

Trends and drivers of homicide main findings: Annexes 1 to 9

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Technical Annex

Annex 1: Trends in England & Wales

1. Introduction

The homicide trend in England and Wales over the last 70 years has had three clear phases. For the 40-year period from the 1960s through to the 1990s there were consistent decade-upon-decade increases. Then, between 2001/02 and 2014/15, the rate of homicides in England and Wales reduced by 42%¹. From 2014/15 to 2017/18, however, the homicide trend has increased again, by 39%. At the time of writing (2019) annual totals of homicide are around 220 higher than at the recent low-point in 2014.

The social cost of homicide is very large. Each homicide is estimated to cost society £3.2 million (in 15/16 prices) meaning that the total societal cost of homicide was 1.8bn in 2015/16². The US academic Patrick Sharkey has estimated that the decline in homicide in the US from 1991 to 2012 increased life expectancy for Black males by as much as would be achieved by eliminating obesity in that demographic.³ The homicide increase that occurred in England and Wales between 14/15 and 17/18 means that more *additional* deaths were caused by homicide in that three-year period than all the terrorist attacks in England and Wales going back to 1980 combined. Clearly then, it is important to understand the drivers of homicide trends. Without this, it is difficult to prioritise resources aimed at reducing the number and societal cost of homicides.

The aims of this annex are therefore to outline all the data available on homicide trends in England and Wales and to break the homicide trend down by age, sex, method, geography and other factors to try and shed light on what might have driven the long-term rise and fall, as well as the more recent increase. The main data sources are the Home Office Homicide Index and ONS Mortality statistics. See the Technical Annex for further details about these.

It is important to be clear about what exactly 'homicide' means. In England and Wales, homicide is a collection of three criminal offences: murder, manslaughter, and infanticide. In legal terms, manslaughter can also be broken down into voluntary and involuntary manslaughter.⁴ These terms are explained further below.

¹ These calculations use the rate of the Homicide Index: 'currently recorded as' series.

² See Heeks et al. (2018)

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/732110/the-economic-and-social-costs-of-crime-horr99.pdf

³ Sharkey PT. 2018. *Uneasy Peace: The Great Crime Decline, the Revival of City Life, and the Next War on Violence*. New York: W.W. Norton & Company.

⁴ The Homicide Index only separates out manslaughter where the offender was not mentally sound at the time of the killing (diminished responsibility – also known as section 2 manslaughter).

Homicide offences: murder, manslaughter and infanticide

Murder is an act where a person unlawfully kills another, where there is intent to kill or cause grievous bodily harm and where one of the various defences which convert the act to manslaughter does not apply. The law provides a number of circumstances where a defence to murder establishes that the offence is one of manslaughter (see below).

Manslaughter

Voluntary manslaughter covers cases that would be murder were it not for the partial defence of diminished responsibility, loss of control, or the homicide occurs as part of a failed suicide pact.

'Diminished responsibility' (section 2 manslaughter) – covers homicides where the offender at the time of the offence had a substantial impairment of his/her mental functioning which substantially affected the offender's ability to understand their own conduct, form rational judgment and exercise self-control.

'Loss of control' - where the offender intends to cause serious harm, but the partial defence is that this action was preceded by at least one of two triggers from the victim (fear of serious violence from the victim; things said or done that were extremely grave and caused a justifiable sense of being seriously wronged) that led to a loss of control that could be expected of others with average self-restraint in the same circumstances.

'Suicide pact' is where an offender and victim are planning on dying together, but after killing the other person the offender does not kill him/herself.

Involuntary manslaughter – where a person kills another person but without intention to kill or cause serious harm to the person. The death must have been caused by gross negligence or unlawful/reckless acts.

Reckless acts – i.e. where the offender does not intend to seriously hurt the victim, but where the possibility is foreseeable.

Unlawful and dangerous acts – i.e. where the offender kills the victim through an unlawful act, but the offender could not have reasonably predicted that his/her action would have resulted in the victim's death.

Gross negligence – i.e. where the victim dies due to someone seriously and flagrantly breaching a duty of care.

Infanticide is where a mother wilfully causes the death of her child under the age of 12 months, but at the time "her mind was disturbed by reason of her not having fully recovered from the effect of giving birth". Infanticide is often treated similarly to manslaughter.

2. The overall homicide trend since 1300 and the four different homicide series for England and Wales

To gain an awareness of where current homicide levels sit in the broad span of history, it is helpful to briefly outline some of the academic evidence available on historical homicide rates. Data collated by Eisner (2001) suggest that homicide rates in England have fallen since at least the 14th century from an average rate of 240 per million inhabitants to a rate of about 18 per million in the mid-19th century. Similar trends are seen for other northern European nations where data are available (Eisner 2001). Averaging trends across western European nations, Eisner (2008) finds that the homicide fall continued reasonably consistently between 1850 and 1960.

For England and Wales published annual national data series on homicide start to be available from the late nineteenth century, by which time homicide rates had reached about 10 per million, a 96% reduction compared with our best estimates for the 14th century.

Figure A1.1 shows the series that are available on a roughly consistent basis since 1900. The charts show both numbers of homicides and homicide rates per million population. There is one series derived from police-collected statistics and one derived from General Registrar mortality statistics. Caution is required as even within these series, the exact method of recording homicide changed at various points. Further details are available in the Technical Annex. Note also that the charts are unsmoothed. This is intentional. Smoothed lines that are easier to read can be constructed from the data released alongside this report. But we have generally chosen not to use moving averages or some other smoothing technique because one of the central conclusions from this report is that homicide trends can move up and down very quickly. This is important for understanding drivers of the trends. Something causes these sudden dislocations in trend, so artificially removing them via a smoothing technique feels counter-productive.

Figure A1.1: Homicide trends in England and Wales since 1901

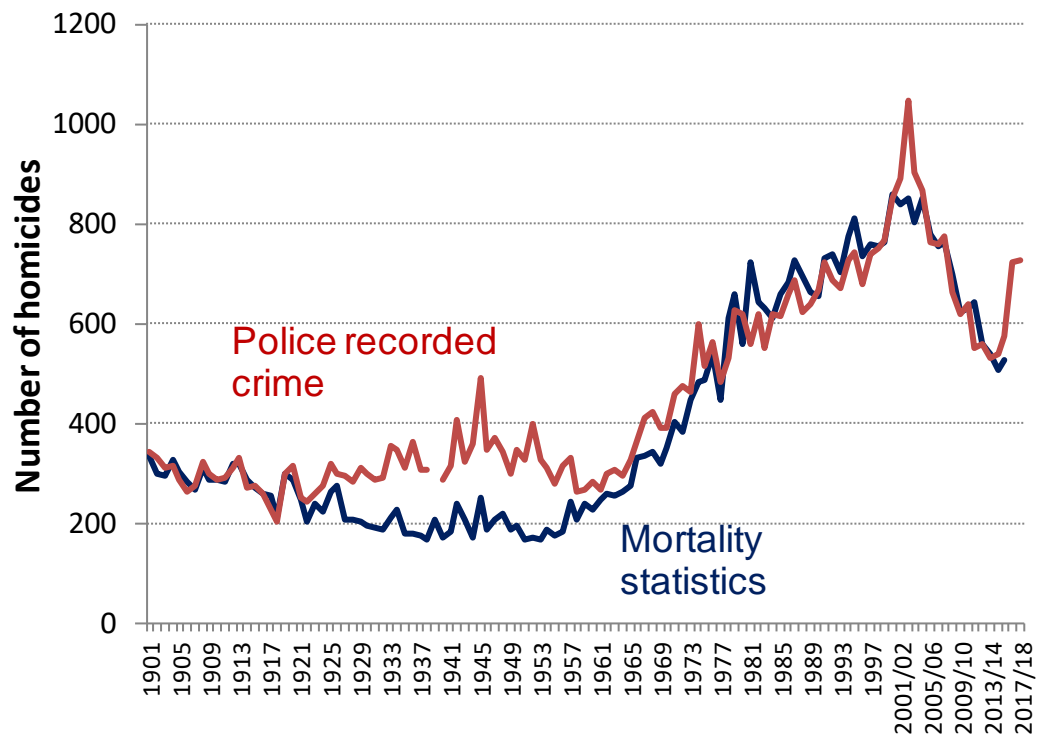
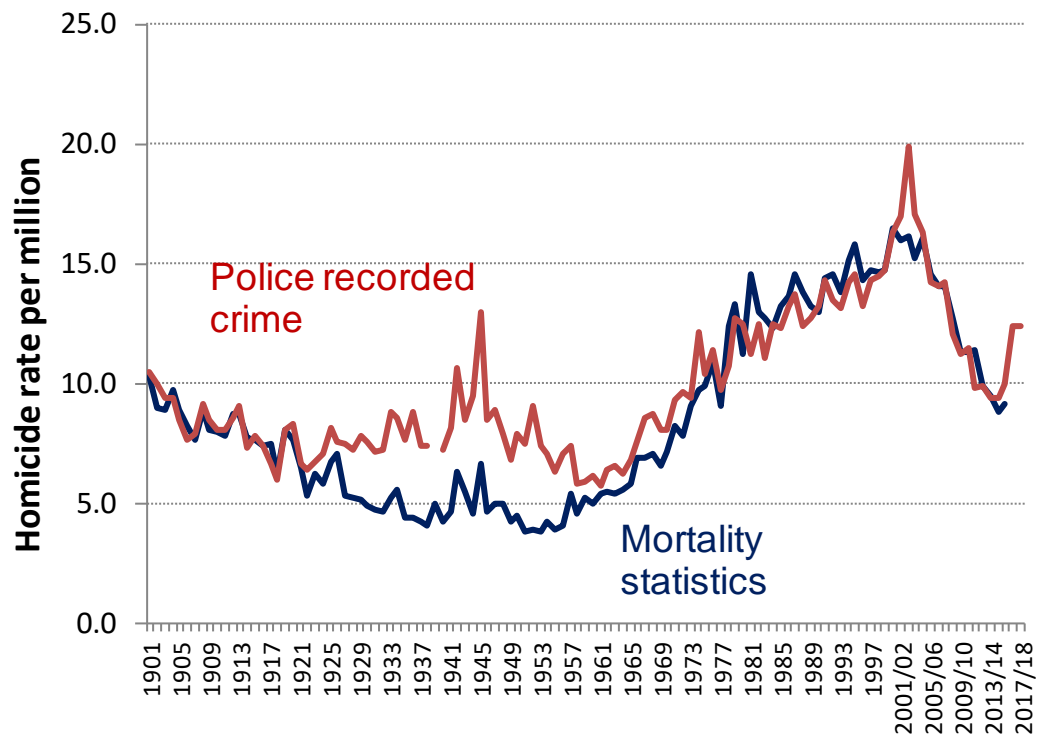


Figure A1.1a: Homicide rates in England and Wales since 1901



Notes: The mortality statistics are calendar year throughout. So 2013/14 is 2013 for that series. The sharp spike in the police recorded crime trends in both charts is caused by the Shipman cases, as explained below.

Overall, Figures A1.1 and A1.1a show a reasonably good level of agreement between police recorded crime and ONS mortality statistics. In 1900 there were fewer than 400 homicides recorded each year on both measures, which equates to a rate of around 10 per million in 1900. Numbers of homicides fell until about 1920 at which point the two series diverge.

Mortality statistics suggest that the long-term fall in homicides documented by Eisner continued right through to the early 1950s (with a few small spikes during the Second World War) at which point the homicide rates reached their all-time low. Police statistics suggest instead a slight rise between 1920 and 1945 followed by a slight fall, reaching their all-time low in the late 1950s. From 1960 the two series more or less converge again.

From 1960 through to the early 2000s, homicides increase on both measures from a rate of around 6 per million to more than 15 per million at the beginning of the 2000s (see Figure A1.1a). During the 1960s alone the rate increased by 40 per cent. Increases continued at a slower rate through the last decades of the twentieth century before peaking in the early 2000s.

The exact date of the peak depends on the way in which the estimated 218 homicides committed by Dr. Harold Shipman⁵ are treated. In the police statistics, 173 of these cases were recorded in 2002/03. However, the murders occurred between 1975 and 1998 (Griffiths 2003). In general, police statistics show crimes based on the date they were recorded, rather than when they actually happened. The Shipman cases therefore create a spike in the police series in 2002/03. By contrast, in the mortality statistics, all the Shipman homicides were recorded in the year in which the homicides occurred, so there is no spike and the series peaks instead in 2000.

From 2004 to 2014 there is a sharp decline in homicides in both series. The fall is around 35-45% depending on the series and whether numbers or rates are used. From 2014, the police series has increased again, by 35% between 2014/15 and 2017/18.⁶ That equates to almost 200 extra homicides per year. The 2017/18 rate is around 12 per million, higher than it was for much of the twentieth century, but still low from the overall historical perspective.

The recent rise is less visible in the mortality statistics because the series ends in 2015. This is because mortality records take time to be finalised. Many cases are still pending while it is considered whether the case actually was a homicide. As a result, totals for the most recent years are excluded because they are artificially low. (Further details are provided in the Technical Annex). This illustrates an important point about the way homicides are recorded. Sometimes the full facts of a homicide case, including whether it actually is a homicide case, only emerge gradually. Some crimes initially counted as homicide turn out not to be after investigation and occasionally the opposite happens too. The police series discussed to this

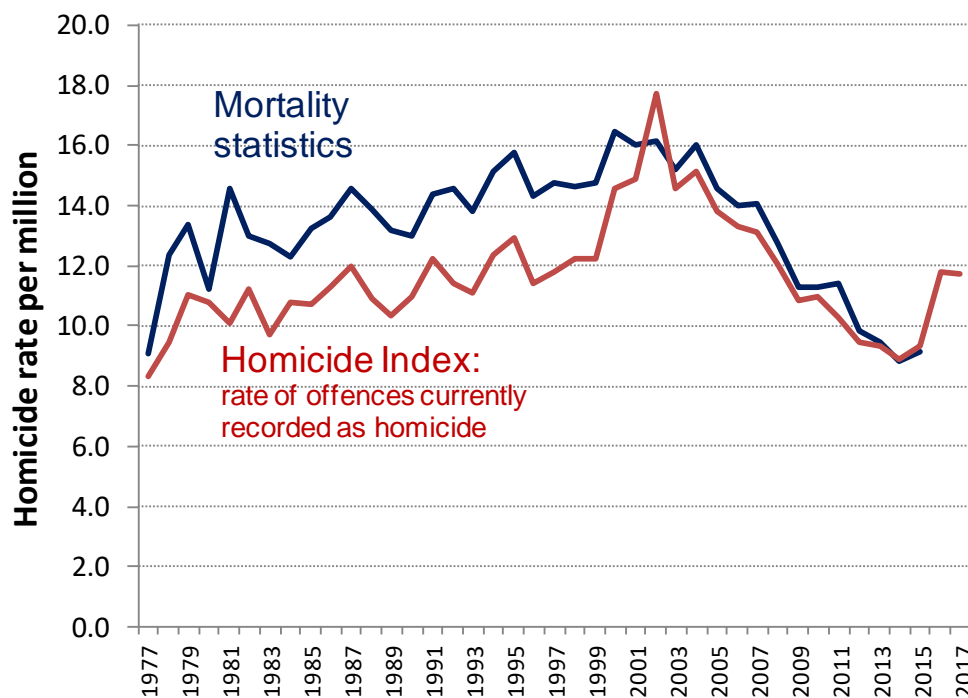
⁵ The estimate of 218 comes from Smith (2005). Available at: <https://webarchive.nationalarchives.gov.uk/20090808155110/http://www.the-shipman-inquiry.org.uk/reports.asp>

⁶ This is the increase in numbers of homicides based on the Police Recorded Crime series.

point essentially counts homicides at the initial point of recording, which is the way police recorded crime statistics generally work.

While the charts use the main police recorded crime series due to historical data being available, the preferred source for homicide statistics is now the Home Office Homicide Index, which is a far richer dataset and which shows both an 'initially recorded as' series and a 'currently recorded as' series. The "currently recorded" series is the most accurate and takes into account court outcomes. But it also takes the longest to emerge⁷, hence the publication of the police recorded crime series, which gives a more immediate guide to the latest trends and is very closely aligned with the 'initially recorded as' series from the Homicide Index. As the intention of this chapter is to understand the underlying drivers of the trends, the 'currently recorded as' series is used wherever possible. This series is shown in Figure A1.2 below alongside the mortality statistics.

Figure A1.2: Homicide rates in England and Wales since 1977



Sources: Mortality Statistics; Home Office Homicide Index

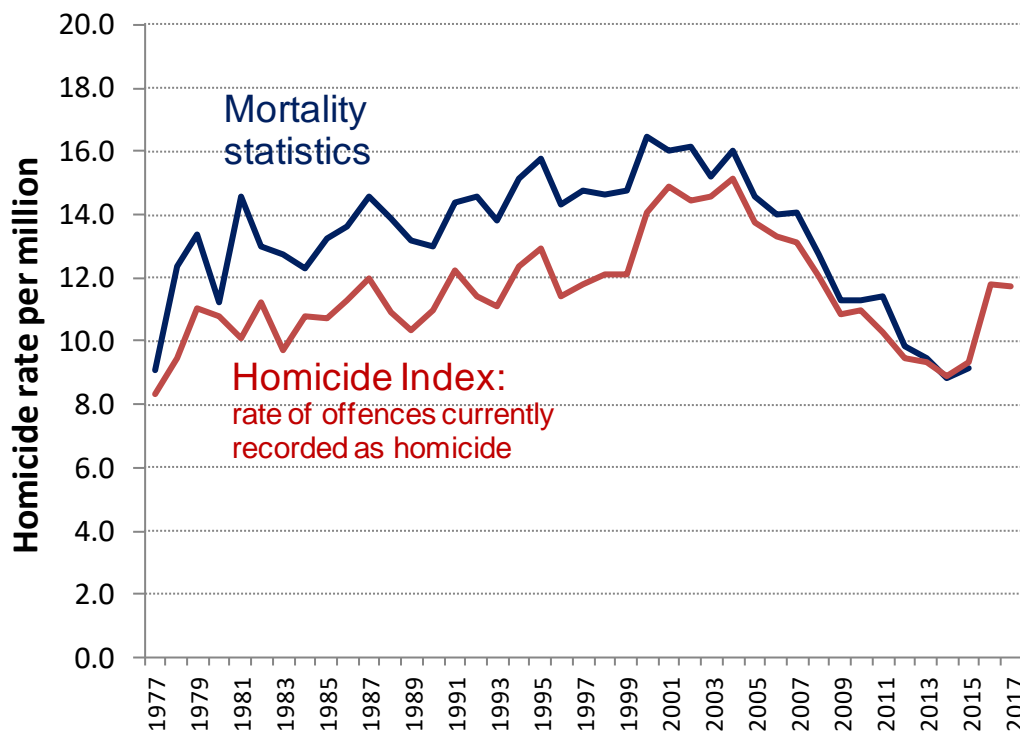
Again, there is reasonably good consistency between the two series. Both show a rising trend through to the early 2000s, followed by a sharp fall thereafter. The Homicide Index also shows a sharp increase from 2014 to 2017. The mortality statistics series stops in 2015 due

⁷ The 'initially recorded' series records cases the police initially thought were homicides. The count for a particular year will not therefore change with time. The 'currently recorded' series by contrast records the current status of the crime. It is possible for these figures to change at any time, as new information emerges to show either that a current homicide is not in fact a homicide, or vice versa. The number for a given year will therefore change depending when the data is taken from the database. Partly for this reason, the data is published with almost a full year lag.

to the lag in the series. But given the close correlation for previous years, it seems likely that this will also show a sharp rise when figures become available.

There are two main differences in the series. The Homicide Index trend has a peak in 2002 and has a consistently lower rate than the mortality series between 1980 and 2000. The first difference is caused by the recording of the 173 Shipman homicides in 2002. If these are removed from the Homicide Index series, along with all other homicides committed by Shipman, the series become even more similar, as shown in Figure A1.2a below.

Figure A1.2a: Homicide rates in England and Wales since 1977 with Shipman cases removed from Homicide Index series



Sources: Mortality Statistics; Home Office Homicide Index

That rates are noticeably higher in the mortality statistics series between 1980 and 2000 might be explained by a number of factors. One is that the exact method for counting homicides within the mortality statistics changed at various points. Full details are contained in the Technical Annex, but one of these recording practice changes occurred in 2001. This may have made the two series more closely aligned. The Shipman cases will also have contributed to some degree. Recall that these are included in the mortality statistics series in the year in which they actually occurred. This means they are recorded throughout the period 1975 to 1998. For the Homicide Index series they have been removed (in Figure A1.2a).⁸

⁸ Comparison with the 'initially recorded' series suggests another possible reason why the two series in Figure A1.2a start to converge in the early 2000s. At this time the 'initially recorded' and 'currently recorded' series also converge, meaning it is possible that previous to that point, the criteria for judging something not to be

To summarise: there are four different series of homicide data. Two of these, mortality statistics and police recorded crime, have been running since 1900 but only contain a limited amount of information. The Homicide Index has more information but most is only reliable from around 1977 onwards. It contains two series: offences initially recorded as homicide and those currently recorded as homicide. As the latter is most accurate it is used wherever possible in this report. Comparison of basic trends between the series reveals good correlation, providing confidence that the main trends are genuine and not artefacts of recording practice. These trends show that homicide rates fell between 1900 and 1960 before rising for four straight decades. There was then a sharp fall from the early 2000s to around 2014 when trends turned upwards again.

3. Mortality Statistics: Trends in sex and age of victims since 1900

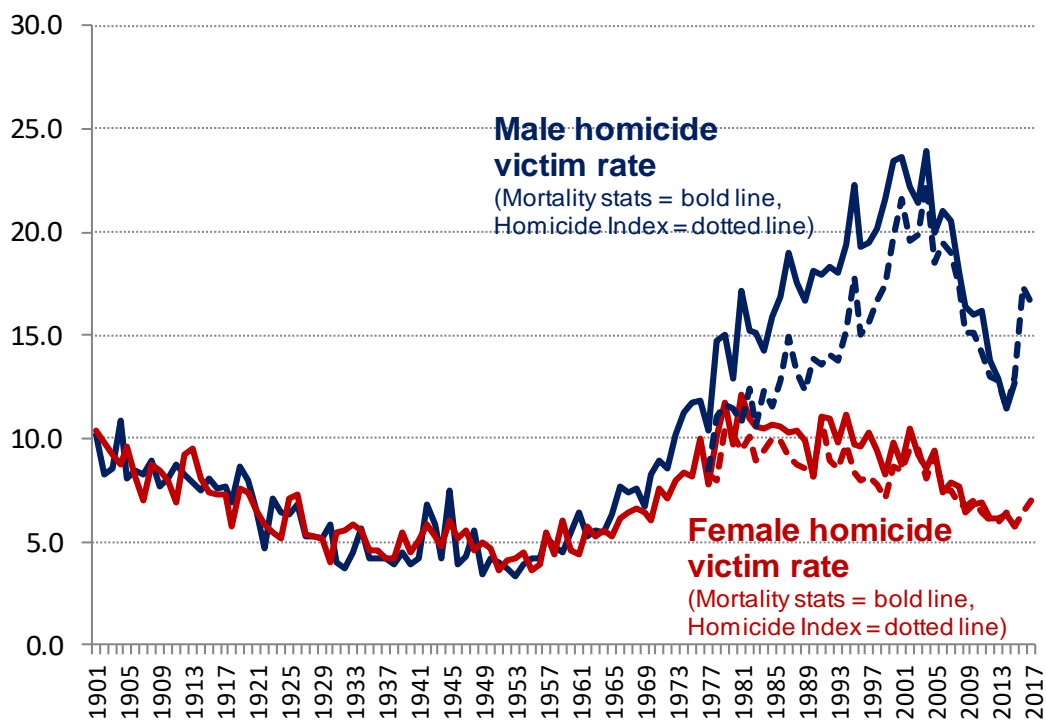
The four different homicide trend series have different advantages and disadvantages. The police recorded crime series is both the most up to date and published data is available back to 1898. But it shows only total homicides. It does not allow for any other breakdowns. The Homicide Index series (initially recorded and currently recorded) are the most granular, allowing for many different breakdowns. But most Homicide Index series are only reliable from 1977/78 and some start even later than that. These are explored in later sections. This section looks at the Mortality Statistics series, which has a very long times series and allows for breakdowns by age and sex of victim. A surprising amount can be gleaned about the drivers of homicides from these simple breakdowns, as this section will show.

Figure A1.3 shows the homicide trend since 1901 broken down by sex of victim. The Mortality Statistics are the main series, though Homicide Index data is shown for comparison from 1977/78. For the period covered by both series there is a reasonably good level of agreement regarding the main trends⁹.

homicide may have changed. For example, it is possible there was a change in recording practice concerning cases in which an offender (or offenders) was/were acquitted and no further suspects were recorded. This could be recorded automatically as a non-homicide, but the current practice is to gauge whether the case still appears to be a homicide, even if an offender is acquitted.

⁹ Rates are shown in Figure A1.3 for mortality statistics and for Homicide Index data. Trends based on counts show very similar patterns to this chart, due to the male/female population split being consistently very close to 50/50.

Figure A1.3: Homicide trends broken down by sex of victim



Note: Homicide Index trend is 'currently recorded as' series with Shipman cases removed.

Sources: Mortality Statistics; Home Office Homicide Index

The mortality statistics suggest that rates of male homicide victimisation were very similar to female rates for most of the twentieth century, and both followed similar trends. They declined to a low point in the 1950s and then increased from 1960. However, around 1980, trends in male and female victimisation abruptly diverged. Thereafter, all the main trends – the rise to the early 2000s, the fall to 2014, the recent increase – have been driven mostly by male victimisation. Female victimisation has generally followed a flat or slightly declining trend through that period.

Even though the Homicide Index data presented here start in 1977/78, they corroborate the idea that there was a divergence in male and female victimisation rates that occurred around about 1980. For the first five years of the series, male rates are comparable to female rates (they are on average 16% higher). But for the period 1998 to 2013, male rates were consistently more than double female rates.

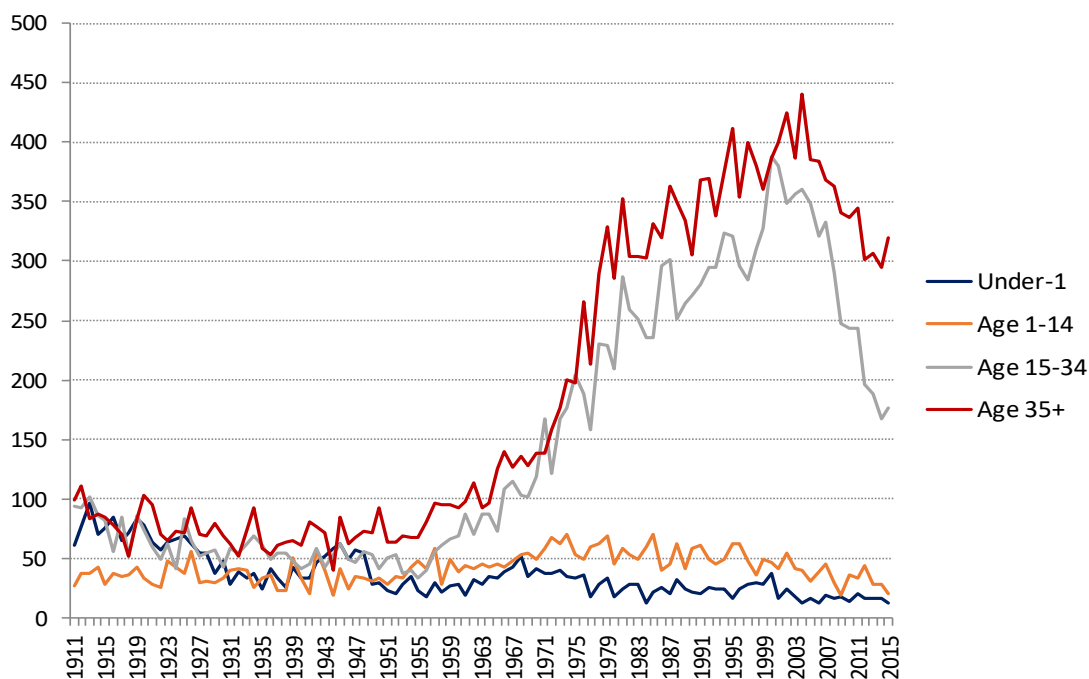
Several tentative conclusions arise from this analysis. Firstly, it seems clear that whatever drove homicide upwards during the period 1960 to 1980 drove up male and female homicide victimisation equally. But from 1980, drivers of homicide may have shifted. From that point there may have been different drivers for male and female trends.

Previous analysis has shown that female homicide victims are most often killed by their partners or ex-partners or another family member, whereas male victims are more likely to be killed by acquaintances (people they know by sight but are not necessarily friends) or by strangers¹⁰. For example, published data for the last decade show that 74% of female-victim homicides (in which the perpetrator is known) were committed by partners or ex-partners or family members, while for male victim cases, 72% were committed by acquaintances or strangers. It seems likely that the drivers of domestic/intimate-partner homicide differ from male-victim acquaintance/stranger homicides. The analysis in this section suggest these drivers have operated separately since about 1980. This is explored further in section 11 below.

Age

Figure A1.4 below shows the long-term Mortality Statistics series broken down by the age of the victim.

Figure A1.4: Numbers of homicides in England and Wales, broken down by age of victim



Source: Mortality Statistics

The chart shows that the large rise in homicides that started around 1960 and the large decline during the 2000s were both driven almost entirely by cases involving victims over the

¹⁰ ONS (2018). Homicide in England and Wales, year ending March 2017. Section 5: How are victims and suspects related. Available at:

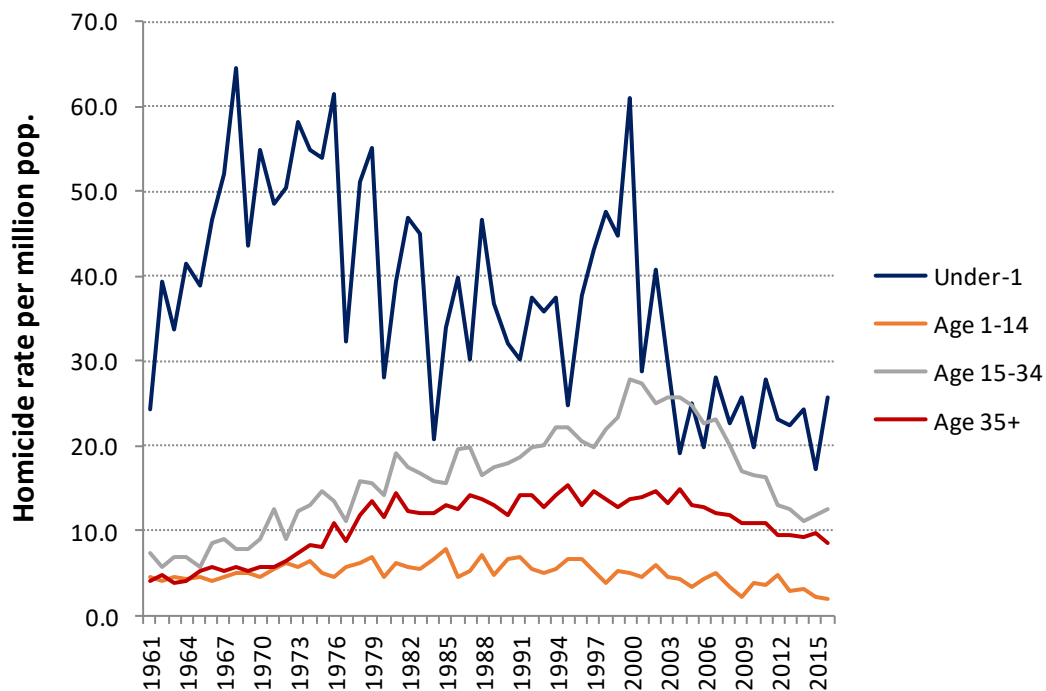
<https://www.ons.gov.uk/peoplepopulationandcommunity/crimeandjustice/articles/homicideinenglandandwales/yearendingmarch2017#how-are-victims-and-suspects-related>

age of 15. The trend in homicides against those aged 15-34 very closely correlates with the trend in homicides against those aged 35+. Both increased and then decreased markedly over the last 70 years.

None of the above means that the overall trend has always been driven by homicides against those aged 15+. In the early twentieth-century homicides against under-1s were about as numerous as cases against 15-34s and cases involving victims aged 35 and over. Homicides against babies then fell through the early decades of the twentieth century and although they increased slightly during World War II and through most of the 1960s, in general they remained at a low level throughout the series. Homicides against children aged 1-14 also remained at a low level, making any trend difficult to see in the chart above. However, inspection of the data shows that homicides against 1-14s almost doubled between 1945 and 1975 before falling thereafter to reach the same low levels as in the first half of the century.

Figure A1.4a shows that the picture changes considerably if rates are used instead of volumes. For these age categories, rates are only possible from 1961 onwards.

Figure A1.4a: Homicide rates in England and Wales, broken down by age of victim



Source: Mortality statistics

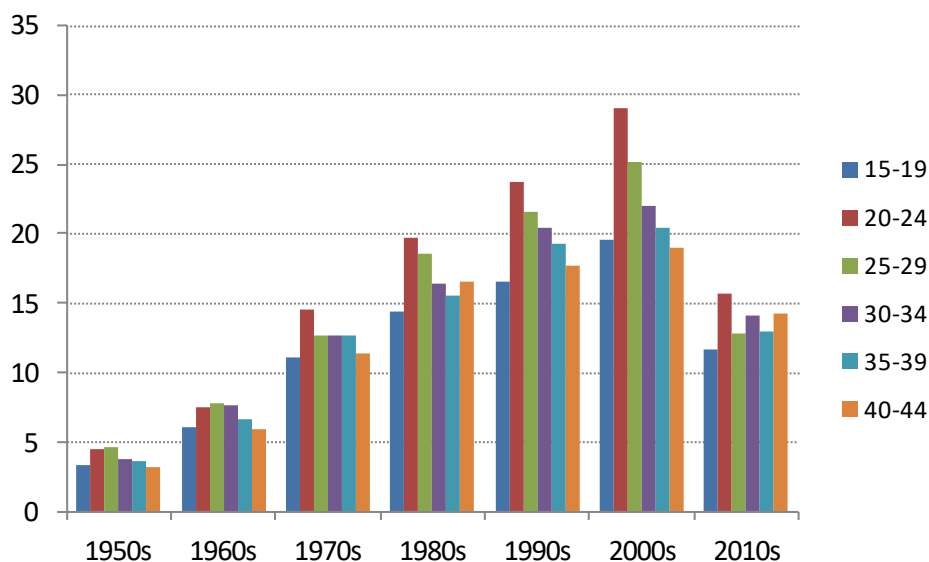
Converting to rates gives a completely different picture of importance. It shows that rates of homicide against babies have almost always been higher than rates of homicides against children and adults. The gap did narrow due to the large volume increase in homicides against over-15s, and briefly in the mid-2000s – close to the homicide peak - those aged 15-34 suffered a higher homicide rate than those aged under-1. But as overall homicide has declined, the under-1 rate has again become the highest. In some respects, this is an

artificial comparison – we are comparing a single year (under 1) with a wide age band (15-34). But more granular analysis [see Technical Annex] shows that the rate of homicide against under-1s has been higher than for victims of all other individual-year ages in 30 of the 41 years between 1977/78 and 2017/18. In line with Figure A1.4a, victimisation rates for Under-1s were consistently higher than any other individual age year from 1977 through to the mid-1990s. After that the under-1s have the highest individual age-year rate in about half the years, with those in their 20s having the highest rate in most other years.¹¹

The trends are also interesting. The under-1 trend is volatile but the familiar rise from 1960 is still visible. From the late 1970s though, the rate clearly drops from more than 50 homicides per million to between 30-40 per million through most of the 1980s and early 1990s. There is then a clear spike around the turn of the millennium. Thereafter the rate drops to below 30 per million and become far less volatile, meaning that the rate of homicide against babies is now lower and more stable than it has been since 1960.

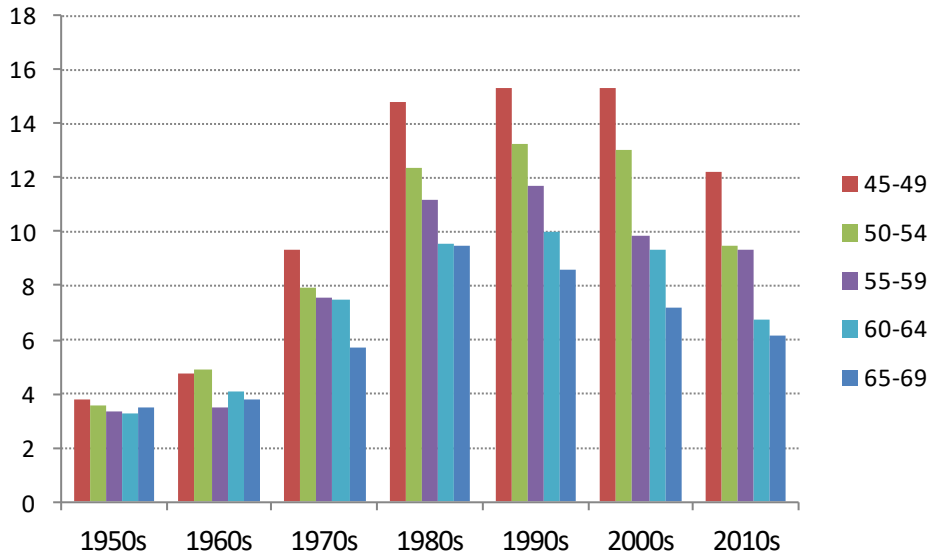
Returning to Figure A1.4 and the trends for victims aged 35+. More granular analysis was done to examine the correlation between the 35+ trend and the trend for 15-34s. The conclusion was that this correlation is driven by the younger age groups within the 35+ range. One way to demonstrate this is to use rates (to remove ageing population effects) and to average the rates across decades by age group. This is shown in Figure A1.5 below.

Figure A1.5: Average homicide rates in England and Wales, by age and decade



Source: Mortality statistics

¹¹ This analysis, shown in full in the Technical Annex, uses the Homicide Index and only looks at individual age-years below 50. This is because there are occasions where just a few homicides of very elderly individuals can drive a very high rate for that age-year given the low population numbers for the very elderly.

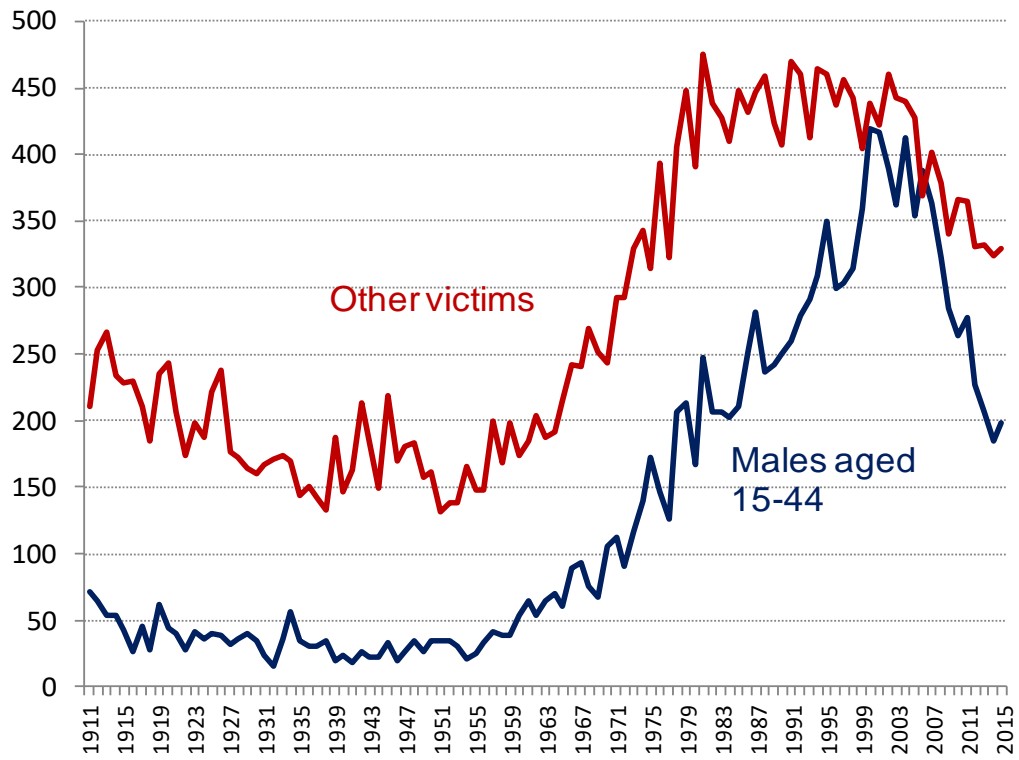


Source: Mortality statistics

The top chart shows that for all the five-year age bands from 15 to 44, average homicide rates increase decade-on-decade from the 1950s to the 2000s before falling back in the (early) 2010s. But the bottom chart shows that the pattern is slightly different for the age bands above 45. For those groups, the real increase occurs between the 1960s and the 1980s. From the 1980s to the 2000s the average rates are quite stable (or falling for the 65-69s). Notice also the different scales. There are higher homicide victimisation rates generally for the younger age groups. Overall, these charts perhaps suggest that there were two phases to the rise in homicide rates between 1960 and the early 2000s: an initial phase up to 1980 which affected both men and women and all age groups and a second phase post-1980 which primarily affected male victims aged 15-44.

