

Compendium

Homicide

This chapter presents analyses of information held within the Home Office Homicide Index, which contains detailed record-level information about each homicide recorded by police in England and Wales. The database is continually updated with revised information from the police and the courts and, as such, is a richer source of data than the main recorded crime dataset.



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Correction

15 March 2017

A small error has been found in Figure 2.2 where the data point for the year ending March 2005 was missing, due to a processing error.

This has now been corrected. We apologise for any inconvenience.

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1 . Main points

There were 571 homicides (murder, manslaughter and infanticide) in the year ending March 2016 in England and Wales. This represents an increase of 57 offences (11%) from the 514 recorded in the previous year.

The number of homicides has shown a general downward trend over recent years and the 571 recorded was still one of the lowest levels since the late 1980s, despite having increased from the previous year.

There were 9.9 offences of homicide per million population, and the homicide rate for males (13.8 per million population) was more than twice that for females (6.0 per million population).

Women were far more likely than men to be killed by partners or ex-partners (44% of female victims compared with 7% of male victims), and men were more likely than women to be killed by friends or acquaintances (35% of male victims compared with 13% of female victims).

There were 38 homicide victims aged under 16 years in the year ending March 2016, the lowest number since data on homicide victims by age of victim was first published in 1972.

The most common method of killing continued to be by knife or other sharp instrument with 213 victims killed in this way, accounting for over 1 in 3 (37%) homicides.

The 26 homicide victims (5% of the total) that were killed by shooting showed an increase of 5 from the previous year, but is otherwise the lowest number since 1980 (19 homicides).

2 . Things you need to know

The term “homicide” covers the offences of murder, manslaughter and infanticide¹. Murder and manslaughter are common law offences that have never been defined by statute, although they have been modified by statute. In this bulletin the manslaughter category includes the offence of corporate manslaughter which was created by the [Corporate Manslaughter and Corporate Homicide Act 2007](#) which came into force on 6 April 2008. The offence of infanticide was created by the Infanticide Act 1922 and refined by the [Infanticide Act 1938](#) (section 1).

Data presented in this chapter have been extracted from the Home Office Homicide Index which contains detailed record-level information about each homicide recorded by police in England and Wales. It is continually updated with revised information from the police and the courts and, as such, is a richer source of data than the main recorded crime dataset².

In accordance with the [Statistics and Registration Service Act 2007](#), statistics based on the Home Office Homicide Index have been re-assessed against the Code of Practice for Official Statistics and found to meet the required standard for designation as National Statistics. The letter of confirmation can be found on the [UK Statistics Authority](#) website. Further information on the interpretation of recorded crime data is provided in the [User Guide](#).

Homicide Index data are based on the year when the offence was recorded as a crime, not when the offence took place or when the case was heard in court. While in the vast majority of cases the offence will be recorded in the same year as it took place, this is not always the case. Caution is therefore needed when looking at longer-term homicide trend figures. For example, the 172 homicides attributed to Dr Harold Shipman as a result of Dame Janet Smith's inquiry took place over a long period of time but were all recorded by the police during the year ending March 2003. Also, where several people are killed by the same suspect, the number of homicides counted is the total number of victims killed rather than the number of incidents. For example, the victims of the Cumbrian shootings committed by Derrick Bird on 2 June 2010 are counted as 12 homicides rather than one incident in the year ending March 2011 data.

The data refer to the position as at 14 November 2016, when the Homicide Index database was "frozen" for the purpose of analysis³. The data will change as subsequent court hearings take place or as other information is received.

The circumstances surrounding a homicide may be complex and it can take time for cases to pass through the criminal justice system (CJS). Due to this, the percentage of homicides recorded in the year ending March 2016 (and, to a lesser extent, those recorded in earlier years) that have concluded at Crown Court is likely to show an increase when the next figures from the Homicide Index are published in 12 months' time. Conversely, the proportion of cases without suspects or with court proceedings pending is expected to decrease as police complete more investigations and as cases pass through the CJS (see What do we know about suspects section for further details).

During 2016, an exercise was carried out with the National Confidential Inquiry at the University of Manchester and Greater Manchester Police to update the Homicide Index with missing CJS outcomes. This has led to a decrease in the number of homicide cases for the year ending March 2005 to the year ending March 2015 with pending or in progress cases, and a corresponding increase in final outcomes. In addition, collaboration with analysts at the National Offender Management Service at the Ministry of Justice (MoJ) enabled life sentence information to be completed for a number of cases with missing outcomes.

For the purposes of the Homicide Index, a suspect in a homicide case is defined as:

- (i) A person who has been arrested in respect of an offence initially classified as homicide⁴ and charged with homicide, including those who were subsequently convicted; or
- (ii) A person who is suspected by the police of having committed the offence but is known to have died or committed suicide prior to arrest/being charged.

Where there are multiple suspects in a homicide case they are categorised in the Homicide Index as either the principal or a secondary suspect. There is only ever one principal suspect per homicide victim. If there is any conviction information available then the suspect with the longest sentence or most serious conviction is determined to be the principal suspect. In the absence of any court outcome, the principal suspect is either the person considered by the police to be the most involved in the homicide or the suspect with the closest relationship to the victim.

As more than one person can be convicted for a single homicide, the number of people convicted will not necessarily be the same as the number of victims recorded. However, if the outcome of only the principal suspect in each case is examined (that is, one suspect per victim), this can provide a more direct comparison to the case outcome of each homicide.

Notes for: Things you need to know

1. Infanticide is defined as the killing of a baby under 1-year-old by their mother while the balance of her mind was disturbed as a result of giving birth.
2. For example, when the police initially record an offence as a homicide it remains classified as such unless the police or courts decide that a lesser offence, or no offence, took place. The offence would be reclassified on the Homicide Index as “no longer recorded” but remain in the main police recorded crime collection as a homicide.
3. The Homicide Index is continually updated with revised information from the police as investigations continue and as cases are heard by the courts. The version used for analysis does not accept updates after it is “frozen” to ensure the data do not change during the analysis period. See Section 3.1 of the [User Guide](#) for more information.
4. The homicide may no longer be recorded as such if all the suspects were acquitted.

3 . What does the long-term trend in homicide look like?

