk of accidental dwelling fires.



Map 1. Accidental Dwelling Fire calculated risk score in the Black Country South

The map shows that areas of Soho & Victoria, West Bromwich Central, St James's, Netherton, Woodside & St Andrews, Brierley Hill & Belle Vale wards in Black Country South presented the highest risk.

There is also strong correlation with the number of residents of **black and Afro-Caribbean ethnicities**: in this case analysis of the data does suggest that they are over-represented as a person present/owner occupier compared to the proportion of the population they occupy according to the 2011 Census.

Accidental dwelling fires also show stronger correlations with the **socially rented, single person** and the **number of persons not in employment**.

It should be noted that correlation is only an indicator that two variables fluctuate together; it however does not necessarily imply causation.

## Source of ignition

The top three sources of ignition for accidental dwelling fires in the Black Country South are **cooking appliances** (52.9% of accidental dwelling fires), **electricity supply** (11.87%), and **smoking related (including cigarette lighter)** (8.69%).

## Casualties

The top three sources of ignition involving fatalities / casualties / rescues for accidental dwelling fires in the Black Country South are **cooking appliances** (62.8% of accidental dwelling fires), **matches, candles** (7.81%), and **smoking related (including cigarette lighter)** (11.25%).

### Cooking appliances fires:

Cooking fires accounted for more than half of accidental dwelling fires, and resulted in more than half of all accidental dwelling casualties (45%).

It is shown that cooking fires were 45% of PI 2 casualties and 7% of all cooking fires where Alcohol/Drugs related.

Chart 3 is the seasonality chart for cooking accidental dwelling fires in the Black Country South. If the column is a positive number (above the 0) then the number of incidents in that month is higher than expected, if the column is a negative number then the number of incidents in that month is lower than expected (the values on the vertical (y) axis are relative values).

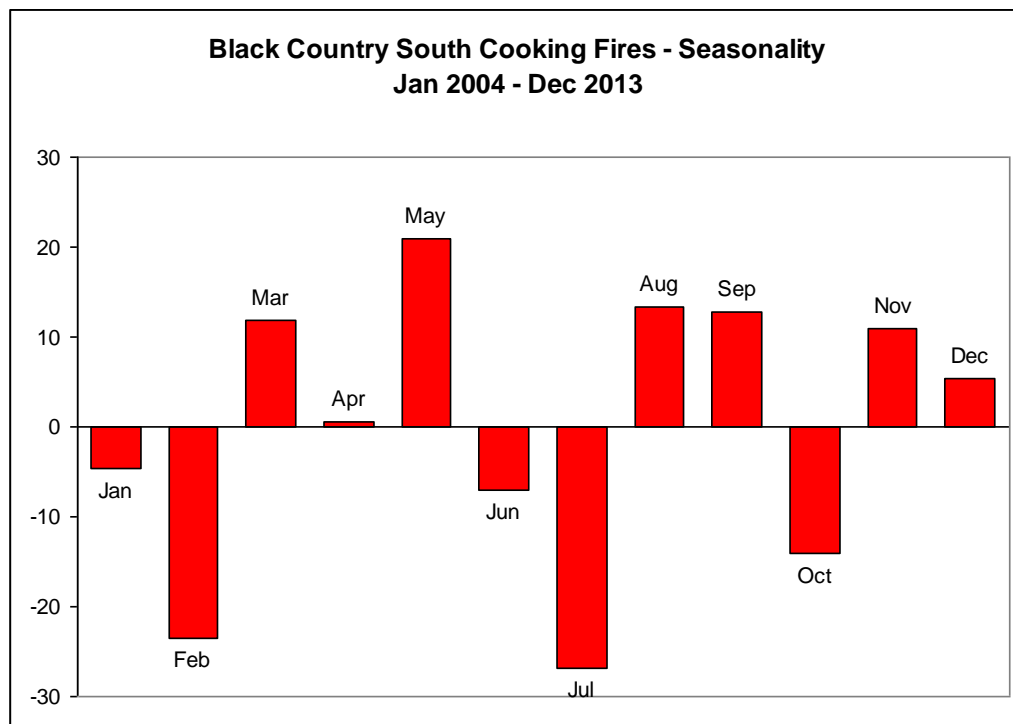
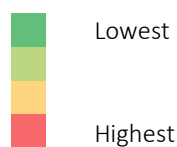


Chart 3. Seasonality - Cooking in Accidental Dwelling Fires in the Black Country South

This shows that accidental dwelling fires are most likely to occur in spring and in summer, more particularly in **May** and in **August, September**.