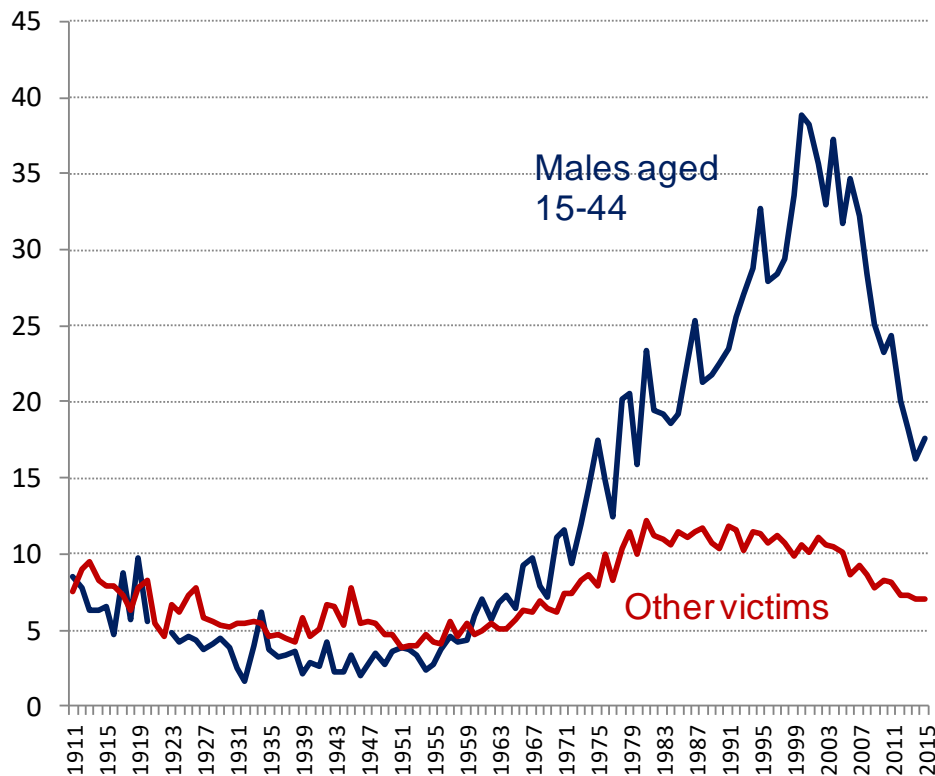
This can be further tested by looking at age and sex simultaneously, rather than in separate charts. Counts and rates by victim age and sex are shown in Figures A1.6 and A1.6a respectively.

Figure A1.6: Homicides in England & Wales, broken down by age and sex of victim



Source: Mortality statistics

Figure A1.6a: Homicide rates in England & Wales, broken down by age and sex of victim



Source: Mortality statistics

To summarise: Figures A1.6 and A1.6a show that the initial rise in homicides from the 1960s to the 1980s was due to rises in cases involving all types of victims. After that, from the 1980s to the early 2000s, the risk of victimisation increased dramatically for males aged 15-44 but stayed roughly stable for all other victims. Theories attempting to explain the drivers of these trends need therefore to be consistent with these different patterns.

4. The Homicide Index data from 1977/78 to 2017/18

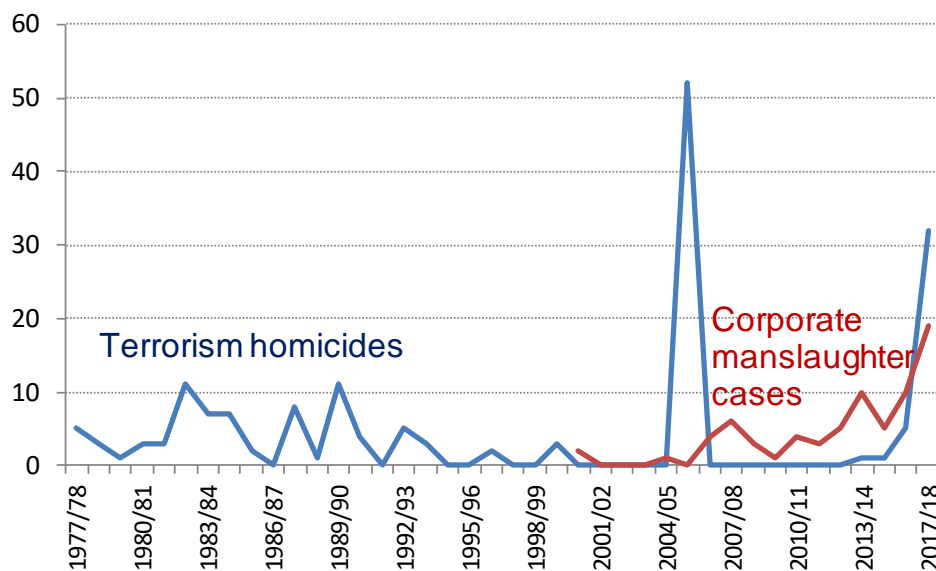
From this point on, this chapter uses the Homicide Index data series from 1977/78 to 2017/18. The richness of this series allows for more breakdowns than the mortality statistics. Before 1977/78, the Homicide Index data are based on paper records which are not consistently populated. To try and study the underlying drivers of homicide trends we make three key adjustments to the data.

- i) Terrorism and corporate manslaughter cases¹² are excluded. As Figure A1.7 demonstrates, these cases – which are likely to have very different causes and

¹² Corporate manslaughter cases were identified using the Homicide Index field 'Initial classification of offence'.

motivation to other homicides – have not played a significant role in driving overall trends. For most of the series there are fewer than 20 of these cases per year combined. The exception is 2005/06, the year of the 7 July attacks in London, when there were 52 terrorist homicides. Overall, the Homicide Index records 170 victims in England and Wales who were killed by terrorist attacks since 1977/78. This is less than a quarter of the total number of homicides in 2017/18. However, as Figure A1.7 shows there has been an increase in both terrorist homicides and corporate manslaughter cases since 2014/15. Together these cases explain 18% of the rise from 2014/15 to 2017/18 (terrorism 15% and corporate cases 3%). They are therefore an important part of the recent increase in homicide but are excluded from other analyses because of their wholly different motivation from other homicides.

Figure A1.7: Number of terrorist homicides and corporate manslaughter cases, 1977/78 to 2017/18



Source: Home Office Homicide Index

ii) The Shipman and Hillsborough homicides are excluded along with homicides in which ten or more victims are killed in a single incident. This paper aims to study drivers of trends. For that reason it makes sense to exclude the Shipman and Hillsborough cases because they did not all occur in the year in which they were recorded. It also makes sense to exclude other multi-victim homicides. This is because we want to study changes in the make-up of victims, offenders, weapons used etc. Including, for example, the Denmark Hill fire of 1980 in which 37 people were killed in a single arson attack would make it appear as if arson suddenly became a typical method of homicide. In fact, all these homicides occurred in a single incident. For that reason, homicide incidents involving more than ten victims are removed. These omitted cases are listed in Table A1.1.

Table A1.1: Non-Terrorist homicide incidents involving more than 10 victims, by year occurred and year recorded on HI

Incident name	Year occurred	Number of victims	Year recorded on HI
Denmark Hill fire	1980	37	1980/81
Hungerford massacre (Michael Ryan)	1987	16	1987/88
Hillsborough	1989	96	2016/17
Dover lorry suffocation	2000	58	2000/01
Morecambe Bay cockle pickers	2004	20	2003/04
Cumbria shootings (Derrick Bird)	2010	12	2010/11
Shoreham air crash	2015/16	11	2017/18
Harold Shipman cases	1970s to 1998	15	1998/99
"	"	25	1999/00
"	"	1	2000/01
"	"	173	2002/03
"	"	4	2004/05

- iii) For all suspect trends principal suspects are used. One of the advantages of the Homicide Index data is that it allows for study of suspects as well as victims. However, homicide suspect data series are more complex than victim series for at least five reasons:
- a) A proportion of homicides will go unsolved so no data on suspects are available for those cases.
 - b) Suspect/perpetrator statistics will vary depending on which stage of the Criminal Justice System is taken as the threshold for identification of the individual. For example, a larger pool of individuals will be charged with homicide than the pool who will be convicted.
 - c) A proportion of homicides involve multiple perpetrators, but homicide statistics are calculated on a per victim basis in England and Wales. A case in which several individuals attack and kill a single person will be counted as a single case in the homicide totals. This means that suspect statistics will differ depending on whether they are counted on a per homicide basis or a per suspect basis.
 - d) A proportion of homicides involve multiple victims. Because total homicides are counted on a per victim basis, a single suspect can be counted multiple times if counting is done on a per homicide basis. For example, the age and sex of a male suspect would appear three times in the data if that individual killed three people in a single incident. The alternative is to count unique suspects. This gives rise to different totals than for total homicides.

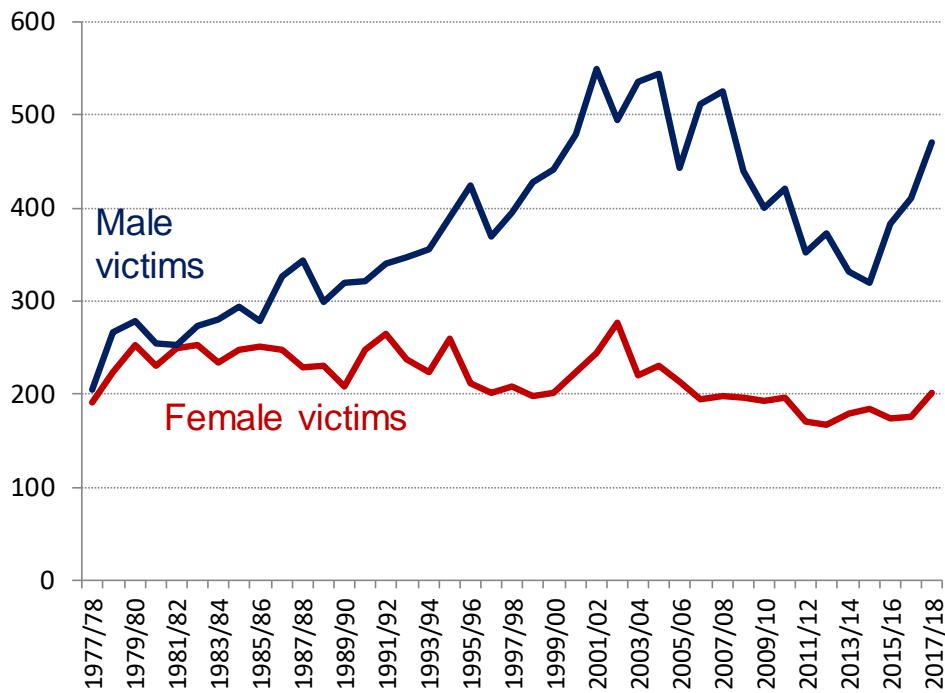
- e) A proportion of homicides are corporate manslaughter cases in which the perpetrator is given as the company or institution rather than an individual.

These factors mean that there are a large number of different permutations for displaying suspect statistics. Given that the aim of this report is to study drivers of homicide trends, a key question was whether trends differ depending on the method selected. The results of that analysis are in the Technical Annex. The overall conclusion was that the large multi-victim cases, like Shipman, clearly skew the suspect series, creating a somewhat artificial view of the typical age and sex of homicide suspects. So these cases were excluded. To deal with the other points listed above, this report uses non-unique *principal suspects*. The principal suspect is an individual charged with homicide. When more than one person is charged, the principal suspect is generally the individual that receives the longest sentence for the offence. (Further details are in the Technical Annex). This means only one homicide suspect is counted per homicide incident in this analysis, so by including no-suspect cases (point a) above) in all tables and charts, this method means that the total number of suspects for each year will equal the total number of victims and hence the total number of homicides.

5. Trends in victim and suspect sex from 1977/78 to 2017/18

This section looks at homicide broken down by victim and suspect sex, using the Homicide Index dataset outlined in the previous section. Figure A1.8 looks first at victim trends.

Figure A1.8: Numbers of homicides in England and Wales, broken down by sex of victim

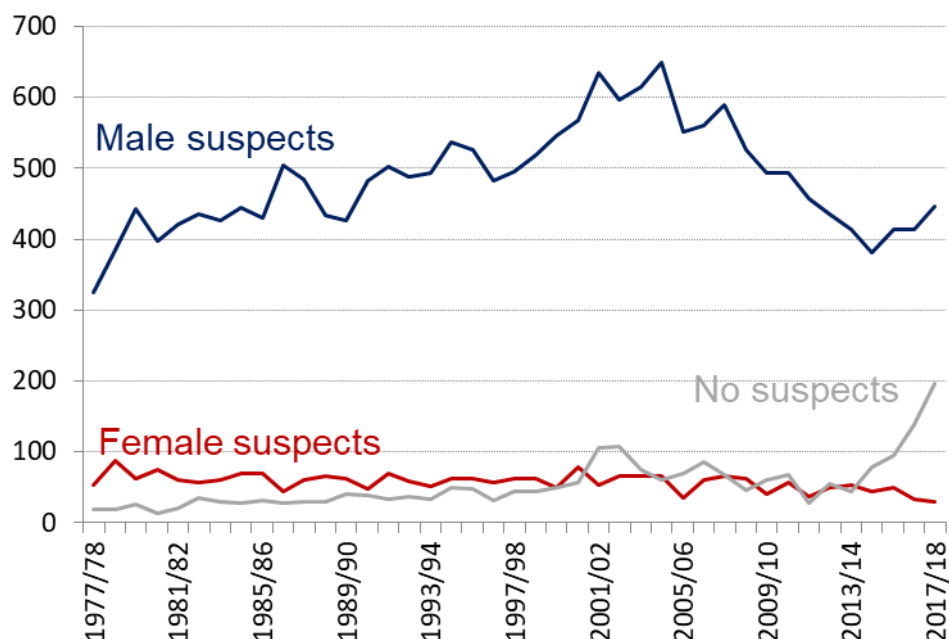


Source: Homicide Index

These trends are similar to the equivalent ones in the Mortality Statistics discussed previously. The conclusions are the same. Male victimisation has driven most of the changes in the overall homicide trend in the last 40 years. Female victimisation has generally trended slightly downwards with some volatility. That means the percentage of male victims increased when homicide increased and vice versa. In the late 1970s homicide victims were almost equally likely to be female as male but at the homicide peak in the early 2000s, fewer than 30% of homicide victims were female. For the homicide rise from 2014/15, 90% can be accounted for by increased male victimisation.

Unlike the Mortality Statistics, the Homicide Index can also be used to study trends in the sex of suspects. These are shown in Figure A1.9 below. [Note that rates are not calculated for suspect trends because it is not possible to calculate a meaningful rate for no-suspect cases].

Figure A1.9: Numbers of homicides in England and Wales, broken down by sex of suspect



Source: Homicide Index

This chart shows that most of the main homicide trends over the last 40 years have been driven by male-perpetrated cases. Partly this is simply because the majority of homicide suspects are male: 81% of all homicides through the period had male principal suspects and this rises to 87% if no-suspect cases are excluded. But also, the male-suspect trend follows the overall trend with a peak in the early 2000s, followed by a decline, and then a rise from 2014. The female-suspect trend, like the female-victim trend does not show these peaks and troughs. It declines generally, particularly from the mid-2000s on. This means that the *proportion* of male suspect cases has risen when homicide has risen and fallen when it has fallen (when no suspect cases are removed). For example, for the five years from 1977/78 to 1981/82 85% of known suspects were male. For the next five years this increased to 88% and for the five years around the peak (2001/02 to 2005/06) it reached 92%. It fell back to 90% in the decade following the peak before returning to 92% in 2017/18.¹³

The chart also shows that no-suspect cases tend to increase when overall homicide does, and this has been particularly noticeable in the current rise. This is likely to be partly an artefact caused by the time required to investigate homicide cases, which can be complex, and charge suspects. It is expected that in a few years some of those recent no-suspect cases will have suspects, most of them male. However, further examination of the grey (no-

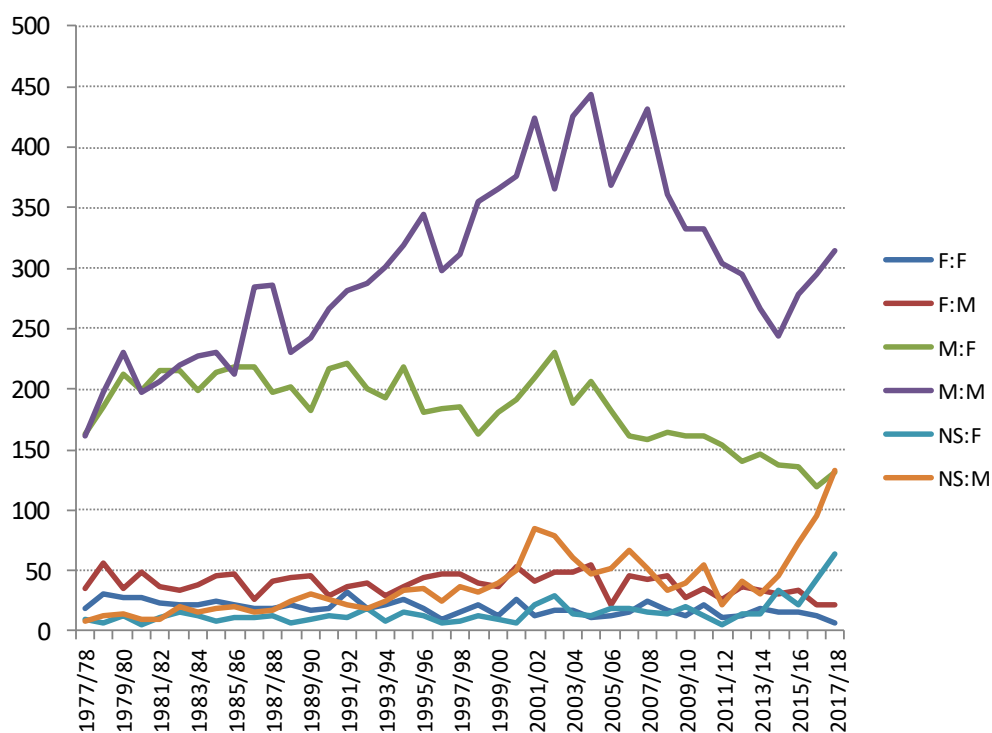
¹³ Note that this only includes the average of the last three years though. The moving average has been calculated using the middle year in a five-year series. So, for the latest year it only includes the last three years as data for the two years after 2017/18 are not yet available.

suspect) line suggests that at the previous peak in the early 2000s there was a clear rise in no-suspect cases that can no longer (in 2019) be explained by a time lag effect.¹⁴

Overall then, there is some evidence that when homicide has risen over the last 40 years it tends to have been driven by male-perpetrated cases or no-suspect cases. The latter may indicate that when homicide increases it is driven in part by a type of homicide that is harder to investigate.

The victim and suspect sex trends can be combined to look at male-on-male cases, male-on-female cases etc. These trends are shown below in Figure A1.10.

Figure A1.10: Numbers of homicides in England and Wales, broken down by sex of victim and suspect (suspect first, then victim)



Source: Homicide Index

Note: In addition to other exclusions, this chart also excludes cases of unknown sex.

The chart suggests that until the mid-1980s male-suspect homicides were as likely to involve a female victim as a male victim. But from that point on, male on-male cases have dominated and were responsible for all the main trends apart from a noticeable peak in

¹⁴ In addition, during the year ending March 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 led to a decrease in the number of homicides with pending or in progress cases, and a corresponding increase in final outcomes. This exercise was not carried out this year; therefore, homicide cases for the year ending March 2017 will have a higher number of pending or in progress cases.

male-on-female cases in line with the overall peak in the early 2000s and the recent rise in no-suspect cases already discussed. The chart shows that this has been driven mainly by no-suspect cases involving male victims, although female-victim cases have also risen. Homicides in which a known male kills a female remain close to their lowest level since 1977/78.

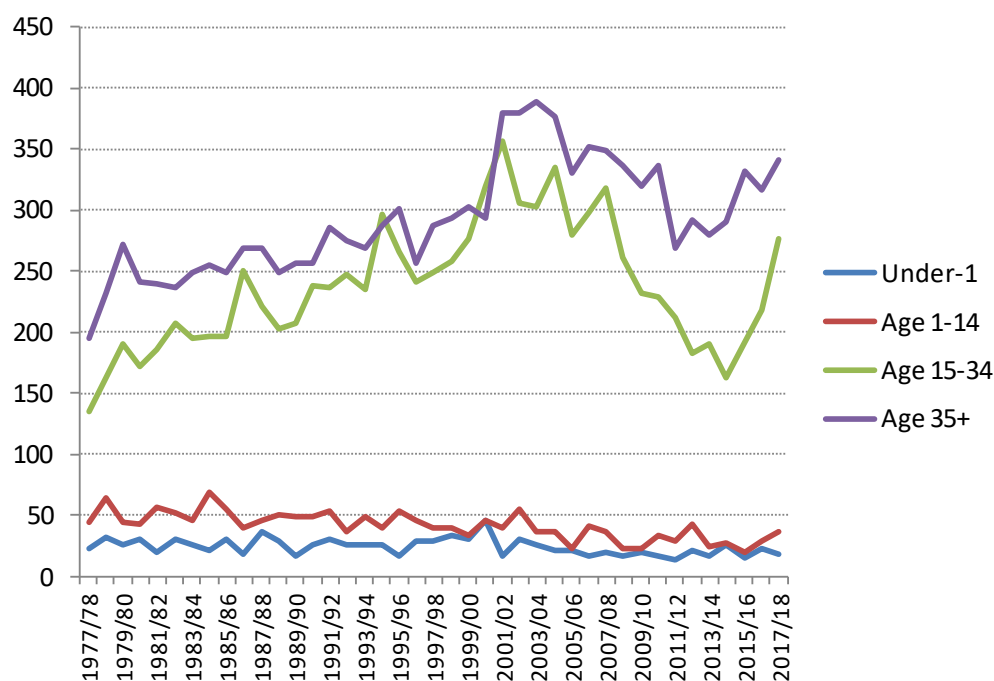
6. Trends by age of victim and suspect from 1977/78 to 2017/18

Victim age trends have already been discussed in section 3 using the Mortality Statistics series. Trends for the Homicide Index since 1977/78 are extremely similar (see Figure A1.11 in comparison with Figure A1.4). As a result, most of the conclusions to be drawn from the data are the same:

- a) volume trends have been driven by homicide cases involving victims over 15 although under-1s suffer the highest rate of homicide (data showing rates are also available in the accompanying data tables); and
- b) trends in victims aged 15-34 have fallen and risen particularly sharply in the last ten years.

However, the Homicide Index series also allows for more insight on the latest increase, as in Figure A1.11. It is clear that the rise since 2014/15 has been driven by homicides involving victims aged 15-34 (69% of increase) and 35+ (31% of increase).

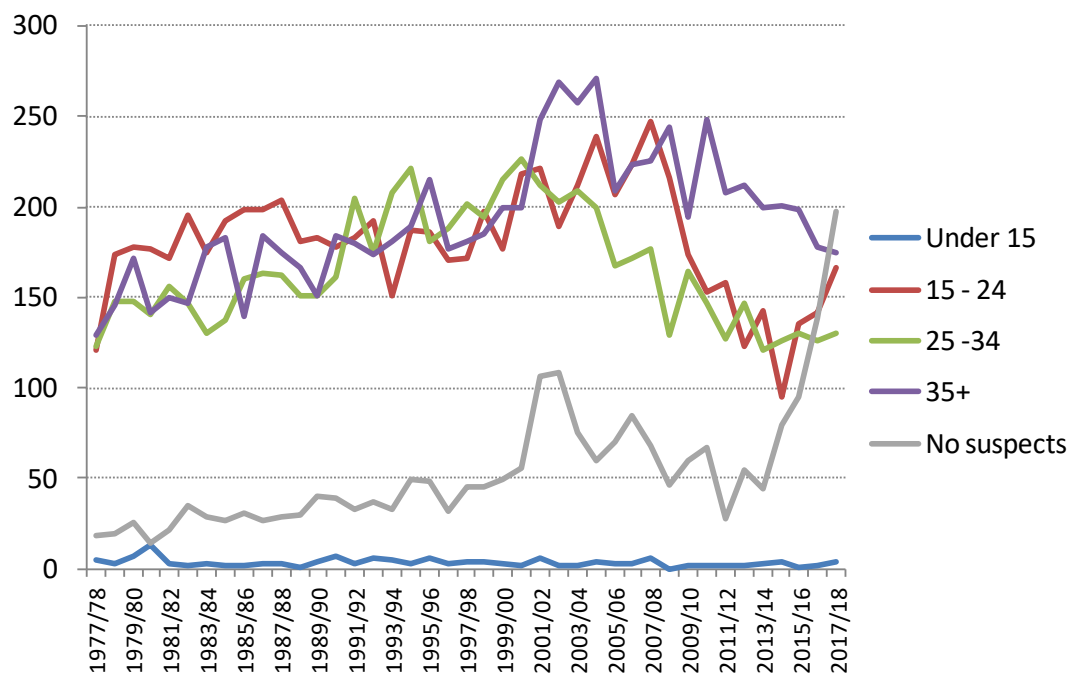
Figure A1.11: Homicides in England and Wales, broken down by age of victim



Source: Homicide Index

Unlike the Mortality Statistics, however, the Homicide Index also allows for trends by age of suspect and these are shown in Figure A1.12.

Figure A1.12: Homicides in England and Wales, broken down by age of suspect 1977/78 to 2017/18



Source: Homicide Index

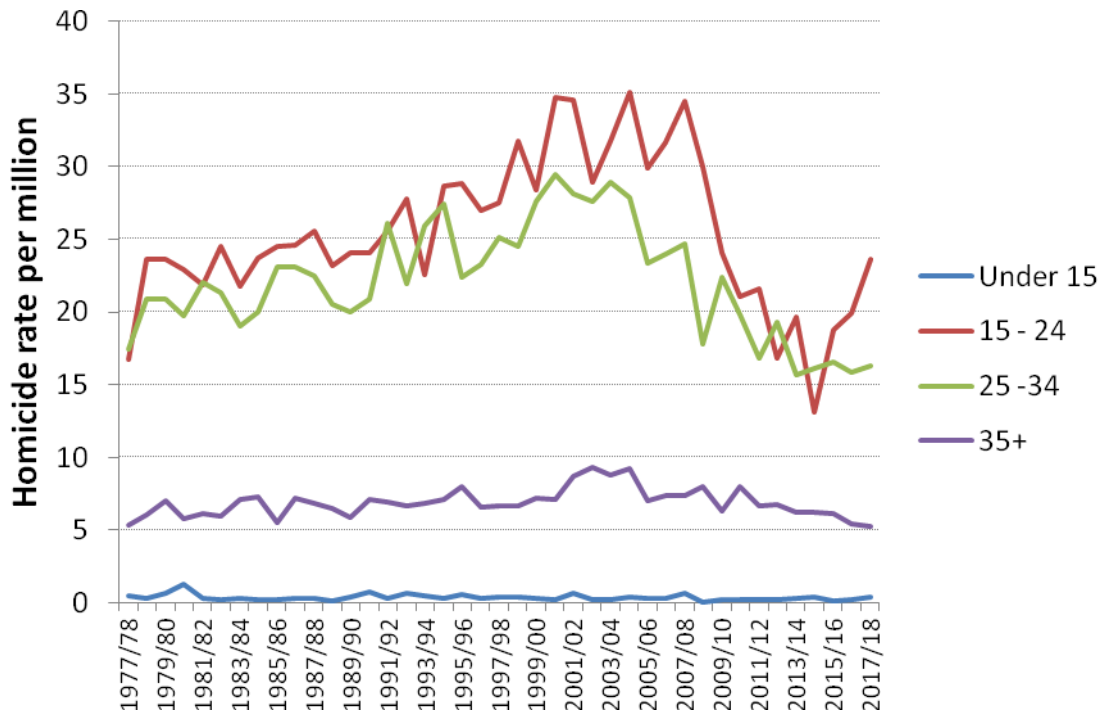
The trends are quite volatile but careful examination reveals some interesting patterns. The number of suspects aged 15 and under is low throughout the series. The number of suspects aged 15-24 is relatively flat from 1980 to 2000 but increases through the 2000s before falling very sharply in around 2008. The trend-line for suspects aged 25-34 is fairly similar to the overall homicide trend: it increases to a peak in the early 2000s and then decreases sharply. The trend for suspects aged 35+ also increases to an early 2000s peak but that peak is sharper with a notable jump in homicides in the early 2000s. It also declines thereafter although by less than for the other age groups. The fall from trend peak in the 2000s (which varies by age group) to trend trough in the 2010s is 62% for suspects aged 15-24, 46% for suspects aged 25-34 and 35% for those aged 35+.

For the recent increase in homicide since 2014/15, Figure A1.12 shows that only the number of suspects aged 15-24 has risen markedly and is at its highest point since 2009/10. However, the large increase in no suspect cases makes it impossible to say with complete certainty that this age group have been primarily responsible for the recent rise in overall homicide. Overall, homicides involving suspects aged 15-24 account for 38% of the upward pressure on homicide since 2014/15 and no suspect cases account for 62%.¹⁵

¹⁵ The phrase 'upward pressure' is used because the increases in these categories total more than the overall increase in homicide between 2014/15 and 2017/18. Other age categories show aggregate falls over the

As with victims (see Section 3), converting the suspect trends to rates provides a change of perspective, though in this case it is less dramatic, as evident from Figure A1.12a below.

Figure A1.12a: Homicide rates in England and Wales, by age of suspect



Source: Homicide Index

The chart shows that those aged 15-34 have far higher rates of homicide perpetration than those aged older or younger. The rate for suspects aged under 15 is particularly low throughout the series. The rate of those aged 15-24 shows more of an increase from the 1980s to the 1990s in this chart (compared with Figure A1.12) because the number of 15-24 year-olds actually fell during that period. It is similar in trend and level to that of 25-34 year-olds from 1977 to 2000. But in the late 2000s, the rate of homicides perpetrated by 15-24s stayed high (to 2008) before falling sharply, whereas the trend for 25-34 year-olds starts falling earlier. That means that for a brief period in the second half of the 2000s, the homicide charge rate for 15-24s was around 10 per million higher than the rate for 25-34 year-olds. By 2010 that gap had closed up again. Since 2014/15 it has opened up again.

The biggest difference between Figures A1.12 and A1.12a is the trend-line for those aged 35+. This age group has the highest volume of homicide suspects at the peak in the early 2000s, but Figure A1.12a shows that their rate remains considerably lower than for younger

period. So the percentage calculations show the proportion of the total upward pressure that can be attributed to no suspect cases and those involving 15-24 year-old suspects. These appear different from other similar calculations in the paper showing, for example, that no suspect cases can explain 71% of the increase from 14/15 to 17/18. The latter calculation uses the total homicide increase as the denominator, rather than the total 'upward pressure'.

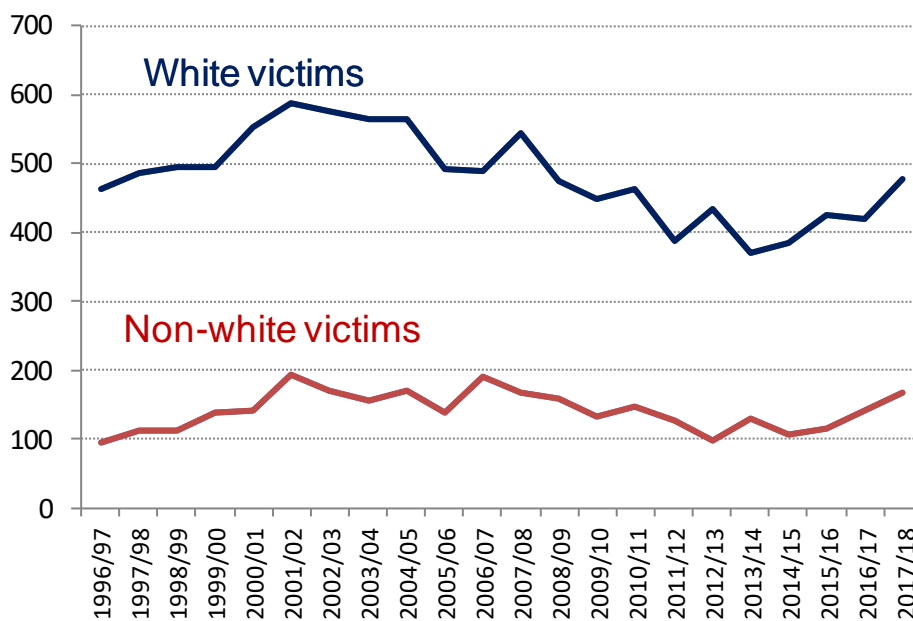
adults, partly because this age group encompasses a much larger range than other age categories. The increase between 1977 and 2000 in homicide suspects aged 35+ is 55% when looking at volumes and 33% when looking at rates. The difference is due to the ageing population. The number of the population aged 35+ has increased by an average of 0.8% per year since 1977.

The Homicide Index allows for cross-tabulation of age and sex data. This shows that 74% of the rise in homicide between 2014/15 and 2017/18 can be accounted for by an increase in victimisation of males aged 15-44.

7. Victim and suspect ethnicity and country of birth¹⁶

The Homicide Index holds reliable data on victim and suspect ethnicity from 1996/97 onwards. Trends in numbers of victims by ethnicity are shown in Figure A1.13.

Figure A1.13: Homicides in England and Wales, broken down by ethnicity of victim where ethnicity is known, 1996/97 to 2017/18



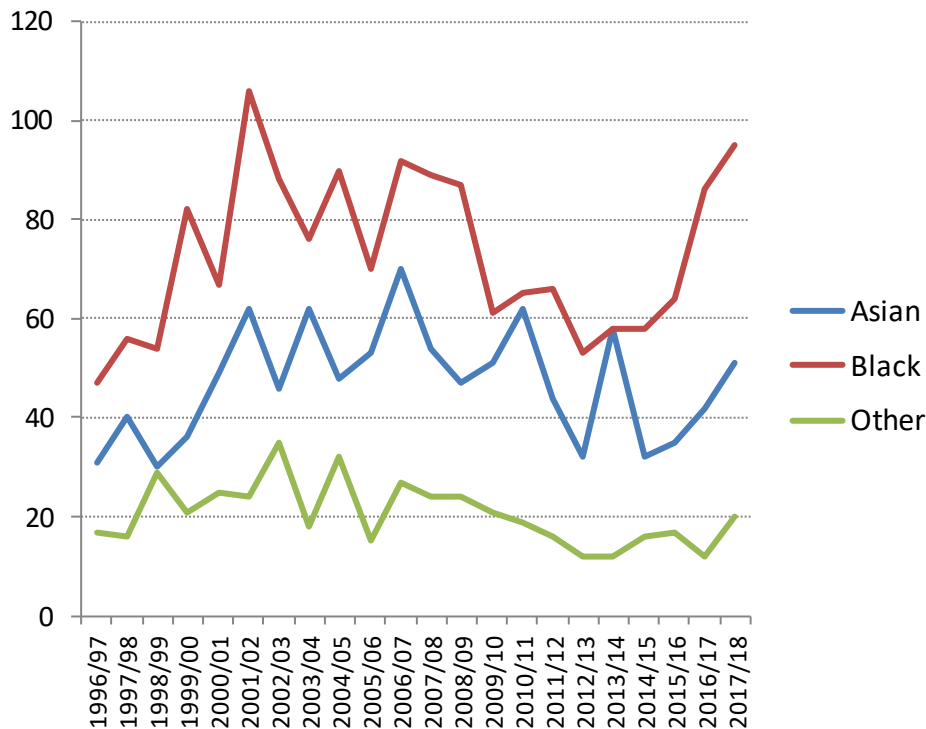
Source: Homicide Index

Figure A1.13 shows that there have been considerably more White victims than victims of other ethnicities since 1996/97. However, the trends are very similar. There is an increase for both White and non-White victims from 1996/97 to 2002/03. These are similar volume

¹⁶ Both suspect and victim ethnicity measures used in this section are police officer-identified ethnicity classifications based on visual appearance. There is also a self-reported suspect ethnicity measure in the Homicide Index but this has a shorter time series.

increases meaning that the rise in non-White victims is greater in proportional terms. In 1996/97 there were over four times the number of White victims as non-White (when considering cases where ethnicity was known).¹⁷ By 2002/03 this had fallen to three times. Both White and non-White victims decrease between the early 2000s and 2014/15 although the peak in non-White victims is later, in 2006/07. Both trends then show a small but noticeable rise since 2014/15.

Figure A1.14: Homicides of non-White victims in England and Wales, broken down by ethnicity of victim where ethnicity is known, 1996/97 to 2017/18



Source: Homicide Index

Breaking the numbers of non-White victims down by ethnicity (Figure A1.14) shows that numbers of Black victims more than doubled between 1996/97 and 2001/02. They then fell back before increasing sharply from 2014/15. Numbers of Asian victims also increased in the early years of the series but have a later peak (2006/07) and since then have trended downwards with considerable volatility.

Taking figures A1.13 and A1.14 together shows that:

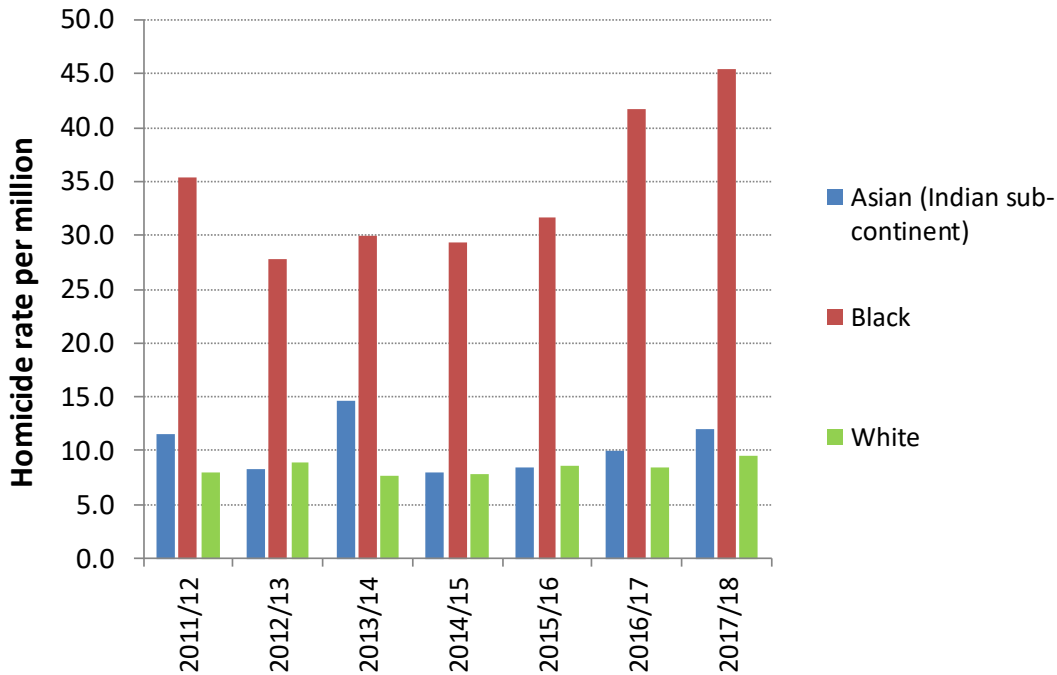
- i) White victim cases account for most of the rise since 2014/15 (56%), with Black-victim cases explaining 22% and Asian victim cases 11%; and

¹⁷ Numbers of unknown cases are shown in the accompanying data tables and range from 1% to 5% of total in different years.