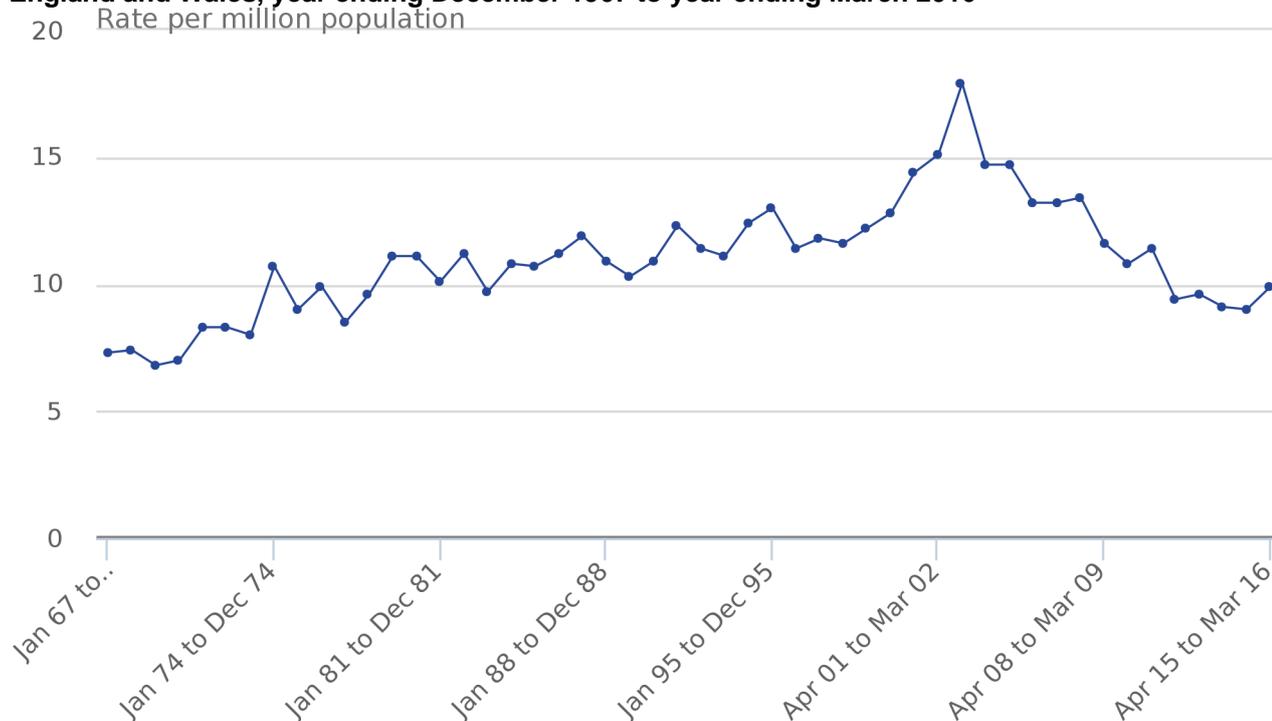
When the police initially record an offence as a homicide it remains classified as such unless the police or courts decide that a lesser offence, or no offence, took place. In all, 577 deaths were initially recorded as homicides by the police in the year ending March 2016 and by 14 November 2016, 6 were no longer recorded as homicides ¹, giving a total of 571 offences currently recorded as homicides.

The 571 offences recorded as homicide in the year ending March 2016 represents an increase of 57 offences (11%) from the 514 recorded for the previous year, but is still one of the lowest levels since the late 1980s.

Homicides generally increased from the 1960s up to the early 2000s (the peak of 944 in the year ending March 2003 includes 172 homicides committed by Dr Harold Shipman). There was then a general downward trend to the year ending March 2015.

To put the actual number of homicides in context, incidence rates show the volume of offences as a proportion of the resident population. The incidence rate for homicide remains relatively low, with 9.9 homicides recorded per million population during the year ending March 2016, higher than the rate for the last 4 years but still one of the lowest homicide rates since the late 1970s. If the 172 homicides committed by Harold Shipman recorded in the year ending March 2003 are excluded from the analysis, homicide rates peaked in the year ending March 2002, at 15.1 offences per million population² (Figure 2.1).

Figure 2.1: Incidence rate per million population for homicide offences currently recorded by the police in England and Wales, year ending December 1967 to year ending March 2016



Source: Homicide Index, Home Office

Notes:

1. Year ending December 1987 includes 15 victims of Michael Ryan.
2. Year ending March 2001 includes 58 Chinese nationals who suffocated in a lorry en route into the UK.
3. Year ending March 2003 includes 172 victims of Dr Harold Shipman.
4. Year ending March 2004 includes 20 cockle pickers who drowned in Morecambe Bay.
5. Year ending March 2006 includes 52 victims of the 7 July London bombings.
6. Year ending March 2011 includes 12 victims of Derrick Bird.

More up-to-date figures on homicide from the main recorded crime return are published as part of the quarterly [ONS Crime Statistics in England and Wales series](#).

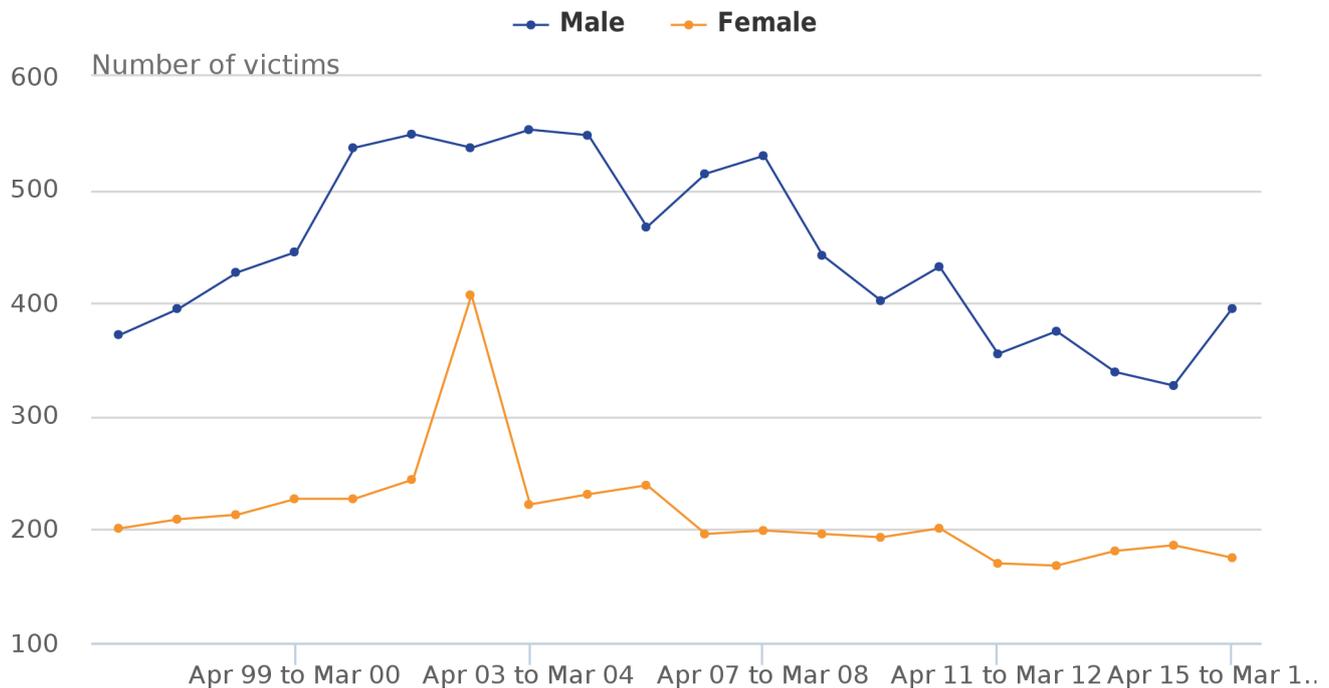
Compared with other offences, homicides are relatively low-volume, and year-on-year variations need to be interpreted with some caution. However, an analysis of trends (discussed in the Statistical interpretation of trends in homicides section of this chapter) shows the number of homicide incidents recorded in the year ending March 2016 was not statistically significantly different at the 95% level than the previous 7 years.