Table 1 shows that the temporal distribution of cooking fires is less spread out than accidental dwelling fires in general:

Day/Hour	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Monday	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest
Tuesday	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest
Wednesday	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest
Thursday	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest
Friday	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest
Saturday	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest
Sunday	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest



**Table 1. Cooking Acc Dwell Fires in Black Country South per hour and day – Jan 2011 to Dec 2013**

The greatest number of incidents with 36.89% took place between **12:00 and 15:00 on Sunday**.

Cooking fires casualties and rescues are more likely to be **aged 45 to 54** (11% of cooking fires), or **75 and over** (20%).

Compared to the 2011 Census, where they represent 3.71% of the Black Country South population, people of **black and Afro-Caribbean ethnicities** were over-represented both as the owner occupier or person present during accidental dwelling fires (14.4%) and as a casualty or rescue (11.3%). People of **white ethnicity** were also over-represented as casualties/rescues: 80.5% compared to 73.7% of the population.

Where Human Factors were entered for accidental dwelling fires 48.34% were recorded as **distraction** and 15% **Falling asleep**.

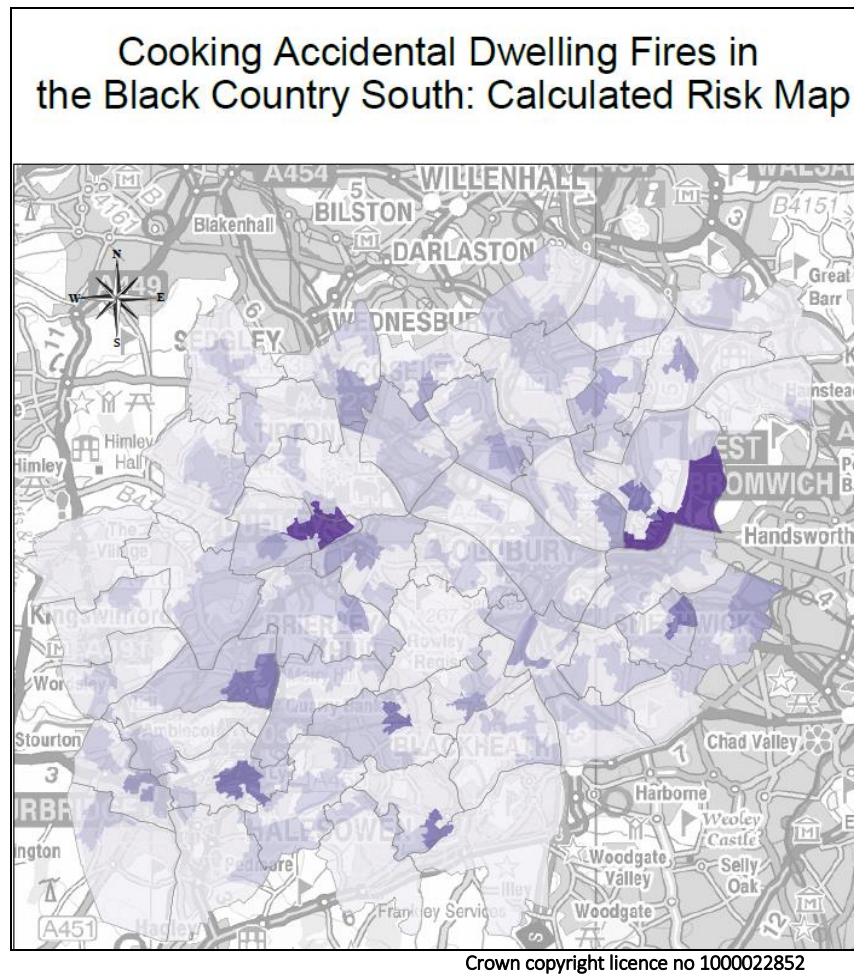
Mental health issues were only a factor in 8% of cooking ADF, but in 50% of incidents mental health is involved those aged over 65 were the person present during the fire or owner occupier.

Analysis also showed that the proportion of **single person households** was higher for cooking fires (47.53%) than accidental dwelling fires overall (38.13%).