- ii) overall victimisation is lower in 2017/18 (compared with 1996/97) for White victims and victims of other ethnicities, but higher for Black and Asian victims.

Once again, the perspective shifts considerably when rates are used instead of volumes, as in Figure A1.15.

Figure A1.15: Homicides rates per 1 million population by victim ethnicity 2011/12 to 2017/18.



Source: Homicide Index

Note: Rates for 'other' ethnicity not shown due to low numbers (count of below 30).

Although the majority of homicide victims were White between 2011/12 and 2017/18, accounting for different population sizes shows that Black people were far more likely to have been a victim of homicide. In the five years since 2013/14, rates of Black victimisation have almost always been at least three times larger than rates for all other ethnicities. The rate of victimisation for Black individuals has also shown a marked increase between 2014/15 and 2017/18, from about 30 per million to more than 45 per million. Further analysis was done to see if the disparity between Black victimisation rates and those for other ethnicities might be partially explained by sex and age effects. If the Black population contains a higher proportion of young males than other ethnicities, then we would expect Black homicide rates to be higher simply because young males are more likely to be involved in homicides than women or older individuals. The Black population does not contain a higher proportion of males. In fact, the Black population has a lower percentage of males (48.2%) than the population of England and Wales as a whole (49.2%). However, 65.2% of the Black population is aged 15-44 compared with 51.9% in the whole population. This means some of the overall disparity in homicide rates is likely explained by the

difference in age patterns. Tables A1.2 and A1.2a shows how homicide victimisation rates vary by sex and age across ethnicities.

Tables A1.2 and A1.2a: Homicide victimisation rates per million population (2007/08 to 2017/18) broken down by ethnicity and sex, age

HOMICIDE VICTIMISATION RATES	Female	Male
Asian	75.6	144.8
Black	146.9	712.5
Other	64.8	148.3
White	65.0	136.5

HOMICIDE VICTIMISATION RATES	Asian	Black	White
Under-15	42.9	116.9	47.4
Age 15 to 25	173.7	1218.7	117.6
Age 25 to 29	122.1	707.8	199.6
Age 30 to 34	129.1	467.7	208.7
Age 35 to 39	124.3	333.1	193.9
Age 40 to 44	164.6	241.0	180.2
Age 45 to 49	195.2	257.5	150.4
Age 50+	123.7	214.2	92.5

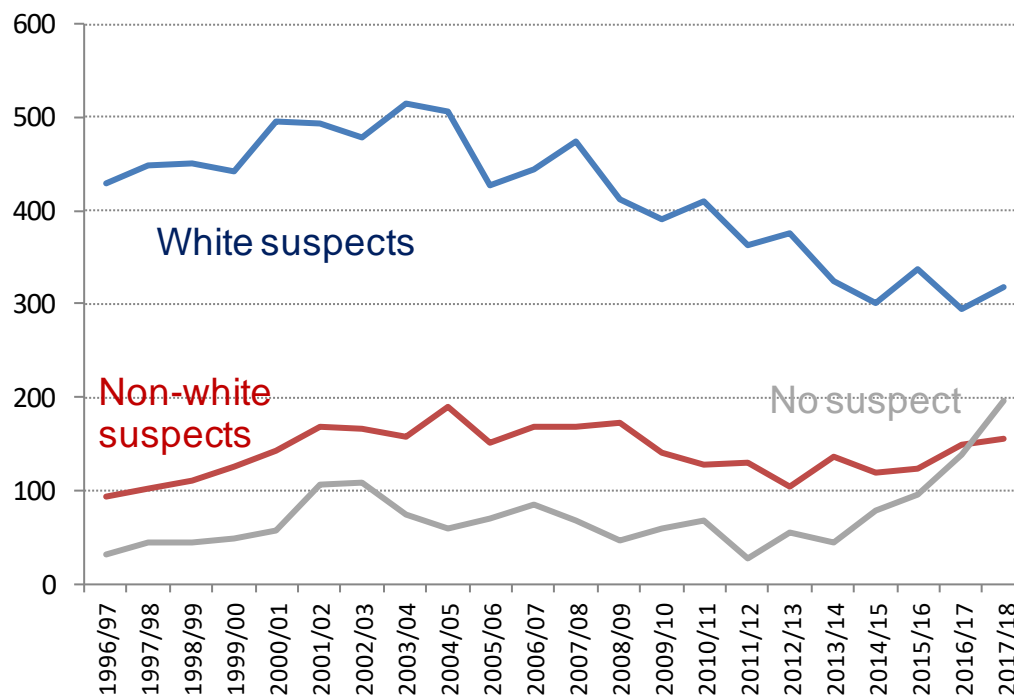
Source: Homicide Index, Census data

The disparity between Black homicide victimisation rates and those of other ethnicities is particularly stark amongst men and amongst those aged 15-25. For example, while Black female rates are 2.3 times those for White females, Black males rates are 5.2 times higher than for White males. The Black/White disparity for those aged 15-25 is 10.4 and it reduces (though does not disappear) for younger and older age groups. In other words, while some of the overall disparity in victimisation can likely be explained by the fact that the Black population is younger than other ethnic populations in England and Wales, that fact cannot explain why Black rates are markedly higher within males and within those aged 15-24 (see Section 9 for further analysis on this point).

Table A1.2a also shows the different age profiles of homicide between ethnicities. While black rates peak in the 15-25 age group, white rates peak in the early 30s and Asian rates peak in the late 40s. As annex 2 demonstrates, this latter finding is consistent with cross-country comparisons showing that Asian countries have much older homicide profiles than the global average.

For the most part, trends in principal suspect ethnicity resemble those of victims, though there are subtle differences.

Figure A1.16: Homicides in England and Wales, broken down by ethnicity of suspect, 1996/97 to 2017/18



Source: Homicide Index

Note: Unknown ethnicity cases excluded¹⁸

As with victim trends, suspect trends for Whites and non-Whites increase from 1996/97 to the early 2000s (Whites) and the mid-2000s (non-Whites) and both decrease thereafter. However, unlike White victims, White suspects have hardly increased at all since 2014/15 and the increase in non-White suspects is smaller than for non-White victims. Care is required here though due to the large increase in no suspect cases. If and when suspects are recorded for these offences it is likely that this will push numbers of both White and non-White suspects higher. Indeed no-suspect cases account for 71% of the rise from 2014/15 with non-White suspect cases accounting for 22%, which is almost entirely due to Black-suspect cases, see below.¹⁹

One other conclusion can be taken from Figure A1.16: despite the trends, the red and blue lines get gradually closer together throughout the series. In 1996/97 there were more than four-and-a-half times as many White suspects as suspects from other ethnicities. In 2017/18 there were almost exactly twice as many.

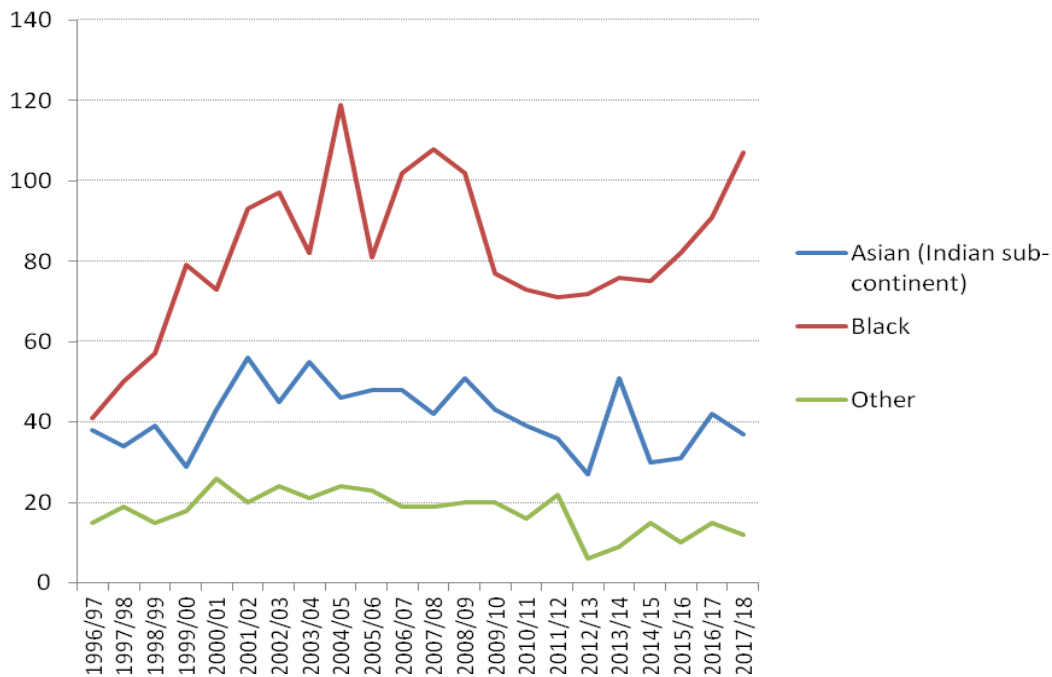
Breaking the 'other ethnicity' trend down (Figure A1.17) reveals very similar trends to the equivalent chart for victims (Figure A1.14). The volume of Black principal suspects almost

¹⁸ Numbers of unknown cases are shown in accompanying data tables and range from 1% to 4% by year. In the 15-year period up to 2017/18, unknown cases have averaged 1% of total.

¹⁹ See footnote 16.

trebled between 1996/97 and 2004/05. Though the increase in White suspects over the same period was only 18%, this actually equates to an identical volume increase. Numbers increased by 78 for both White and Black suspects.

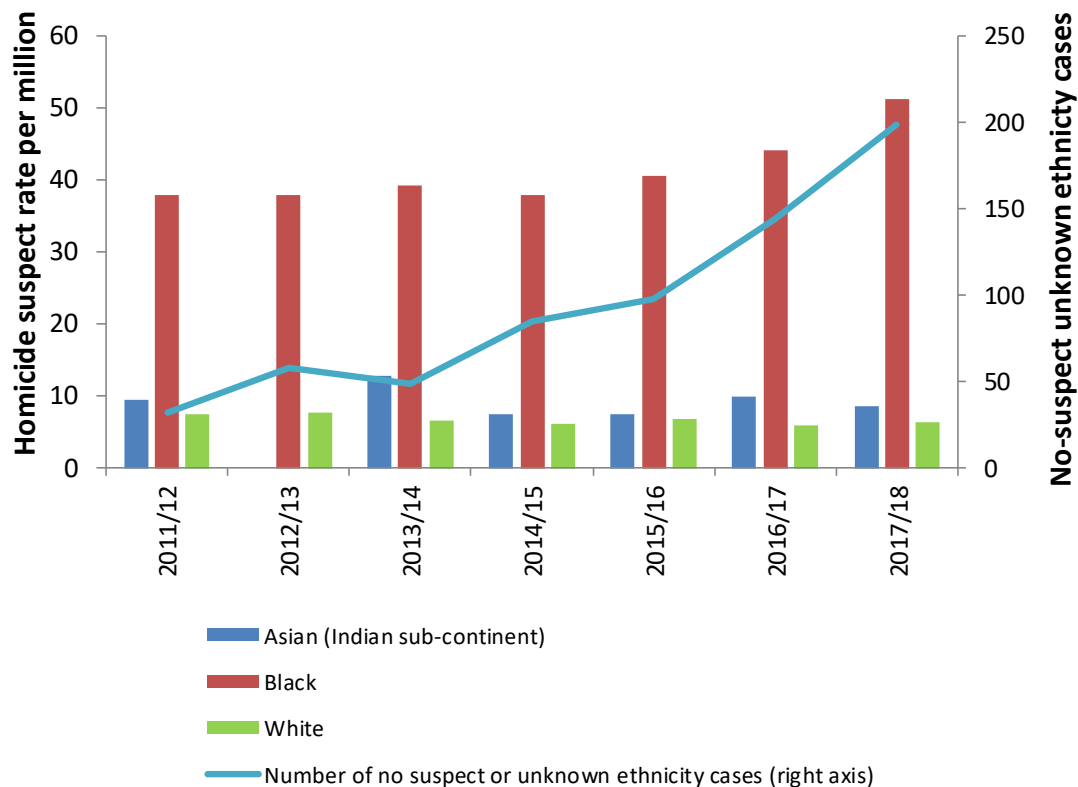
Figure A1.17: Homicides by non-White suspects in England and Wales, broken down by ethnicity of suspect, 1996/97 to 2017/18



Source: Homicide Index

As with victims, numbers of White and 'other ethnicity' suspects were lower in 2017/18 than in 1996/97 and numbers of Asian victims were very similar across the same timeframe. By contrast, numbers of Black suspects have more than doubled over the 20-year period. Note that with the increase in no suspect cases in recent years, the real percentage increase may be even higher.

Figure A1.18: Homicides rates per 1 million population by suspect ethnicity 2011/12 to 2017/18



Source: Homicide Index, Census data.

Note: Rates for 'other' ethnicity not shown due to low numbers (count of below 30). This is also why the Asian rate for 2012/13 has been removed.

Converting to rates (shown in Figure A1.18) reveals a similar picture to that seen for victims. While White people make up the largest proportion of principal suspects, Black people have markedly higher rates. Rates of Black suspects have been at least three times larger than rates for all other ethnicities in the seven years from 2010/11 and in 2017/18 they were almost six times higher than rates for Asians and more than eight times higher than rates for White suspects. Also like the victim rates, the rate for Black suspects shows an increase from 2014/15 even though the number of no suspect cases has increased sharply.

As well as ethnicity, the Homicide Index also contains data on victim/suspect country of birth. Victim data is available from 1977/78 to 2017/18 and suspect data is available from 1996/7 to 2017/18. The data must be treated cautiously due to the high number of cases in which Country of Birth is recorded as unknown or left blank (about 20% overall) and additionally for suspect analysis due to the cases in which there is no suspect. Also, the data is categorised into both individual countries and groups of countries like 'Other Africa' and 'Other Eastern Europe'. Bearing these caveats in mind, Table A1.3 displays aggregated results for the data.

Table A1.3: Numbers of homicides from 1996/97 to 2017/18 by victim/suspect country of birth

Nation	Victims				Suspects	
	1977/78 to 1995/96	% of total	1996/97 to 2017/18	% of total	1996/97 to 2017/18	% of total
Pakistan	126	1.2%	141	1.0%	144	1.0%
India	119	1.2%	115	0.8%	96	0.7%
Ireland	125	1.2%	79	0.6%	87	0.6%
Jamaica	64	0.6%	136	1.0%	177	1.3%
Poland	22	0.2%	170	1.2%	141	1.0%
Other Africa	10	0.1%	114	0.8%	114	0.8%
Other E.Europe	4	0.0%	132	0.9%	125	0.9%
Bangladesh	14	0.1%	45	0.3%	61	0.4%
UK	7561	73%	9490	67%	8549	61%
Other non-UK	380	4%	867	6%	866	6%
Unknown/blank	1932	19%	2777	20%	3706	26%

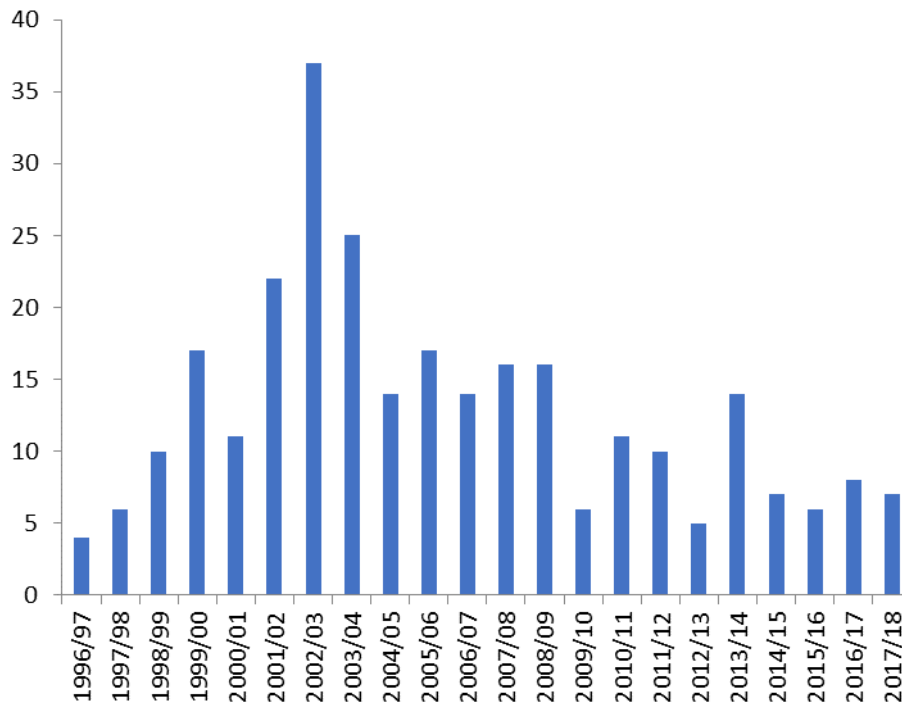
Source: Home Office: Homicide Index

From 1977/78 to 1995/96 the most common birth locations for non-UK homicide victims were Pakistan, India and Ireland, but after 1996/97 it switches to Poland, Jamaica and other Eastern European nations. Jamaica has the highest number of non-UK suspects from 1996/97 to 2017/18. In all years however, the majority of both victims and suspects are UK-born. However, as a proportion of the total, UK-born²⁰ involvement has been decreasing. Further analysis shows that this decrease occurred from around 2000 on. Prior to that UK-born involvement in homicide seems to have been increasing slightly, although the unknown/blank cases make firm conclusions problematic.

The data relating to Jamaicans were explored further given the evidence in the drugs literature review that Jamaican posses likely played a role in the homicide spike in the US in the late 1980s/early 1990s during the crack epidemic. Studies also suggested that this select group of military-trained Jamaicans were subject to a massive enforcement effort in the US in the early 90s which resulted in some coming to England to try and set up crack markets here. While largely anecdotal, police reports linked the rise in serious violence in England and Wales in the late 1990s/early 2000s to these newly arrived individuals, or 'yardies,' as they were known, particularly the rise in shootings, see Figure A1.21 below (Metropolitan Police Authority, 2004; see also Annex 4). Numbers are small, but Figure A1.19 below shows that Jamaican involvement in homicide peaked in line with overall homicide in the early 2000s.

²⁰ This group amalgamated the following categories: British, UK, England, Scotland, NI, Wales.

Figure A1.19: Homicides involving Jamaicans, either as victim or suspect.



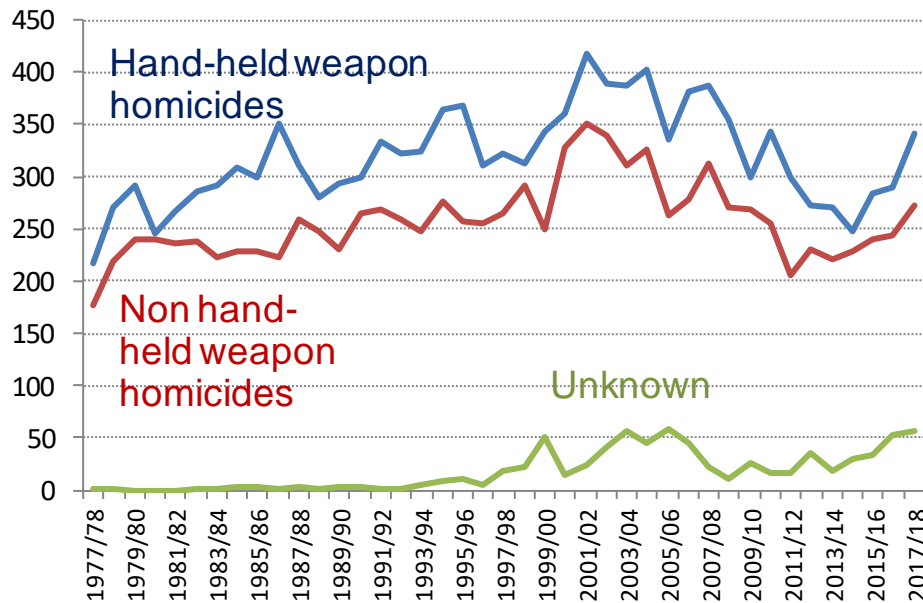
Source: Homicide Index

8. Method of homicide

The Homicide Index contains data on the method of homicide. This section explores the main trends. Figure A1.20 below shows numbers of homicides where a hand-held weapon²¹ was used (firearms, sharp instrument or blunt instrument), where one was not, and unknown methods.

²¹ Note: weapon includes sharp instrument, blunt instrument, and shooting. No weapon includes all other methods: hitting/kicking, strangulation (manual and with ligature), struck by motor vehicle, poisoning, explosion, burning, drowning and other (Exposure of newly-born child -killed by natural elements, aborting, neglect and 'other' such as baby shaking)

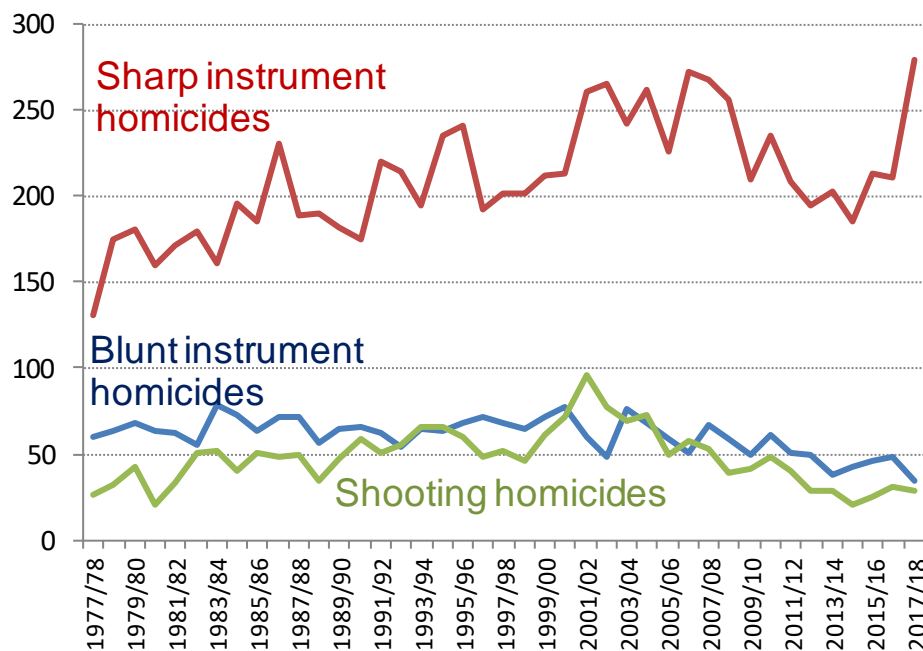
Figure A1.20: Homicide victims in England and Wales by method of homicide, 1977/78 to 2017/18



Source: Homicide Index

Just over half of all homicides in which the method was known involve hand-held weapons. Over the whole series the percentage involving hand-held weapons is 55% and this has stayed relatively constant through the series. The trends in hand-held weapon and non hand-held weapon homicide are very similar. Both rise to a peak in 2001/02 with a fall thereafter and in both there are signs of a new increase in the most recent years.

Figure A1.21: Victims by method of homicide, 1977/78 to 2017/18



Source: Homicide Index

Figure A1.21 breaks down the groups within the category 'weapon'. The dominant weapon throughout the series was a sharp instrument (mainly knives). These were used in 60% of weapons homicides and a third of all homicides in 1977/78. These proportions stayed more or less the same until 2000/01, meaning that sharp instrument homicides increased in proportion to overall homicide to that point. After that, sharp instrument homicides have become even more prominent, accounting for 82% of weapons homicides in 2017/18 and 45% of all homicides.

The chart also shows that the rise in weapons homicides from 1977/78 to 2001/02 was almost entirely driven by sharp-instrument cases and shootings. The former almost doubled from 131 to 261 over that period, while shootings increased from 26 to 96 over the same timeframe. By contrast, there were 60 blunt-instrument homicides in 2001/02, exactly the same number as there had been in 1977/78.

The fall in homicides from 2001/02 was more evenly distributed. Comparing the average of three years around the peak (2001/02 to 2003/04) with the average of three years around the trough (2012/13 to 2014/15), sharp instrument homicides fell by 24%, blunt instrument homicides fell by 30% and shootings fell by 68%. This is partly driven by the fact that there is a noticeable spike in shootings around the homicide peak, whereas sharp-instrument homicides actually peak later, in 2006/07.

The rise in homicide since 2014/15 is dominated by sharp instrument cases, which have risen by 51% between then and 2017/18, explaining 56% of the overall rise (or 68% of the overall rise if cases where the method is unknown are removed).

It is also possible to break down the non-weapon homicides (see accompanying data table A15). The main conclusions are as follows. An average of 22 homicides per year over the period were cases of arson/burning. This series has been volatile but with a relatively stable trend when smoothed, except for a notable decline since 2012/13. Poisoning homicides average 16 per year but show a notable trend that is similar to homicides overall. They rise sharply in the early 2000s, fall sharply to around 2014 and then rise again in recent years. Homicides caused by motor vehicles show a similar trend but are responsible for only 10 homicides per year on average. Drownings average just seven homicides per year and have no discernible trend.

9. Geography and deprivation

Trends in the Homicide Index can be broken down by region and by police force area. These data are given in full in the data tables accompanying this report and are shown graphically via a panel of charts in the Technical Annex. To give an idea of how homicide has changed since 1977/78 by region, Table A1.4 below shows the total homicide volume and average annual rate for four three-year periods: the start of the series, the early 2000s peak, the trough in the early 2010s and the end of the series. It also shows the percentage change between these periods.

Table A1.4: Three-year homicide volumes and average annual rates in four periods for all regions in England and Wales (also shows percentage change between periods)

		81/82 to 83/84	01/02 to 03/04	12/13 to 14/15	15/16 to 17/18	% change 1	% change 2	% change 3
East Midlands Region	Numbers	109	147	132	149	35%	-10%	13%
	Avg rate	9.4	11.6	9.6	10.5	23%	-17%	10%
Eastern Region	Numbers	94	183	132	171	95%	-28%	30%
	Avg rate	6.4	11.2	7.4	9.3	75%	-34%	26%
London Region	Numbers	412	544	316	363	32%	-42%	15%
	Rates	20.3	24.6	12.5	13.8	21%	-49%	10%
North East Region	Numbers	81	94	73	69	16%	-22%	-5%
	Avg rate	10.3	12.3	9.3	8.7	20%	-24%	-6%
North West Region	Numbers	193	375	226	269	94%	-40%	19%
	Avg rate	9.3	18.4	10.6	12.4	98%	-42%	17%
South East Region	Numbers	147	275	149	198	87%	-46%	33%
	Avg rate	6.7	11.4	5.6	7.3	69%	-50%	29%
South West Region	Numbers	96	154	123	118	60%	-20%	-4%
	Avg rate	7.3	10.3	7.6	7.1	42%	-26%	-6%
Wales	Numbers	78	90	73	91	15%	-19%	25%
	Avg rate	9.3	10.3	7.9	9.7	11%	-23%	23%
West Midlands Region	Numbers	167	229	174	206	37%	-24%	18%
	Avg rate	10.7	14.4	10.2	11.8	34%	-29%	16%
Yorkshire & Humber	Numbers	166	226	152	168	36%	-33%	11%
	Avg rate	11.3	15.1	9.5	10.3	34%	-37%	9%

Source: Home Office: Homicide Index

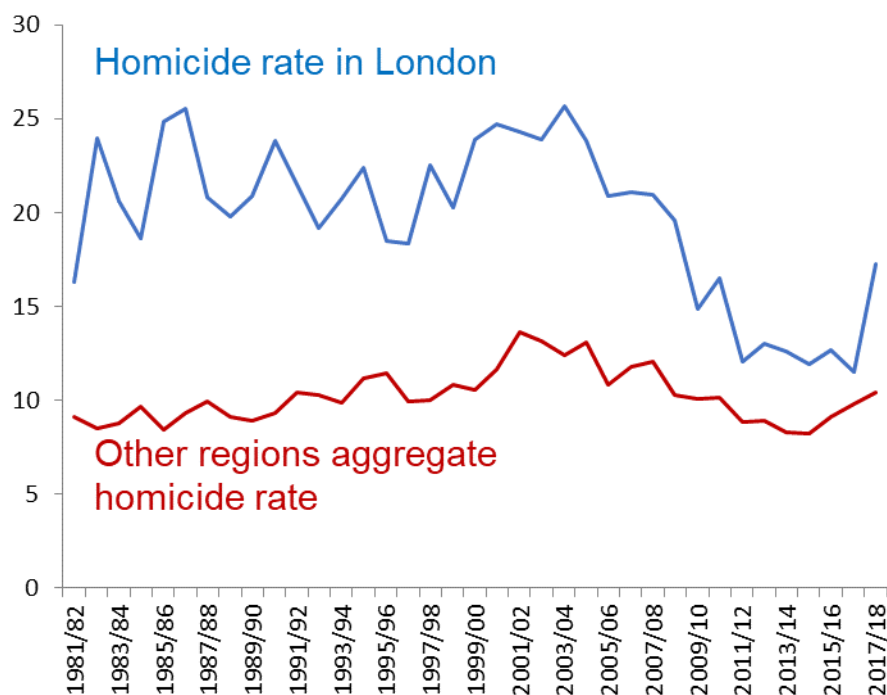
Table A1.4 shows that London had a consistently higher volume and rate of homicide than any other region throughout the series, although the gap between London and other regions' homicide rates was narrower in recent years compared with the early 1980s. Another clear conclusion arises from the red and green percentage change figures. They show considerable uniformity of basic trends. Every region had an increase in homicide rates of 10% or more from the early 1980s to the early 2000s and then every region had a homicide rate fall over the next decade of at least 15%. All but two regions have seen that decline reversed in the last three years. However, this overall similarity does not mean that the regional trends were identical. Close examination (see charts in Technical Annex) reveals that although all regions saw homicide rates rise from the 1980s to the 2000s and fall thereafter, Wales, the South West and the North East had their peak years before the national peak in the early 2000s and Yorkshire and Humber had its peak later, in the second half of the 2000s.

Table A1.4 also shows that four regions had lower homicide rates in the last three years compared with the early 1980s (London, the South West, the North East and Yorkshire and the Humber) and the rest had a higher rate. The Eastern region and the North West regions had the biggest percentage increases in both volumes and rates across the whole series.

Figure A1.22 features homicide rate trends for London and the other regions aggregated. London's rate oscillates between two and three times higher than the rest of the country in the 1980s and remains around twice as high through most of the 1990s and 2000s. But between 2008/09 and 2016/17 the ratio drops to almost parity before the sharp rise in London's rate in 2017/18. This means that London entered the 1980s with a much higher homicide rate than the rest of the country and its increase to the early 2000s peak was far

less pronounced as a result (and more focused on the period from 1995 onwards). This brought its rate closer to the rates for other regions. London (and the South East) then had a proportionately larger fall in homicide than the rest of the country, bringing rates closer together still.

Figure A1.22: Homicide rates for the London region and all other regions combined from 1981/81 to 2017/18



Source: Homicide Index

London has followed a similar homicide trend to the rest of the country, in that the rises and falls have occurred at similar times, but London has generally performed better throughout the series. The red and blue lines are much closer in recent years generally.

It is also possible to look at homicide since 2002/03 at Lower Super Output Area (LSOA) level in order to map the data against the Indices of Multiple Deprivation. There are 34,753 of these in England and Wales (2011 Census) and each contains an average of 1,614 residents. Homicides were mapped by LSOA for all the LSOAs in England but not for Wales. Welsh deprivation indices exist, but use a different methodology, so were excluded for the purposes of this analysis only. This resulted in 32,482 or 32,844 (pre and post 2011 census) LSOAs being used in the analysis. The data were matched to the Indices of Multiple Deprivation and divided into deciles, from homicides occurring in the 10% most deprived areas through to the 10% least deprived areas.²² Location data is also available for victim

²² This involved converting from CSP to local authority area. See the Technical Annex for details of this mapping.

and suspect address, so these can also be divided by deprivation decile. Figure A1.23 shows the results of this analysis.

Figure A1.23: Proportion of homicides from 2007/08 to 2017/18, by deprivation decile

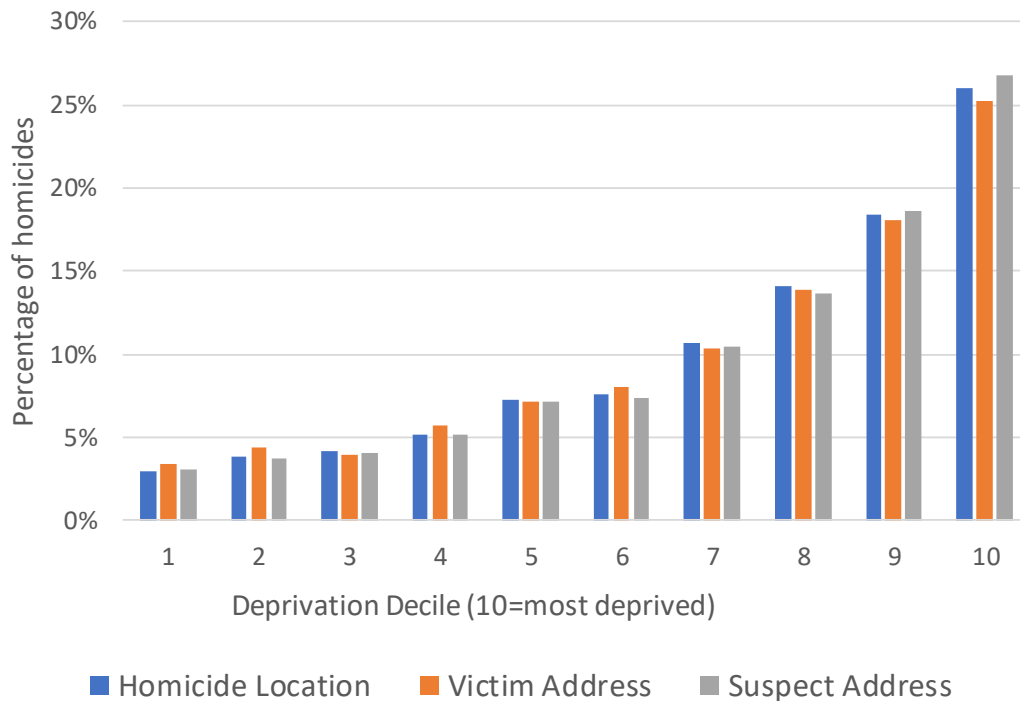
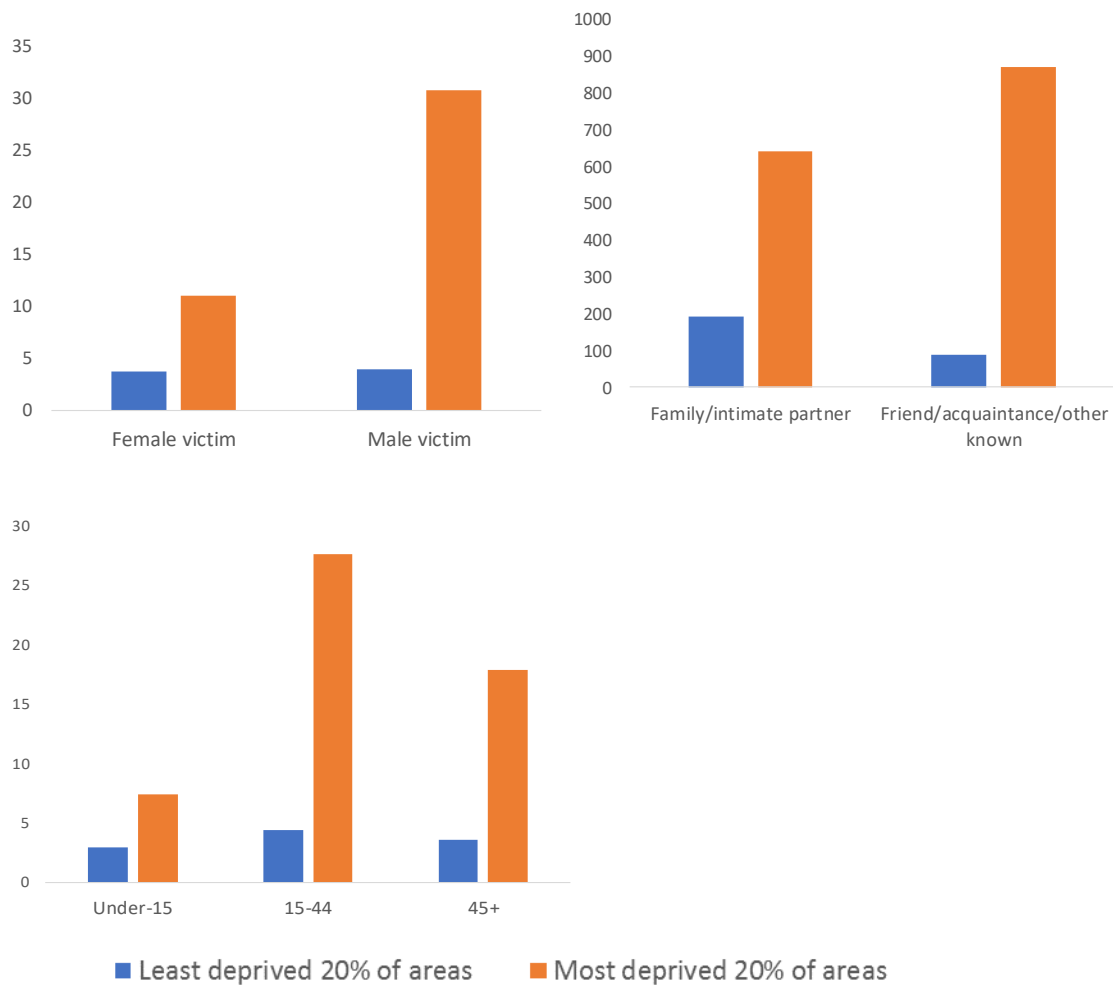


Figure A1.23 shows that a disproportionate number of homicides since 2007/08 have occurred in deprived areas. The proportion of homicide occurring in the 10% most deprived areas is around eight times that in the 10% least deprived areas. The pattern is the same regardless of whether location is based on victim address, suspect address or homicide location. This finding is consistent with other studies of homicide, both for England and Wales (see for example Dorling (2006) and Brookman and Maguire (2003)) and other nations (see Annex 8).

Figure A1.24 below compares the 20% most and 20% least deprived areas. In the most deprived areas, relative to the least deprived, a greater proportion of homicides involve male victims, victims aged 15-44, and a victim-suspect relationship of friend/acquaintance.

Figure A1.24: Homicide rates in the 20% most deprived areas versus the 20% least deprived, by sex (rates per m), age (rates per m) and victim-suspect relationship (volumes)

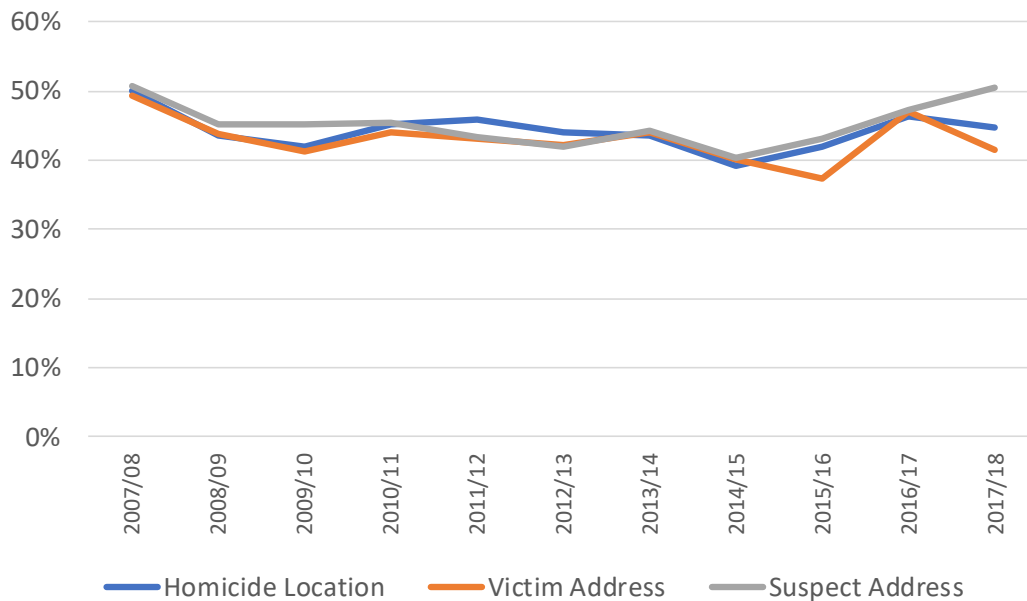


Source: Homicide Index, Census data

In the least deprived areas males and females are equally (un)likely to be homicide victims. In the most deprived areas rates of male-victim homicides are almost three times higher. In the least deprived areas domestic homicides (by a family member/ intimate partner) are more common than friend/acquaintance homicides. This reverses for the most deprived 20% of areas. No-suspect and stranger homicides are also relatively more likely in the most deprived areas. Homicide rates are higher in deprived areas regardless of the age of victim. But while homicides against under-15s and over-45s are three and five times more likely in the most deprived areas, homicides of 15-44s are six times more likely.