4 . How do homicide rates vary across the population?

In the year ending March 2016, around 7 in 10 homicide victims were male (69%, 395 victims) and 3 in 10 were female (31%, 175 victims). This is similar to the sex of victims over the last decade, with the exception of the previous 2 years, when 64% to 65% of victims were male.

The number of male victims of homicide (395) increased 21% from 327 in the previous year, ending a generally downward trend. In contrast, the number of female homicide victims decreased slightly, from 186 to 175 victims (a 6% decrease), continuing the longer-term gradual downward trend (Figure 2.2).

Figure 2.2: Homicide offences currently recorded by the police in England and Wales by sex of victim, year ending March 1997 to year ending March 2016



Source: Homicide Index, Home Office

Notes:

1. Year ending March 2003 includes 42 male and 130 female victims of Dr Harold Shipman.
2. Year ending March 2012 includes 1 victim with unknown gender.
3. Year ending March 2015 includes 1 victim with unknown gender.
4. Year ending March 2016 includes 1 victim with unknown gender.

The homicide rate for males (13.8 per million population) was more than twice that for females (6.0 per million population), a pattern that is consistent with previous years ([Appendix Table 2.02](#)). However, it should be noted that the nature of homicides differs between men and women, as discussed in the How are victims and suspects related? section of this chapter.

In the year ending March 2016, there were 38 homicide victims under 16 years of age, compared with 56 victims in the previous year and 44 in the year ending March 2014. This was the lowest number since data on homicide victims by age of victim was first published in 1972.

There were increases from the previous year in the number of homicide victims in all the male adult age groups, but it was particularly marked among males aged 25- to 34-years-old (up 43%) and males aged 75 and over (up 71%). However following a low figure for the year ending March 2015 (54 males in the 25 to 34 age groups), the number for the year ending March 2016 (77) has returned to the levels seen in previous years ([Appendix Table 2.02](#)).

Children under the age of 1 have the highest rate of homicide (22 per million population) along with males aged 16 to 44 (20 per million population).

Of the 571 offences recorded as homicide in the year ending March 2016, 7% involved victims under the age of 16, lower than the proportion in the year ending March 2015 (11%, [Appendix Table 2.02](#)). Just under a half (47%) of victims aged under 16 were male, and 53% were female. In comparison, 56% of victims aged 75 and over were male, and around two-thirds or more of victims in other age groups were male.

5 . What methods of killing are used?

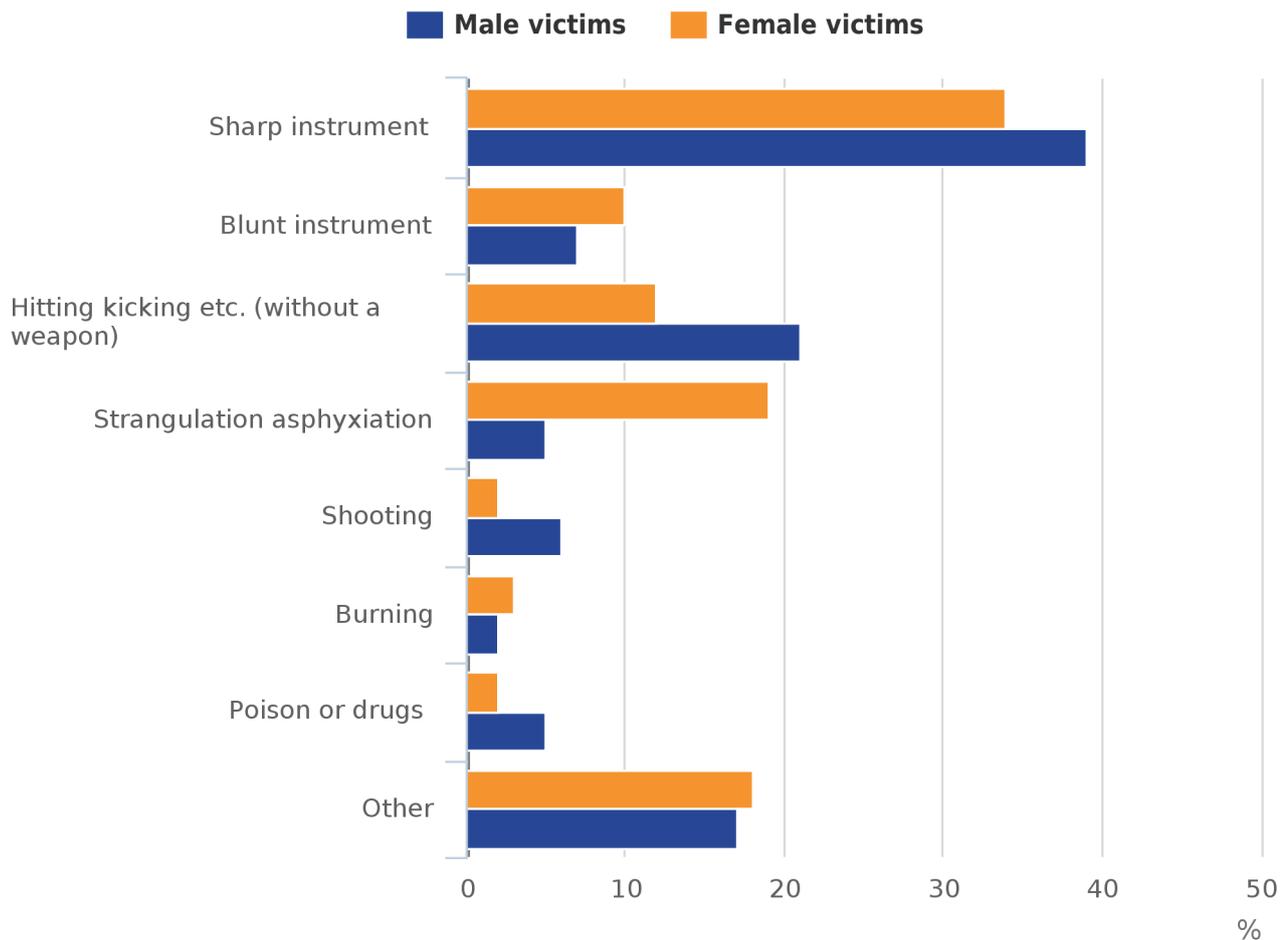
As in previous years, the most common method of killing for both male and female victims was by a knife or other sharp instrument, with 213 such homicides (37% of the total) recorded in the year ending March 2016 ([Appendix Table 2.03](#)). Although the absolute number of homicides committed by knives or sharp instruments has risen from 186 in the previous year, the proportion of homicides committed by this method remains similar (36% for the year ending March 2015).

The second most common method of killing was “kicking or hitting”, accounting for 102 homicides (18% of the total), a proportion that has remained roughly a fifth over the last decade. The majority (79%) of those killed in this way were male victims.