Properties **rented from the council** accounted for 34.21 % of accommodation type where a cooking ADF occurred.

Cooking fires tended to be **caused by adults** aged 18-64 (59.7% of incidents) and the **elderly** (33.3%).

As cooking fires make up such a large proportion of ADF, the geographical distribution of the risk of cooking fires is very similar to that of ADF overall, with areas of Soho & Victoria, West Bromwich Central, St James's, Netherton, Woodside & St Andrews, Brierley Hill & Belle Vale wards in Black Country South presented the highest risk.



Map 2. Cooking Acc Dwell Fire calculated risk score in the Black Country South



The box below summarises the main features of cooking accidental dwelling fires in the Black Country South:

Cooking Fires:

May, August and September

Cooker – attached ring /hotplate and grill

Cooking oil or fat

12:00 – 15:00 and Sunday

Caused by Adults (45-54) or the Elderly (65+)

Distraction

Casualties and rescues:

186 Casualties

24 Rescues

14.29% alcohol/drug related

Single person households

Rented accommodation

***Electricity supply***

Between January 2011 and December 2013, accidental dwelling fires caused by electricity supply accounted for 11.87% of all acc dwell fires, and resulted in 8 casualties and one rescue (2.87% of all casualties and rescues), but no PI injuries or fatalities).

The seasonality chart below shows that electricity supply accidental dwelling fires are most likely in the **winter months**, which is consistent with more electricity being used for lighting or heating, as daylight diminishes and the weather becomes colder.

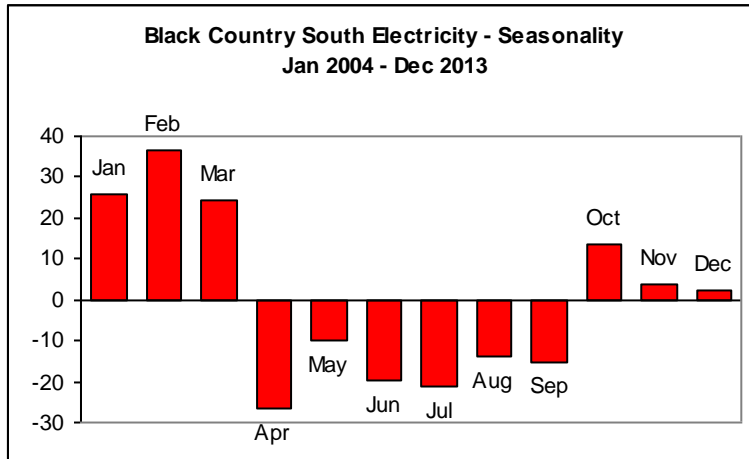
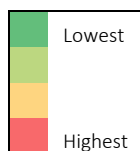


Chart 4. Seasonality - Electricity Supply Accidental Dwelling Fires in the Black Country South

Table 2 shows that electrical fires tend to be highest in the afternoon, particularly on Tuesdays and Saturdays:

Table 2. Electricity supply Acc Dwell Fires in Black Country South per hour and day – Jan 2011 to Dec 2013

Day/Hour	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Monday	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Highest	Highest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest
Tuesday	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest
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Friday	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest
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**Wiring, cabling and plugs** were responsible for over 95% of electricity supply fires. Current recording practices do not allow for analysis of the type of appliances the wiring, cable and plugs were connected to, although wiring insulation was recorded as the item mainly responsible in over half of incidents.

Those incidents are highest in **rented properties**, with 56.69% of electricity supply incidents at this type of accommodation.

Electricity supply accidental dwelling fires were most likely to start in a **kitchen** (21.26%) or in the **bedroom** (16.54%).

50.39% of the owner occupier or person present during the fire were within the **25-44 years old** age bracket.

Correlation analysis did not result in strong enough correlations to enable a calculated risk score and an illustrative map, but the box below summarises the main features of electricity supply accidental dwelling fires in the Black Country South:

Electricity Supply Fires:

- Winter months
- Kitchen / Bedroom
- Rented properties
- Owner occupier or person present aged 25-44 years old

**Smoking related (including cigarette lighter)**

Between January 2011 and December 2013, smoking related accidental dwelling fires accounted for 8.69% of all accidental dwelling fires, and resulted in four fatalities, 27 casualties and five rescues (11.46% of all casualties and rescues, and 45% of PI 2 casualties).