Figure A1.25 shows how the deprivation gradient has varied over time.

Figure A1.25: Percentage of homicides occurring in the two most deprived deciles, 2007/08 to 2018/18



Source: Homicide Index, Census data

Figure A1.25 suggests the deprivation gradient is fairly stable across time regardless of the level of homicide, although there is tentative evidence that homicide becomes more focused in deprived areas when the level increases (from 2014/15) and vice versa, particularly for suspect addresses. This links to other findings in the report about short-term increases and decreases in homicide being associated with homicides of males aged 15-44 in which victim and suspect are friends/acquaintances.

The next set of analyses examines the relationship between deprivation, ethnicity and homicide.²³ A higher proportion of White people live in the least deprived areas. The proportions of other ethnicities increase in the more deprived areas. Around 45% of the Black population reside in the 20% most deprived areas, whereas 17% of the White population do. Therefore, some of the overall ethnic disproportionality in homicide rates is likely to be accounted for by deprivation. However, Table A1.5 shows that Black rates are higher than White rates at every decile of deprivation, albeit the disproportionality is at its lowest in the highest-deprivation deciles. In the most deprived decile Black rates are just over double white rates, but in the most affluent deciles, Black rates are more than four times higher.

²³ The ethnicity data at LSOA level was not available for all LSOAs. From 2007-12 there is 97.5% coverage (31,672 LSOAs), 2013-17 is 100% complete (32,844 LSOAs). Over the full 11 year period (2007/08 to 2017/18) 1.4% of LSOAs did not have ethnicity data. None of the recorded homicides occurred within the 1.4% of LSOAs without ethnicity data so these were simply excluded.

Table A1.5: Resident population and average annual homicide rate (per m population, 2007/08-2017/18), by ethnicity and deprivation

Deprivation Decile	RESIDENT POPULATION				HOMICIDE RATE			
	Black	Mixed/ Other	Asian	White	Black	Other	Asian	White
1	1%	2%	4%	94%	18.1	6.9	5.3	3.0
2	1%	2%	4%	93%				4.0
3	1%	2%	4%	93%				3.5
4	1%	2%	5%	92%				5.0
5	2%	3%	6%	89%	28.4	6.9	6.1	6.3
6	3%	3%	7%	87%				7.0
7	4%	4%	9%	83%	30.9		12.0	8.3
8	6%	4%	11%	79%	27.3		11.3	12.4
9	8%	5%	13%	74%	39.7	11.9	13.1	15.3
10	7%	5%	14%	73%	50.7	15.7	16.1	23.4

Source: Homicide Index, Census data

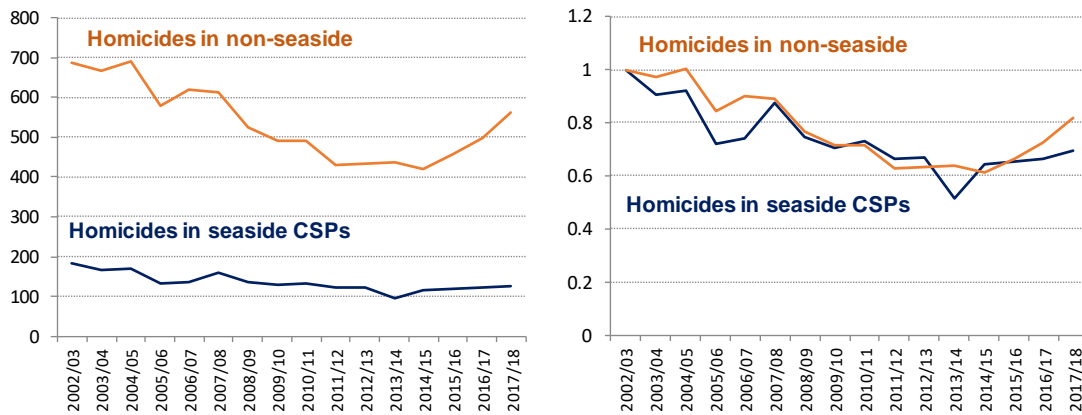
Note: Homicide rate splits by decile based on victim's address. Some decile calculations have been merged due to low counts of homicide (below 30).

Further analysis was also completed looking at whether there was a correlation over time between regional homicide rates and i) Gross Value Added and ii) population change (migration in and out of region). This was to examine the possibility that, for example, London's improved homicide trend over time may be due to its economic performance and/or areas affected by marked population drain may have had worse homicide trends. However, results of these analyses revealed no clear correlations. See the Technical Annex for more. Finally, given some commentary about the possibility of crime migrating from urban areas to seaside towns²⁴, homicide trends were disaggregated into seaside and non-seaside areas. The unit of area used was the Community Safety Partnership (CSP).²⁵ Results are shown in Figures A1.26 and A1.26a below.

²⁴ See for example: <https://www.dailymail.co.uk/news/article-2398822/How-Britains-coastal-towns-deprived-country.html> and <https://www.telegraph.co.uk/men/thinking-man/something-sinister-british-seaside-towns/> and <https://www.economist.com/britain/2014/05/15/trouble-spreads-out>

²⁵ For this analysis, the police recorded crime series was used with certain exclusions (e.g. Shipman, Hillsborough etc. See data table A20).

Figures A1.26 and A1.26a: Numbers of homicides broken down by whether they occurred in a seaside or non-seaside area, volumes and indexed trends



Source: ONS police recorded crime data.

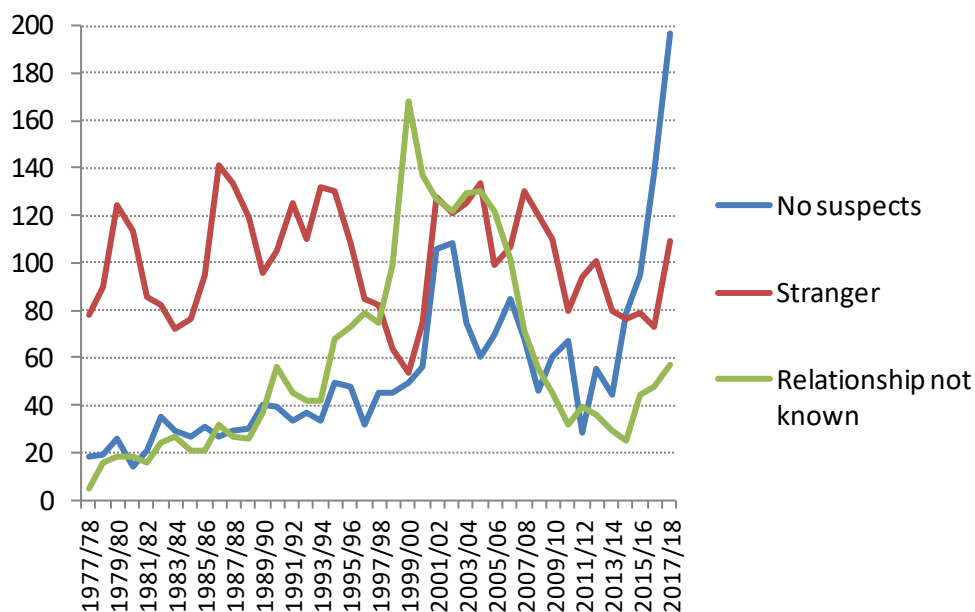
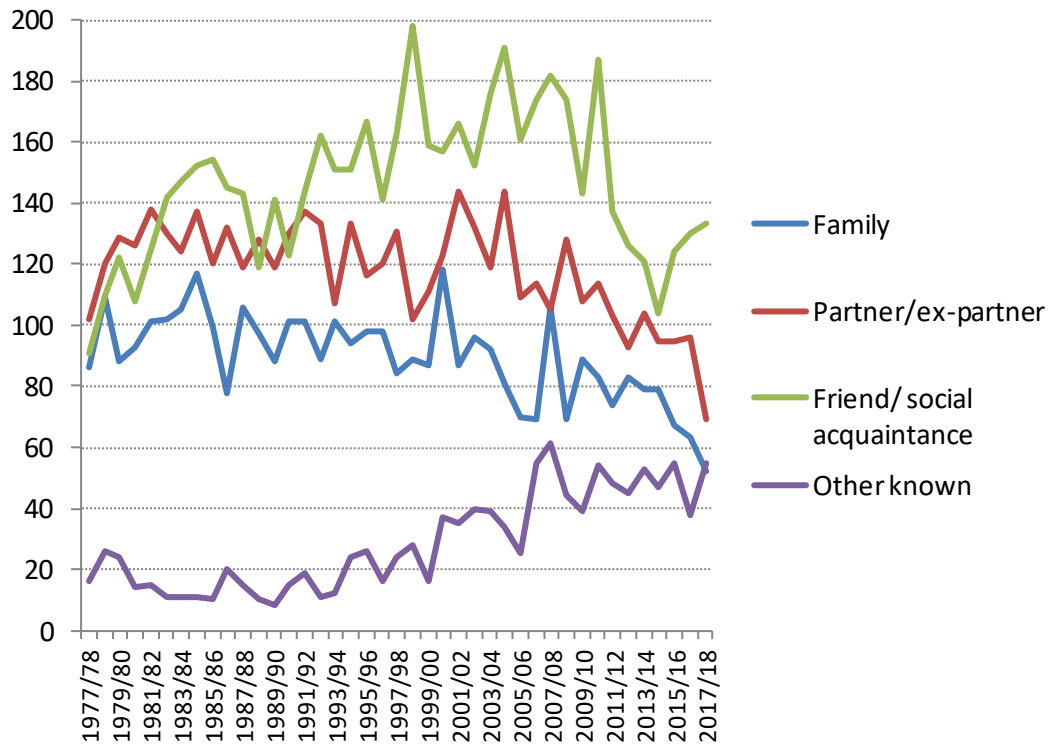
The charts show that more homicides take place in non-seaside areas (largely because there are more of these areas and more people live in them) but that the trends for all areas are highly correlated.

Overall, this section has shown that there is a strong spatial relationship between deprivation and homicide and that this helps to explain (but does not fully explain) racial disparities in homicide rates. The section has also shown that while some regions have certainly done better than others in relation to homicide rates over the last 40 years (notably London), there are also shifts in the trend that seem to be common to virtually all areas regardless of economic performance, population change or proximity to the coast.

10. Victim and suspect relationship

The Homicide Index contains data on the relationship between suspect and victim. Figures A1.27 and A1.27a show the main trends.

Figures A1.27 and A1.27a: Relationship between victim and principal suspect, 1977/78-2017/18



Source: Homicide Index

The first chart shows cases in which the victim and suspect know each other in some way. But before drawing any conclusions from that chart, it is important to note the trends in the bottom chart. There are some very large swings in both the 'relationship not known' category and the 'no suspects' category. This makes interpretation of trends for the other categories

more difficult. To try and overcome the issue of cases where the victim-suspect relationship was recorded as unknown, an attempt was made to return to the individual files for each homicide and re-code the relationship categories. Full details of this exercise can be found in the Technical Annex. The re-coding focused on the two-year period from 2001/02 to 2002/03. A total of 145 homicide cases previously labelled as 'relationship unknown' were successfully recoded, out of a total of 235 unknown cases for those two years. Half of those re-coded were to 'stranger' and the next most common category was friend/acquaintance. Only 17% (n=25) were recoded to intimate relationship categories²⁶. The method for calculating intimate cases is explained in Section 11. The category involves homicides committed by partners (including casual sexual partners), ex-partners, family members, lover's spouses, emotional rivals, plus other cases where the police have noted a suspicion of domestic dispute.

Using that and the charts above, the following conclusions seem reasonable:

- The category of friend/social acquaintance²⁷ shows a similar trend to homicide as a whole although it stays higher for longer in the 2000s, falling sharply from 2010/11. It was consistently the highest of the relationship categories since 1990. Out of the relationship categories, it therefore seems to be the main driver of the overall trend.
- The partner/ex-partner and family series contribute little to the rises in homicide up to the early 2000s and the more recent increase since 2014. But they do contribute to the fall from the mid-2000s to 2014. Indeed, these series have continued to show a noticeably falling trend in recent years, in contrast to overall homicide (though this may change somewhat once more is revealed about the unknown cases).
- There has been an increase in the 'other known'²⁸ category since the mid-1990s and it seems likely that resolving the unknown or no-suspect cases would only increase this.
- Numbers of stranger cases have a generally flat trend with considerable volatility and an apparent downward trend since the mid-2000s. However, as the Technical Annex shows, this category is likely to be hugely affected by the unknowns and no-suspect cases so no strong conclusions can be drawn.

²⁶ The recoded number of cases might have been slightly higher if the category 'domestic dispute' had also been looked at. This was not assessed in the analysis presented here.

²⁷ Friend/social acquaintance is a sub-category of victim-suspect relationship where the victim and suspect are acquainted. They are not business associates, criminal associate, family, partners or ex-partners, nor do they have a working relationship such as carer/health worker, customer/client, or prostitute/client.

²⁸ 'Other known' includes: business associate, carer, health worker/patient, casual sexual partner, criminal associate, customer/client, emotional rival (not elsewhere specified), lover's spouse, prostitute/client.

- There is a clear spike in the no-suspect cases in line with the homicide peak and then a very large increase in the most recent years. The latter will partially reflect the time it can take to apprehend homicide perpetrators. But this is unlikely to explain all the increase or the earlier spike. Our conclusion is that the homicide peak was partially driven by a rise in no-suspect cases and that there are strong reasons to believe that these cases increase disproportionately when overall homicide rises.

11. Type of Homicide

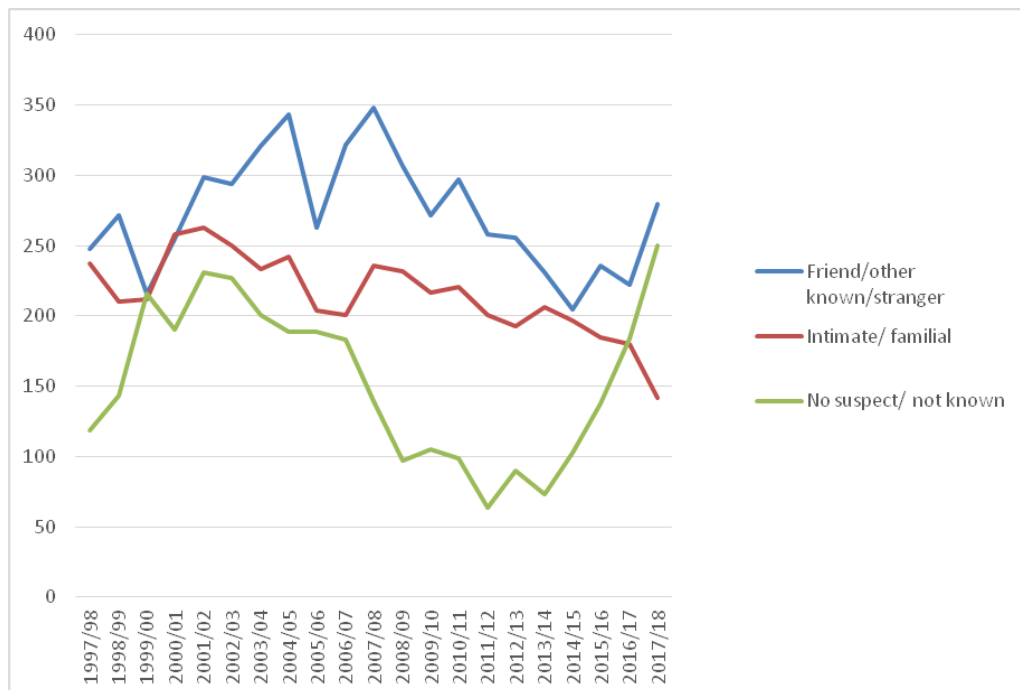
Analysis was carried out to try and categorise homicides since 1997/98 based on the variables described so far. The aim was to shed light on which types of homicides were driving trends.

Initially, an attempt was made to categorise cases that involved intimate relationships, to assess the extent that these drove trends. The aim was to include all cases involving domestic/familial or romantic relationships. So unlike the Office for National Statistics (ONS) definition of domestic homicides, we attempted to include cases involving ex-partners killing new partners and other similar cases.²⁹ Results are shown in Figure A1.28.³⁰

²⁹ See Technical Annex for a full discussion of the ONS definition and the way it has been adjusted for the analysis in this paper.

³⁰ Trends are only shown from 1997/98 to reflect when some details of case circumstances were recorded more consistently. Corporate manslaughter started to be recorded in 2000/01.

Figure A1.28: Number of homicides each year, excluding corporate and terrorism cases, broken down by intimate relationship and unknown cases, 1997/98 to 2017/18.



Source: Homicide Index

Figure A1.28 suggests that intimate and familial homicides have generally trended downwards since 1997/98. The upward swings seem therefore to have been driven mostly by other types of homicides. This links to the Mortality Statistics explored earlier, which showed that female homicides have generally trended downwards since 1980, while male homicides have been very volatile. The Homicide Index allows for cross-referencing of intimate/familial homicides by sex (see Technical Annex) from 1996/97 onwards. This cross-referencing sheds more light on the downward trend in female homicides. It shows that the gradual downward trend is propelled by intimate/familial homicides which decrease steadily from 1996/97 to 2017/18. Other types of female homicide are more volatile and show similar trends to overall homicide: rising to the early 2000s, before falling for a decade and then rising again. This is important for the recent rise in homicide from 2014/15 to 2017/18. Figure A1.3 showed that this was almost entirely driven by male victimisation and that female victimisation remained largely flat. In fact though, the flat trend in female victimisation masks a decrease in intimate partner/familial homicides, balanced by an increase in other types of female homicide (see Figure TA 5 in Technical Annex). It seems likely that the latter are being driven by the same factors as those driving the rise in male homicides over the same period. However, all of these conclusions must be treated cautiously due to the high number of no-suspect and unknown cases.

Overall then, our tentative conclusion is that non-intimate relationship homicides were more of a factor in driving the homicide peak in the early 2000s and the recent increase in homicide than intimate relationship cases. However, further re-coding work would help to

cement this conclusion. Some other suggestions for further work in this area are contained in the Technical Annex.

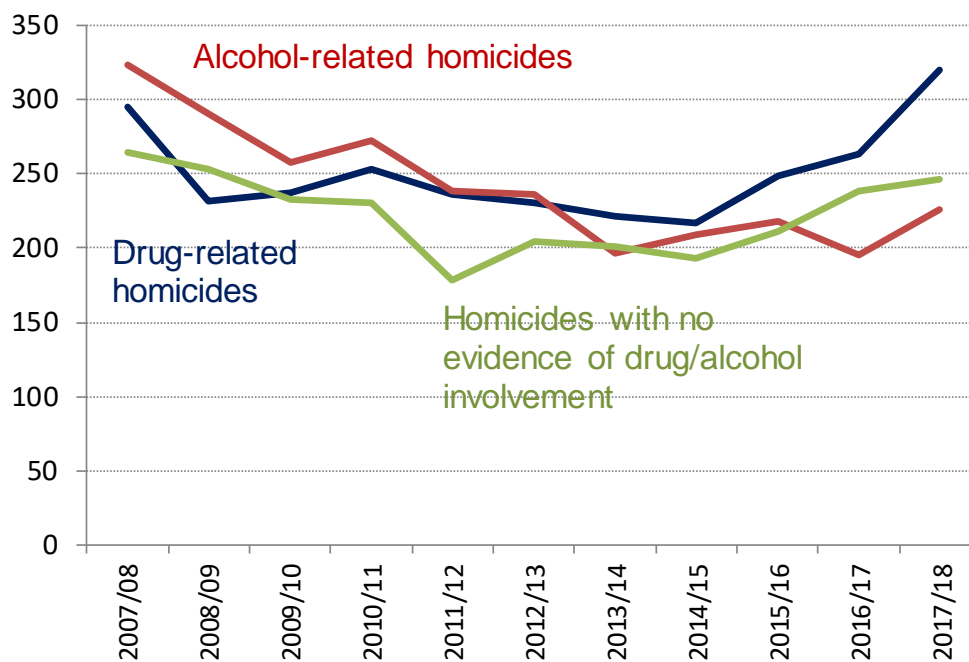
12. Trends in drug- and alcohol-related homicides

From 2007/08 the Homicide Index has captured information on whether the homicide was linked to drugs and/or alcohol. Using this information, we have constructed trends in alcohol-related homicides and drug-related homicides. See Figure A1.29 below. It is important when interpreting these trends to fully understand how they have been generated. See the Technical Annex for a full description, but two overarching points to understand are that:

the categories are not mutually exclusive because a homicide can involve both drugs and alcohol

the categories are very broad: for example, the drugs-related homicide trend contains cases in which there was *any* evidence of either the victim or perpetrator either using or dealing in illegal drugs (even if there was no evidence of drugs being directly linked to the motivation for the homicide).³¹

Figure A1.29: Number of alcohol and drug-related homicides, 2007/08 to 2017/18



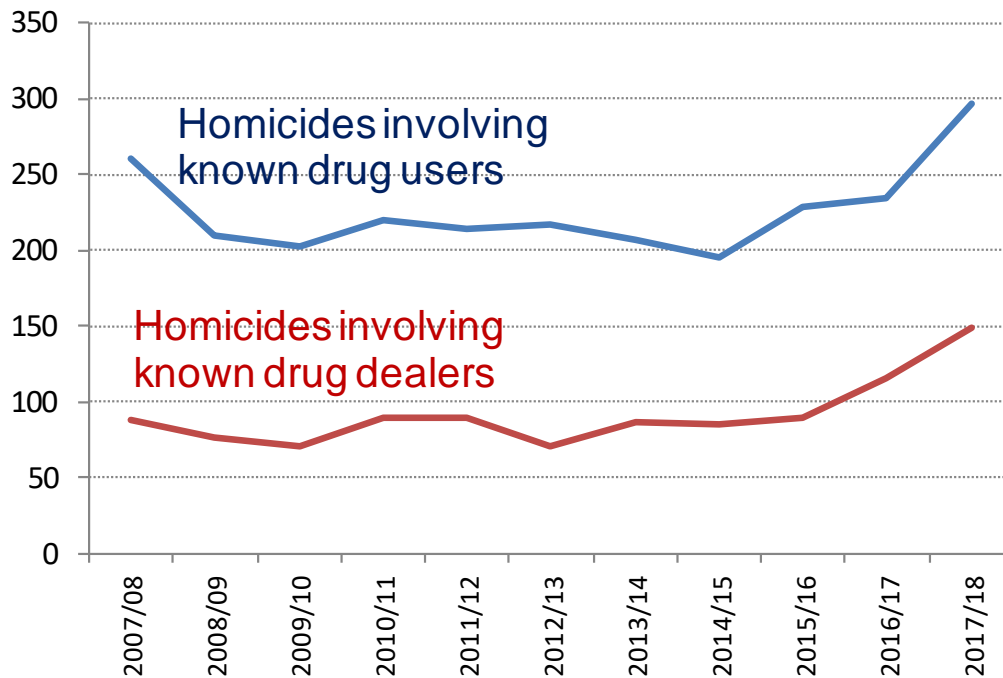
Source: Homicide Index

³¹ The reason for this approach was to try and allow for the more systemic impacts of drug markets, as outlined in the drugs literature review chapter. In brief, if the illegality of the drugs market leads individuals to carry weapons and adopt violent personas generally, then trends in drugs markets could indirectly drive homicide trends even if individual homicides were ostensibly motivated by other types of dispute.

The chart shows that drug-related homicides were higher in 2017/18 than they were a decade earlier. They have increased from 217 to 320 between 2014/15 and 2017/18 explaining 62% of the overall homicide increase when terrorism cases are excluded or around 50% when they are included.³² By contrast, alcohol-related homicides have decreased since 2007/08. The trends in the two series are similar to 2014/15 but then they diverge. The rise since 2014/15 has been mainly accounted for by drug-related cases and cases involving no evidence of either drugs or alcohol.

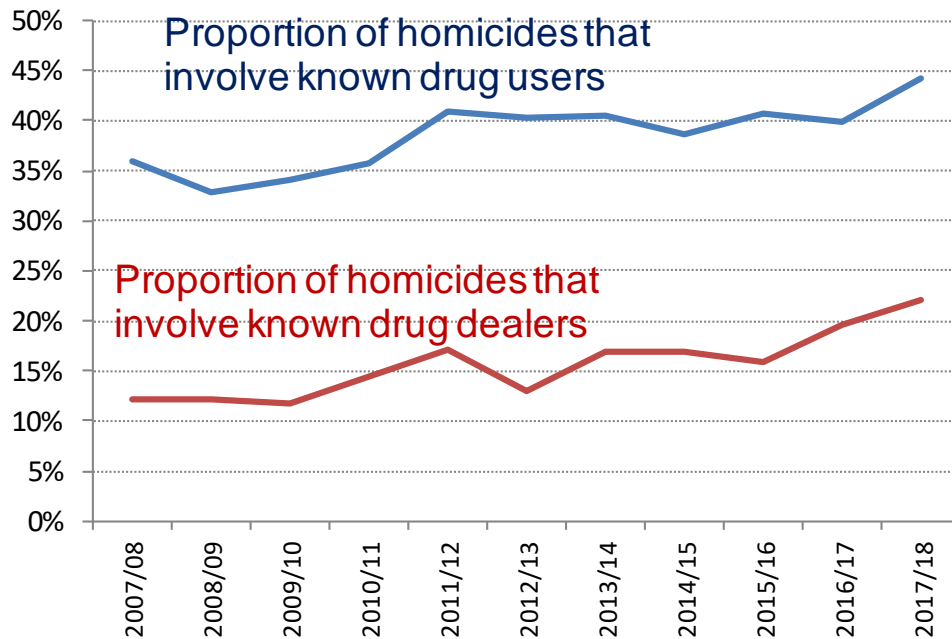
To further assess what role drugs might be playing in the recent rise, cases were analysed by whether the suspect or the victim was a drug dealer, or a drug user. Figures A1.30 and A1.30a show the results.

Figures A1.30 and A1.30a: Number of homicides where victim/suspect was a known drug user or dealer and their proportion of total homicides³³



³² One homicide not shown in the figure above was recorded as corporate and involved drugs. The victim was listed by police as both drug user and dealer. Thus we can conclude that excluding corporate cases from the overall drugs trends as in the figure above does not mask major drug trends.

³³ These categories are not mutually exclusive as a homicide can involve both a drug user and dealer.



Source: Homicide Index

Figure A1.30 shows that cases involving users and dealers have both increased since 2014/15 (and many of these will be the same homicides – i.e. they involve both known users and dealers). The cases involving users have higher volumes and have had a greater volume increase from 2014/15 to 2017/18 (102 additional homicides compared with 64). However, the percentage rise over that period is greater for homicides involving drug dealers (75% increase compared with 52% for drug user homicides). Figure A1.30a shows that the proportion of cases involving users and dealers have also increased. This is partly due to the rise in volumes, but probably also due to the fall in familial/intimate homicides which tend to contain fewer drug-related cases.

Further analysis showed that the increase in drug-related cases from 2014/15 to 2017/18 was driven primarily by no-suspect and friend/acquaintance cases with an additional sharp uptick in stranger cases from 2016/17 to 2017/18, see Figure TA 7 in Technical Annex.

In conclusion, the last decade has seen a shift from alcohol-related homicides to drug-related homicides. The former were more numerous until 2011/12, the latter have had higher numbers since. Within drug related homicide, cases involving drug users have higher numbers but the number involving drug dealers has increased at a faster rate between 2014/15 and 2017/18.

13. Correlation with other crime types

This section briefly examines the degree to which homicide correlates with other types of crime in England and Wales. Correlation coefficients were calculated for selected crime types within the Police Recorded Crime series from 1901 to 1997. Data was not included

after 1997 because the recorded crime series went through two significant recording practice changes from 1998 to 2004 which affected trends in many crime types, but not homicide. Results are shown in Table A1.6.

Table A1.6: Police recorded crime (PRC) correlation coefficients between homicide and selected other crime types, 1901 to 1997

	PRC violence	PRC sexual offences	PRC robbery	PRC theft
Correlation with homicide 1901 to 1997	0.93	0.79	0.87	0.94

Source: ONS police recorded crime data.

There is a very high correlation between homicide and all other police recorded crime categories. But police recorded crime trends have important caveats. They only capture crimes reported to and recorded by police and it is likely that recording of crimes has gradually increased over time which may give the series a degree of spurious correlation. An arguably better test is to see the correlation between the homicide series and crime trends from the Crime Survey of England and Wales (CSEW). The latter is a victimisation survey so should capture crimes even if they were not reported to police. Table A1.7 shows selected correlations for the period from 1981 (when the CSEW started) to 2017/18.³⁴

Table A1.7: Correlation between homicides and selected Crime Survey in England and Wales trends, 1981 to 2017/18

	Violence	Violence with Injury	Wounding	Robbery	Theft
Correlation with homicide, 1981 to 2017/18	0.31	0.25	0.38	0.60	0.17

Source: ONS police recorded crime data.

Table A1.7 shows a high correlation between homicide and robbery, but a far lower correlation with the other crime types.

³⁴ For the purpose of these correlations CSEW trends were interpolated for the years in which there was no survey.

14. Conclusion

Over the long-term, homicide trends in England and Wales have had relatively few meaningful turning points. Evidence suggest homicide rates fell almost continuously from 1860 to around 1960. They then increased almost continuously until the early 2000s before falling sharply for around a decade. Between 2014/15 and 2017/18, rates increased again.

Data show that the homicide rise from 1960 to 1980 involved all types of homicide including infanticide and homicides against women, which accounted for around 50% of all homicides from 1900 to 1980.

After 1980, female and familial/intimate homicides had a flat or falling trend while male homicides, particularly of those aged 15-44, showed large swings that drove the overall homicide trend.

The Homicide Index shows that between 1977/78 and 2017/18, homicide in England and Wales has become:

- More male-dominated
- More likely to involve friends/acquaintances and less likely to involve family or intimate partners
- More likely to involve victims and suspects aged 15-44
- Less likely to involve the killing of babies and young children
- More likely to involve knives and guns
- More likely to be drug-related
- Less London-centric
- Less likely to involve White victim/suspects and less likely to involve UK-born victims/suspects

The increase in homicide to the early 2000s was driven partly by cases involving guns, while the rise since 2014/15 has been more about knives. Both increases involved a marked proportion of cases in which no suspect has been identified.

Since 1977/78 when regional figures are available, the data show that most regions followed a similar trend to the national one, although there are some variations. Homicide shows a strong spatial relationship with deprivation, particularly for the homicides of friend/acquaintance males aged 15-44 that have come to dominate homicide trends.

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Annex 2: How does England and Wales compare to other developed nations?

1. Introduction

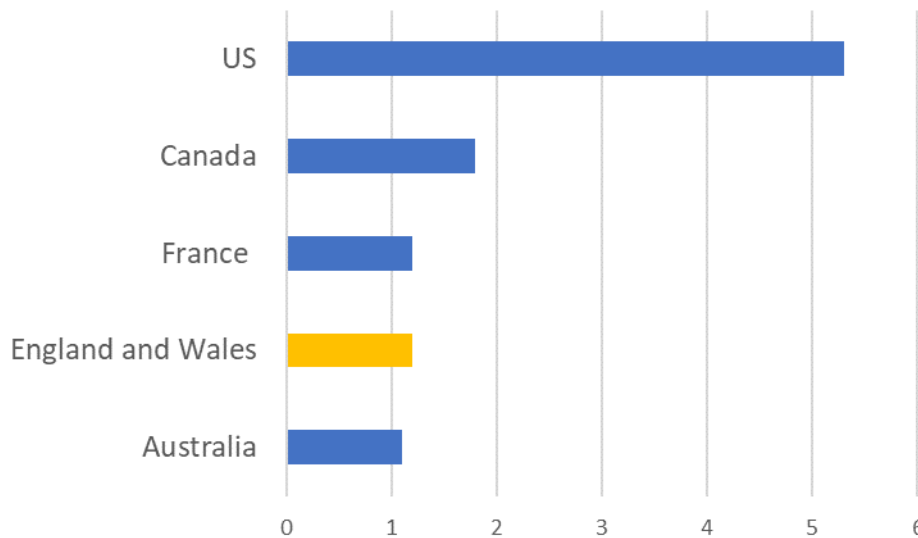
The aim of this chapter is to compare the homicide trend in England and Wales since the 1960s with trends in other nations. Have the identifiable rises and falls in homicide in England and Wales discussed in the previous chapter also been seen in other countries, or are different patterns visible? In addition, have the key demographic factors of gender and age which were identified as having a key influence on long-term trends in England and Wales also been influential in other countries? This annex addresses these questions.

Comparing homicide rates across countries is subject to several limitations due to differences in definition and variations in data sources and quality. Some countries record homicide incidents, others count victims. Some draw their data from coroners' reports and cause of death statistics. Other countries publish criminal justice statistics on homicide which rely on recording of incidents at the time an offence is first recorded, after investigation, or when a criminal justice outcome has been reached. Some countries count only completed homicides while others include attempted homicides in their published statistics. Definitions of homicide also differ between countries, with inconsistencies in the inclusion of assault leading to death, assisted suicide, negligent killing, abortion, euthanasia and infanticide.¹

These issues notwithstanding, available evidence suggests that the rate of homicide in England and Wales is low relative to other nations, even despite the recent increase. Figure A2.1 shows homicide rates in nations that use comparable definitions of homicide to England and Wales.

¹ For example, according to the European Sourcebook of crime and criminal justice statistics, Albania, Armenia, Belgium, Bulgaria, Czech Republic, Estonia, Finland, Hungary, Netherlands, Portugal and Slovenia all exclude assaults leading to death from homicide statistics. Sourcebook, p 379.

Figure A2.1: Homicide rates per 100,000 population in selected nations



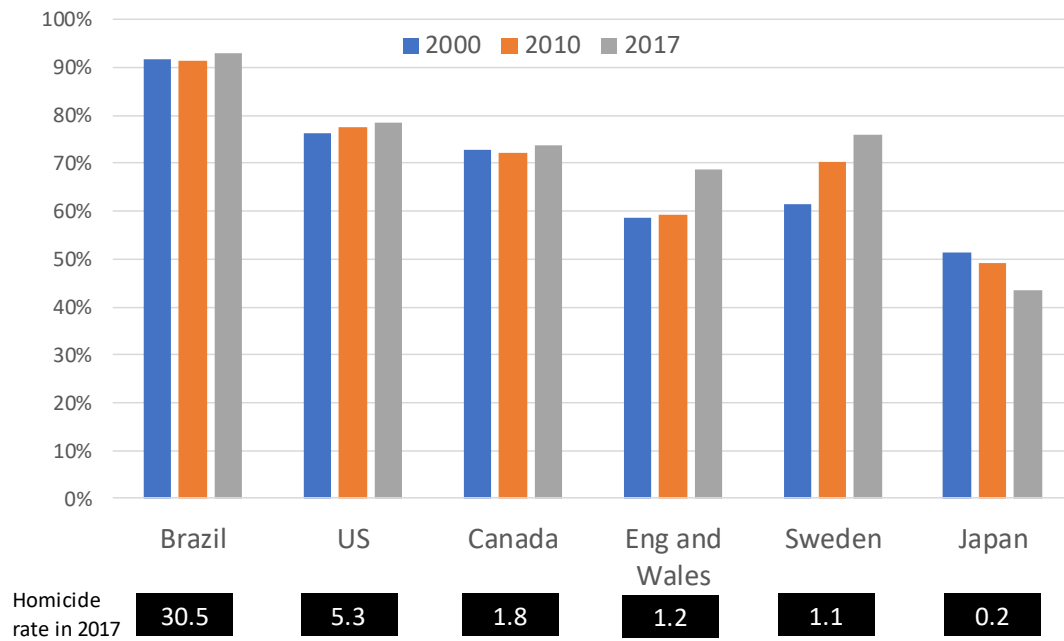
Sources: **US:** Uniform Crime Reports Data Tool; **Canada:** Statistics Canada, Homicide Survey, Canadian Centre for Justice Statistics; **France:** Interstats Conjoncture Series; **England and Wales:** Homicide Index; **Australia:** Victims of crime Australia (excluding attempted murder victims).

The Global Homicide Index 2019 estimated that the global rate of homicide was 6.1 per 100,000 in 2017, making England and Wales well below the average. Breaking the figures down to region, the study estimated that Western Europe had an average rate of 1.0 per 100,000. The region with the lowest rates in 2017 was Asia with countries like Singapore and Japan having rates of just 0.2 homicides per 100,000.²

The UNODC also provides cross-national data on rates by sex and age. Notwithstanding the definitional issues, two other broad conclusions seem justified from this data. While there are exceptions, countries with higher homicide rates generally have a higher proportion of male victims and a higher proportion of victims aged 15-44, see Figures A2.2 and A2.3.

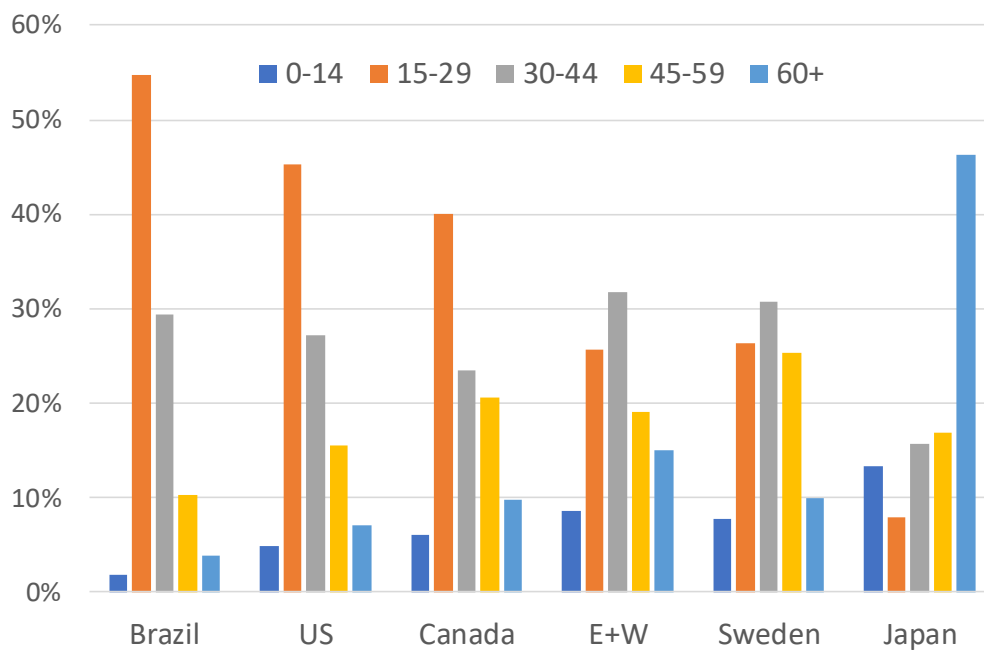
² Several reasons have been suggested for the lower rates of homicide (and crime generally) in Asia, including recording and definitional issues (Yu and Zhang, 1999), lower rates of risk factors like sexual abuse (Finkelhor et. al., 2013); lower levels of inequality (Braithwaite, 2014); different parenting styles (Bui, 2014) and a more collectivist culture (Finkelhor et. al., 2013).

Figures A2.2 and A2.3: Percentage of homicide victims that are male in selected countries, 2000 to 2017



Source: UNODC Global Homicide Data

Figure A2.3: Homicide in selected countries in 2010, by age of victim



Source: UNODC Global Homicide Data

Figure A2.3 shows that Japan is quite unlike the other nations in the chart in having a markedly higher rate of homicides for over-60s than for younger people. However, Japan's overall homicide rate in 2017 was only 0.2 per 100,000. So although Japan's rate for over-60s appears high it is actually still lower than the over-60 victimisation rate for England and Wales.³ The really different thing about Japan's homicide profile is its markedly lower rate of homicide among younger people. The UNODC data shows that Japan's older age profile for homicide is true for Asia generally. For example, data produced by Sea et al (2018) show a similar age distribution for homicide in Korea, where 73% of male homicide victims are over 30 and 45% are over 40. Furthermore, Annex 1 showed that Asians in England and Wales display a far older homicide profile than other ethnicities. This perhaps suggests that part of the reason for these patterns is cultural.