In total, 26 homicide victims were killed by shooting, and although this was 5 more than the previous year it was one of the lowest numbers since 1980 (19 homicides).

Similar proportions of male and female victims were killed by a sharp instrument or by a blunt instrument but there were differences between the sexes in other methods (Figure 2.3). For example, while hitting and kicking was the second most common method for male victims (81 homicides), for female victims it was strangulation or asphyxiation (33 homicides). Differences in methods of killing by sex of victim tend to reflect differences in victim to suspect relationships as discussed in the How are victims and suspects related? section of this chapter.

Figure 2.3: Offences currently recorded as homicide by apparent method of killing and sex of victim, year ending March 2016



Source: Homicide Index, Home Office

Notes:

1. 'Other' includes all other apparent methods and where method is unknown.

Use of licensed firearms

Information on homicides where there was a licensed firearm used has previously been published on an ad hoc basis, but is now included in this publication for the first time. It should be noted that the proportion of firearm homicides carried out with licensed firearms is relatively small in volume and subject to large fluctuations from year to year, especially if there are multiple homicides, such as the Derrick Bird shootings in June 2010.

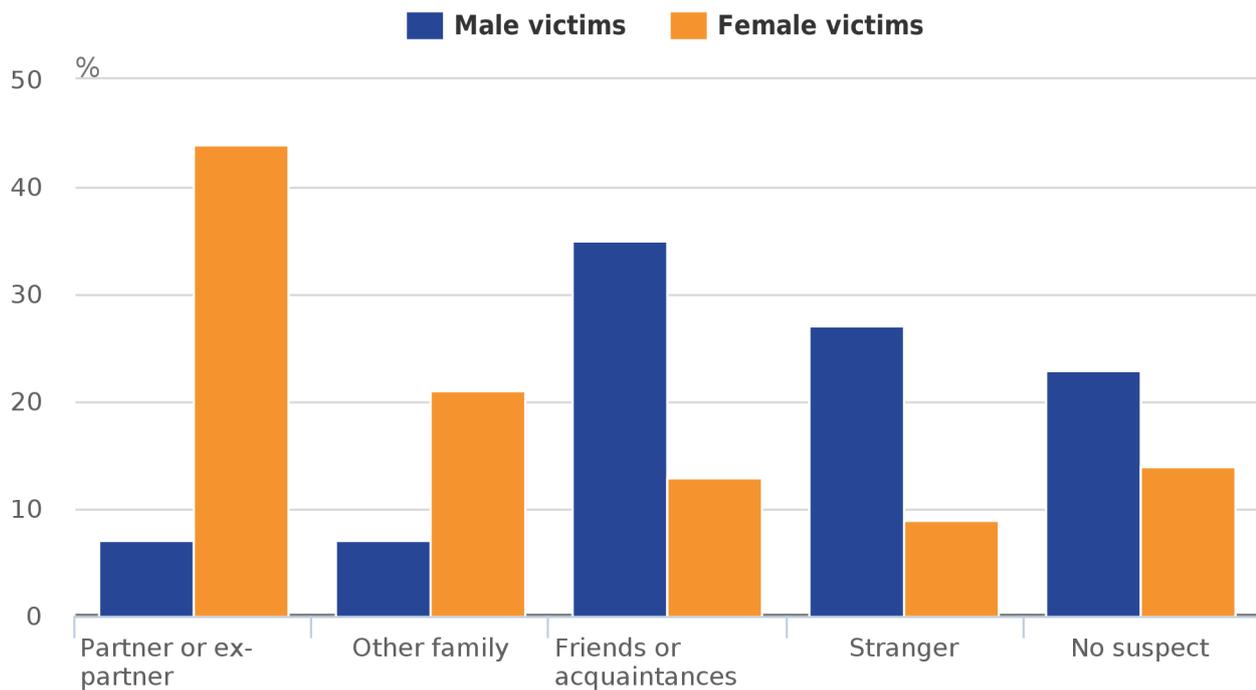
There were 26 homicides involving a firearm in the year ending March 2016, and in only 1 of these cases was the firearm known to be licensed. In 18 homicides the firearm was not licensed, and in the remaining 7 homicides it was not known if the firearm was licensed or not ([Appendix Table 2.04](#)).

6 . How are victims and suspects related?

Data on the relationship of victims to principal suspects for the year ending March 2016 show findings consistent with previous years, with differences between males and females. Female victims (77%) were more likely than male victims (50%) to have been acquainted with the principal suspect ([Appendix Table 2.05](#); Figure 2.4)¹. In particular, women were far more likely to be killed by partners or ex-partners (44% of female victims compared with 7% of male victims). In contrast, men were far more likely to be killed by friends or acquaintances (35% of male victims and 13% of female victims) or strangers (27% of male victims compared with 9% of female victims).

The percentage of male victims with no suspect identified is higher than for previous years (23%), but this figure is likely to fall as police continue their investigations.

Figure 2.4: Relationship of homicide victims to principal suspect by sex of victim, year ending March 2016



Source: Homicide Index, Home Office

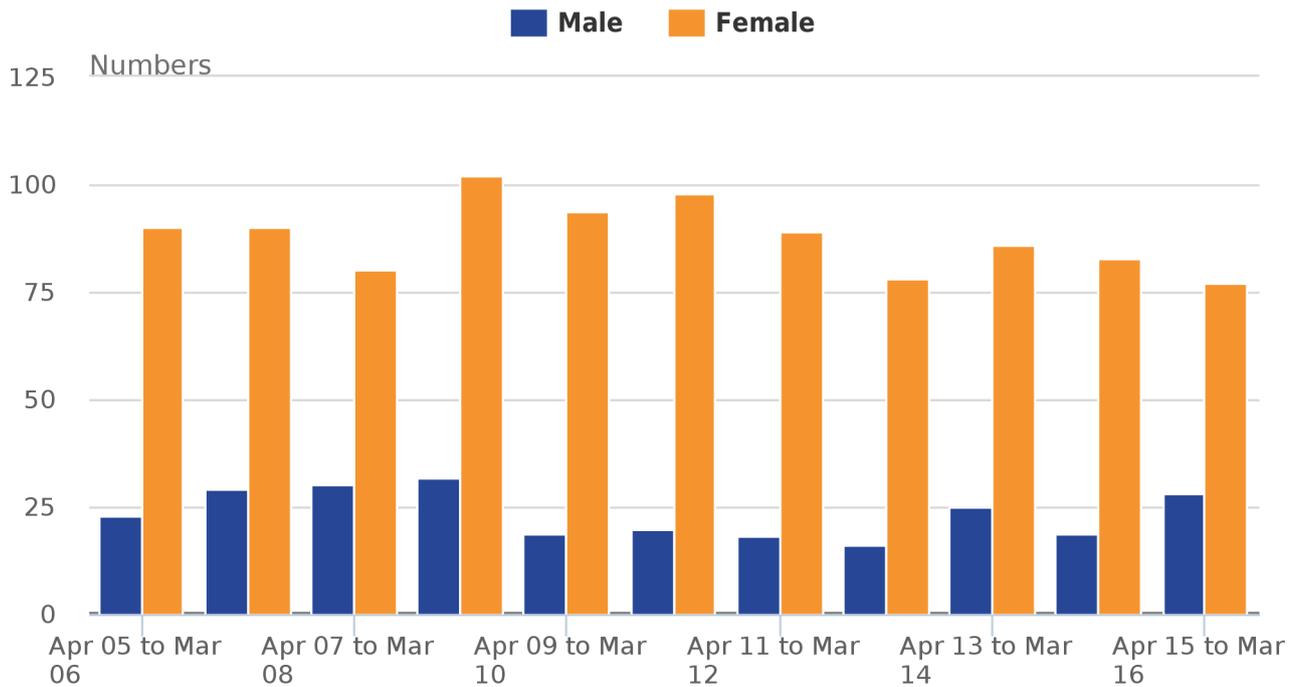
To account for differences by age in the relationships between victims and principal suspects, the analysis in the next 2 sections reports on adult victims (those aged 16 and over) and child victims (those aged under 16) separately.