Temporal analysis did not identify any pattern in the day or time smoking related accidental dwelling fires occur, although **Friday between 13-15hrs** showed a slightly higher concentration than the rest of the week.

**Table 3. Smoking Related in Acc Dwell Fires in Black Country South per hour and day – Jan 2011 to Dec 2013**

Day/hour	0	1	2	3	4	6	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
Monday	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest
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Saturday	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest	Lowest
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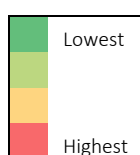
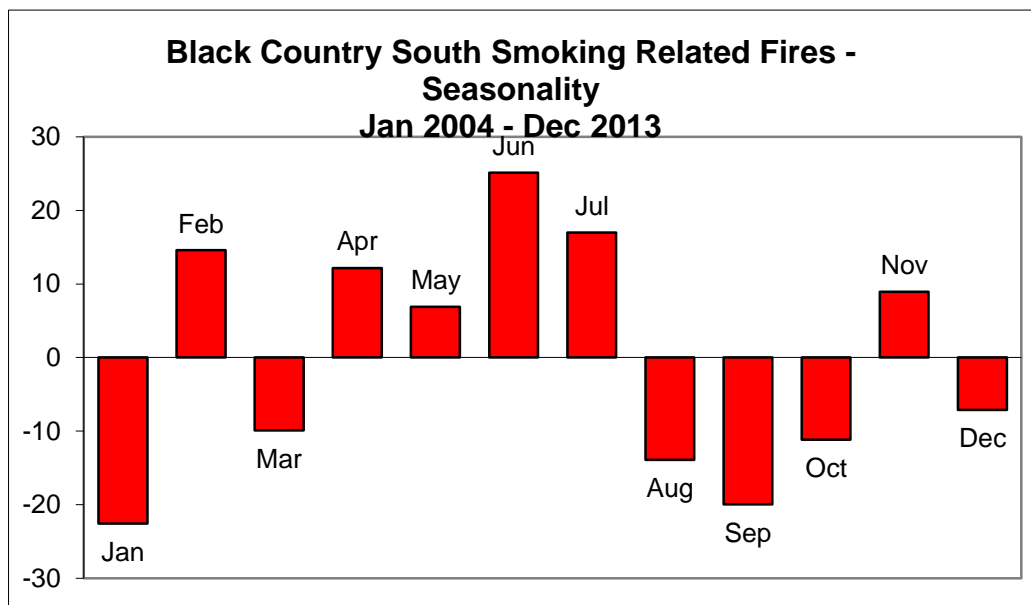


Chart 4 is the seasonality chart for smoking related dwelling fires in the Black Country South. It shows that, in the Black Country South, these types of incidents are more likely in June and July.



**Chart 4. Seasonality - Smoking related Accidental Dwelling Fires in the Black Country South**

Smoking related fires had the highest proportion of **alcohol / drug related** incidents, with 21.51% recorded as believed to be linked to alcohol or drug consumption.

Contributing factors to smoking related ADF were 23.21% of **mental health issues** and 17.86% **falling asleep**.

Smoking related ADF also had the highest proportion of properties recorded as **single person households**, which accounted for 41.94% of incidents.

Over half of smoking related ADF started either in the **bedroom** (27.96%) or **living room** (22.58%).

Adults **between the ages of 25-44** were the most likely **person present during the fire/owner occupier** for smoking related ADF, and those in **the 25-44 age range** were more likely to be **casualties** in smoking related ADF. While **adults (aged 18-64)** are most likely to cause smoking related ADF.

**Rented properties** were over-represented compared to ADF overall and to the area's tenure distribution according to the Census 2011, accounting for 70.97% of smoking related fires, compared to 59.81% of all ADF, and 34.55% of households in the Black Country South (Census 2011).

Correlation Analysis only showed a strong correlation for single person household and did not result in enough correlation to enable a calculated risk score and map.

The box below summarises the main features of smoking related accidental dwelling fires in the Black Country South:

Smoking Related Fires	
☐	June and July
☐	Friday evening
☐	26.67% Alcohol/Drug related
☐	Rented properties (especially from the council)
☐	Single person households
☐	Casualty aged 25-44 years old
☐	Caused by Adults and the Elderly
☐	Mental Health
☐	Living room/bedroom

## Place the fire started

**Kitchen** fires accounted for 62.5% of all ADF in BCS, which is consistent with cooking appliance being the greatest source of ignition.