While these findings are interesting, it is important to remember the caveat that figures are not perfectly comparable across nations due to definitional differences. The primary focus of this report is *trends* over time. For trends, most of the definitional differences between nations are likely to have only minimal impact. It is reassuring to note that while published comparisons of cross-national homicide data suggest that the rank ordering of countries may differ between databases due to the use of different underlying sources, datasets have largely shown to be consistent with each other when comparing *trends* in homicide between countries.⁴ Nonetheless, comparing trends over a long period of time does raise the need for caution and an awareness of changes in the methods of recording within a country, and of missing data.

2. International Trends in Homicide

Methodological Note: This section compares homicide trends in England and Wales to trends from a number of other nations. The data sources are listed throughout. We have tried to select the best data series and those most comparable to England and Wales. We welcome correspondence from analysts in other nations about whether these are the best sources. Throughout, the data source for the England and Wales trend is the police recorded crime series with certain exclusions (e.g. Shipman, Hillsborough). This is because the chapter compares trends both for the most recent period and back to the 1960s. The police recorded crime series is the only one that can be used for both those purposes. Countries also use different reporting periods. Some uses calendar years and some financial years. This means that in most charts some of the nations' trends are shown using a

³ According to UNODC data, Japan's homicide victimisation rate for males over 60 in 2010 was 0.5 per 100,000 population and for women it was 0.6. The equivalent figures for England and Wales were 0.7 and 0.8 respectively.

⁴ Smit et al. (2012) Homicide Data in Europe: Definitions, Sources, and Statistics in Liem and Pridmore (Eds) Handbook of European Homicide Research. P7.

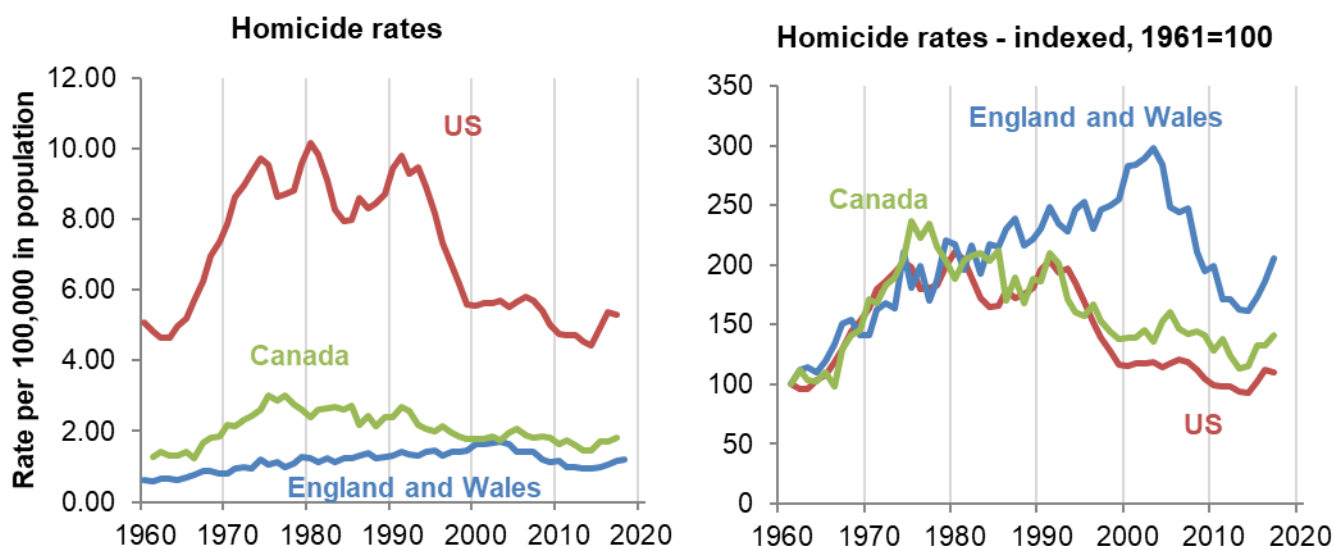
financial year axis when their trend is in calendar years, or vice versa. This is acknowledged in the notes for each chart.

a) North America

The first half of this annex contrasts the homicide trend in England and Wales with several different countries, focusing initially on those which are either geographically or culturally close, or those which have experienced broadly similar socio-economic trends to England and Wales. Where possible, data from approximately 1960 have been compared.

Given the wealth of research on US homicides and the centrality of that research in the key literature discussed elsewhere, it is appropriate to begin by comparing the trend in England and Wales to the US, and to its neighbour Canada.⁵

Figures A2.4 and A2.5: Rates of homicide in England and Wales, US and Canada



Source: *E&W* - Historic PRC data, Home Office, and ONS mid-year population estimates. *US* - FBI UCR data. Census Bureau data. *Canada* – Statistics Canada. England and Wales trend uses financial years from 1997 onwards, so 2017 on chart is actually 2017/18.

The left-hand chart (Figure A2.4) shows homicide rates per 100,000 people in the population for the three nations. As is immediately evident, the prevalence of homicides in the US far exceeds that of the other two nations. Between 1960 and 2016, the average homicide rate in the US (7.0 per 100,000) was more than three

⁵ Statistics Canada records only culpable homicide in its annual homicide survey. This includes murder, manslaughter or infanticide. Deaths caused by criminal negligence, suicide and accidental or justifiable homicide (e.g. self-defence) are not included. Statistics Canada (2017) Homicide Survey: Glossary of terms. Available from: https://www.statcan.gc.ca/eng/statistical-programs/document/3315_D3_T9_V1

times that of Canada (2.1 per 100,000) and more than six times that of England and Wales (1.2 per 100,000).

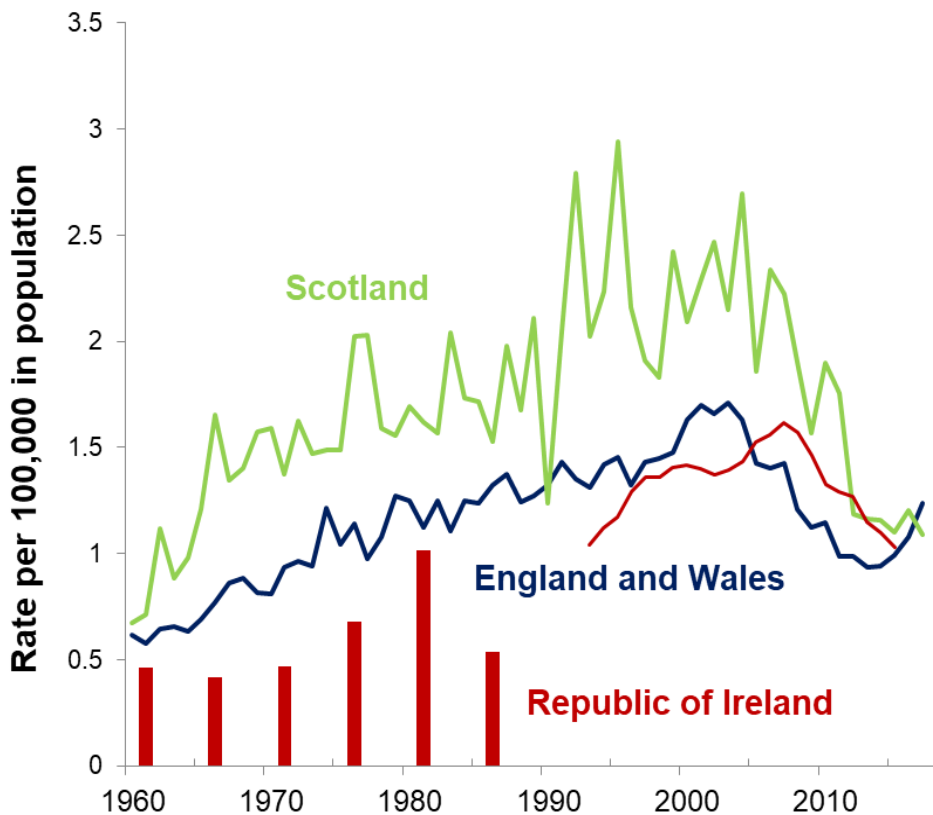
Due to this difference in magnitude, the trends are easier to see if the rates are indexed, as shown in the right-hand chart (Figure A2.5). From this, there are four principal observations to make:

- The homicide rates of all three nations rose by similar proportions throughout the 1960-70s. Compared to the first three years of the series, the average rate of homicides for the three-year period between 1978-1980 was 91 per cent higher in Canada, 97 per cent higher in the US, and nearly 100 per cent higher in England and Wales.
- There is a high degree of correlation between the trends for Canada and the US, despite their different levels of homicide. Both experienced a 'spike' in homicides during the late 1980s and early 1990s.
- The fall in homicides in England and Wales occurred around a decade later than the fall in Canada and the US. This is a recurring theme that will be noted in relation to many other developed nations.
- All three nations have had a noticeable upturn in homicides since about 2014.

b) Scotland and the Republic of Ireland

Considering the geographic proximity and cultural similarities, it would be reasonable to expect homicide levels and trends to be similar across the different countries of the British Isles. However, lethal violence in Northern Ireland has been strongly influenced by political instability, so this analysis looks only at England and Wales, the Republic of Ireland and Scotland.

Figure A2.6: Rates of homicide in England and Wales, the Republic of Ireland, and Scotland



Sources: *E&W* – Historic PRC data, Home Office, and ONS mid-year population estimates. **Scotland** – homicide figures up to 1980 from Parliamentary research paper 99/56 (records homicide incidents rather than victims), from 1980/81 to 2008/09 homicide victim figures from ‘Homicide in Scotland, 2014-5’, Scottish Government. From 2009/10 figures from Homicide in Scotland, 2018-19. Population figures from Scottish Records Office. **Republic of Ireland** – homicide figures up to 2003 from the National Crime Council, and from 2003 homicide figures from Central Statistics Office. Population figures from Central Statistics Office. England and Wales trend uses financial years from 1997 onwards, so 2017 on chart is actually 2017/18. Scotland data is financial years from 1980/81.

In common with Canada and the US, homicide rates in Scotland and Ireland increased through much of the second-half of the 20th Century. However, more closely resembling the trend in England and Wales, homicide rates continued to increase during the 1990s and into the 2000s in both Scotland and Ireland.

The homicide rates of all three countries in Figure A2.6 roughly tripled between 1960 and 2000. Notably however, in contrast to trends in the British countries, the homicide rate in Ireland began increasing a decade after England and Wales and Scotland (during the 1970s) and did not begin to see longer term falls until slightly later (in the late 2000s).

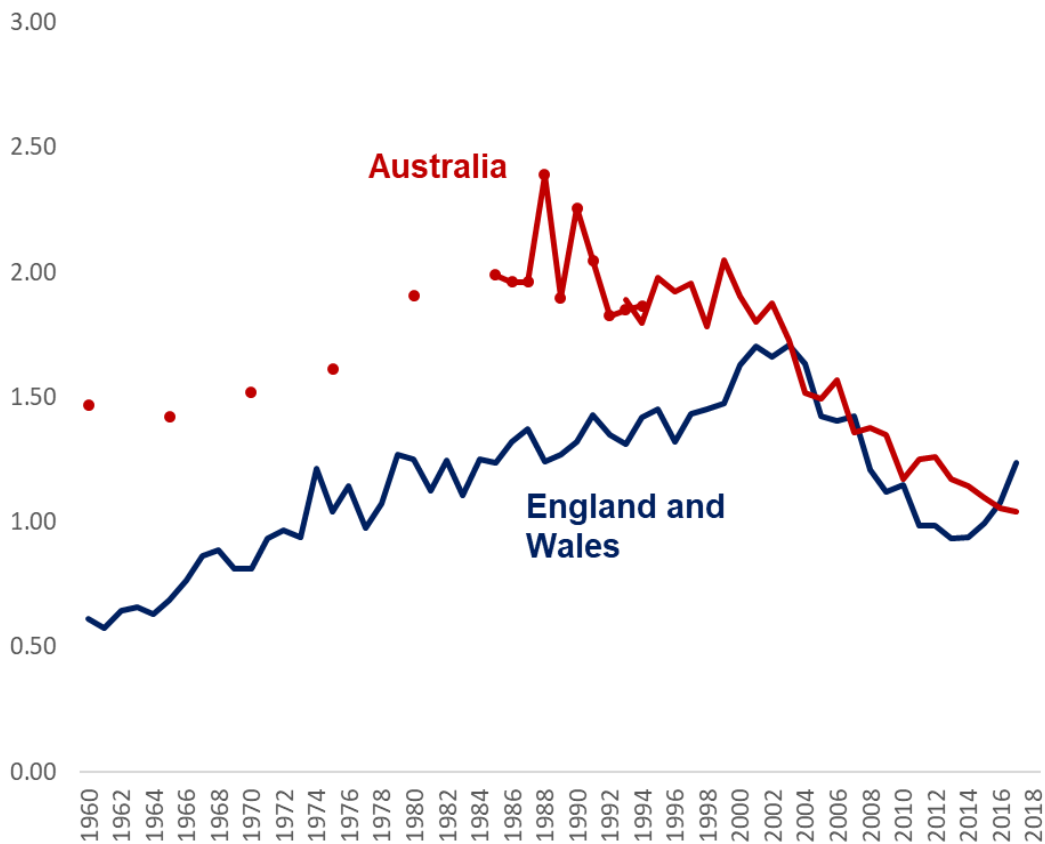
Additionally, it can be observed that over the past 50 years Scotland has had consistently higher rates of homicide than both Ireland and England and Wales. One reason for this is due to recording practices – an acquittal of a homicide suspect in England and Wales is more likely to result in a deletion of a recorded homicide than in Scotland. However, Soothill et al. (1999) estimated that over the period 1985-94 this recording difference explained less than 10 per cent of the difference in homicide rates. Instead, the research concluded that the main reason for the difference was that Scotland had much higher rates of male-on-male ‘acquaintance’ and ‘stranger’ homicides across all adult ages. Whilst a gap between homicide rates in Scotland and those in England and Wales and Ireland has persisted throughout the time series, the gap has narrowed since the late 2000s due to more substantial falls in the homicide rate in Scotland. It is also noticeable that while homicide has risen markedly in England and Wales since 2014, there has been no increase over that period in Scotland.

c) Australia and New Zealand

Australia and New Zealand are two further countries that share several characteristics with England and Wales. No single source of consistent data to cover the period of study was found for either New Zealand or Australia, so multiple sources were cross-referenced. Figure A2.7 shows homicide trends in Australia and England and Wales. Several observations can be readily made:

- Australia has a broadly similar trend to the other nations looked at so far – homicide rates higher in 2000 than 1960, but lower in the early 2010s than in 2000.
- However, the rate of increase in Australia between the 1960s and 2000 was not as substantial as in England and Wales or other countries examined so far.
- Homicide rates in Australia appeared to reach a peak in the late 1980s/early 1990s, roughly in line with the peaks in Canada and the US although caution is required as different sources show slightly different figures. Unlike the US and Canada, Australia’s homicide did not see a sharp drop in the late 1990s. It was not until the 2000s that Australia’s rate declined sharply.
- Unlike England and Wales, Australia has not had a homicide rise since 2014. This means that in 2017 and 2018 it had a lower homicide rate than England and Wales, contrary to the period 1960 to 2000.

Figure A2.7 – Rates of homicide per 100,000 in England and Wales and Australia

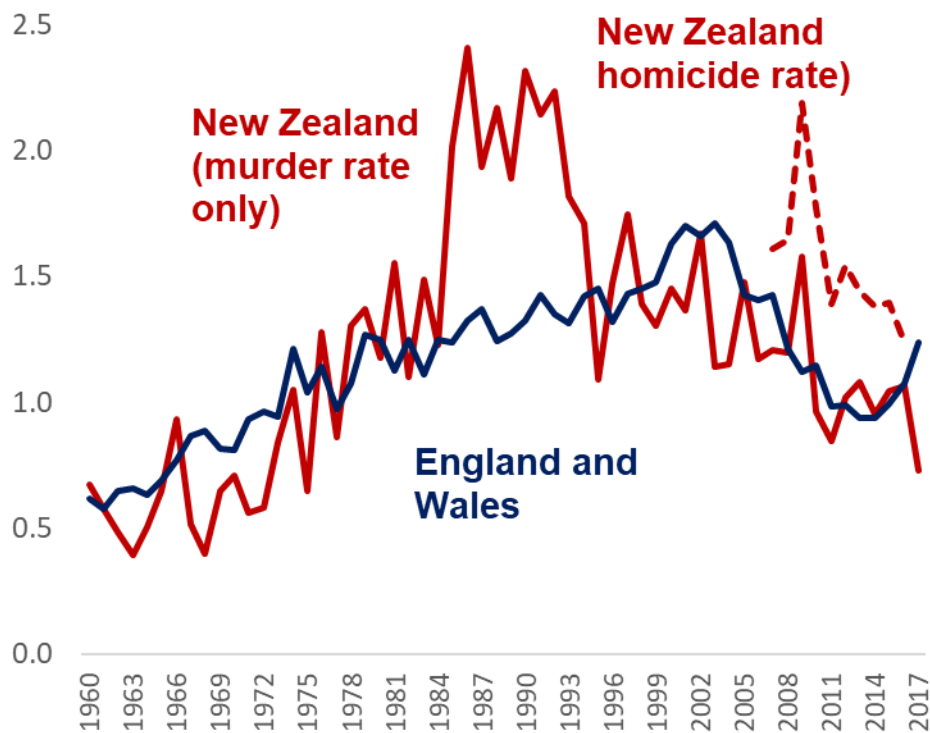


Sources: *E&W* - Historic PRC data, Home Office, and ONS mid-year population estimates. *Australia* – First series based on recorded homicides as presented in Mukherjee & Carcach 1996. Second series from Australia Bureau of Statistics, Victims of Crime Australia 2016. Australian Bureau of Statistics, ‘Australian Historical Population, 2014’. England and Wales trend uses financial years from 1997 onwards, so 2017 on chart is actually 2017/18

Figure A2.8 shows the homicide trend in New Zealand, compared with that in England and Wales. Data on *murders* in New Zealand was located back to 1949 but an equivalent series, including both murder and manslaughter, was only located from 1994. Nevertheless, given the similarity in trends for the period in which the two series overlap, we can have some confidence that the long-term trend paints an accurate picture.⁶

⁶ This observation is further reinforced by Simpson et al. (2004), who similarly found a close trend between when using alternative data sources.

Figure A2.8: Homicide rates in New Zealand and England and Wales, 1960 to 2017/18



Sources: *E&W* - Historic PRC data, Home Office, and ONS mid-year population estimates. **New Zealand** –Series on murder victims from

<https://www.police.govt.nz/sites/default/files/publications/historic-new-zealand-murder-rates.pdf>.

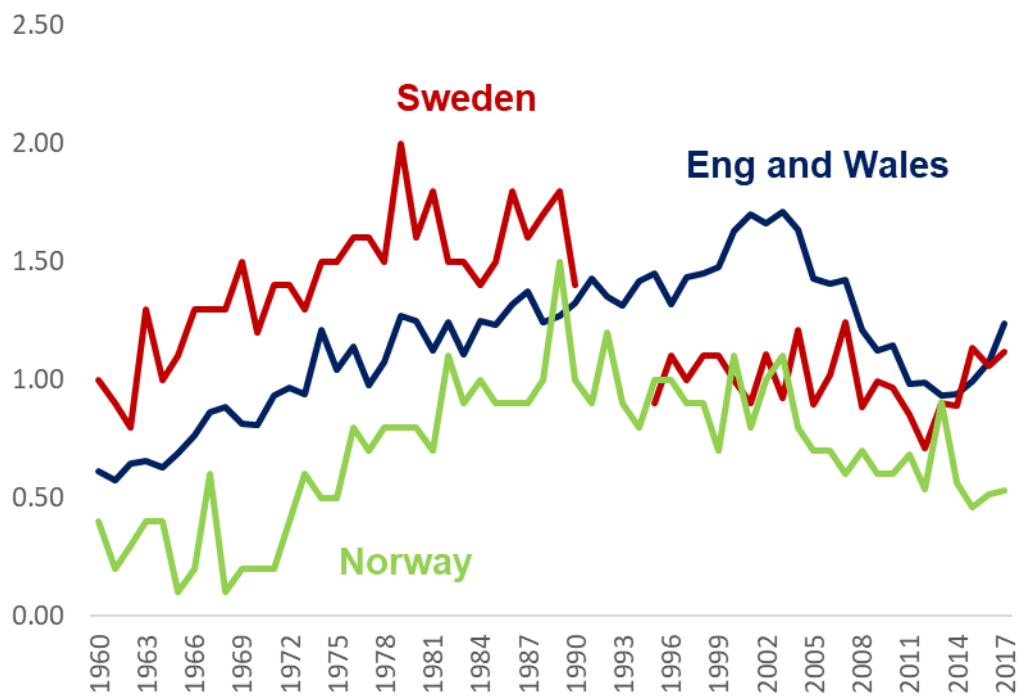
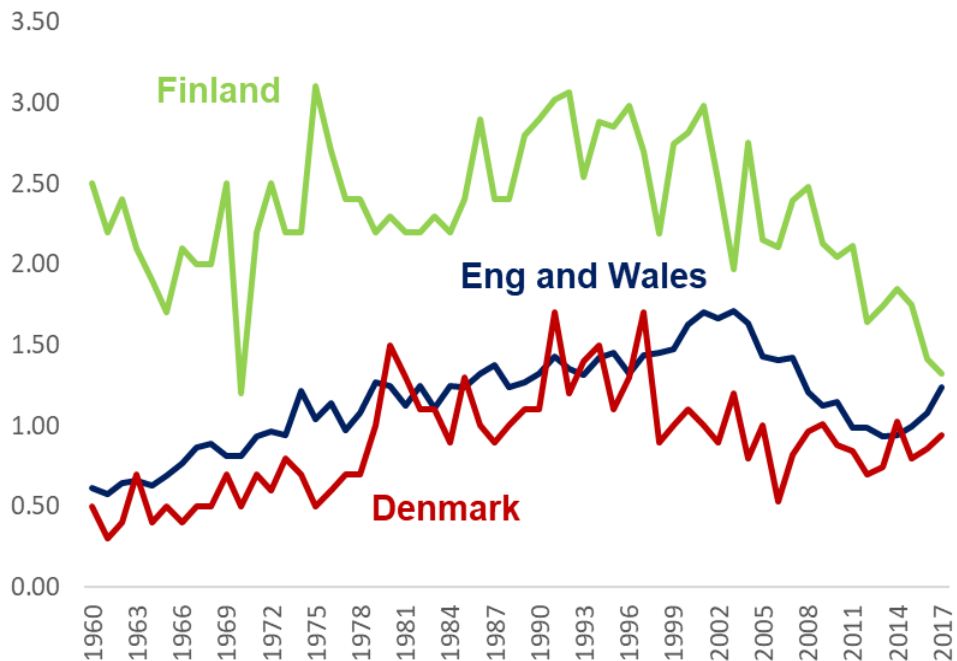
Series on recorded homicides from Statistics New Zealand, Annual Recorded Offences for the latest calendar years. Historical population tables, Statistics New Zealand. England and Wales trend uses financial years from 1997 onwards, so 2017 on chart is actually 2017/18

New Zealand’s trend shows a pronounced rise in homicide from 1960 to 1990, although New Zealand’s trend also has a clear step-change up in 1985 and then a similar sized drop in the mid-1990s. Like England and Wales, New Zealand’s homicide rate has decreased (with some volatility) from the early 2000s to 2014, but unlike England and Wales, New Zealand’s rate has also continued to fall in the most recent years. It reached its lowest point for more than 40 years in 2017.

d) Nordic countries

Figures A2.9 and A2.10 show homicide trends in the Nordic countries. Finland’s persistently high homicide rate has long marked it out as an outlier in northern Europe (von Hofer et al. 2012; Granath et al. 2011).

Figure A2.9 and A2.10: Rates of homicide per 100,000 in England and Wales, Finland, Sweden, Denmark and Norway



Sources: *E&W* - Historic PRC data, Home Office, and ONS mid-year population estimates. **Swe, Fin, Den, Nor** – up to 2010 data from von Hofer et al. 2012. **Sweden** – www.SCB.se, Kriminalstatistik. **Denmark** – Kriminalitet, Danmarks Statistik Finland – Statistics Finland’s PX-Web databases. England and Wales trend uses financial years from 1997 onwards, so 2017 on chart is actually 2017/18.

Notes: data for confirmed homicide incidents in Sweden missing for 1990s and early 2000s. Two estimations, the first using mortality data and the second uses *initially reported* incidents have been used.

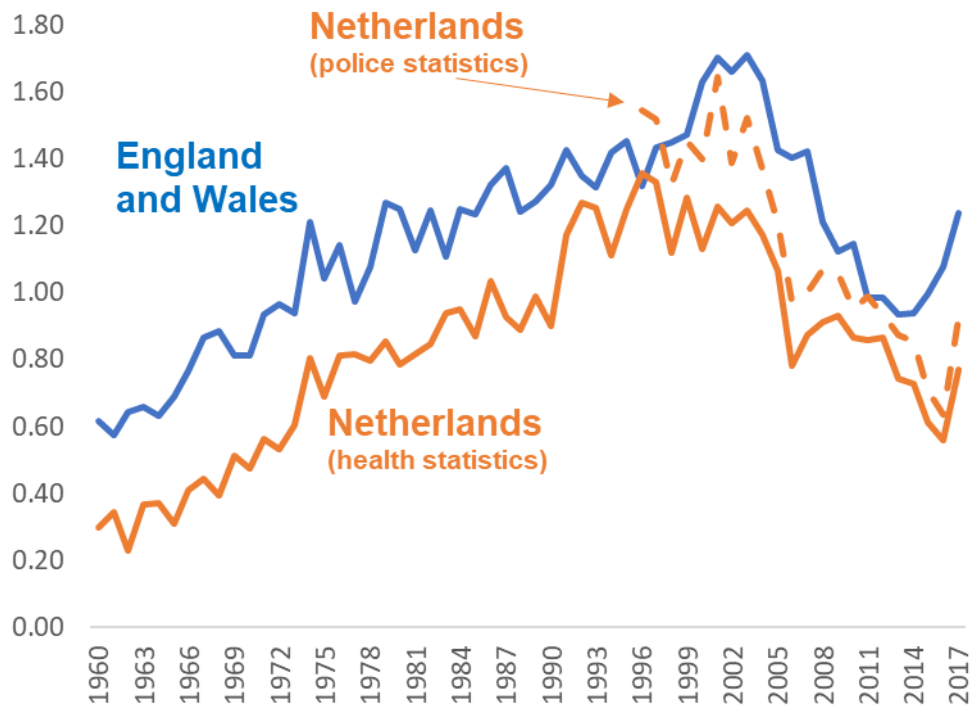
Observations:

- All Scandinavian countries show the general pattern of overall increases between 1960 and 1990 and an overall fall thereafter.
- There are also elements of these trends that differ from England and Wales and are more like the US and Canada. For example, Finland, Denmark and Sweden have earlier peaks, in the 1970s and 1980s, as well as in the early 1990s.
- Homicide rates have changed by much more in low-homicide Norway and Denmark than they did in higher homicide Sweden and Finland.
- Homicide rates are lower in Sweden and Finland now than they were in 1960, but the opposite is true for Norway and Denmark.
- Homicide rates in Norway and Finland did not increase until the 1970s.
- While Sweden has had a recent uptick in homicide, like England and Wales, Finland and Norway have not. Denmark is somewhere in the middle.

e) Western Europe

Figure A 2.11 shows the homicide trend in the Netherlands. Statistics were drawn from cause of death certificates, part of the Netherlands health statistics. These are available from 1950 until the current year. They include deaths where the cause was recorded as 'homicide and injury purposely inflicted by another person with intent to injure or kill'. More detailed police homicide data are also available for the Netherlands from 1996. This is shown via the dotted line. These broadly confirm the trend shown in the cause of death statistics, although they do indicate that the cause of death data generally underestimates the true homicide rate in the Netherlands.

Figure A2.11: Rates of homicide per 100,000 in England and Wales and the Netherlands, 1960 to 2017/18



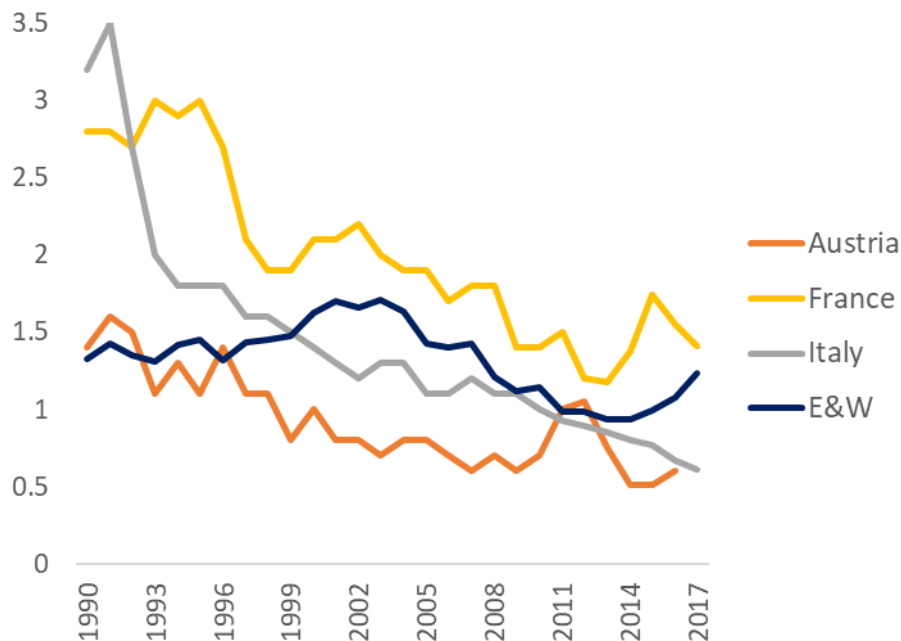
Sources: **England and Wales** - Historic PRC data, Home Office, and ONS mid-year population estimates; **Netherlands** – statline.cbs.nl. England and Wales trend uses financial years from 1997 onwards, so 2017 on chart is actually 2017/18

The trend in the Netherlands shows a high degree of correlation with England and Wales. Homicide remained at higher levels throughout the 1990s and, in common with England and Wales, only began to see sharp declines from 2003. Both nations have also seen a sharp rise in homicide rates since 2014.

Although a long time series of homicide data could not be located for Germany, available evidence suggests that it also had a rise in homicide from 1960 to the mid-1990s and a decline thereafter (Birkel and Dern, 2012). But there were also differences from England and Wales. In West Germany, the rise from the 1960s was more gradual than in England and Wales and featured a small decline in the 1980s prior to unification before rising again after unification to peak in the mid-90s. Since then, there was a decline to 2012, followed by a rise (Eurostat).

Looking beyond the Netherlands and Germany, data from the successive editions of the European Sourcebook enable a comparison from 1990 to 2011 of England and Wales with three further Western European countries: France, Italy and Austria. All three countries experienced declines in their homicide rates during the 1990s, the decade prior to the start of the decline in England and Wales.

Figure A2.12: Rates of homicide per 100,000 in England and Wales, France, Italy and Austria 1990 to 2017



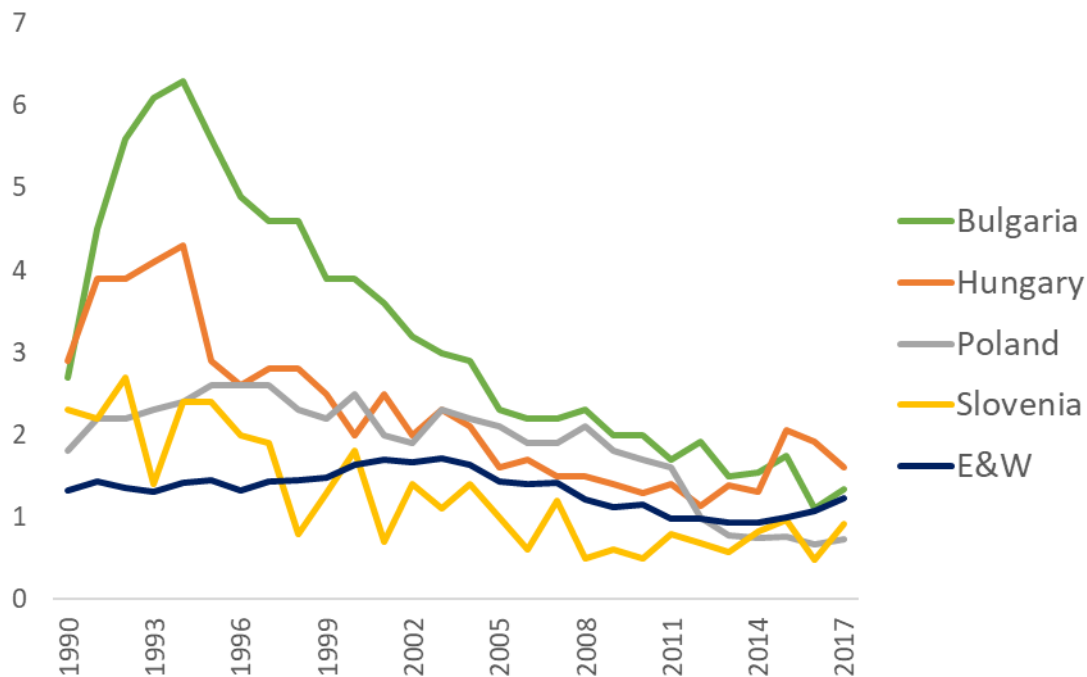
Source: England and Wales - Historic PRC data, Home Office, and ONS mid-year population estimates; **European nations** - European Sourcebooks, editions 1 to 5, accessed from Eurostat. England and Wales trend uses financial years from 1997 onwards, so 2017 on chart is actually 2017/18.

A longer-term analysis of trends in France, which draws together information from multiple sources, indicates that France experienced a substantial increase in homicides between 1971 and the early 1980s and a decline (with some volatility) thereafter (Mucchielli, 2012). As can be seen in the European Sourcebook data above, the continuation of this decline into the 1990s brought homicide levels in France much closer to England and Wales and other European counterparts, with its rate halving from 3 per 100,000 in 1993 to 1.5 per 100,000 in 2010. Like England and Wales, France has also seen higher levels of homicide since 2014, whereas Italy has continued on a downward trend following a sharp peak in the early 1990s.

f) **Central and Eastern Europe**

Data from Eurostat enables the comparison of trends in some central and eastern European countries with England and Wales from 1990 until 2017. The four countries examined (Bulgaria, Hungary, Poland and Slovenia) are shown in Figure A2.13.

Figure A2.13: Rates of homicide per 100,000 in England and Wales, Bulgaria, Hungary, Poland and Slovenia, 1990 to 2017



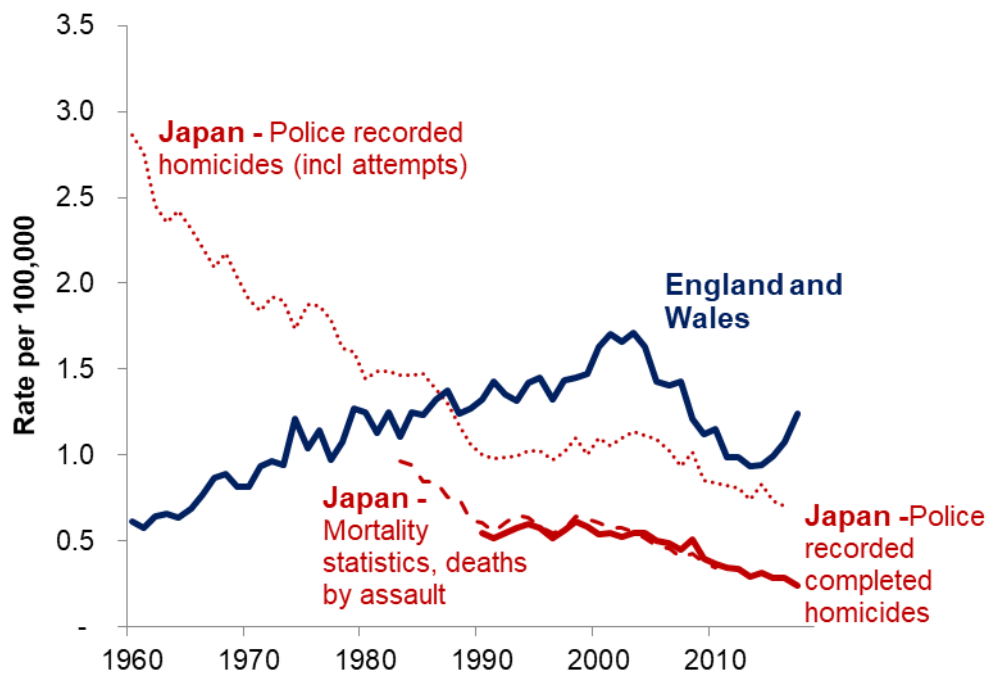
Source: England and Wales - Historic PRC data, Home Office, and ONS mid-year population estimates; **European nations** - Eurostat. England and Wales trend uses financial years from 1997 onwards, so 2017 on chart is actually 2017/18.

These trends fit with the overall patterns seen so far. Several countries have notable spikes in homicide in the 1990s – Bulgaria and Hungary particularly, in the immediate post-Soviet period. But all nations show a decline through most of the 2000s with some variation since 2014. Hungary’s homicide level was higher in 2015-2017 than in 2014, like England and Wales, whereas Poland and Bulgaria showed no such change in trend. Slovenia is notable for its low homicide rate throughout.

g) East Asia

In sharp contrast to all the other developed nations reviewed, homicide rates in Japan have fallen reasonably consistently over the past five decades, see Figure A 2.14. The Japanese authorities do not ordinarily separate completed and attempted homicides (dotted red line). The actual homicide rate, as collected by the UN, (dark red line) is much lower. However, as figure 6 suggests, the trend that includes attempted homicides is likely to be a reasonable proxy for the trend in completed homicides.

Figure A2.14: Rates of homicide per 100,000 in Japan and England and Wales, 1960 to 2017



Sources: *E&W* - Historic PRC data, Home Office, and ONS mid-year population estimates. *Japan mortality statistics* – WHO database. *Japan police recorded completed homicides* – UN data, <http://data.un.org/Explorer.aspx> *Japan police recorded homicides including attempts* – ‘Historical statistics of japan, chapter 28’, and various ‘Statistical yearbooks’ *Japan population* – World Bank database. England and Wales trend uses financial years from 1997 onwards, so 2017 on chart is actually 2017/18.

The 2017 rate of homicides in Japan (0.2 per 100,000) is one of the lowest in the world. As section 1 (above) outlined, Japan’s low rate is fairly typical for East Asian nations and is driven by a reduced rate of homicides amongst young men.

Like other nations though, when Japan’s homicide rate was high, during the immediate post-war period, it was driven by homicides involving young men. Johnson (2008) points out that Japanese males aged 20-24 in 1955 committed homicide at a rate 10 times higher than their 20-24-year-old counterparts do today (Johnson 2008, p.149). In 2017, Japanese men in their 50s committed homicide at a higher rate than males aged 20-24.

h) Central and South America, Africa and other nations

Like, Japan, homicide trends in Central and South American countries tend to differ from the prevailing pattern seen in all other nations so far. Unlike in Japan, this isn't because they follow a long-term downward trend. Many Central and South American countries continue to suffer a high rate of homicide and some nations have seen sharp increases in recent years.

For example, available data suggest that Brazil's homicide rate has increased reasonably consistently from at least 1980 to 2017 (Murray et al., 2013; UNODC Global Homicide Data). Its 2017 rate was estimated at 30.5 per 100,000 by the UNODC, making it one of the highest in the world. Venezuela also seems to have had a marked upward trend in homicide since 1990 with rates rising from 12.5 in 1990 to 45.5 per 100,000 in 2010 (UNODC Global Homicide Data).