Adult victims

There were large differences in the victim-suspect relationship between men and women. In the year ending March 2016, a half (50%) of female victims aged 16 or over were killed by their partner or ex-partner ² (77 offences). This is similar to the previous year (51%) but lower than years prior to that, continuing a general downward trend since the year ending March 2009.

In contrast, only 7% of male victims aged 16 or over were killed by their partner or ex-partner in the year ending March 2016 (28 offences), a percentage that is similar to previous years ([Appendix Table 2.06b](#), Figure 2.5).

Figure 2.5: Number of homicide victims aged 16 and over killed by partner or ex-partner, by sex of victim, year ending March 2006 to year ending March 2016



Source: Homicide Index, Home Office

Over one-third of adult male victims (138 victims, 37%) were killed by a friend or acquaintance (a lower proportion than that found in previous years, although there is some fluctuation in the series). Female adult victims were less likely to be killed by a friend or acquaintance (14% of homicides, 22 offences).

Around 3 in 10 adult male victims (106 males, 28%) were killed by strangers, compared with around 1 in 11 female victims (14 females, 9%).

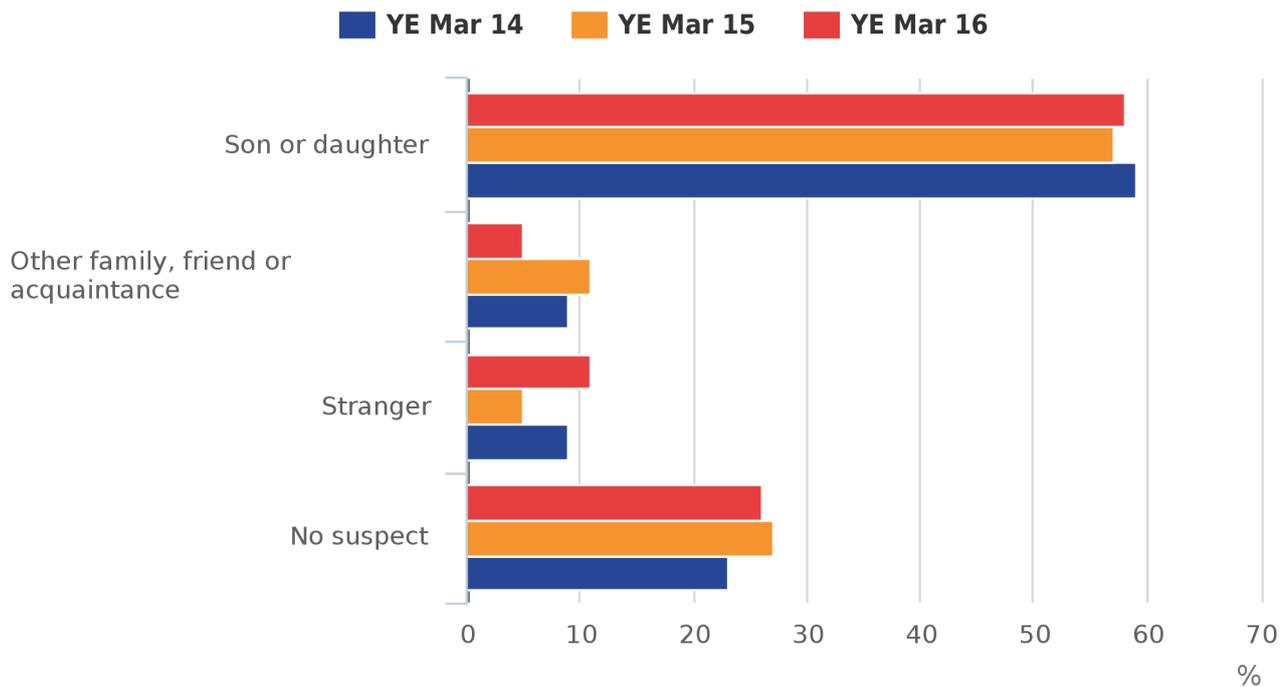
Child victims

As in previous years, the majority of victims aged under 16 were acquainted with the principal suspect (63%, 24 offences), and in all but 2 of these cases they were killed by a parent or step-parent (Figure 2.6).

Proportionally few homicides of those aged under 16 were committed by strangers. The victim was known to have been killed by a stranger in 4 offences in the year ending March 2016 (11%). This number has varied between 1 and 9 victims in each year over the last decade.

As of 14 November 2016, there were 10 victims aged under 16 (26%) for whom no suspect had been identified, a higher proportion than among adult victims (20%). This number is likely to fall as police investigations continue.

Figure 2.6: Homicide victims under 16 years of age, by relationship of victim to principal suspect, year ending March 2014 to year ending March 2016



Source: Homicide Index, Home Office

Notes:

1. Figures are likely to change as cases progress through the courts and more information becomes available.
2. YE= year ending

Notes for: How are victims and suspects related?

1. The relationship between victim and principal suspect is not always known and, for the purposes of this analysis, such cases have been included in the “stranger” category. Stranger category includes: police or prison officer killed in the course of duty, stranger (terrorist or contract killing and other) and where there is insufficient information about the suspect to determine relationship to victim.
2. Partner or ex-partner includes the sub-categories “spouse, cohabiting partner, boyfriend or girlfriend, ex-spouse or ex-cohabiting partner, ex-boyfriend or girlfriend, adulterous relationship, lover’s spouse or emotional rival”.

7 . What do we know about the circumstances and location of homicides?

Circumstances of homicides

Similar to previous years, the latest figures show about a half (49%, or 277 offences) of all homicide cases resulted from a quarrel, a revenge attack or a loss of temper. This proportion was higher where the principal suspect was known to the victim (57%), compared with when the suspect was unknown to the victim (37%).

Irrational acts accounted for 6% of homicides (32 offences)¹, and 4% of homicides (23 offences) occurred during furtherance of theft or gain. As at 14 November 2016, the apparent circumstances were not known for 20% of homicides (116 offences) recorded in the year ending March 2016 ([Appendix Table 2.08](#)). This figure is likely to decrease as the police carry out further investigations.