**Bedroom** fires were the second largest place where ADF started (8.7%) are also more likely to result in larger burn damage than kitchen fire.

**Kitchen, Living room** and bedroom fires all resulted in a disproportionate large percentage of casualties.

Place where fire started	% of ADF	% of Casualties
Kitchen	62.52	71.13
Bedroom	8.69	11.27
Living room	7.01	9.51

No alarms were present in 11.81% of kitchen fires, 21.51% of bedroom fires and 14.67% of Living room fires.

Where a smoke alarm was present and not working these accounted for 19.58% of kitchen fires, 25.81% of bedroom fires and 38.67% of living room fires. The alarm failed to operate in 82 kitchen fires, 12 bedroom fires and 15 living room fires were due to the Fire products did not reach detector.

## Property

63% of accidental dwelling fires in the Black Country South occurred in **rented properties**, while representing only 34.5% of households according to Census data<sup>1</sup>.

**Table 4. Tenure types in the Black Country South: Accidental Dwelling Fire and Census 2011**

Tenure type	% of total households (census 2011)	% of total ADF	% adf cooking	%adf smoking	% adf electrical
Owner occupied	63%	38.13%	33.22%	25.81%	44.88%
Rented from housing association	3.86%	7.48%	8.83%	9.68%	3.15%
Rented from the council	19.68%	34.21%	38.16%	50.54%	22.05%
Rented privately	11.01%	17.01%	16.08%	10.75%	26.77%
Rented, landlord not known		1.12%	1.77%	0	0.79%
Not known		2.06%	1.94%	3.23%	2.36%

Properties **rented from the Council** in particular were over-represented when comparing accidental dwelling fires and Census data. This is likely to be linked to the correlations between ADF and the income and employment deprivation indices.

**Purpose-built Flats** accounted for the greatest proportion of accidental dwelling fires with 53.3% of Alcohol or drug related incidents being higher in flat/maisonettes.

## Demographics

### *Person present during the fire/owner occupier*

There is a disparity between men and women with regards to the person present at the fire or owner occupier for accidental dwelling fires as a whole, with 41.5% and 54.55% respectively. However, some types of ADF showed differences in the distribution (please note the percentages in the table may not add up to 100% due to incidents where the gender is “unknown” or was left blank):

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<sup>1</sup> Tenure Census data also includes a “living rent free” category which is not included above as it is not found in ADF data for the Black Country South. Tenure Census data does not contain categories for unknown tenure type or “rented, landlord not known”.

**Table 5. Gender distribution of person present during fire / owner occupier for Accidental Dwelling Fires in the Black Country South**

Gender	Cooking appliance	Electric Lighting	Electricity supply	Heating equipment	Matches, candles, incense burners etc.	Other domestic style appliance	Smoking Related (incl. cigarette lighters)	Grand Total
Female	61.31%	52.17%	40.16%	47.83%	48.84%	65.56%	29.03%	54.55%
Male	37.28%	39.13%	49.61%	52.17%	51.16%	34.44%	50.54%	41.19%

In general, the person present at the fire / owner occupier was more likely to be **aged between 25 and 44**.

7.1% of accidental dwelling fires were believed to be linked to alcohol or drug use; 10.78% of those took place in single person household.

In 45.34% of accidental dwelling fires the rented from council occupier or person present during the fire was recorded as "lone person", while Census data shows that in 2011 28.9% of households in BCS were **single person households**, suggesting that people living on their own are slightly more at risk of accidental dwelling fires.

Compared to accidental dwelling as a whole, incidents where the owner occupier or the person present during the fire was recorded as a lone person were more likely to:

- be due to cooking appliances, heating equipment or smoking material
- involve someone under 65 years old
- be related to alcohol or drug
- living in rented accommodation

Analysis shows that, in the Black Country South, the aspects of deprivation which align most with the risk of accidental dwelling fires are **income and employment deprivation**.



### *Cause of the fire*

Overall, **adults (18 – 64)** were the greatest cause of the fire, with 43.74% of accidental dwelling fires in the Black Country South caused.