Homicide rates in Mexico have also increased sharply in recent years, particularly between 2006 and 2010 and from 2015 to 2018. Its 2017 rate was estimated at 24.8 by UNODC (UNODC Global Homicide Data). Mexico's long-term trend is very different from the prevailing pattern found in most nations studied in this report. Homicide in Mexico fell from 1945 to 1970, then rose slightly to 1993 before falling again up to 2006 (INEGI-Estadísticas Vitales; Mexico Mexico; Calderon et al., 2019).

Homicide in Colombia also seems to have fallen from the late 1950s to the late 1970s, when homicide across much of the rest of the world was increasing. However, between the late 1970s and 1991, Colombia had a sharp rise in homicide such that its trend peaks in line with the US and Canada. Like those nations, it also had a prolonged decline through the late 1990s and 2000s (Guerrero and Fandiño-Losada, 2017).

Only a limited amount of time series homicide data could be located for African countries, limiting the number of conclusions that can be drawn. However, media reports suggest that South Africa's homicide trend followed the prevailing pattern with a steep increase to a peak in the early 1990s and a fall thereafter, followed by a rise in the mid-2010s.⁷ There is also some evidence that the homicide trend in India followed a similar pattern with a peak in 1992 (Unnithan, 2013).

⁷ See: <https://africacheck.org/2016/07/22/analysis-why-sas-murder-rates-today-arent-higher-than-ever/>

3. Breakdowns of the overall homicide trend in selected nations

The analysis in this annex reveals clear similarities in homicide trends over time across several countries. Where data were available from 1960 onwards, trends in almost all countries except those in East Asia and Central/South America showed increases in homicide rates for several decades from the 1960s or 1970s. The countries then witnessed relatively prolonged declines in homicide rates from either the 1980s (France), 1990s (US, Canada, Finland, Sweden, Denmark, Norway, Germany, Italy, Austria, Bulgaria, Hungary, Poland, India, South Africa and Slovenia) or, in common with England and Wales, from the early 2000s (Scotland, Ireland, Australia and the Netherlands).

The near simultaneous decline in homicide rates in numerous countries has been given attention in analyses that have been published on global trends in homicide. In most cross-country analyses, the start of the decline is consistently dated to a single point - the 1990s. For example, combining WHO data for 108 countries, Rennó Santos and Testa (2018) identified a 25% drop in the homicide rate from 14.59 per 100,000 population in 1990 to 10.87 in 2015. While identifying the 1990s as the start of the decline, they noted that larger declines occurred between 2000 and 2015, and that short periods of rising homicide rates have occurred globally during this time, most notably between 1999 and 2002. They also observed from WHO data that rates of decline between 1990 and 2015 were greater in the safest regions of the world (Western Europe and Oceania), while regions with higher initial rates either saw smaller declines (Eastern Europe) or slight increases (Latin America). Finally, comparing the most recent data available to them, they suggested that 'most regions of the world experienced either a flattening or a slight increase of homicide rates since 2013' (2018: 205). Our analysis shows that while all but two of 13 nations studied had falls in homicide from 2008 to 2014, seven out of the 13 had increases from 2014 to the most recent year available (mostly 2017, see sources note).

Table A2.1: Change in homicide from 2008 to 2014 and from 2014 to 2017 in selected countries

	Homicide Rates	
	Change from 2008 to 2014	Change from 2014 to 2017
Eng. & Wales	-22%	32%
US	-18%	19%
Scotland	-39%	-6%
Sweden	1%	25%
Canada	-21%	22%
France	-23%	2%
Norway	-19%	-6%
Australia	-17%	-9%
Denmark	7%	-9%
Finland	-26%	-28%
Italy	-27%	-24%
Austria	-27%	18%
Netherlands	-20%	8%

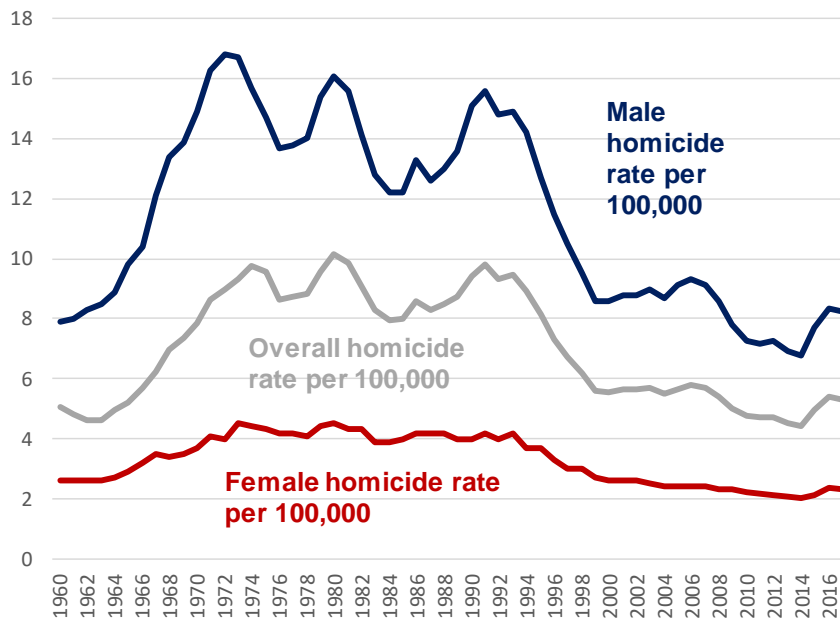
Sources: Same as for individual country charts, listed above. Note that figures for England and Wales are in financial years so 2014 is 2014/15. Latest year available for Austria was 2016.

The rest of this section looks to shed more light on these patterns by showing breakdowns of the overall trend in selected nations, those for which data was available over the long term.

Homicide trend breakdowns in the US

Figure A 2.15 shows US homicide broken down by male and female victimisation rates.

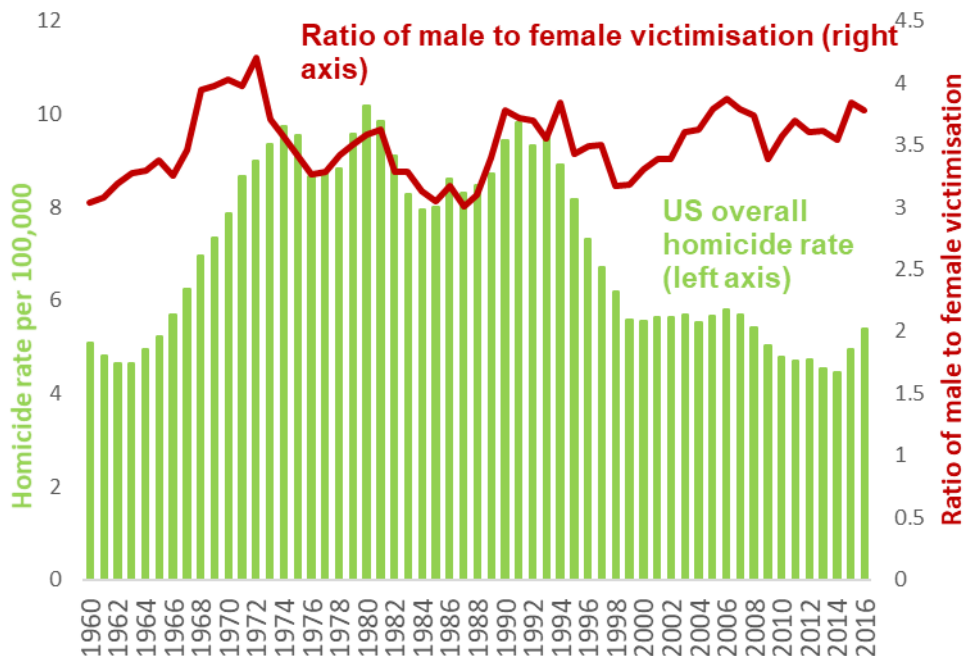
Figure A 2.15: Male and female homicide victimisation rates in the US, 1960 to 2017



Sources: National Research Institute on Legal Policy Comparative Homicide Time Series (Lehti, 2013). Recent figures from FBI UCR reports.

Unlike in England and Wales, male rates in the US have been higher than female rates throughout the series and both follow the overall pattern of a rise from the 1960s and a fall through the 1990s and 2000s. However, the swings are bigger in male victimisation rates, particularly around the specific peaks in the trend. This is shown clearly in Figure A2.16.

Figure A 2.16: Homicide rates in the US and the ratio of male-to-female victimisation, 1960 to 2017



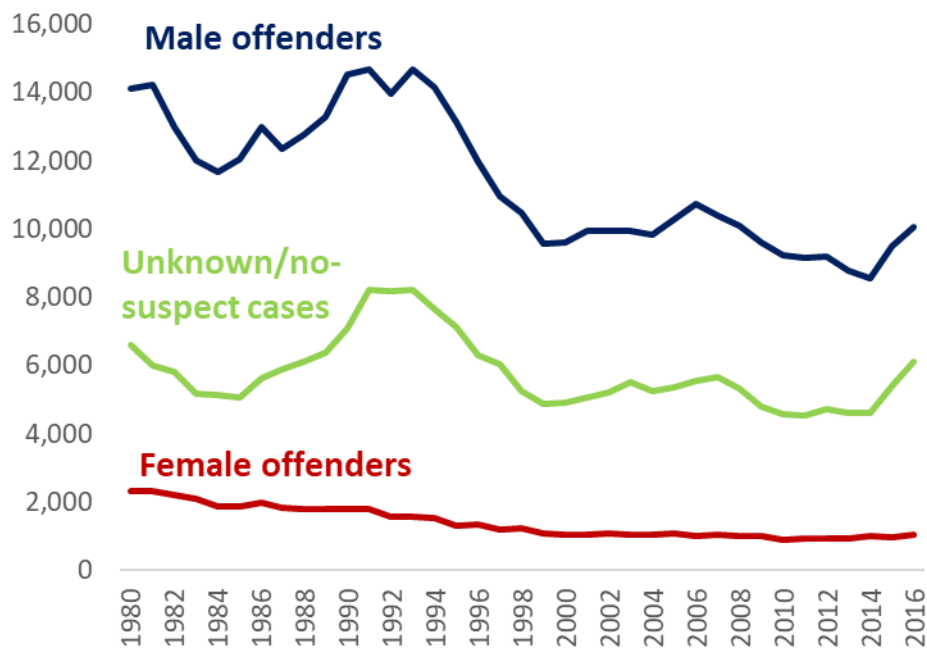
Sources: National Research Institute on Legal Policy Comparative Homicide Time Series (Lehti, 2013). Recent figures from **Source:** Puzzanchera, C., Chamberlin, G., and Kang, W. (2018). "Easy Access to the FBI's Supplementary Homicide Reports: 1980-2016." Online. Available: <https://www.ojdp.gov/ojstatbb/ezashr/>

It is clear that the specific peaks in US homicide rate trends – in the early 70s, 80s and 90s – were driven by sudden increases in male victimisation and the rise since 2014 is somewhat similar. However, the long-wave pattern is also visible in this chart. From the 1960s to the 1980s there is a large overall rise in homicide, yet the male to female victimisation ratio changes little. The same is true for the downturn of the wave through the 1990s. In other words, homicides against both men and women had a long sustained upturn followed by a long downturn.

Finally, it is noticeable that after the US homicide rate stabilised in the mid-1990s, the ratio of male to female victims increased up to 2007 as female victimisation continued on a gradual decline, while male victimisation saw a gradual upturn.

Suspect data (showing sex of those arrested for homicide) is available from 1980, see Figure A2.17.

Figure A 2.17: Male and female homicide offenders in the US, 1960 to 2016

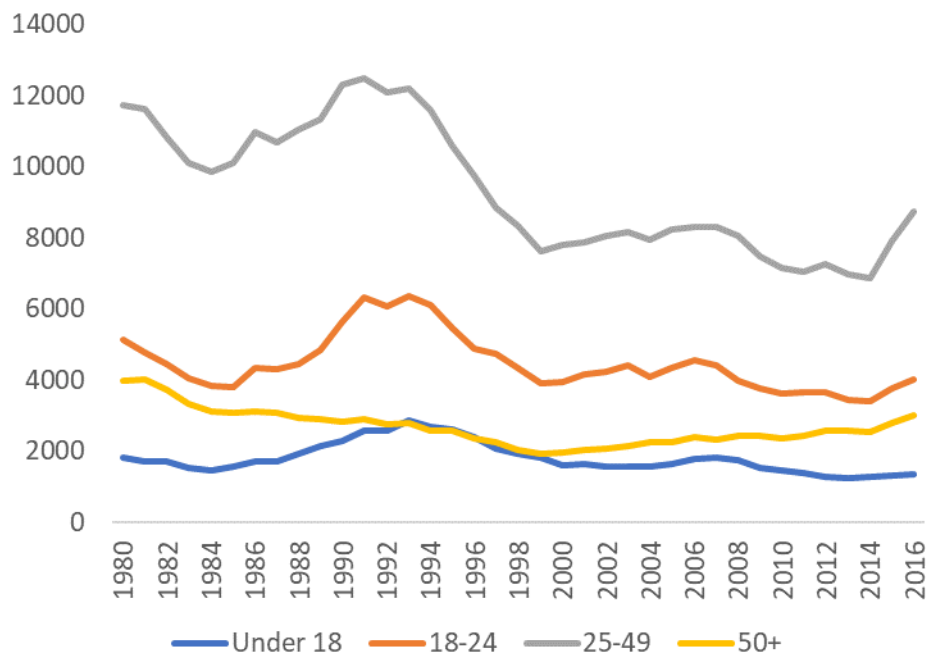


Source: Puzzanchera, C., Chamberlin, G., and Kang, W. (2018). "Easy Access to the FBI's Supplementary Homicide Reports: 1980-2016." Online. Available: <https://www.ojdp.gov/ojstatbb/ezashr/>

As 89% of known homicide offenders in the US have been male from 1980 to 2016 (a very similar figure to that for England and Wales, see Annex 1), the male suspect trend drives the overall trend. The overall homicide peaks in the early 1980s and 1990s were clearly driven by male-suspect and no-suspect cases as was the recent rise. Note that, as with victims there is a slight rise in male suspect rates from the late 1990s to 2007. This is balanced by a fall in female suspect cases.

Turning to age breakdowns, Figure A2.18 shows the US homicide trend broken down by age of victim.

Figure A2.18: Numbers of US homicides by age of victim, 1980 to 2016

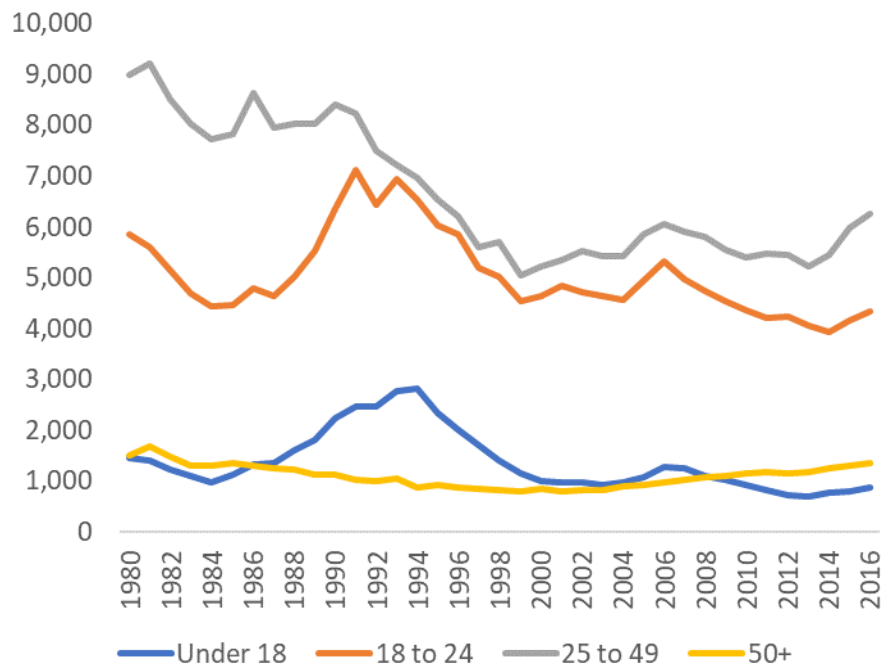


Source: Puzzanchera, C., Chamberlin, G., and Kang, W. (2018). "Easy Access to the FBI's Supplementary Homicide Reports: 1980-2016." Online. Available: <https://www.ojdp.gov/ojstatbb/ezashr/>

In volume terms, the 25-49 category has done most to drive overall trends, particularly the recent rise. However, the trends for 18-24s and under-18s show the same overall pattern with clear peaks in the early 1990s. Older victims show a more consistent decline from 1980 to 2000 and then a slight upward trend. This is partly driven by the ageing population. More detailed data (see accompanying data tables) show that – as with England and Wales homicides against babies and children under the age of 15 are at historically low rates in the US.

Figure A2.19 shows numbers of US homicides by age of the eldest offender.

Figure A2.19: Number of homicides in the US by age of the eldest offender, 1980 to 2016

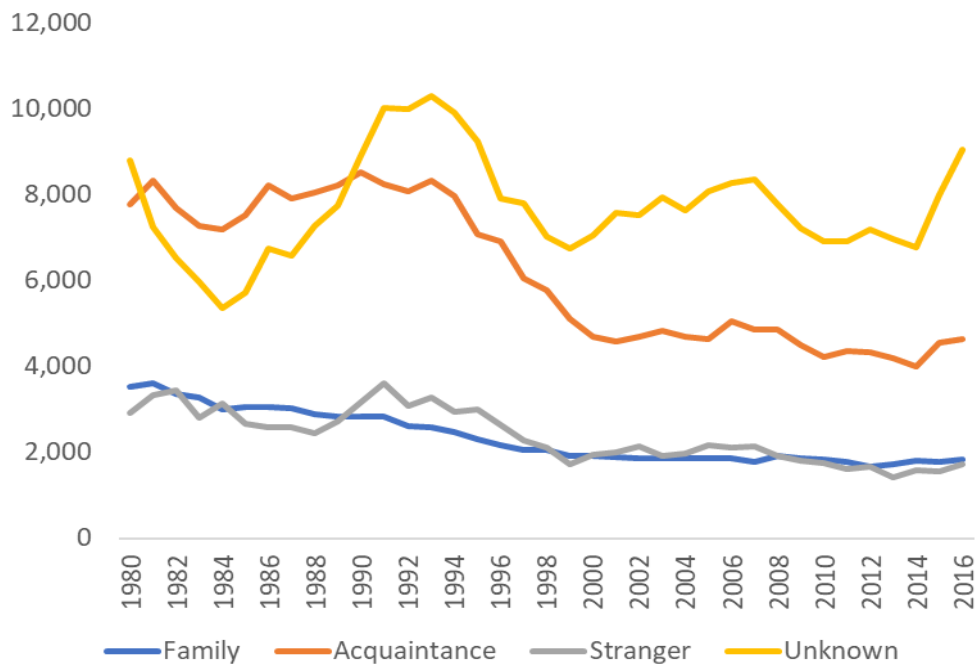


Source: Puzzanchera, C., Chamberlin, G., and Kang, W. (2018). "Easy Access to the FBI's Supplementary Homicide Reports: 1980-2016." Online. Available: <https://www.ojjdp.gov/ojstatbb/ezashr/>

The picture for offenders by age is somewhat similar to victims except that there was clearly a surge in *younger* offenders that drove the 1990s peak. The number of 25-49 offenders was higher in 1980 than 1990 whereas the reverse was true for 18-24s and under-18s. This pattern has been linked with young people being drawn into the illicit drug market due to the crack epidemic of the 1980s (see drugs annex). To the extent that the retail end of the drug market involved street gangs, such a conclusion is also supported by trends showing a sharp increase in the proportion of multi-offender homicides from 1985 to 1990 as well as those involving gangs and handguns (Cooper and Smith, 2012).

Figure A2.20 shows numbers of US homicides by the victim-suspect relationship, where known.

Figure A2. 20: Number homicides in the US by victim-suspect relationship, 1980 to 2016



Source: Puzzanchera, C., Chamberlin, G., and Kang, W. (2018). "Easy Access to the FBI's Supplementary Homicide Reports: 1980-2016." Online. Available: <https://www.ojdp.gov/ojstatbb/ezashr/>.

There are a considerable number of US homicides in which the victim-suspect relationship is unknown, making firm conclusions difficult to draw. However, as in England and Wales, acquaintance homicide is the most voluminous category of the known homicides and (along with the unknown/no-suspect cases) has driven most of the recent overall trends. Also like in England and Wales, the trend in family-related US homicides shows few peaks and troughs and has generally trended downwards slightly.

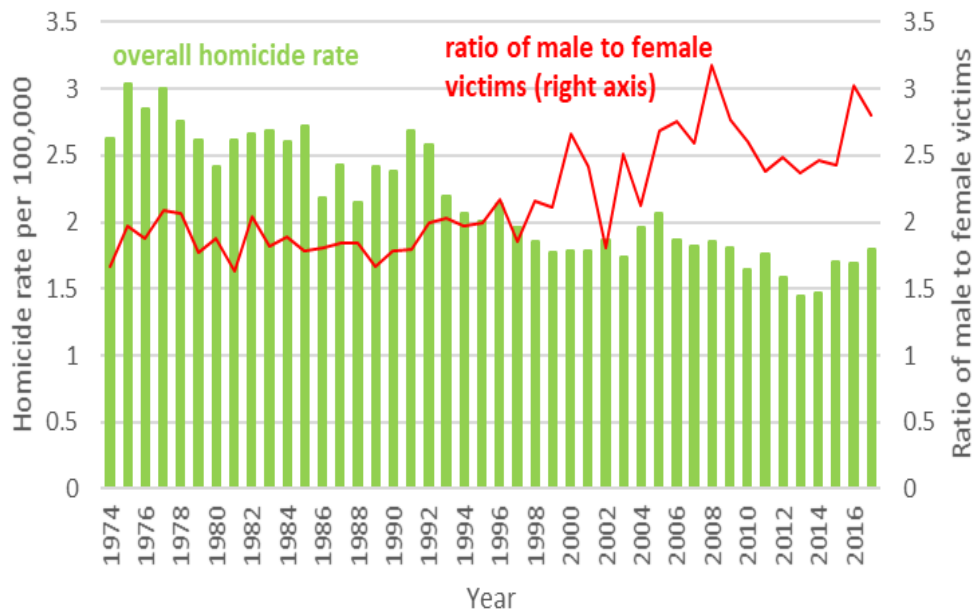
Finally, there is also some evidence that the recent increase in US homicides has been driven partly by a rise in drug-related cases, as in England and Wales. For example, Rosenfeld et al., (2017) noted that the trend in drug-related homicides increased at a faster rate from 2014 to 2015 than other types of homicides. They estimated that drug-related cases accounted for 22% of the overall rise, which may be an under-estimate given the high percentage of cases for which no information was available.

Homicide trend breakdowns in Canada

Data for male and female homicide victimisation was located for Canada from 1974, to 2017, see Figure A 2.21. For Canada there is less evidence that the individual peaks from 1974 to the early 1990s were driven by a disproportionate rise in male victimisation. The male/female ratio stays quite constant from 1974 to 1990. From

the mid-1990s to 2008, however, the ratio increased consistently as overall homicide fell. This contrasts with the general pattern from Figure A2.2, which is that the share of female victims is generally higher when the homicide rate is lower. Since 2008, there has been something of a reversion to the more normal pattern and certainly data suggest that the rise since 2014 has been mainly driven by male victimisation.

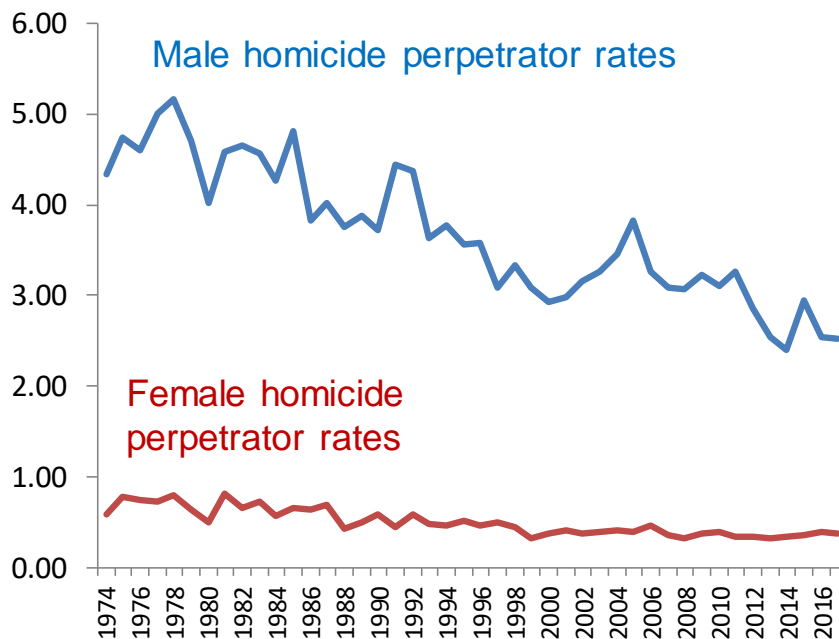
Figure A 2.21: Homicide rates in Canada and the ratio of male-to-female victimisation, 1975 to 2017



Source: Statistics Canada

Data on the perpetrator of Canadian homicides is also available from 1974, see Figure A2.22.

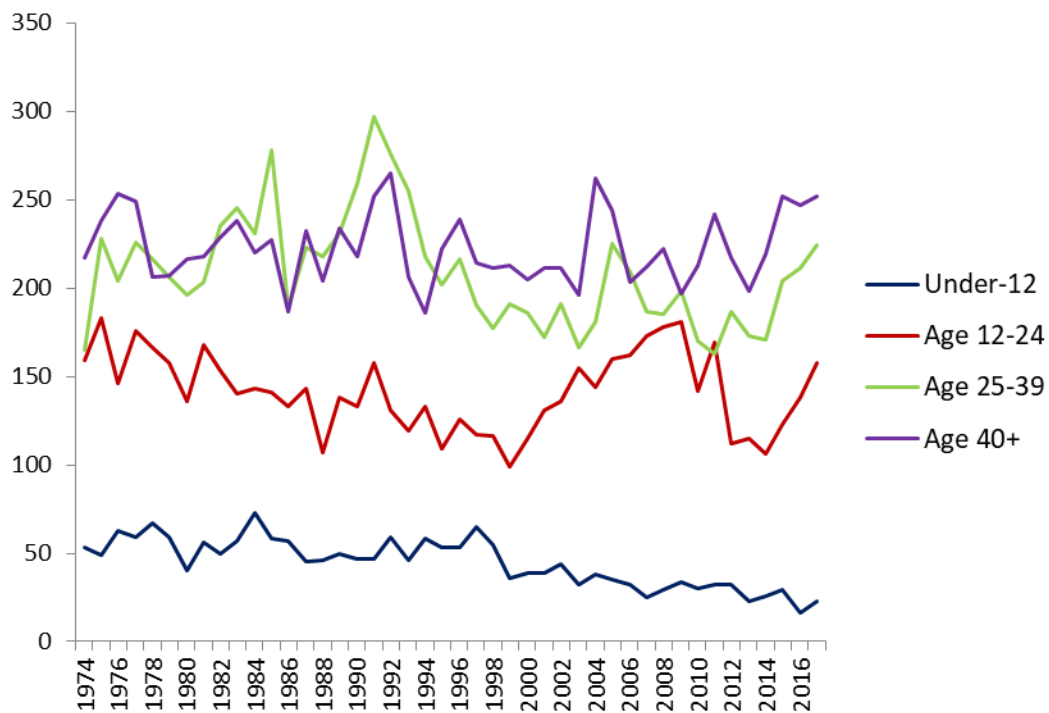
Figure A 2.22: Male and female homicide perpetrator rates in Canada, 1975 to 2017



Source: Statistics Canada

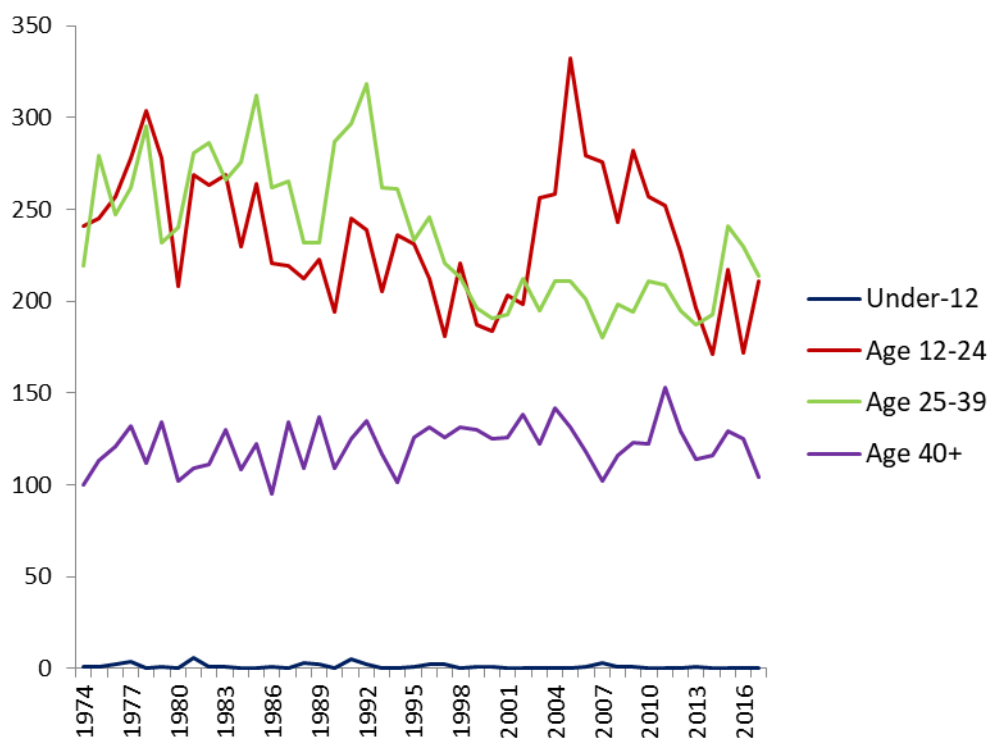
Male and female offender trends in Canada have been similar in Canada from 1974 to 2017 despite the difference in levels. Figure A 2.22 tells us little about the rise from 2014 because all of the increase is captured by the number of no-suspect/unknown cases. As in other nations studied, these cases correlate generally with trends overall. Figures A2.23 and A2.24 show Canada’s homicide trend broken down by age of victim and perpetrator.

Figure A 2.23: Homicide in Canada broken down by age of victim, 1975 to 2017



Source: Statistics Canada

Figure A 2.24: Homicide in Canada broken down by age of perpetrator, 1975 to 2017



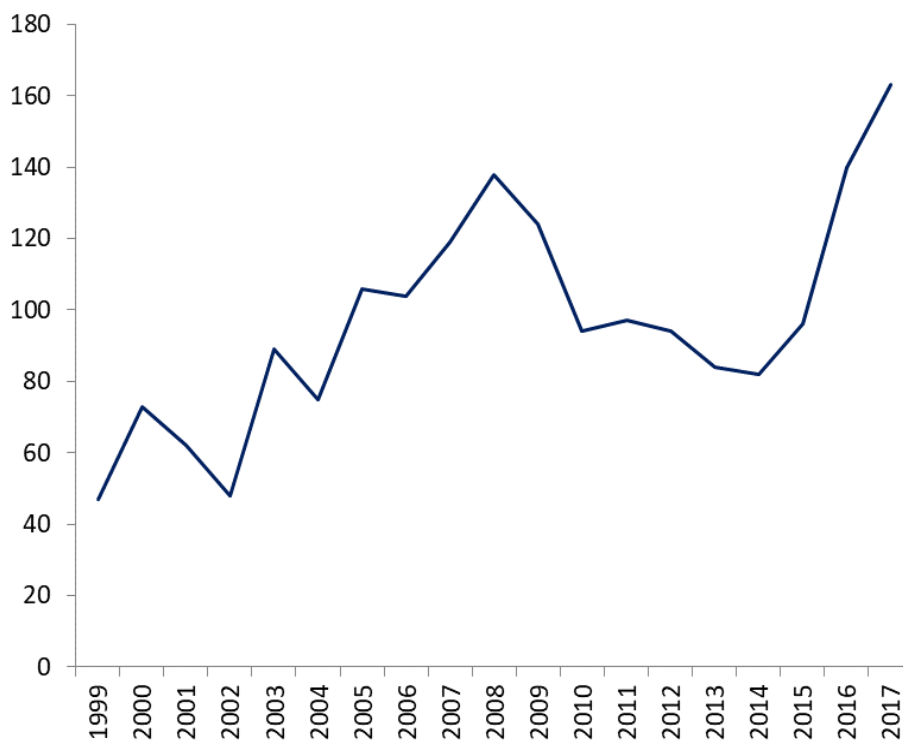
Source: Statistics Canada

These charts (along with the chart showing the sex ratio for Canadian victims) suggest that Canada's homicide trend has had two phases. From 1974 to the 1990s, homicide in Canada was driven most by perpetrators aged 25-39 and victims aged 25 and above. Though younger (12-24) perpetrators were important for the mid-1970s peak in Canada, they did not drive the early 1990s peak. From 2000 to 2012 though, there was a very noticeable transition to homicides involving younger perpetrators and victims. Note that this is somewhat similar to what happened in England and Wales, see Figures 12 and 12a which also show a shift to youth-involved cases from 2005 to 2008 and a sharp drop after that. The situation in the US was also somewhat similar (Figure A 2.19), though the increase and decrease are more muted.

In addition, Figure A 2.23 shows that, like in the US and England and Wales, homicides against babies and young children are at historically low levels in Canada.

Finally, Canadian homicide statistics allow for a breakdown by number of gang- and/or organised crime involved homicides. While caution is required in interpreting these figures, given the possibility that they reflect better intelligence rather than genuine trends, they do show both a general increase and a strong correlation with the overall trend, see Figure A 2.25. These cases explain 60-percent of the total homicide rise from 2014 to 2017 in Canada.

Figure A 2.25: Number of gang- and organised crime-related homicides in Canada, 1999 to 2017



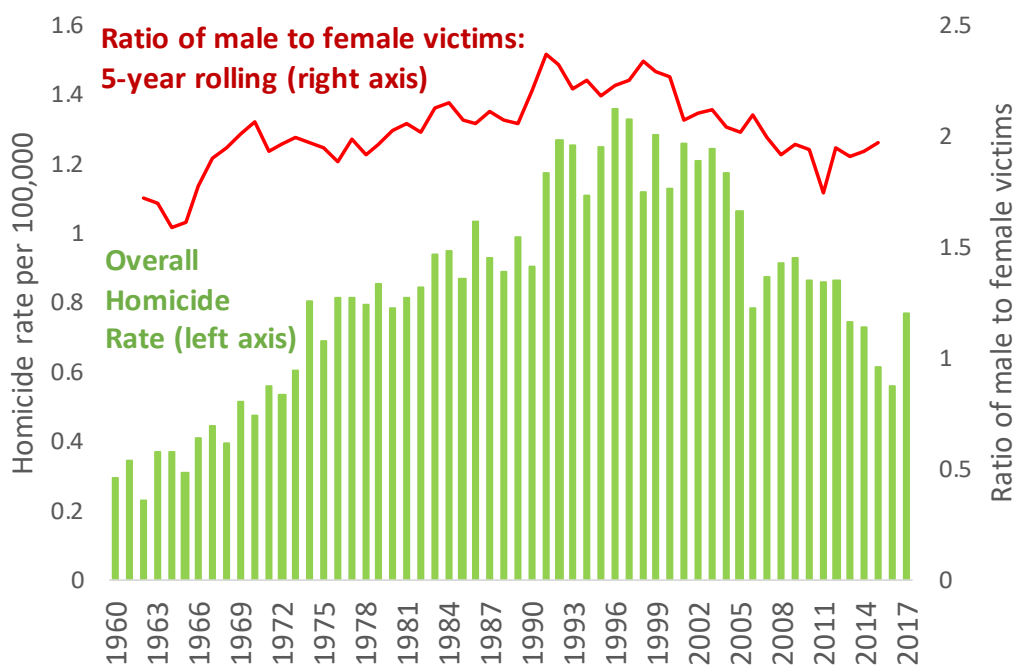
Source: Statistics Canada

Overall then, it is clear that Canada’s homicide trend has become increasingly dominated by homicides involving male youths, some of whom are involved with gangs and organised crime.

Homicide trend breakdowns in the Netherlands

In the Netherlands, male and female victimisation trends were similar from the 1960s to the 2010 with a general rise and then fall pattern. However, as Figure 2.26 demonstrates, the rate of increase was faster for male victims through the rise and the rate of decrease was also slightly faster for males during the decline. This means the ratio of male-to-female victimisation correlates with the overall homicide trend.

Figure A 2.26: Homicide rates in the Netherlands and the ratio of male-to-female victimisation (5-year moving average), 1960 to 2017



Source: Statline.cbs.nl.

While homicide trends in the Netherlands have been driven to some extent by male victimisation, a comparison between Figure A2.26 and Figure A1.3 for England and Wales, suggest the male dominance of homicide is less dramatic in the Netherlands. This concurs with the findings of Lappi-Seppala and Lehti (2016), who found that, in the British Isles and Scandinavia, the homicide increases from the 1960s to the 2000s were noticeably steeper amongst men, whilst in other regions of Europe, like the Netherlands, there was more symmetry between the male and female trends.

When looking at countries individually, Lappi-Seppala and Lehti (2016) noted that there was generally less volatility in female victimisation rates, particularly in Germany and Austria, where female victimisation showed near continuous rises from the 1960s to 1990s before near consistent falls. This contrasted with male victimisation which had been decreasing in Germany from 1970 until reunification and had oscillated up and down quite dramatically in Austria between the mid-1970s and 1990s, before beginning a continuous descent.

Homicide trend breakdowns in Australia

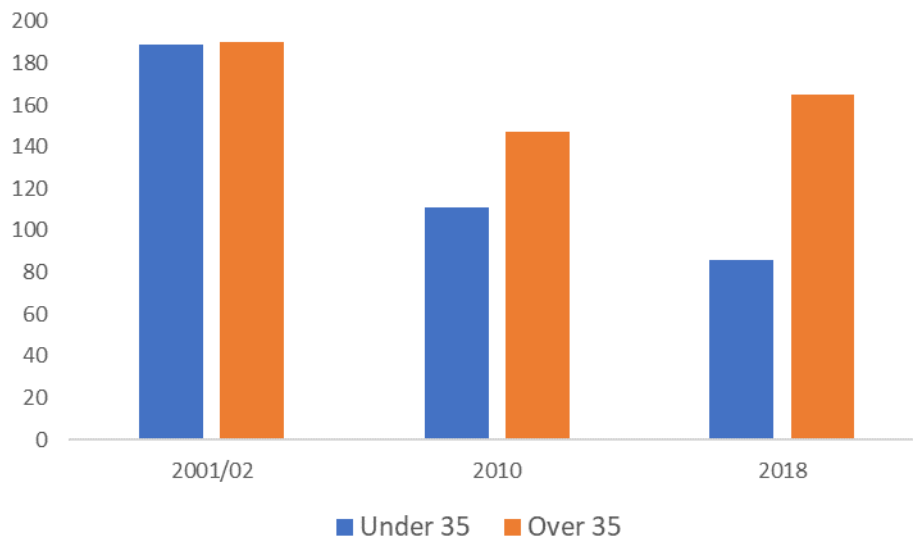
No consistent data set could be found for Australian homicide sex or age breakdowns. However, a reasonable picture can be built up from the regular homicide reports produced by The Australian Institute of Criminology and other sources.

Male and female trends in homicide victimisation in Australia are somewhat similar to those in England and Wales. Female homicide rates in Australia began a prolonged and steady rise from the 1950s before falling consistently from the early 1990s. By contrast, male homicide victimisation saw much sharper rises, which also commenced slightly later, in the 1970s. Male homicide rates also fell later than for females in Australia, with sharp declines only beginning in the early 2000s (Lappi-Seppala and Lethiti 2016: 448).

This means that the sharp overall decline in homicide that has occurred in Australia since 2001 occurred because male victimisation stopped rising and instead joined an already falling female victimisation trend.

In relation to age, the homicide decline since 2001 has been driven by falling numbers of young-person cases, involving both sexes, see Figure A2.27.

Figure A 2.27: Numbers of homicide (murder and manslaughter) victims in Australia, by age of victim, 2001/02, 2010 and 2018



Sources: Homicide in Australia: 2001-2002 National Homicide Monitoring Program (NHMP) annual report; Recorded Crime – Victims, Australia, 2018 (which includes data back to 2010). Attempted murders were excluded to match homicide definition in England and Wales.