Location of homicides

Over a half (56%, or 321 offences) of all homicide cases occurred in a house or a dwelling. Around a fifth (19% of homicides, 109 offences) occurred in a street, footpath or alleyway and 7% took place in an open outdoor area (39 offences)².

The pattern was different for males and females, reflecting differing victim-suspect relationships ([Appendix Table 2.09](#), Figure 2.7). The majority of female homicides (86%, 151 offences) took place in or around a house or dwelling or residential home compared with 48% of male homicides (191 offences). Around a quarter (26%) of male homicides took place in a street, path or alleyway (101 offences) compared with only 5% of female homicides (8 offences).

Figure 2.7: Offences currently recorded as homicide by location of homicide and sex of victim, year ending March 2016



Source: Homicide Index, Home Office

Notes:

1. 'House, dwelling (in and around)' includes residential homes.
2. 'Other' includes all other locations including unknown.

Notes on: What do we know about the circumstances and location of homicides?

1. These figures for irrational acts do not account for all homicides committed by mentally disturbed people, as offences with an apparent motive (for example, during a quarrel or robbery) are instead included under the respective circumstance. Higher overall totals for homicides committed by mentally disturbed people are quoted elsewhere ([National Confidential Inquiry into Suicide and Homicide by People with Mental Illness](#)).
2. "Open outdoor area" here includes the category from the Homicide Index and car parks.

8 . How many homicide cases have criminal justice system (CJS) outcomes?

Of the 571 cases currently recorded as homicide in the year ending March 2016, data on the case outcomes of the principal suspects at 14 November 2016 showed ([Appendix Table 2.10](#)):

- court proceedings had resulted in homicide convictions in 224 cases (39%)
- court proceedings were pending for 170 cases (30%)
- no suspects had been charged in connection with 119 cases (21%)
- suspects had committed suicide in 27 cases (5%)
- proceedings had been discontinued or not initiated or all suspects had been acquitted in 26 cases (5%)

These figures are similar to those published last year for the [year ending March 2015](#).

9 . What do we know about suspects?

More than one suspect may be charged per homicide victim and in some cases no suspect is ever charged (Table 2.1). Due to this, the number of suspects is not the same as the number of offences. It should also be noted that the number of cases with no suspect will reduce as the police continue their investigations.

Table 2.1: Number of suspects for initially recorded homicide victims, year ending March 2013 to year ending March 2016

England and Wales

	Apr '12 to Mar '13	Apr '13 to Mar '14	Apr '14 to Mar '15	Apr '15 to Mar '16	Apr '12 to Mar '13	Apr '13 to Mar '14	Apr '14 to Mar '15	Apr '15 to Mar '16
	Number				Percentage			
No suspects charged	67	51	90	119	12	9	17	21
One	378	376	350	367	67	70	66	64
Two	73	61	57	48	13	11	11	8
Three or more	47	49	33	43	8	9	6	7
All initially recorded homicides	565	537	530	577	100	100	100	100

Source: Homicide Index, Home Office

Notes:

1. As at 14 November 2016; figures are subject to revision as cases are dealt with by the police and by the courts, or as further information becomes available.

In total, there were 611 suspects as at 14 November 2016 relating to the 577 homicides initially recorded in the year ending March 2016 ([Appendix Table 2.12](#)). Of these:

- court proceedings had concluded for 372 suspects (61% of all suspects)
- court proceedings were pending for 212 suspects (35%)
- 25 suspects had committed suicide or died (4%)
- the remaining 2 suspects had no proceedings taken on advice of the Director of Public Prosecutions

For those suspects where proceedings had concluded, 91% were male (318 suspects) and 9% were female (33 suspects).

Among male suspects:

- nearly three-fifths (58%) of those indicted for a homicide offence and with a court outcome were convicted of murder
- just under a quarter (23%) were convicted of manslaughter
- 15% were acquitted or their proceedings were discontinued
- 4% had another outcome¹

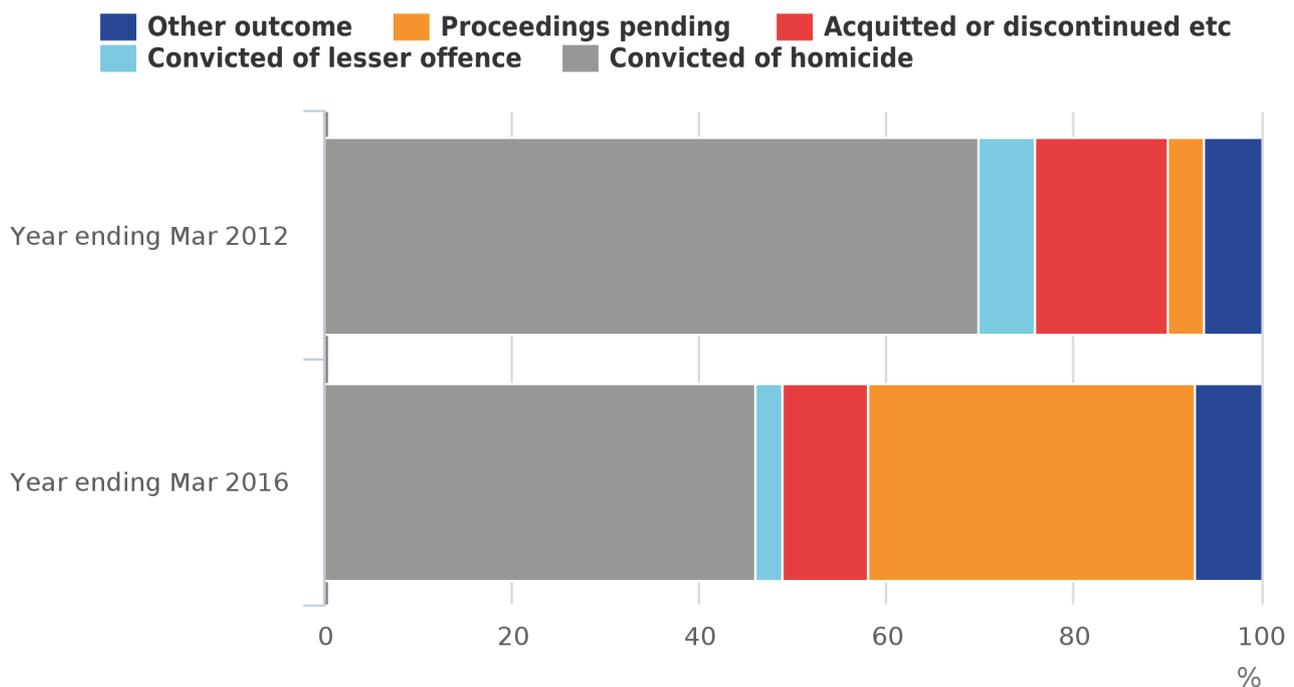
For females indicted for homicide with an outcome:

- 61% were convicted of murder
- 21% were convicted of manslaughter 15% were acquitted or had their proceedings discontinued
- 3% were convicted of a lesser offence

In the 3 years from the year ending March 2014 to the year ending March 2016, 82% of suspects indicted for homicide with a court outcome were found guilty of homicide and 13% were acquitted ([Appendix Table 2.13](#)). Similar criminal justice statistics produced by the MoJ in their publication [Criminal justice system statistics quarterly: December 2015](#) show that the conviction ratio (the number of convictions within a given period divided by the number of prosecutions in the same period) for homicide offences in 2015 was 74%².