**Table 6. Cause of Accidental Dwelling Fires in the Black Country South**

Caused by	% of total ADF
Adult (18 - 64)	43.74%
Faults in system or appliance	22.06%
Elderly (65 plus)	21.50%
Person, unknown age	3.27%
Youth (10 - 17)	3.08%
Other	2.52%
Child (0 - 9)	1.68%
Not known	1.12%
Animal	0.56%
Natural occurrences (e.g. lightning strikes)	0.47%

Cooking, electrical supply and smoking are still the main cause of source of ignition with a third of elderly (65+) involved in cooking fires.

Percentage of non fatal casualties in accidental dwelling fires caused by:

Caused by	Non-fatal Casualty
Adult (18 - 64)	52.46%
Elderly (65 plus)	28.87%
Faults in system or appliance	9.51%
Youth (10 - 17)	3.52%
Child (0 - 9)	2.82%
Natural occurrences (e.g. lightning strikes)	1.06%
Other	1.06%
Animal	0.70%

The most common human factor recorded as believed to have been contributory to the cause, spread or resulting injuries from the fire was **distraction**, with 21.78% of accidental dwelling fires in the Black Country South.

**Mental health** was only recorded as a factor in 3.46% of accidental dwelling fires overall. It was a human factor 21.62% of smoking related ADF, and 56.76% of cooking ADF.

Half of incidents where mental health was a contributory factor were caused by the elderly.

### ***Casualties and rescues***

Casualties and rescues were more likely to result from **cooking and smoking related** fires:

Source of Ignition	% of ADF	% of casualties and rescues	% PI 2 injuries
Cooking appliance	52.90%	64.01%	5.73%
Electricity supply	11.87%	2.87%	0.00%
Smoking Related (incl. cigarette lighters)	8.69%	10.19%	1.91%
Other domestic style appliance	8.41%	6.05%	0.32%
Heating equipment	4.30%	4.14%	1.91%
Matches, candles, incense burners etc.	4.02%	7.64%	2.55%
Electric Lighting	2.15%	0.64%	0.00%
Other	1.96%	1.91%	0.00%
Natural occurrence	0.65%	0.96%	0.00%
Industrial equipment	0.56%	0.64%	0.32%
Fuel / chemical related	0.47%	0.64%	0.00%
Chimney	0.37%	0.32%	0.00%

Smoking related fires resulted in more fatal casualties than any other types, with four (one in 2011 & 2012 and two in 2013).

Accidental dwelling fires from **matches, candles or incense burners** only accounted for 4.2% of incidents, yet resulted in 7.64% of all casualties and rescues and one fatal casualty.

**The elderly (65+)** accounted for third of casualties and rescues from accidental dwelling fires, while they made up 15.21% of the Black Country South population according to the 2011 Census.

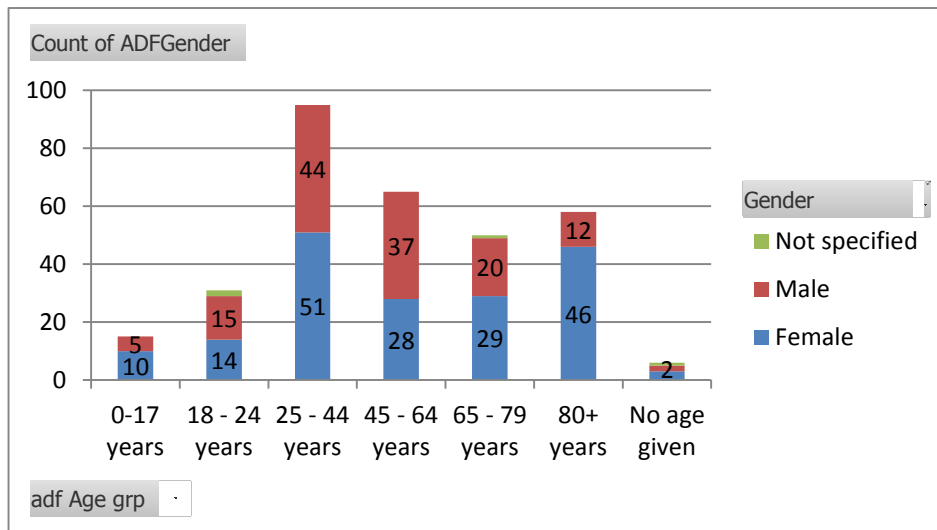
Those aged 75 + in particular were over represented as casualties and rescues, accounting for 20.94% of casualties and rescues but 7.25% of the population.