Australia has had no increase in homicide since 2014 meaning it now has a rate that is about a third lower than in England and Wales. The primary driver of this, as with other low-homicide nations like Japan is a difference in homicide rates for young men. In 2018, Australia’s rate for homicides against males aged 20 to 34 was estimated to be 14.9 per million population.⁸ The equivalent rate for England and Wales in 2017/18 was 27.5.⁹

4. Conclusions

- It is difficult to accurately compare homicide rates across nations due to definitional differences. However, our best estimate is that the 2017/18 rate for England and Wales is below the global average and about average for Western Europe.

⁸ This is an estimate because while figures for murder are published broken down by sex of victim, the manslaughter figures are not. The estimated rate assumes that three of the four manslaughter victims in 2018 were male.

⁹ This excludes terrorism homicides. The rate is 29.1 per million population if terror cases are included.

- Most nations examined in this annex have a similar homicide trend to England and Wales. That is, a long decline in homicide through to the 1950s, a rise from the 1960s to the 1990s and a fall through most of the 2000s. This is true for many European nations, the US and Canada, and Australia and New Zealand. India and South Africa also seem to follow this pattern.
- There are two clusters of nations that do not follow that pattern. East Asian countries, notably Japan, seem to have had a reasonably consistent fall in homicide since the 1950s and now have the lowest homicide rates globally. By contrast, many Central and South America countries have seen sharp, recent increases in homicide and some of these nations now have the highest global homicide rates. There is limited data on homicide trends for most Africa nations.
- Trends since 2014 have been more varied with some nations having a sharp increase, similar to that in England and Wales, including the US, Canada, Sweden and the Netherlands. Other nations have not had an increase, notably Australia, New Zealand and Scotland.
- Generally, nations with higher homicide rates have a higher proportion of male-victims and a higher proportion of victims aged 15-44. Australia and Japan used to have higher rates of youth (and overall) homicide than England and Wales. But in 2017, Australia's homicide rate for men aged 20 to 34 was about half that of England and Wales' and Japan's was even lower.
- Broadly, male/female homicide victimisation trends have been similar across nations¹⁰, with an overall rise from the 1960s to the 1990s and a fall thereafter. This is consistent with the long-wave pattern noted in Annex 1 and the main report, which seems to have affected all types of homicide (and indeed other crime) in many nations.
- Despite a similar overall pattern in most nations, the timing of individual peaks varies. The US and Canada have a series of mini-peaks through the 1970s and 1980s, England and Wales had a peak in the early 2000s. For the most part, data suggest these short, sharp surges in homicide are driven by male victimisation. This includes the post-2014 increase seen in many nations. However, England and Wales is unusual in the degree to which male cases have dominated that increase.¹¹

¹⁰ England and Wales is something of an exception in having a sharp divergence in male and female victimisation trends from 1980, though Australia is somewhat similar.

¹¹ These conclusions need to be treated with some caution due to the high number of unknown/no-suspect cases in recent figures.

- Female victimisation trends are less volatile and homicide against babies and young children are at their lowest ever level in many of the nations studied, even those that have seen recent rises in other homicide.
- As well as the overall trend being similar, homicide patterns in England and Wales share other similarities with the US and Canada. For example, all three nations had a notable rise then fall in youth homicides between 2005 and 2008 which was largely hidden in the overall trend by declines in other types of homicide.

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ANNEX 3: Alcohol and Homicide - Literature Review Findings

The systematic search identified 17 studies that met the criteria and which contained unique quantitative or qualitative analysis of alcohol as a driver of homicide.¹ There were also 18 further studies that fitted our description of secondary evidence.

The research question for this section was: is alcohol a driver of homicide trends? The primary concern was therefore to establish whether there is evidence to suggest that changes in alcohol consumption at the macro level have affected homicide trends. Most of the identified studies tested this without formally testing the *mechanism* by which alcohol might lead to homicide, though often they did provide a summary of the possibilities. These are outlined below:

Researchers have proposed two main ways in which alcohol might affect homicide: directly via the pharmacological effects and indirectly via the drinking environment:

- Pharmacological mechanisms: Some have proposed that alcohol intoxication in itself leads to aggression (NIAAA 1997). Others suggest that alcohol leads to a 'disinhibition effect': a reduction in self-control that would otherwise limit the effects of aggression (Bye 2012). Pharmacological effects may also make homicidal situations more likely. Impaired motor skills might make an individual more likely to bump into someone or hit someone harder than intended and impaired social skills might make people less able to defuse aggressive situations. Miles (2012) notes that homicide victims' level of alcohol may also be important. Intoxicated victims may spark altercations and may be less able to defend themselves or seek medical attention when injured. Chronic alcohol abuse also has possibly associated neurological effects. It can impair cognitive functioning (Uekermann and Daum 2008), lead to irritability and in some cases combine with other factors to cause psychosis (Perälä et al. 2010).
- Environmental mechanisms: Separate to the effects of intoxication, the spatial concentration of young people in bars and nightclubs may increase the risk of arguments and subsequent violent behaviour. In certain contexts violent drunken behaviour may be less frowned upon. Binge drinking is more socially condoned in some nations than others (Bye, 2012). Finally, in jurisdictions where

¹ The original search uncovered 19 studies, but it became clear that Rossow 2001 and Norstrom et al. 2001 used the same underlying data and technique so have effectively been considered as one study in this review. And Bye (2012) was a review of the other existing studies.

alcohol is illegal, there may be systemic violence associated with enforcing contracts in a black market (Miron 1999, Owens 2011).

All these different mechanisms may intertwine. To further complicate the picture, some offenders may deliberately consume alcohol to garner the 'Dutch courage' to commit an offence, such as robbery, which may result in homicide (Zhang et al., 2002). Similarly, offenders may consume alcohol as an excuse to commit a violent act (Parker and Rebhun, 1995). A final possibility is that dependent drinkers may commit crimes to fund alcohol use, which could in turn lead to homicide (ibid.).

For the most part, these mechanisms suggest an association between alcohol and general violence, which implies that alcohol is most likely to affect spontaneous homicides rather than premeditated attempts to kill. This has important implications for policy as noted by Brookman (2005):

"It is plausible that alcohol-related homicides represent, for the most part, the 'top of the pyramid' of a common type of violent crime, rather than a distinct form of behaviour. If this is the case it is likely that strategies which significantly reduce alcohol-related violence will also reduce alcohol-related homicide."

Selected studies

Of the 17 selected studies, 11 performed quantitative analysis to assess the relationship between area-level homicide trends and an alcohol-related variable. Of these, nine used area-level consumption for the alcohol variable (with six testing national-level trends in consumption, two testing sub-national and one testing both).² Two studies looked at alcohol availability rather than consumption and one tested both consumption and membership of alcoholics anonymous over time. The remaining seven studies used descriptive statistics or narrative/historical analysis to assess causality.

² For the studies that analysed alcohol consumption, most used official or industry data on per capita sales of alcohol (often converted into litres of pure alcohol) as a proxy for consumption. Though this includes both off-trade and on-trade alcohol, there are limitations with this approach. Official alcohol sales will not match exactly the amount of alcohol consumed. 'Homebrew' will not be included, which is of particular importance in countries like Russia where a large proportion of alcohol is sold on the black market (Pridemore 2006). Alcohol bought in one country may be consumed in another and some types of alcohol are used in cooking or preservation, where much of the alcohol is likely to evaporate before consumption.

There was a reasonable degree of geographical variation in the areas analysed. 14 of the 17 studies looked at the relationship between alcohol and homicide within a single nation and three studies examined two or more nations. Though five of the studies were purely US-based, 20 different countries were examined in at least one study. No studies looked exclusively at England and Wales, but England and Wales data were included in two of the multi-nation studies.

Judged by standard scales of methodological rigour for causal studies, the overall quality was low. There were no randomised control trials or studies that used quantitative analysis to exploit 'natural experiments'. However, given that the variable of interest was area-level homicide rates this is hardly surprising. Nations cannot be randomised and then have their citizens forced to consume different levels of alcohol. Indeed, because alcohol consumption is not an 'intervention' with a discrete start date, but a continuous variable, standard tools for measuring the methodological rigour of studies (like the Maryland Scale) are less applicable. The research question here is not whether an intervention works but whether one continuous variable is causally related to another continuous variable. The dominant technique used in the quantitative studies was the autoregressive integrated moving average (ARIMA) model. This was employed in eight studies. Fixed effects models were used in two studies (one of which also used ARIMA). One study used a Generalised Least Squares model and one study used structural equation modelling. A fuller description of the quantitative studies and their findings is given in Table A3.1:

Table A3.1 – Quantitative studies examining the association between alcohol and homicide

Study	Area and time period	Alcohol variable	Method and finding
Bye (2008)	6 Eastern European nations, 1953-2004	National level consumption (measured by sales)	ARIMA with no controls. Three of the six countries had significant relationships with consumption (p<0.05).
Lenke (1990)	Sweden, 1870-1984	National level consumption (measured by sales); heavy drinking (measured by liver cirrhosis mortality)	ARIMA with no controls. Significant positive relationship (p<0.05)
Mann et al. (2006)	Ontario, Canada. 1968-91	Sub-national consumption (measured by sales and split by beer and spirits); membership of alcoholics anonymous (AA)	ARIMA with a single control (unemployment): Positive significant relationship with consumption (p<0.05); negative relationship with AA membership

Norstrom (2011)	48 US states, 1950-2002	State level consumption (measured by sales)	ARIMA/Fixed effects models with no controls. Positive significant relationship between (pooled states) consumption and homicide ($p < 0.01$) and in the ARIMA model this was stronger in states with more hazardous drinking
Parker (1998)	17 nations (inc. England and Wales), 1951-1981	National level spirits consumption (measured by sales); drinking style.	Generalised least squares regression with 8 controls. Neither spirits consumption nor drinking style had a significant association with homicide. But the interaction between spirit consumption and divorce rates was positively related to male homicide.
Parker and Rebhun (1995)	256 US cities in 1960, 1970 and 1980	Alcohol availability (number of liquor stores)	Structural equation modelling using repeated cross-sections and control variables. Finds positive significant relationship between alcohol and homicide in 1970, but not in 1960 or 1980 ($p < 0.05$)
Parker and Cartmill (1998)	USA, 1935-1995	National level consumption (measured by sales and split by beer, wine, spirits)	ARMA with three controls: Positive lagged relationship between spirits consumption and White homicide and between beer consumption and Black homicide ($p < 0.05$); wine negatively related to White homicide
Parker et al (2011)	91 US cities, 1984-2006	Availability (measured by alcohol outlet density)	Fixed effects models with six controls. Positive significant relationship between alcohol availability and youth homicide ($p < 0.05$)
Ramstedt (2011)	Australia, 1950-2003	National level consumption (measured by sales)	ARIMA with no controls (1): Significant positive relationship ($p < 0.05$)
Rossow (2001)	14 Western European nations (inc. UK), 1950-1995	National level consumption (measured by sales)	ARIMA with no controls: five nations had significant positive relationship ($p < 0.05$)
Rossow (2004)	Canadian provinces, 1950-99	National and sub-national level consumption (measured by sales)	ARIMA with no controls: 2 of 7 provinces had significant positive relationship as did Canada as a whole when semi-log model used.

Methodologically, the two strongest studies were those that used the fixed effects design. Both of these used exclusively US data. Fixed effects models combine cross-sectional and time series data and are widely recognised as one of the best

approaches for causal inference when the data is non-experimental.³ Any non time-varying differences between areas are automatically controlled for by the research design, which only examines within-area change. Time-varying confounders can also be controlled for by including them in the model. Parker et. al (2011) included six time-varying controls, making it probably the strongest of the studies in this section.

The Parker et. al (2011) study used a panel dataset of 91 large US cities over the period 1984 to 2006. The authors tested the relationship between alcohol availability, measured by alcohol outlet density, and homicide, measured using police statistics. They controlled for most of the other main factors that have been proposed to drive homicide trends including: structural disadvantage, drugs (they used percentage of narcotics-related homicides), gangs (percentage of gang-related homicides) and gun availability (percentage of suicides with a firearm). Findings showed that drugs, gangs and alcohol variables were significant predictors of homicide in the expected direction. The only variable that did not have a statistically significant effect on homicide was the percentage of young people in the population. These results proved robust to sensitivity analysis. The authors concluded that there was a link between alcohol and homicide and that reducing the number of alcohol outlets could therefore be expected to dampen homicide rates.

The other fixed effects study, Norstrom (2011) did not use time-varying controls. However, the study did fit both an ARIMA model and a fixed effects model to state-level consumption data from 48 US states between 1950 and 2002. Results could therefore be checked for model specification bias. Two approaches were tested in each case: pooling the data into a single total and pooling the data into three groups of states based on their level of hazardous drinking.⁴ Both models showed a positive relationship between alcohol consumption and homicide when the data were pooled into a single total and the ARIMA model also found that the relationship was stronger in states with more hazardous drinking patterns. The fixed effects model did not find a significant difference based on hazardous drinking patterns, though the results were in the expected direction.

The dominant method used in the other quantitative studies was ARIMA modelling, which is also known as the Box-Jenkins method, (Holmes at al., 2012; Box & Jenkins 1976). This is generally regarded as a weaker approach to determining causality compared with fixed effects because it only looks at time series data rather than a combination of time series and cross-sectional data. The overarching aim of the technique is to remove the possibility of mistaking spurious time series correlation

³ See for example: <http://www2.sowi.uni-mannheim.de/lsssm/veranst/Panelanalyse.pdf>

⁴ This was based on state-level data on: (i) the prevalence of heavy episodic drinking, as indicated by the percentage who had consumed five drinks or more in a day at least once during the past month; (ii) the prevalence of alcohol abstention; and (iii) sales of alcohol per capita in 2005.

with causality. This is generally done by removing secular trends or seasonality from the time series to make them stationary, often by differencing (i.e. using the differences between the years as values, rather than the values themselves). This greatly reduces the chance of spurious correlation.

Only two of the ARIMA papers used control variables and many looked at one nation only. Without controlling for other variables, it might be the case that the apparent relationship between alcohol consumption and homicide may be fully mediated by a third variable. For example, it is possible that both alcohol consumption and homicide are simply a function of, say, the number of young males in the population. However, the results from the controlled and uncontrolled studies were similar in that they found a positive relationship between alcohol consumption and homicide in some contexts but not others. The two controlled studies (Parker and Cartmill, 1998; Mann et al., 2006) both found a positive relationship between alcohol consumption and homicide, but only in certain contexts. Parker and Cartmill, 1998, found a positive lagged relationship between spirits consumption and homicides involving White victims and a positive relationship between beer consumption and Black homicide. But wine consumption was negatively related to homicide generally. Mann et al., (2006) found positive relationships between alcohol and homicides involving male victims, but not for homicides involving female victims.

These results are mirrored by the remaining quantitative studies. For example, Rossow (2001) found that, when data was pooled, Northern European nations (Norway, Finland, Sweden) had a stronger alcohol-homicide relationship than mid-European nations (UK, Germany, Netherlands), and that in southern European nations (Portugal, Spain, Italy) there was little or no relationship. As a result, the authors suggested that drinking culture may be just as important as the total amount of alcohol consumed. Southern European nations have relatively high levels of overall alcohol consumption, but much of this is comprised of frequent low-level consumption of wine with meals (Bye 2012). In contrast, northern European nations have relatively low total alcohol consumption, but a much higher proportion is concentrated in 'binge' sessions leading to high levels of intoxication and it is this kind of drinking that seems to be more strongly linked with homicide rates (ibid.). Similarly in Bye (2008) and Rossow (2004) just less than half the countries tested (in aggregate) had a positive significant relationship between homicide and alcohol consumption and these were generally those identified as having more hazardous drinking cultures. And in Parker and Rebhun (1995), alcohol appeared to be a driver of homicide in 1970, but not in the other two years tested (1960 and 1980). Whether 1970 was a period of more hazardous drinking in the US compared with 1960 and 1980 is hard to determine, but certainly US consumption of spirits (which tends to be the drink of choice in nations with a stronger relationship between homicide and alcohol) has declined since around 1970 (Greenfield et al., 2000).

Seven of the short-listed studies assessed the relationship between alcohol and homicide through descriptive statistics or narrative techniques. These are summarised in Table A3.2:

Table A3.2 – Studies that examine the association between alcohol and homicide via a method other than national-level trends in consumption

Study	Area and time period	Alcohol variable	Method (Maryland score) and finding
Christensen et. al (2015)	Greenland, 1985-2010	No formal variable - cites some official statistics suggesting alcohol consumption has fallen in line with homicide	No formal quantitative hypothesis tested. Suggests homicide trends responded to changes in consumption by demonstrating the very high proportion of homicides in which alcohol was involved.
Granath (2011)	Sweden, 1990-1996, 2002-2008	Proportion of offenders with alcohol abuse	No formal hypothesis tested. Suggests a relationship by showing that as homicide fell so did proportion of offenders with alcohol abuse problems. Finds positive effect of alcohol on homicide in 1970
Kivivuori (2002)	Finland, 1950-99	Uses proxies (e.g. day of week on which homicide occurred)	No formal hypothesis quantitatively tested. Uses descriptive statistics and historical analysis to suggest a relationship.
Salla, J., Ceccato, V., & Ahven, A. (2012)	Estonia, 1947-2010	National level consumption (measured by sales)	No formal hypothesis quantitatively tested. Correlation is demonstrated with a chart, and narrative relationships drawn out.
Savolainen et al. (2008)	Finland, 1750-2000	No formal variable, but uses proportion of offences when victim or offender intoxicated	No formal hypothesis quantitatively tested. Uses descriptive statistics and historical analysis to suggest a relationship.
Tardiff et. al (2005)	New York, 1990-98	Alcohol consumption by victim (measured using toxicology data)	Test relationship indirectly by looking at change in victim toxicology and using accident data as a control. Conclude that alcohol was unlikely to be a factor in the New York homicide decline.

Generally speaking, these studies reinforced the conclusions from the quantitative papers. Most of the papers in Table A3.2 examined Northern European nations - i.e. those that have been identified as having relatively hazardous drinking patterns (Bye, 2012) - and concluded that there was evidence to suggest that levels of

alcohol consumption are related to homicide trends in these nations to some degree. The papers generally highlighted the correlation between national level trends in alcohol consumption and homicide and also used descriptive statistics, like the high number of victims and/or offenders who had drunk alcohol at the time of the incident.

Overall, looking at both sets of studies as a whole, all but one concluded that alcohol can be considered a driver of homicide to some extent and the study that found no relationship (Tardiff et al., 2005) was methodologically weak⁵ and examined just one city (New York) for a relatively short period (1990-98). But collectively the studies also suggest that the relationship is complex. Most of the papers find a significant relationship in some but not all of the alcohol-homicide relationships tested. In some nations, and for some types of drink, there appears to be little or no influence on homicide as can be seen from Figure A3.1, which is a panel of charts showing the level of correlation in different nations.

Key factors seemed to be the drinking culture and the type of alcohol consumed. In nations with stronger relationships between alcohol and homicide, like the Northern European countries, there is a greater degree of spirit drinking and drinking with the aim of intoxication, rather than drinking at mealtimes. In one of the stronger studies methodologically, Norstrom (2011) found a similar relationship across US states – alcohol appeared to be a bigger driver of homicides in states with more hazardous drinking patterns.

⁵ Tardiff et. al, 2005) examined homicide in New York in the 1990s by looking at instances where the victim tested positive for alcohol in post-mortem tests. They found that *rates* of homicides in which the victim was intoxicated fell but that there was no statistically significant change in the *proportion* of intoxicated victims through the period. It stayed at around 30%. From this they concluded that the fall in homicide was not concentrated in alcohol-related homicides and hence alcohol was not a driver of the trend. However, the study did not test alcohol intoxication of offenders, which would arguably provide a slightly better test of possible causality.

Figure A3.1: Panel of charts showing strong correlation in some countries (inc. E+W) and weak correlation in others

Strong correlation

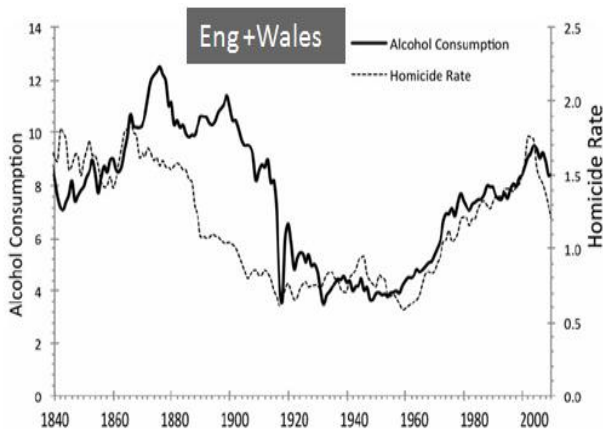


FIG. 12.—Homicide rate and alcohol consumption in England and Wales, 1840–2010. Source: Alcohol data until 1922 are from Wilson (1940). Homicide rates were smoothed with 3-year moving averages.

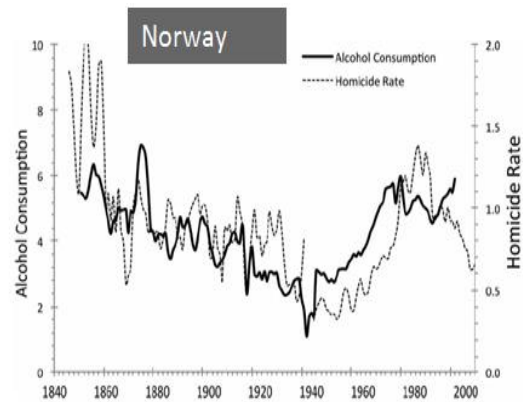


FIG. 15.—Homicide rate and alcohol consumption in Norway, 1850–2010. Source: Alcohol consumption: personal communication Jan Bentzen, Aarhus University. Homicide rates were smoothed with 3-year moving averages.

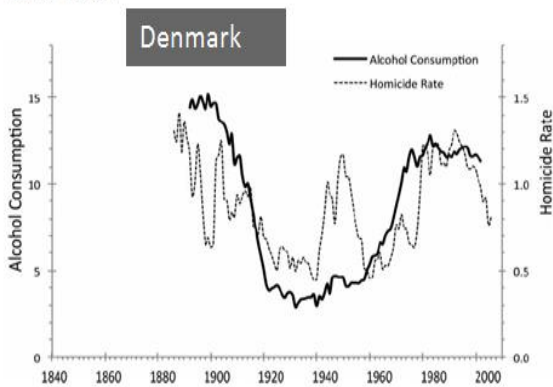


FIG. 13.—Homicide rate and alcohol consumption in Denmark, 1880–2010. Source: Alcohol data: personal communication Jan Bentzen, Aarhus University. Homicide rates were smoothed with 3-year moving averages.

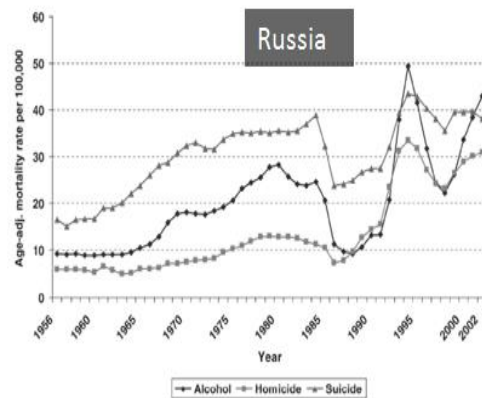
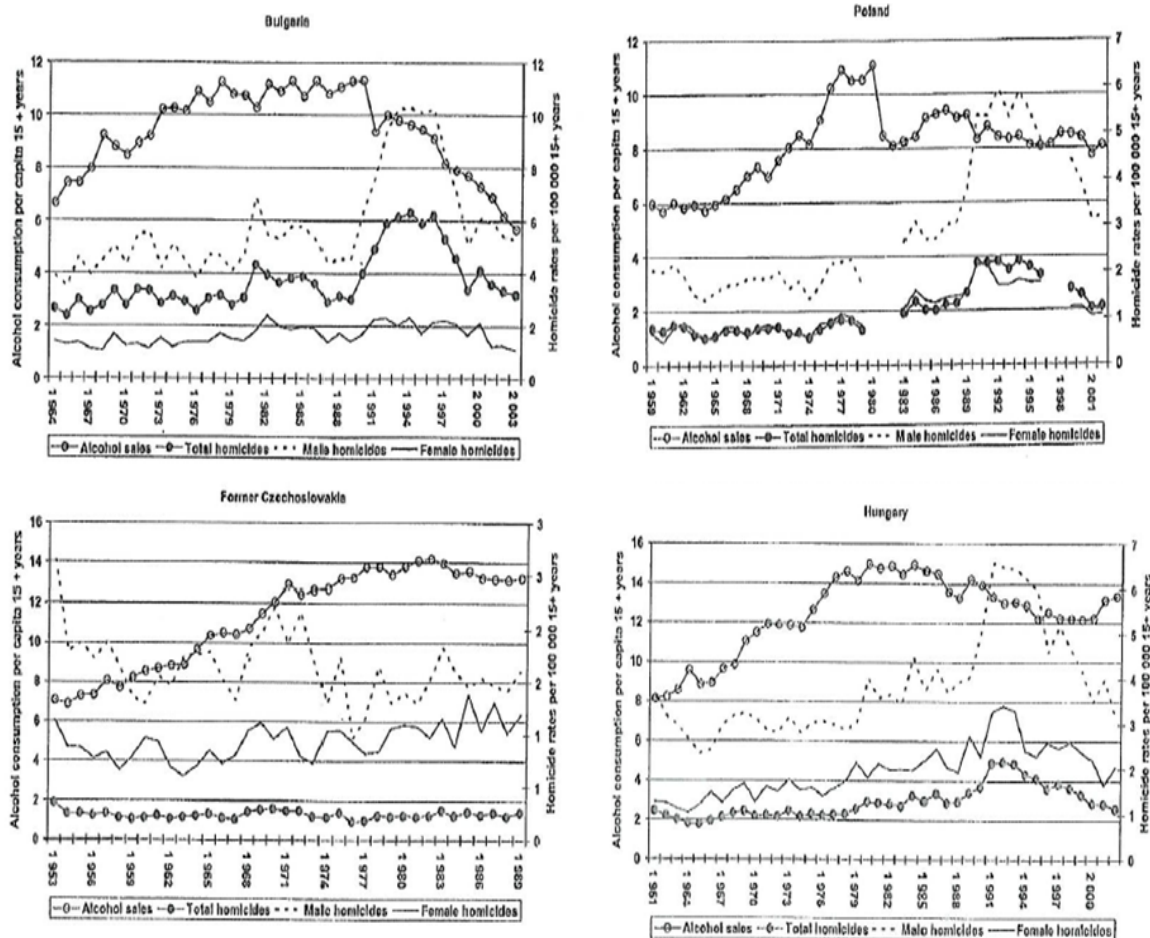


Figure 1. Overall age-adjusted alcohol-related, homicide and suicide mortality per 100 000 residents in Russia, 1956–2002

Weak correlation



Sources: Eisner (2014); Pridemore (2006), Bye (2008)

A similar pattern was generally observed for gender. There is good evidence to suggest that a higher proportion of men undertake hazardous drinking compared with women (see for example, Richardson et al., 2003). And in the six quantitative studies which tested by gender, four found that total alcohol consumption (i.e. by both sexes) was significantly associated with male homicide victimisation rates only (Parker, 1998; Mann et al., 2006; Rossow 2004; Ramstedt 2011), and in Rossow (2001) there were significant relationships for both genders but they were generally stronger for males. Only Bye (2008) found no significant gender differences.⁶ These findings lend weight to Brookman's (2005) conclusion that: "Alcohol-related homicides predominantly occur amongst unrelated adult males and are often

⁶ Bye (2008) found no gender differences. In Russia homicides of males and females both displayed a relationship with alcohol. In other nations, neither did.

spontaneous and unpremeditated attacks amongst men who are, for one reason or another, protecting their masculine pride.”⁷

It is important to understand the degree to which this evidence might apply to England and Wales. Research generally suggests that England and Wales has a moderate to high level of hazardous drinking relative to other European nations when considering metrics like binge drinking and drinking outside of mealtimes (see for example, Anderson and Baumberg, 2006; WHO, 2014). But there is a greater tendency in England and Wales compared with Northern European nations for hazardous drinking to involve beer rather than spirits (ibid.). Furthermore, only two studies that met the inclusion criteria actually used data from England and Wales to test the relationship to homicide. The first, Parker (1998), pooled 17 European nations and did not separate out findings for England and Wales. The other, which was reported in Rossow (2001) and Norstrom et. al (2001), used ARIMA modelling of UK per capita consumption of alcohol against homicide rates from 1950 to 1995. The relationship for the UK was in the expected direction – higher alcohol consumption was associated with higher homicide rate – but it was not statistically significant.⁸ Overall then, the available evidence for England and Wales suggests a possible link between alcohol and homicide but does not conclusively demonstrate it.

Given that, any estimation of the magnitude of an effect should be treated with great caution. However, as a purely indicative exercise it is worth demonstrating what comparable estimates for other nations would imply for the homicide trend in England and Wales. Ramstedt (2011) found that a one litre increase in the annual consumption per capita was associated with an eight per cent increase in Australian homicide rates. Rossow (2004) and Nortsrom (2011), using data from Canada and the US respectively, both estimated that an annual one litre increase in per capita consumption would increase homicide in those nations by around six per cent. Extrapolating this finding and given that per capita alcohol consumption in the UK fell 18 per cent between 2002 and 2013 (a fall of 1.4 litres of pure alcohol per capita for

⁷ This is also an example of how alcohol is likely to interact with other drivers of homicide like a belief in the rightness of violence when a person’s honour or respect is questioned – see Annex on character as a driver of homicide.

⁸ However, it is worth noting that both the studies relating to England and Wales use WHO mortality data as the measure of homicide rates. This is a different measure compared with those used in this report. Furthermore, the Rossow and Nortstrom et al. studies use homicide data for the UK as a whole, including Northern Ireland. This is problematic because the overall UK figures are strongly affected by the large homicide fluctuations caused by the period of intense sectarian violence often referred to as ‘the Troubles’.

those aged 15 or over), would imply that one-fifth of the fall in the homicide rate over the same period might be attributed to changes in alcohol consumption.⁹

Secondary evidence

We also reviewed a number of studies that did not directly meet our criteria for the REA but which appeared to offer some potentially useful information about the extent to which alcohol might be considered a driver of homicide trends in England and Wales. Broadly, these studies can be divided into three types: i) studies containing relevant data from England and Wales, ii) studies examining alcohol policy effects and iii) studies examining the relationship between alcohol and violence more broadly.

Further evidence relating to England and Wales

Given the paucity of short-listed evidence for England and Wales, we prioritised secondary evidence that contained any analysis of England and Wales data. Findings are summarised below.

Though it does not prove causality, there is much evidence showing that homicide perpetrators and victims are much more likely to have consumed alcohol at the time of the incident compared with the general population at any given moment. According to the Homicide Index, between 2012/13 and 2014/15, 30 per cent of victims and 35 per cent of suspects¹⁰ had been drinking prior to the homicide¹¹ (ONS 2016). In 20 per cent of cases both were under the influence and in 40% of cases, at least one was. These figures are likely to be underestimates as they will only capture incidents in which the police can be sure alcohol was involved. A separate study by Shaw et al., (2006) using psychiatric reports prepared for court in homicide cases

⁹ 8 percentage points of the 37 per cent fall. Given that the alcohol data is for the UK as a whole, the calculation assumes that the alcohol trends in Northern Ireland and Scotland mirror those in England and Wales. But even if the trends diverge somewhat, given that Scotland and Northern Ireland only make up 11% of the whole UK population, the estimate given above is unlikely to change much.

¹⁰ This figure only covers apprehended suspects. It is plausible that this is a slight overestimate of the proportion of all offenders whether caught or not; non-intoxicated offenders are probably more likely to commit pre-meditated and instrumental homicide, and are more likely to avoid apprehension. But even assuming all of the prime suspects not identified by police were sober, that would still mean 32 per cent of *all* suspects had been drinking prior to the homicide.

¹¹ This includes those who had consumed both alcohol and illicit drugs

found that 45% of homicide perpetrators in England and Wales between 1996 and 1999 had consumed alcohol.

Kuhns and colleagues (2010) conducted meta-analyses of all available toxicology studies internationally and found that, across 61 studies, 48 per cent of victims had consumed alcohol prior to the homicide and 33-35 per cent were intoxicated. In a separate meta-analysis looking at offenders, the same authors found that across 23 studies, 48 per cent had consumed alcohol and 37 per cent were intoxicated (Kuhns et al., 2014). Russia and Finland had the highest proportions of offenders testing positive (both 66%), with the UK towards the middle of the distribution at 45%, a similar level to the US and Australia (ibid.) Taken together, these results suggest that in much the same way as England and Wales lies somewhere in the middle of the distribution of developed nations for hazardous drinking it is also roughly in the middle for the degree to which homicide victims and perpetrators had consumed alcohol at the time of the incident.

Another conclusion from the meta-analysis which examined victims was that the proportion of those consuming alcohol prior to the incident had decreased over time generally (Kuhns et al., 2010). Data for England and Wales is only available from 2007/08) see Annex 1. It also shows a declining trend in alcohol-related homicides from 2007/08 to 2017/18, which fits to some extent with declining consumption playing a role in the homicide decline to 2014.

In relation to gender, the Homicide Index shows that 32% of male homicide victims between 2012/13 and 2014/15 had consumed alcohol prior to the homicide compared with just 9% of female victims. Whilst this fits to some extent with the reviewed evidence suggesting that there has been a stronger relationship over time between male homicide rates and alcohol than female rates, it is actually the opposite pattern to most nations. The Kuhns et al., (2010) meta-analysis pooling toxicology data on victims from 61 studies found a higher proportion of female victims testing positive for alcohol than male victims.¹²

Finally, there has been some analysis of different drinker types involved with homicide in England and Wales. Rodway et al., (2010) used Homicide Index data from 363 England and Wales youths (aged 10-17) who committed homicides between 1996 and 2004 and matched them to National Health Service data. They found that almost a quarter had a history of alcohol misuse (i.e. there was medical information to show they regularly drank more than the recommended number of units). Shaw et al., (2006), using a similar approach, found that of 1,579 homicide

¹² Note that the Kuhns et al. (2010) finding does not in itself contradict the tendency for alcohol consumption to have a stronger relationship with male homicide victimisation over time. It is possible that a much greater proportion of male homicide victims had consumed alcohol at the homicide peak and that this proportion has now reduced. This would be consistent with both sets of studies.

perpetrators between 1996 and 1999, 40 per cent were misusing alcohol in the twelve months before the homicide and 11 per cent had an NHS record for alcohol dependence. Most types of violence are generally linked to binge drinking rather than dependent drinking (see for example Richardson et. al., 2003). Though limited, these studies may suggest homicide may be something of an exception to this rule.

Alcohol policy effects¹³

Studies that examined the effects of alcohol policies on homicide were briefly examined even if they did not come from OECD countries or fit the other criteria. This was because credible evidence of an effect indirectly suggests a degree of causality. For example, Pridemore (2002) examines the trends in alcohol consumption and homicide in Russia.

¹³ A number of papers considered the effects of alcohol prohibition on homicide. These have not been included simply because prohibition was not in operation in England and Wales before or after the homicide fall so cannot be an explanation for the changes in trend. Also, the identified evidence on prohibition was mixed. Jensen (2000) found that prohibition increased US homicide rates in the first half of the twentieth century and concluded that any dampening effects on consumption were outweighed by the effect that prohibition had in creating illegal markets in which individuals did not have recourse to the normal mechanism of justice to resolve disputes and hence resorted to violence, it might be expected to increase homicide. But Owens (2011), using a more sophisticated approach that took into account the state-level variation in prohibition policies, found no overall effect on homicide as the small rise in homicide for states that went completely dry was counter-balanced by a fall in states in which some consumption was still tolerated.

Figure A3.2: Alcohol consumption, homicide and suicide trends in Russia, 1956-2002

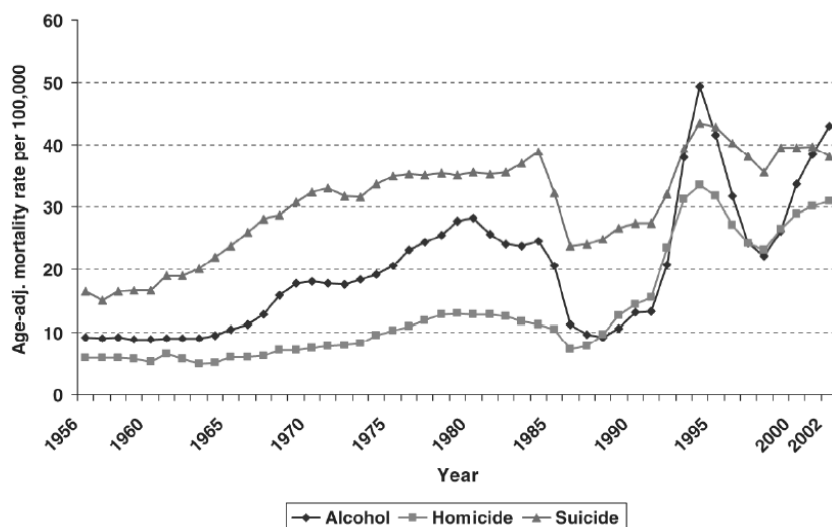


Figure 1. Overall age-adjusted alcohol-related, homicide and suicide mortality per 100 000 residents in Russia, 1956–2002

Using historical analysis, Pridemore argues that the post-1985 dip in alcohol, homicide and suicide rates can be linked to Soviet policies implemented at that time aimed at curbing alcohol consumption (by limiting manufacture and availability). He also observes that with the end of the Soviet era and the complete removal of these controls, alcohol prices dropped markedly and consumption increased around five-fold. The fact that homicide (and suicide) rates also rose markedly at the same time further suggests an association. Two papers on Belarus by Razvodovsky (2008a; 2008b) demonstrate a similarly strong correlation.

These conclusions fit with two of the short-listed studies, which suggest that alcohol is an important driver of the very high (by European standards) homicide rate in Finland (Savolainen, 2008; Kivivuori, J., 2002). Though neither study robustly tested the assertion, descriptive statistics show that rises in Finland’s homicide rate coincided with increases in alcohol consumption and specifically the de-regulation of Finland’s alcohol industry in 1969, and that changes in the pattern of homicides are consistent with alcohol being a potential causal factor: i.e. as homicides rose, a greater proportion took place on Friday nights and between young intoxicated men (Savolainen, 2008; Kivivuori, J., 2002).

Whilst these results suggest a degree of causality between alcohol and homicide, they all refer to nations with so-called ‘hazardous’ drinking patterns. Pridemore (2006) points out that Russia has very high levels of consumption of distilled spirits,

often drunk in private settings and hence away from bar staff, bouncers or police, who might otherwise have intervened.¹⁴

Some studies, from other locations, have found no link between alcohol policies and homicide. For example, Hingson et al., (1985) found no significant decline in violent deaths (excluding traffic accidents) among Massachusetts 15- to 19-year olds after the state raised its drinking age from 18 to 20. And though Jones-Webb et al. (2008) found an association between the promotion and availability of malt liquor and homicide levels in disadvantaged areas of US cities, it became non-significant once race and socio-economic conditions were controlled for.

Evidence relating to alcohol and violence generally

To the extent that some homicides are effectively the 'top of the pyramid' of a common type of violent crime, two other types of studies, which look at violence more generally, are also relevant: laboratory studies testing the relationship between alcohol and aggression and longitudinal studies examining the relationship between alcohol use and violence within the same individuals over time.

Laboratory studies: The most telling studies of this kind randomly allocate participants in a double blind manner to one of the following conditions:

- a) The participant is told they will consume alcohol, and they do
- b) The participant is told they will consume a non-alcoholic drink, and they do
- c) The participant is told they will consume alcohol, but are actually given a non-alcoholic drink
- d) The participant is told they will consume a non-alcoholic drink but are given alcohol.

Following the consumption, the participant completes various tests, such as subjecting another mock participant to electric shocks following incorrect answers to questions (Exum 2006). Overviews of seven meta-analyses of experimental studies of this type, Exum (2006) concludes that there is a consistent causal effect of alcohol consumption on increasing aggressive behaviour and that this is mostly to do with the pharmacological effects of alcohol, not due to expected behaviours when intoxicated. In addition, the pharmacological effect was not simply due to a lowering

¹⁴ Linked to this, Stamatel (2008) showed that the age structure of homicide in post-communist nations has been very different from the UK or the US, with middle-aged men, rather than young men, being the most likely victims. She suggested that this may be linked to patterns of alcohol use.

of inhibitions but was instead due to an increased susceptibility to react aggressively to provocation and frustration (ibid.).