The case outcomes for suspects of homicides recorded in the year ending March 2016 (Figure 2.8) are likely to change as cases progress through the CJS and more information becomes available. As such, cases from previous years are more likely to have concluded at court. While court proceedings were pending for 35% of the suspects in homicides recorded in the year ending March 2016, proceedings were pending for only 4% of the cases recorded in the year ending March 2012. Conversely, 46% of the suspects of homicides recorded in the year ending March 2016 had been to court and been convicted of homicide compared with 70% of those recorded in the year ending March 2012.

Figure 2.8: Current outcomes for suspects of homicides recorded in year ending March 2012 and year ending March 2016



Source: Homicide Index, Home Office

Notes:

1. As at 14 November 2016
2. 'Other outcome' includes suspect unfit to plead, proceedings concluded with other outcome, suspect committed suicide or died and the cases where no court proceedings were taken.

Previous homicide convictions

The Homicide Index shows that in the year ending March 2016, there were 2 convictions for homicide offences for suspects who had a previous conviction for homicide. As more cases are concluded at Crown Court, this figure may rise. For homicide offences recorded in the year ending March 2015, there were 4 people convicted of homicide who had a previous conviction for homicide ([Appendix Table 2.15](#)).

For homicide offences recorded between the year ending March 2006 and the year ending March 2016 in total, 47 people who were convicted of a homicide offence had a previous conviction for homicide (less than 1% of all homicide convictions). Of these 47 offences, the second conviction was for murder in 40 cases ([Appendix Table 2.16](#)).

Notes for: What do we know about suspects?

1. "Other outcome" includes suspect unfit to plead, proceedings concluded with other outcome, suspect committed suicide or died and the cases where no court proceedings were taken.
2. It is worth noting that offenders found guilty in a given year may have been proceeded against in previous year. This series has fluctuated between 67% and 88% in the last decade.

10 . International homicide comparisons

A number of international organisations, including Eurostat¹, have attempted to collate international homicide statistics. There are issues surrounding the comparability of international homicide data including:

- different definitions of homicide between countries, although definitions vary less than for some other types of crimes
- differing points in criminal justice systems at which homicides are recorded, for instance, when the offence is discovered or following further investigation or court outcome;
- the figures are for completed homicides (that is, excluding attempted murder) but, in some countries, the police register any death that cannot immediately be attributed to other causes as homicide

Caution should therefore be taken in comparing homicide rates across countries.

Figures published by [Eurostat](#) show that police recorded intentional homicide offences consistently decreased across EU Member States from 2008 to 2014.

The [Scottish government](#) publishes annual homicide figures, and the most recently published report showed there were 57 victims of homicide in Scotland in the year ending March 2016, 5 fewer than the 62 victims in the previous year. This was the lowest number of homicides since 1976, the first year for which comparable data are available.

The [Police Service of Northern Ireland](#) publish monthly figures on homicides, and the financial year trends release shows that there were 21 homicide offences recorded by the police in Northern Ireland in the year ending March 2016, continuing a general downward trend.

The United Nations Office on Drugs and Crime (UNODC) publish a [Global Homicide Handbook](#) which gives a comprehensive overview of intentional homicide across the world. The most recent of these was published in 2014, and showed that the global average homicide rate stands at 62 per million population. Southern Africa and Central America had rates over 4 times higher than that (above 240 victims per million population). Meanwhile, with rates some 5 times lower than the global average, Eastern Asia, Southern Europe and Western Europe were the sub-regions with the lowest homicide rates.

The [Department of Justice and Federal Bureau of Investigation](#) published figures showing that the homicide rate in the United States of America in 2015 was 49 per million population.

Notes for: International homicide comparisons

1. Eurostat is the statistical office of the European Union situated in Luxembourg. Its mission is to provide high quality statistics for Europe. While fulfilling its mission, Eurostat promotes the following values: respect and trust, fostering excellence, promoting innovation, service orientation, professional independence.

11 . Statistical interpretation of trends in homicides

The number of homicides recorded by the police fluctuates from year to year and there is interest in knowing the extent to which these fluctuations in the level of homicides represent an indication of a real underlying trend as opposed to random year-to-year variation. Using data for London between April 2004 and March 2007, [London murders: a predictable pattern?](#) found that homicides in London have a predictable level of fluctuation over time, which allowed them to apply statistical techniques for analysis.

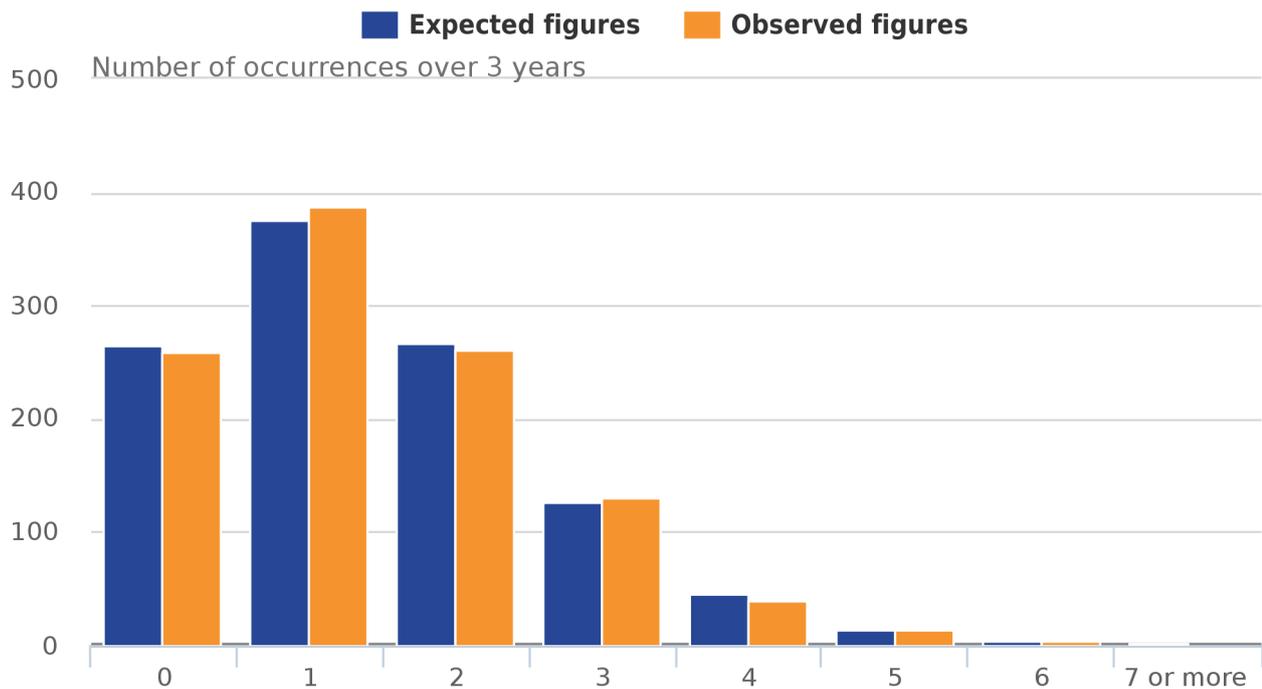
It should be noted that the discussion in this section is related to the statistical properties of the data, and it should not be interpreted as saying that small changes in the numbers of homicides are not of concern.