This age group is consistent with the other age groups most at risk from cooking, smoking and other domestic style appliances.

After the Elderly those **aged 25 to 34** were also more likely to be a casualty, accounting for 15.8% of casualties.

In contrast with the person present at the fire / owner occupier, men and women were unequal as casualties, with women accounting for 52.69% of casualties and men 42.04% (1.27% not

specified). Only in the **18-24** and **45-64** age brackets were there more **male** than female casualties:



**Chart 1. Gender distribution of casualties of Accidental Dwelling Fire in the Black Country South**

Although the majority of casualties were of **white ethnicities** (77.81%), residents of **black and Afro-Caribbean ethnicities** were over-represented compared to Census data, making up 7.04% of all casualties, compared to 3.71% of the population.

**Alcohol or drug** was a factor in 7.1% of accidental dwelling fires, yet resulted in 12.68% of casualties. In particular, 50% of fatalities and 25% of PI 2 injuries resulted from fires where alcohol or drug was a factor.

The box below summarises the main features of casualties and rescues of accidental dwelling fires in the Black Country South:

- Casualties

  - Cooking, smoking and domestic appliances, matches/candles/incense burners
  - Elderly (65+)
  - Females (75+)
  - White and Black & Afro Caribbean
  - Alcohol/drug related incidents

## APPENDIX A – Correlation analysis: datasets used

The datasets used for this analysis were as follows (all were broken down into LSOAs):

The number Accidental Dwelling Fires (Jan 2011 to Dec 2013)

The number of households (Census 2011)

Income Deprivation Index

Employment Deprivation Index

The number of children aged 0 to 16 (Census 2011)

The number of elderly residents (aged 65 and over) (Census 2011)

The number of single parent households (Census 2011)

The number of households socially renting (Census 2011)

The number of Disability Living Allowance claimants (as of May 2013, NOMIS)

The number of people not in employment (Census 2011)

The number of Accidental Dwelling Fires PI 2 casualties (Jan 2011 to Dec 2013)

The number of Incapacity Benefit/Severe Disability Allowance (as of August 2013, NOMIS)

The number of single person households where the resident is aged under 65 (Census 2011).

The number of residents of all Black and Afro-Caribbean ethnicities (Census 2011)

The number of residents of all mixed ethnicities (Census 2011)

All of the above were included in the overall Accidental Dwelling Fires calculated risk score; other datasets were also included in the initial correlation analysis, but showed weak or no correlation, and so were not included in the risk scoring.

Correlation analysis showed a moderate to strong correlation between Accidental Dwelling Fires and all other datasets.

ADF (Apr11-Mar14)	1
Households	0.403428
Income deprivation index	0.4910557
Children 0-16	0.2118573
Elderly 65+	0.0030664
Single parent household	0.3624407
Socially rented household	0.5413342
Disability allowance claimants (DWP)	0.4269459
Not in employment	0.4051197
IB/SDA claimants	<b>0.3996142</b>
single person aged <65 household	0.6049871
white all	-
afro/caribb all	0.3009492
mixed all	0.2162047
Casualties (PI2)	0.2161351
Cas PI 1 All	0.5186184
single person household	0.5945255
Single person aged 65+ household	0.326603

Strong correlations are highlighted in dark orange, moderate correlations in light orange, and negative moderate correlations in yellow.

Please note, the 'number of people not in employment' dataset differs from Employment deprivation in that it refers to the count of people who were not in employment at the time of the Census, while the Employment Deprivation index measures employment deprivation in an area conceptualised as involuntary exclusion of the working age population from the labour market.

Cooking fires showed no or weak correlation to the number of households, the number of IB/SDA claimants, the number of Disability Living Allowance claimants, or the number of elderly residents, and so these datasets were not included in the scoring for this type of accidental dwelling fires.

Smoking related fires showed no correlation to the number of single person aged under 65 households, the number of children aged 0 to 16, the number of households, or the number of elderly residents, so these datasets were not included in the scoring for this type of accidental dwelling fires. They however showed a moderate correlation to the number of rented households overall, so this dataset was added to the scoring.

Electricity supply fires only showed weak correlations to any of the datasets used.

It should be noted that correlation analysis is only intended as an indicator that two variables fluctuate together; it does not imply causation and may in some instances show no correlation where analysis of fire data demonstrates a link.