This section presents analyses of homicide incidents, defined as incidents where the same person (or a group of persons) is suspected of committing one or more related homicides. The numbers therefore differ from the total number of recorded homicides presented above (the focus of analysis is on such incidents as it is not possible to statistically model multiple homicides that relate to one case and were recorded on the same day; for that reason the homicides attributed to Dr Harold Shipman and the 7 July London bombings are, for example, each treated in this analysis as one incident). Although each incident is highly related to socio-economic characteristics of the suspect and the victim and independent from other incidents, over a period of time, the probabilities of homicide incidents happening can be closely modelled by a Poisson distribution¹. This can be used to test whether any change in the numbers of incidents per year is statistically significant, or what can be termed within the range of expected “natural variation” of the data.

Expected homicide incidents per day

Between April 2013 and March 2016, the police recorded 1,560 independent homicide incidents in England and Wales. The observed number of homicide incidents on a daily basis closely matches the expected number under the Poisson distribution (Figure 2.9). For example, from knowing there was an average of 1.42 homicide incidents a day, we would predict over the time period of 1,096 days that there would be 267 days on which there would be exactly 2 independent incidents. This is close to the observed number of 261 days, indicating that the occurrence of these apparent “clusters” is not as surprising as one might anticipate. A statistical test (?) shows no significant difference between the expected and observed figures. Thus, the observed figures are Poisson distributed. This allows for calculation of the number of days on which it would be expected that no incidents or one incident occurs and so on.

Figure 2.9: Observed and expected number of homicide incidents recorded on a day, combined data years ending March 2014 to March 2016



Source: Homicide Index, Home Office

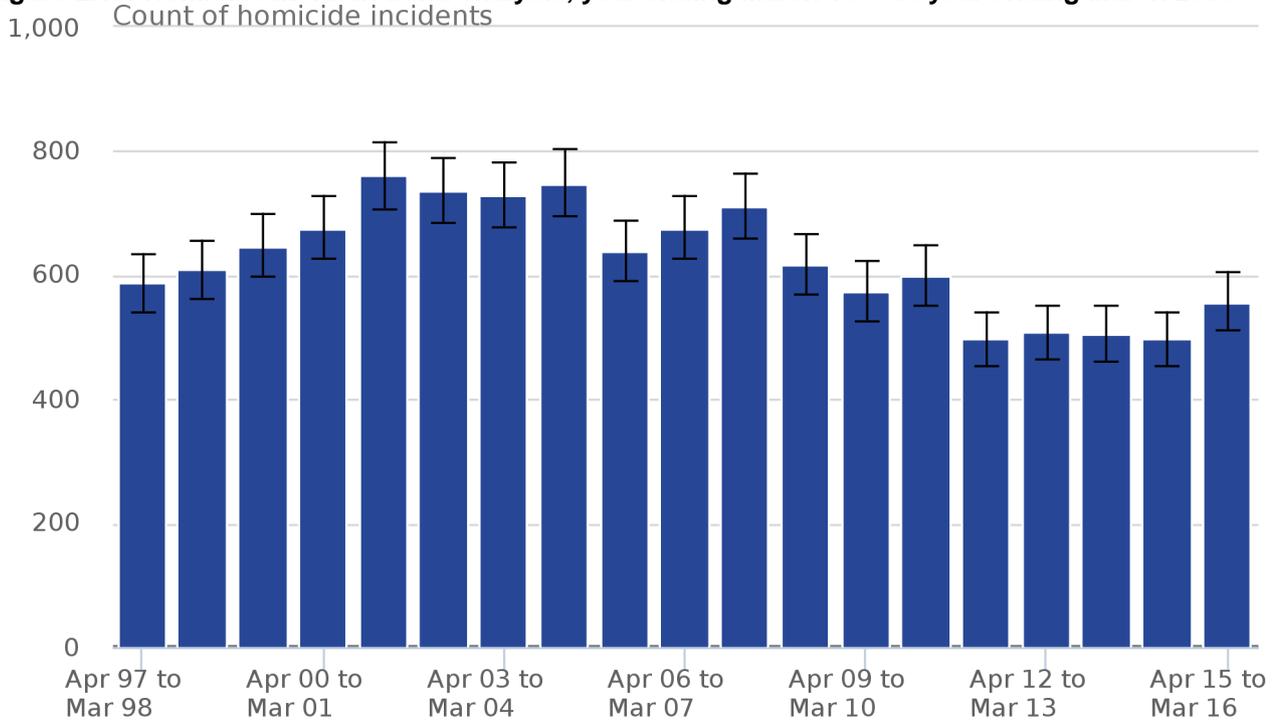
Trend analysis

Furthermore, knowing that homicide incidents are statistically distributed allows the application of statistical techniques in order to assess longer-term trends. Figure 2.10 shows the number of homicide incidents since the year ending March 1998. For each year, the observed count is given along with a 95% confidence interval on the Poisson error. The interval represents the range of values one would expect to measure 95% of the time if the underlying risk of homicide remained unchanged. These confidence intervals can be used as a rough approximation to determine whether the number of homicide incidents in any 2 years are statistically different from one another. If the confidence intervals do not overlap, one can infer there has been a significant change in the underlying risk of homicide. However, it is possible for the confidence intervals to overlap and for there still to be a statistically significant change in the number of homicide incidents. In order to measure the significance more accurately, it is appropriate to use a statistical test.

As has been shown previously, the Poisson distribution can be applied to the number of homicide incidents per year and the number of these incidents is large enough to approximate the normal distribution. Therefore a statistical test (in this case a Z-test) can be used to determine if the counts in each year are statistically significantly different from one another at the 95% confidence level (that is, whether there has been a true change in the underlying risk).

Based on this statistical test, one can assess that the number of homicide incidents recorded in the year ending March 2016 was not statistically significantly different at the 95% level than the previous seven years. The number of homicide incidents in the year ending March 2016 is statistically significantly lower than the years between the year ending March 2000 and the year ending March 2008, (Figure 2.10). This means the risk of being a victim of homicide was lower for the year ending March 2016 compared with those earlier years.

Figure 2.10: Homicide incident trend analysis, year ending March 1998 to year ending March 2016



Source: Homicide Index, Home Office

Notes:

1. As at 14 November 2016

Many of the short-term fluctuations seen from year to year in the number of homicide incidents are not statistically significant and appear to arise as natural statistical variation in the data. In looking at homicide data the degree of natural variation needs to be considered in interpreting trends and also when looking at year-to-year changes.

Notes for: Statistical interpretation of trends in homicides

1. The Poisson distribution expresses the probability of the number of events occurring in a given period of time if these events occur with a known average rate and independently from each other.