Of course, one limitation of these studies for the purpose of this report is that they are conducted in laboratory conditions that are quite different from the situations in which homicides occur.

Longitudinal studies: On the whole these offer mixed evidence for a causal relationship between alcohol and violence. Many longitudinal studies that test alcohol use and violence throughout adolescence suggest a reciprocal relationship – alcohol use predicts later violence and violence also predicts later alcohol use (Xue et al., 2009). But a particularly detailed study by White et al (2012) reveals that unlike the relationship between heroin/crack use and acquisitive crime – in which crime clearly rises during periods of addiction and falls during periods of sobriety (see for example, Ball et al., 1983), the relationship between alcohol and violence is less clear. The authors found that the most persistent violent offenders had the earliest growth in alcohol use and that late-onset violence coincided with late-onset alcohol use. But they also found that alcohol use dropped off markedly at age 24/25 for the most persistent offenders, yet their level of violence was seemingly unaffected. Indeed, in a follow-up study, White et al. (2015) found that involvement in drug markets may be the better predictor of persistent violent behaviour. They concluded that: “after adolescence, illicit drug use, compared to alcohol use, may play a more important role in initiation and maintenance of serious violent offending”. However, in a longitudinal study using UK data, Lightowlers et al. (2014), found that youth violence did accelerate during periods of heavy episodic drinking, and that while 60 per cent of the variation in violence was due to differences between individuals, 40 per cent was due to changing drinking patterns within the same individual.

Similarly, studies that have examined domestic violence on a day-by-day basis also offer mixed results. Studies that use clinical samples (e.g. domestically violent men entering treatment for alcoholism) show that violence is markedly more likely on days in which victim and/or offender have been drinking (see for example Fals-Stewart, 2003). But non-clinical male samples show less persuasive results and a meta-analysis concluded that “there is a small to moderate effect size for the association between alcohol use/abuse and male-to-female partner violence and a small effect size for the association between alcohol use/abuse and female-to-male partner violence (Foran and O’Leary, 2008).

One interpretation of these results – that would fit with other evidence presented in this section – is that alcohol is clearly a driver of some types of violence/homicide for some individuals. But it is clearly not the only driver of violence/homicide and so trends in alcohol use might only ever be expected to drive trends in a partial subset of homicides. This also fits with the long- and short-wave hypothesis set out in the conclusion of the main report.

A final point worth mentioning is that the trend in alcohol consumption continues to show strong correlation with homicide. The most recent statistics show that after falling for falling consistently from 2007 to 2013, alcohol consumption has risen since 2014, in line with homicide. However, when adjusted for population the increase *per capita* has been very marginal: a rise from 9.0 litres per capita in 2014 to 9.1 in 2018. This may explain why, unlike drug-related homicides, alcohol related homicides have increased only very marginally since 2014, accounting for only a very small proportion of the increase.

Conclusion

Overall, the evidence suggests that there is a degree of causality to the temporal relationship between changes in alcohol consumption and homicide, but that its strength varies considerably by time, place and homicide type. The more hazardous the drinking culture, the stronger the relationship is likely to be. These results are suggested by the striking correlations between national-level alcohol consumption and homicide rates in some countries, by the results from the more robust studies that have attempted to control for other factors that might render this correlation spurious, and by the limited evidence from alcohol-specific policies impacting on homicide trends in certain nations.

However, the evidence review has also demonstrated situations in which alcohol does not appear to have had a strong link with homicide trends or when other factors seem to have been far more important. The homicide fall in New York in the 1990s is perhaps one example, and in France during the period 1960-80, homicide increased while alcohol consumption fell (Smith and Rutter, 1995). These kinds of findings led Roth (2012), who has studied the history of homicide in America in great depth, to conclude that generally other factors are more important than alcohol in explaining homicide trends:

“Drugs and alcohol have been contributing factors in many homicides for centuries throughout the Western world, yet many countries that consume drugs or alcohol at a higher rate than the US have much lower homicide rates: and in the nineteenth century when the United States had the worst substance abuse problem in history, and Americans consumed more than twice the alcohol per capita they consume today, the North and the mountain South had their lowest homicide rates ever.”

Direct evidence for England and Wales is extremely limited, but based on the findings from the international evidence, and given that studies suggest England and Wales has a moderately high level of hazardous drinking (below Russia and other Eastern European nations, but above Southern European nations and similar to the

US and Australia) (Anderson and Baumberg, 2006; Popova et al., 2007), it seems reasonable to suggest that the falls in alcohol consumption that have occurred since 2004 have had some effect on the homicide trend. Two other findings from this review also support this to some degree. Firstly, international evidence suggests that the proportion of victims under the influence of alcohol has decreased as homicide has fallen (Kuhns et al, 2010)¹⁵, though this trend is not yet clear for England and Wales. And secondly the recent fall has been mostly due to reductions in male homicide victimisation and particularly male-on-male cases and evidence has shown these are the most likely to be alcohol related.¹⁶ Taking the - admittedly crude - step of applying the most robust international effect sizes for the association between alcohol and homicide and applying them to trends in England and Wales, would suggest that around a fifth of the fall in homicide between 2002 and 2013 might be attributed to the decrease in alcohol consumption over that period.¹⁷

So our tentative conclusion – that alcohol has probably played some role in the homicide fall in England and Wales – requires further testing. Two projects, in particular, are recommended:

- Examining the detailed Homicide Index records from the early 2000s homicide peak through to the 2014 trough to examine whether the proportion of alcohol-related offences fell.
- Using ARIMA and/or fixed effects modelling to examine whether there is a statistical relationship between homicide trends and alcohol consumption in England and Wales (using police statistics)

Data on two other important policy questions might also be gathered where possible. The first of these relates to drinking patterns. Although much of the literature above links violence and homicide to binge drinking, more than 10% of homicide offenders in one UK study were dependent drinkers (Shaw et al, 2006). Policy approaches for these two groups might be quite different. For example, while night-time economy security might be an appropriate method for reducing violence by binge drinkers, treatment might be better for dependent drinkers. So further evidence on the relative importance of each would be beneficial. Finally, we propose further investigation of

¹⁵ This suggests causality but does not prove it. It is possible that that another causal factor changed the types of homicides committed through the crime decline and that this entailed fewer people who were likely to have consumed alcohol being caught up in homicides.

¹⁶ It is important to point out that this is only really true in a volume sense: male-on-male homicides have contributed most to the fall in *volume* of homicides. Proportionately, the fall in different gender combinations of homicide have been reasonably similar see Annex 1.

¹⁷ Though crude this method does at least compare effect sizes from countries (like Australia and the US) that have been shown to have reasonably similar drinking patterns and levels of alcohol consumption by homicide victims/offenders as England and Wales.

the relationship between alcohol, homicide and gender, as the findings from this review have been somewhat equivocal in that area. Whereas trends in alcohol consumption seem to have a stronger relationship with male-victimisation homicides, the proportion of female victims testing positive for alcohol is actually higher (Kuhns et al., 2010).

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Annex 4: Drugs and Homicide: Literature Review

Findings

The systematic search identified 45 studies that met the criteria and which contained unique quantitative or qualitative analysis of drugs as a driver of homicide. There were a number of further studies that fitted our description of secondary evidence.

The research question for this section was: do illicit drugs or illicit drug markets drive homicide trends? The theoretical link between drugs and homicide trends was examined in most of the short-listed studies and many framed the discussion around the typology set out in Goldstein (1985). Based on interviews with drug users and suppliers, Goldstein (1985) outlined three mechanisms linking drugs to violence:

Psychopharmacological violence. Violence is induced by the effects of drugs taken. Goldstein (1985) suggested that alcohol and stimulants (like cocaine) are most associated with this behaviour. He also pointed out that the direct effects of opiates and cannabis are unlikely to lead to violence, but that opiate withdrawal is associated with significant irritability and could contribute to violence.

Economic compulsive violence. In this formulation violence is a bi-product of acquisitive crime used to fund drug-taking. A proportion of homicides take place during robberies or burglaries. This means that drugs may be an indirect driver of these offences. Goldstein (1985) noted that substances such as heroin and (crack-) cocaine are most likely to be associated with this kind of violence.

Systemic violence. This concerns violence that is intrinsic to the market for illicit substances. Conventional markets are governed by the rule of law meaning wronged parties have legal recourse for resolving disputes. This is not the case in illegal markets, which increases the likelihood that disputes are resolved violently. In practice, this category covers homicides resulting from disputes over territory, hierarchy enforcement, elimination of informers, punishment for selling bad drugs, punishment for failing to pay debts, etc.

The main weakness of the typology, which Goldstein acknowledged, is that the mechanisms are not mutually exclusive. A case in which an individual uses drugs before robbing a drug dealer could fit all three categories. Despite this, Goldstein's typology remains the most popular theoretical framework for discussing drug use and violence, so we use it to frame the discussion below.

Selected Studies: 1) Crack Markets in the US

The first finding from the systematic search was that the relationship between drugs and recent homicide trends has been explored extensively in the US and Mexico, but it has been largely ignored elsewhere, including in Europe. Of the 45 studies, 34 focused exclusively on the United States and the majority of these tested the proposition that the rise and fall of crack-cocaine markets drove the rise and fall in homicides in the US over the last 30 years. Eight studies looked at drug markets and homicide in Mexico and three studies used data from multiple nations including the UK/England and Wales.

Though the intended focus of this review is on illicit drugs of all kinds and their possible effects on homicide trends, the strongest studies methodologically all focused either on crack markets in the US or cartel-related violence in Mexico. As very few of the short-listed studies focused on England and Wales, other studies (labelled secondary evidence), which fell outside the main focus of the review, were nonetheless reviewed to help determine whether the evidence from the US and Mexico is relevant to trends in England and Wales.

i) Crack Markets in the US: The Blumstein hypothesis.

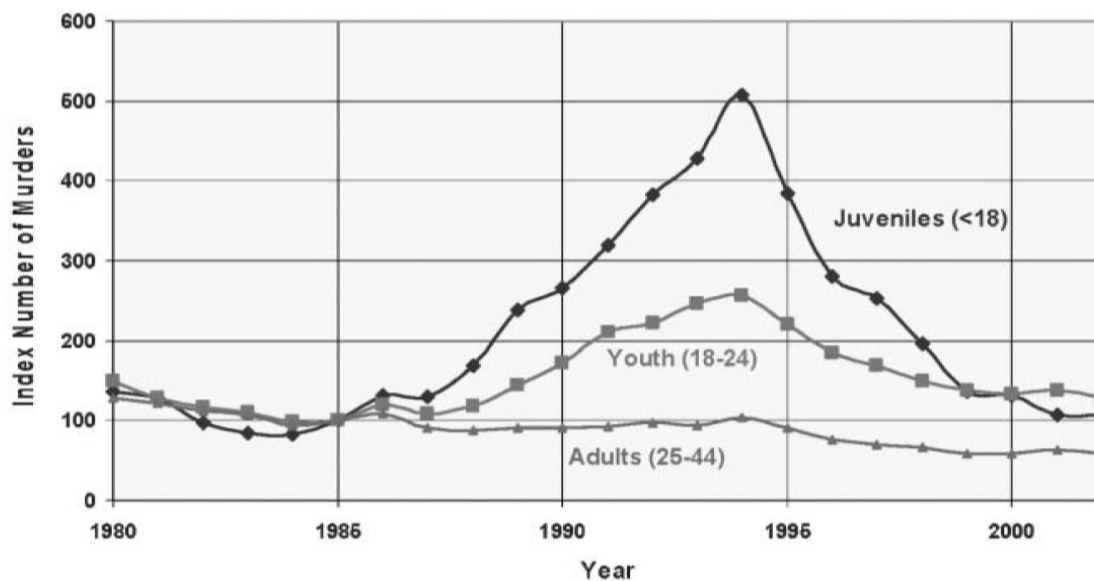
Though they are not necessarily the methodologically strongest studies, the logical starting place for a review of the evidence on crack markets and homicide in the US is a series of papers by Blumstein and colleagues shown in Table A4.1. It is these studies which most clearly set out the hypothesis that crack markets were the most important driver of the sharp rise and then fall in US homicide trends during the 1980s and 1990s. Most of the other studies tested different aspects of Blumstein's hypothesis or provided extensions to it.

Table A4.1: Studies setting out the 'Blumstein hypothesis' on the link between crack markets and homicide in the US

Study	Area and time period	Drug variable	Method and finding
Blumstein, 1995a, 1995b.	US, 1970-95	Drug arrest rate	Descriptive analysis of homicide trends based on age, race, weapon-used and related drug arrests. Concludes with hypothesis that crack markets were important in driving homicide trends.
Blumstein and Rosenfeld, 1998	US, 1985-97	Drug arrest rate, ethnographic evidence.	Descriptive analysis. Suggests crack markets were a major driver of the homicide rise and may also have contributed to the fall as markets matured. Shows that the pattern of localised epidemic peaks follows drug-epidemic evidence.
Blumstein et al., 1999	US, 1968-97	Not applicable.	Review of other studies plus analysis of gun trends. Re-iterates main hypothesis but adds further evidence on diffusion of handguns via crack markets to less involved individuals. Suicides and accidents involving guns increased in line with gun homicides.
Blumstein et al., 2000	US, 1985-1998	Drug arrest rate - juvenile and adult.	Descriptive analysis updating trends from previous studies to emphasise main hypothesis.
Blumstein, 2002	US, 1975-2000	Drug arrest rates.	Descriptive analysis re-iterating previous findings, but does add FBI circumstance data to show that the proliferation of guns among youth not directly involved with crack.

Blumstein first developed the crack hypothesis by conducting descriptive analysis of national-level homicide trends, looking particularly at breakdowns by age, sex and weapon used (Blumstein, 1995a, 1995b). Using arrest rates for known offenders, Blumstein demonstrated that the rise in homicide during the late 1980s was primarily due to handgun shootings involving young males both as victim and offenders. In particular he noted that between 1985 and 1992 when overall homicide in the US increased by 25%, homicide arrest rates for persons aged eighteen and younger more than doubled, while the rates for those thirty and above declined by about 20-25% (Blumstein and Rosenfeld, 1998). He also showed that this increase in youth homicide predominantly involved handgun shootings, see Figure A4.1:

Figure A4.1: Handgun homicides by age group (indexed 1985 = 100)



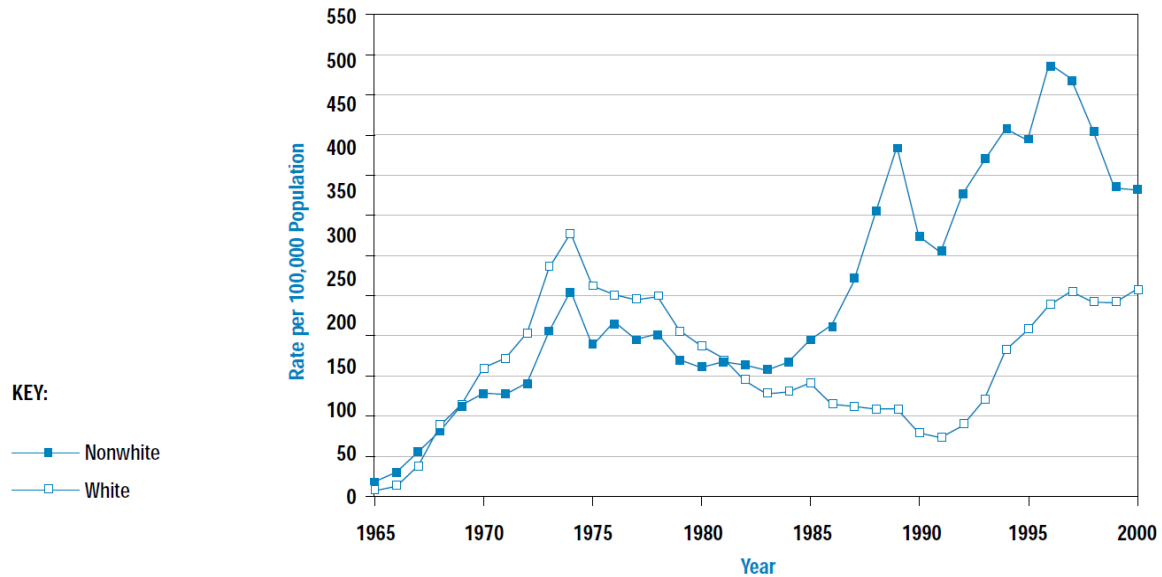
Source: Blumstein, 2006

Blumstein also showed that juvenile (aged 17 and under) drug arrests¹ increased

¹ These include arrests for drug sales and drug possession and they include all drugs, not just crack-cocaine.

markedly from 1985, particularly for non-Whites, see Figure A4.2. He pointed out that, although arrests are an imperfect measure for capturing the dynamics of drug markets, the increase in juvenile drug arrests was in line with the emergence of crack-cocaine markets in inner cities documented by ethnographic studies (Golub, et al., 1996).²³

Figure A4.2: US drug arrest rates age 17-and-under, by ethnicity



Source: Blumstein, 2002

Putting these facts together with wider evidence, Blumstein outlined a hypothesis for the rise and fall in homicide. The main points are re-produced below:

- Crack was far cheaper than powder cocaine which meant it appealed to low-income individuals. This multiplied drug dealing both because of the new market and because poorer entrants tended to buy the drug “one hit at a time”, giving a strong, but short high. This meant users often bought crack multiple times a day.

² Note that the arrest statistics appear to capture the epidemic’s rise quite well yet they continue to rise well beyond the epidemic peak, which according to most ethnographic studies would have been much earlier in the 1990s. This is probably partly because the institutional response – i.e. drug arrests - would be likely to persist even as demand for crack fell. For example, Wilson (2013) cites evidence from one of the earliest documented heroin epidemics in Chicago, showing that police efforts directed at the heroin epidemic tended to intensify (in the form of higher arrest rates) only after the peak of the epidemic had passed.

³ Arrests were not the only metric that demonstrated the rise in crack-cocaine use. Goode (2004), citing Chatlos, (1987) noted that: “The national cocaine helpline received no calls on crack-cocaine from its finding to mid-1985 compared with 1 million calls on powder cocaine. A year later, half of all the calls were about crack.”

- In order to accommodate the new demand, drug sellers recruited many new sellers. Young, African American males excluded from the job market were the obvious source of supply.
- The nature of the illegal industry encouraged the new sellers to carry handguns because they were easily available, provided a sense of protection and could be used to resolve disputes.
- Guns spread to non crack-involved youth who felt they needed to carry one for protection from the drug violence and because guns became a sign of status. This meant all juvenile disputes were more likely to be settled with guns and hence result in homicide.
- The fall in homicide was linked to crack markets in a symmetrical way because demand decreased rapidly as new youth cohorts saw the harm crack could do.
- The drop-off in demand meant fewer sellers were recruited and markets matured. They developed less violent dispute-resolution procedures because they were based more on established relationships with longer-term users and new phone technology meant more delivery-style deals and fewer open-air street markets.

The initial studies provided only descriptive statistics in support of these points – hence causality could not be proven. Furthermore, the measures Blumstein used to assess homicide trends and the timing and magnitude of the impact of the crack epidemic have known weaknesses. Homicide arrests will miss the proportion of offenders who are not caught. Also, drug arrests conflate both possession and supply offences and relate to any illicit drug, hence we cannot be sure that the trends reliably capture shifts in crack-cocaine supply and demand. But most seriously perhaps, drug arrests are a measure of police activity, hence can be influenced by policing priorities and resources. To give one example, it is notable from Figure A4.2 that although the arrest statistics appear to capture the epidemic’s rise quite well, arrests continue to rise or remain at a high level well beyond the epidemic peak, which according to most ethnographic studies would have been much earlier in the 1990s. This may be because the institutional response – i.e. drug arrests - would be likely to persist even as demand for crack fell. This also means that it is hard to be certain whether any relationship between drug arrests and homicide is due to the fact that a) drug arrests are acting as proxy for drug demand and hence the size of drug markets and it is this which drives homicide, or b) that drug arrests are a proxy for the level of destabilization in drug markets and it is this which drives homicide, or c) that drug arrests isn’t actually a proxy variable but is itself causal – i.e. that it is the police response that destabilizes markets and causes homicide.

ii) Studies that examined the Blumstein hypothesis

Despite the difficulties, the correlations in Figures A4.1 and A4.2 remained persuasive for many subsequent scholars. Indeed, many of the short-listed studies

aimed to test the Blumstein hypothesis or aspects of it. These are shown in Table A4.2:

Table A4.2: Short-listed studies that examined the Blumstein hypothesis

Study	Area and time period	Drug variable	Method and finding
Baumer et al., 1998	142 US cities from 1984 to 1992.	Drug arrests (all)	Two-level hierarchical model using panel data. They found that cities with higher levels of crack use had higher homicide rates and more rapid increases in homicide.
Beeghley, 2003	US, no formal dates specified	Various but mainly the proportion of drug-involved homicides.	Narrative approach with descriptive statistics. Concludes that drug markets have played a role in driving homicide trends in the US.
Bowling, 1999	New York, 1985-1997	Not applicable.	Multi-method approach. Conducted 33 interviews with youth workers, business people, police, medical examiners and district attorneys. Also did 50 house direct observation of police patrol, homicide task force, crime scene operatives, and compstat meetings and examined available crime data. Found much support for the crack-homicide connection both for the rise and fall in homicide.
Cerda et al., 2010	74 New York police precincts from 1990 to 1999	Accidental deaths with cocaine toxicology	Bayesian hierarchical models with a spatial error term. Finds that the proxy for cocaine use is statistically related to homicide rates for youths and those aged over 35.
Chauhan et al., 2011	180 New York City precincts, 1990-99	Drug arrests (not including marijuana arrests), the annual proportion of accidental deaths with toxicology results positive for cocaine.	Uses Bayesian hierarchical models with some controls. They found significant relationship between the accidental death crack measure and increases in homicide though only in communities with a high Black population.

Chauhan and Kois, 2012	74 New York precincts from 1990-99	Cocaine consumption (estimated using annual percentage of accidental deaths with toxicology results testing positive for cocaine and drug arrests per 10,000 people.	Descriptive/correlational analysis. Find only mixed support for a relationship between the crack measures and homicide - some of the key precincts have relationships in the expected direction but some do not.
Cheatwood, 1995	Washington DC, 1985-89	Drug arrests, drug prices	Correlational analysis with no control variables. Shows that as drug enforcement increased, drug prices decreased and homicide increased.
Cohen et al., 1998	Neighbourhoods of St Louis and Chicago, 1985-95	Proportion of drug-related homicides	Fixed effects model. Find that increases in gang/drug homicides increased likelihood of non-gang/drug homicides. But overall no systematic pattern.
Cork, 1999	Examines 237 US cities between 1976-96 but this is reduced to 53 cities for the final model.	Juvenile arrests for crack-cocaine.	Diffusion models and cluster analysis. Mean lag of two years between juvenile crack arrest peak and gun homicide peak. This pattern started in big, coastal cities and then moved inland.
Donohue, 1998	US (national-level) from 1950 to 1998	Cocaine expenditure and cocaine consumption	Descriptive analysis. Concludes that the emergence of crack-cocaine is likely to be central to the rise in homicides from 1986 and may also have played a role in the sharp fall in the 1990s.
Fagan et al., 1997	New York, 1985-1996	Drug overdose deaths and incidence of drug-positive arrestees	Descriptive/correlational analysis. Shows that New York's 1991 homicide peak was driven by gun homicides, but these show only sporadic correlation with the drug measures.

Fryer et al., 2005	100 US cities and 50 US states, 1985-2000	Uses an index based on cocaine arrests, cocaine-related emergency room visits, cocaine-induced drug deaths, crack mentions in newspapers, and DEA drug busts	Fixed effects regression models with time varying controls. Finds significant effect on homicide that is strongest for Black homicide and strongest during the rise, rather than the fall in crime.
Grogger and Willis, 2000	27 US cities and surrounding metropolitan areas from 1970 to 1991	Police chief survey on date of crack arrival and hospital data on admissions attributable to cocaine smoking	Difference in difference models to give estimates the effect of the crack epidemic relative to an estimate had it not occurred. They conclude that the arrival of crack cocaine caused a statistically significant rise in crime, including homicide.
Harries, 1997	No formal testing, uses US qualitative and quantitative evidence from a variety of geographic locations	Not applicable.	Largely descriptive analysis using available data and media reports. Shows that the percentage of drug-related homicides increased markedly from the powder cocaine era of the late 70s to the crack era of the late 80s.
Lattimore, 1997	8 US cities, 1985-1994	Arrestee crack-cocaine use, drug prices	In-depth analysis of 8 cities including simple correlation comparison of homicide and crack trends. Conclude that there is some evidence of a relationship.
Messner et al., 2005	68 US cities from 1979-2001	Uses indirect measures (i.e. Looks at whether city trends match predictions from drug-epidemic literature)	Spine regression to determine cities experiencing epidemic then examines whether the patterns match known drug epidemic patterns. Finds, in line with epidemic models, that bigger, more densely populated cities, and those with high levels of resource deprivation were in the vanguard for rising and falling homicide rates and that homicide epidemics tended to spread from coastal cities inland.

Messner et al., 2007	74 New York City precincts from 1990 to 1999.	Proportion of accident victims testing positive for cocaine (proxy for crack prevalence).	Mixed regression models with 8 controls. Find statistically significant positive relationship between cocaine prevalence and homicide rates.
Ousey and Lee, 2004	122 US cities, 1984-97	Arrest rate for supply of opiates/cocaine, arrest rate for cocaine/opiates possession, arrestee urine analysis for cocaine	Fixed effects regression with time-varying controls. Find a significant relationship between crack variables and both Black and White homicide rates, but that the relationship is stronger for Blacks and in areas Where there is greater Black/White economic inequality.
Ousey and Lee, 2002	122 US cities, 1984-97	Arrest rate for supply of opiates/cocaine, arrest rate for cocaine/opiates possession, arrestee urine analysis for cocaine	Fixed effects regression with time-varying controls. Find a significant relationship between crack variables and homicide rates but that crack is a stronger predictor in areas of high-deprivation.
Ousey and Lee, 2007	137 US cities, 1984-2000	Crack-cocaine related arrests	Fixed effects regression models with time-varying controls. They find a significant relationship between drug markets and homicide but one that a) is moderated by structural disadvantage and b) weakens over time.
Parker et al., 2011	91 US cities, 1984-2006	Proportion of drug-related homicides as judged by police.	Fixed effects models with time-varying controls. Significant positive relationship with youth homicide rates.

Pearson-Nelson, 2008	68 US cities from 1979 to 2001	Distance from cocaine hub, number of hubs within 500 miles	Spine regression to determine cities experiencing epidemic then Tobit regression to measure factors that predict an epidemic and its magnitude and duration. Proximity to cocaine hubs only predicted the magnitude of an epidemic and in the non-expected direction (i.e. magnitude was greater when there were fewer hubs within 500 miles).
Tardiff et al., 2005	New York, 1990-98	Toxicology reports for cocaine-presence in homicide victims.	Trend analysis with data on accidents used as a control. Finds that although cocaine-related homicides fell, their proportion stayed quite constant suggesting that other factors were more important.
Zimring and Hawkins (1999)	Uses data from multiple nations (mainly the US, England and Wales and Australia) and at multiple geographies (mainly national and city-level).	Multiple measures used.	Descriptive analysis. Demonstrates that drug markets thrive in some cities and at some times without generating homicide epidemics. But also finds the evidence of a link between crack and homicide in the 1980s/90s in the US compelling. Concludes that crack must be a contingent cause - i.e. will generate high homicide rates under certain conditions.

Of the 23 studies in Table A4.2, 13 employed quantitative analysis. These sought to model the relationship between drugs markets and homicide across a variety of (mainly US) locations. The analyses usually sought to control for other changes over time by including variables known to be associated with homicide. Of the remaining studies, most used historical analysis coupled with descriptive statistics and simple trend correlations to analyse the potential causal relationship between crack markets and homicides. One notable exception was Bowling (1999) which supplemented data analysis with direct observation of related police activity and interviews.

There were no randomised control trials, but many of the quantitative studies employed panel data, multiple control variables and sophisticated statistical techniques to achieve quasi-experimental conditions. Arguably the main limitation of this evidence was not the methods employed but the fact that there was no data variable that could fully capture the sequence of events outlined in the Blumstein hypothesis. Growth and (particularly) decline in drug markets are notoriously hard to

measure because only a proportion of users and sellers come into contact with administrative datasets. In addition, it is virtually impossible to find a variable or combination of variables to adequately test the hypothesis that handgun use spread to non-crack-involved individuals. For these reasons, the studies employed an array of proxy variables to try and capture the rise and fall of crack cocaine markets but there was general acknowledgement that none was perfect.

Some quantitative studies sought to test the Blumstein hypothesis directly while others explored particular aspects of it. Of the former, arguably the strongest study methodologically was Fryer et al, (2005) because it tested the relationship between crack markets and homicide at both the US state and city level and employed an index of different crack-cocaine measures including the number of arrestees testing positive for cocaine, cocaine-related emergency room visits, the frequency of crack mentions in newspapers, cocaine-related drug deaths, and the number of DEA drug seizures and undercover drug buys involving cocaine. They acknowledged that each measure had its own shortcomings, but they argued that combining measures provided a variable that is not particularly sensitive to any one individual measure. While this is not a perfect solution because some biases may be repeated across measures (notably that both criminal justice system and health data are likely to lag genuine effects), this is arguably better than employing a single flawed measure for crack markets. Fryer et al. found a significant effect for the crack-cocaine index on homicide, with the effect being strongest for homicides involving Black victims and during the rise rather than then fall in crime.

The latter finding was echoed by Grogger and Willis (2000), who used a difference-in-difference approach and two measures for crack markets: emergency room visits for cocaine smokers (who are likely to be almost entirely crack users as powder cocaine is generally snorted) and a police survey asking city police departments to estimate the year they first encountered crack. They estimated that the arrival of crack led to a 9% increase in homicide across the 27 Metropolitan areas tested. However, of the two models tested (one in which the specified relationship was linear and one in which it was log-linear) the homicide result only reached significance in the latter model, though it was in the expected direction for both. Finally, the paper only tested the effect on the rise in homicide, not the fall.

Baumer et al., (1998), Messner et al., (2007), Cerda et al., (2010) Parker et al., (2011) also found significant relationships between homicide and crack markets across US cities (or in the case of the Messner et al. and Cerda et al. studies, New York City precincts). The studies generally used different proxies for crack cocaine markets. Baumer et al., 1998 used arrests for all types of drug, Messner et al, (2007) and Cerda et al. (2010) used the proportion of accident victims testing positive for cocaine and Parker et al., (2011) used the proportion of all drugs-related homicides.⁴

⁴ Cerda et al (2010) only found a statistical relationship between the crack-market proxy and homicide for homicides against those aged under-25 and over-35. They speculated that the younger population may be those most likely to be caught up in market violence while the older group may be more likely to be longer-term dependent users.

Several regression studies sort to test specific aspects of Blumstein's hypothesis. For example, Cork (1999) tested whether the timing of crack's arrival in US cities correlated with the timing of rises in juvenile handgun homicides. Using diffusion models and cluster analysis, Cork found a significant relationship with juvenile homicide rises tending to lag increases in juvenile crack arrests by two years. The study also found that this pattern began on the East and West coasts before moving inland, which is consistent with evidence on the diffusion of drugs epidemics (Hunt and Chambers, 1976). However, the authors only tested 53 large US cities. Smaller cities were excluded due to their low homicide volumes.

Messner et al., (2005) also tested diffusion by looking at the order in which different cities suffered homicide epidemics. Using spline regression to distinguish cities that had a homicide epidemic in the late 1980s/early 1990s from those that did not, they found that bigger, densely populated cities, and those with high levels of resource deprivation, were in the vanguard for rising and falling homicide rates. The authors felt this supported Blumstein's hypothesis generally though they also found that the duration of epidemics varied across cities, which seemed unrelated to crack.⁵

Three of the quantitative studies had more equivocal findings. Cohen et al, (1998) sought to test whether surges in drug or gang homicides spread to non-gang/drug homicides. They used fixed effects models with neighbourhood data from Chicago and St. Louis. Their results suggested that gang/drug homicides tended to be self-limiting – a surge being frequently followed by a decline – but that diffusion only occurred in certain instances. Drug homicides in St. Louis and gang homicides in Chicago predicted later non-drug/gang youth homicides involving guns. However, 11 different lag lengths were tested and only a minority were significant.

Another study that found only partial support for the Blumstein hypothesis was Pearson-Nelson (2008). This employed spline regression to determine cities experiencing an epidemic then Tobit regression to measure whether proximity to cocaine hubs predicted the presence, magnitude and duration of epidemics. Proximity only predicted the magnitude of an epidemic and in the non-expected direction (i.e. magnitude was greater when there were fewer hubs within 500 miles).

⁵ A finding from Cook and Laub (2002) is also relevant here. They show that the decline in US homicide rates in the 1990s was not uniform, but was concentrated in the largest cities, such that by 1999 the average homicide rate for medium-sized cities – those with populations of 250,000 to 500,000 – was just as high as for the largest cities. They show that this was historically unique. It is also consistent with a drug epidemic diffusion process in which big cities generally experience the epidemic before smaller ones and hence also exit the epidemic earlier. However, Messner et al.'s finding about the duration of the epidemic being unrelated to city size rather challenges this interpretation.

The author speculated that profits may be higher in more remote cities due to greater mark-ups or more monopolistic structures and that this might lead to more violence.⁶

In two papers, Chauhan and colleagues found slightly conflicting results when testing the Blumstein hypothesis at precinct level in New York. Chauhan et al., (2011) concluded in favour of the crack hypothesis using Bayesian hierarchical modelling, which showed a significant relationship between trends in accidental cocaine-related deaths and Black homicides. But Chauhan and Kois (2012) employed more descriptive analysis to suggest that this significant result was driven by trends in just a few precincts and that in other areas there appeared to be no relationship.⁷

One of the most important developments of Blumstein's hypothesis was proposed by Zimring and Hawkins (1999). They noted that European drugs epidemics, including the dramatic rise in heroin use in England and Wales in the 1980s had not led to similar increases in homicide.⁸ They therefore proposed a theory of *contingent causation* in which illicit drugs epidemics are a necessary but not sufficient condition for marked rises in homicides. They proposed that the effect of a drugs epidemic might be contingent upon other social factors like the availability of handguns or levels of structural deprivation.

In a series of papers, Ousey and colleagues attempted to test the contingent causation hypothesis. In line with other evidence, they consistently found a relationship between drug markets and homicide using different proxies for crack

⁶ It seems possible that this finding might also reflect the fact that proximity to cocaine hubs might capture an area's prior level of illegal market activity, pre-crack. In some large coastal cities it seems likely that there was some level of drug market structure (and hence violence) in place prior to the epidemic whereas in inland regions this might not have been the case which could be why the magnitude of the homicide increase was so large in these areas.

⁷ One short-listed study, mostly concerned with the relationship between youth-gangs and crime (and hence explored in more detail in the gangs section of the 'other' annex), also found limited support for the Blumstein hypothesis. Cohen and Tita (1999) found that the homicide surge in Pittsburgh in 1993 correlated better with the emergence of youth gangs in 1991/2 than with the arrival of crack in 1989, though they also found some evidence of contagion from youth-gang homicides to non-youth-gang cases. Whether the arrival of crack played a role in the emergence of youth-gangs was not explored, but the authors did speculate that crack may have played less of a role in Pittsburgh's homicide trends compared with other US cities because crack arrived later in Pittsburgh, when open-air markets were starting to be replaced by delivery-style markets using beepers and phones.

⁸ Zimring and Hawkins (1999) use WHO statistics for homicides in England and Wales to make this point. However, the conclusion is to some extent similar when police statistics are used. Although police-recorded homicides do rise during the 1980s in line with heroin markets, the upward trend is much the same as it was in the 1970s. There is no extra acceleration in homicide rates to suggest a marked impact of heroin markets. However, the analysis in Annex 1 shows that from the late 1970s, the continued rise in the general trend actually masks a rise in male-on-male homicides (which would be consistent with the Blumstein hypothesis) and a flattening/fall in homicides against women.

markets (Ousey and Lee, 2002, 2004 and 2007). But they also found that drug markets had a stronger effect on homicide in:

- i) areas with higher levels of structural deprivation, particularly population exodus (Ousey and Lee, 2002),
- ii) areas with greater inequality between Blacks and Whites (Ousey and Lee, 2004)
- iii) the rising period of the crack epidemic, with the effect weakening over time (Ousey and Lee, 2007).⁹

Of the non-quantitative studies, two of the most comprehensive also found some support for the relationship between drug markets and homicide. Lattimore (1997), conducted an in-depth analysis of eight US cities and concluded that crack markets offered a plausible explanation for at least part of the rise in homicide during the late 1980s. Bowling (1999) did an in-depth ethnographic analysis of homicide in New York involving 33 interviews with youth workers, business people, police, medical examiners and district attorneys. He also did 50 direct observations of homicide staff including crime scene operatives, ride-alongs with police patrol and the homicide task force and he attended Compstat meetings and examined available crime data. He found much support for the crack-homicide hypothesis. A number of interviewees clearly believed it to be the main driver of trends with the chaotic formation of markets fuelling the rise in homicide and market maturation fuelling the fall. However, Bowling also found evidence that police retreatism, corruption and even deliberate provocation of inter-gang violence were important conditions that made the crack epidemic particularly deadly in New York.

Beeghley (2003) also argued that the emergence of crack markets was a key driver of high homicide rates in the US. He did not perform a formal test of the hypothesis, concentrating instead on the marked shifts in related statistics. He noted that Paul Goldstein had found that 24% of homicides in New York were drug-related in 1984 but that this rose to 53% by 1988 (Goldstein, 1985); and that a year after crack first appeared in Washington DC only 5% of homicides were drug-related, but that a year later this had increased to 35% (Beeghley, 2003, citing Zimring and Hawkins, 1999). Though these statistics are striking, caution is required given that drug-related can relate to any type of drug and relies on accurate police coding.¹⁰

⁹ It is worth noting that Pearson-Nelson (2008) found little support for Zimring and Hawkins (1999) contingent causation theory using a very different crack variable: the proximity to cocaine hubs. This did not seem interact with social variables to predict parameters of the epidemic across cities.

¹⁰ Several studies have looked at the reliability of drug-related homicides as a category recorded by the police. Ryan et al., (1990) compared police classification of drug-related homicides with social scientist classification (obtained by re-interviewing participants). They found that police markedly under-estimated drug involvement in New York homicides in 1988.

Donohue (1998) also used descriptive analysis to look at short-run and long-run factors influencing US homicide rates. In line with other studies, he found that crack offered a persuasive explanation for the rise in homicide but was less persuasive in relation to the fall. He also noted that most of the persuasive evidence relating to crack concerned arrest statistics and hence that its effect on homicide may have been as much driven by the aggressive enforcement response as by the epidemic itself. If enforcement activity, measured through arrests, created instability in markets – either directly or via increased prices and raised competition, it may be that this was the key factor in driving homicides up [and the presence of guns] rather than the existence of the markets themselves. This conclusion was echoed by Harries (1997) and Cheatwood (1995). Both analysed the marked homicide rise in Washington DC during the late 1980s. Cheatwood (1995) looked at Operation Clean Sweep, which was a big drug crackdown resulting in a high number of drug arrests relative to other US cities. He noted that as arrests increased, cocaine prices fell and homicide trends increased, which was the undesired result in both cases. He concluded:

If, following Operation Clean Sweep, the homicide rate had been cut in half within four years, there is little doubt but that it would have been publicized as a major victory and proof of the effectiveness of the drug war. Yet the fact that the homicide rate tripled was merely seen as evidence that more stringent measures, more law enforcement, and more prisons were needed. It is as though we had a headache, and pounded ourselves on the head with a hammer to drive it out. And then, noting how much worse the headache had become, decided that what we needed was a bigger hammer.

Three of the non-regression studies found little support for the Blumstein hypothesis. All analysed trends in New York. Chauhan and Kois (2012) has already been discussed above. Fagan, Zimring and Kim (1997) showed that New York's 1991 homicide peak was driven entirely by a rise in gun homicides, which would fit with Blumstein's hypothesis.¹¹ However, the authors found little correlation between gun homicides and drug overdoses or the incidence of drug-positive arrestees. The study only looked at general drug overdoses/arrests rather than crack-specific ones. Tardiff et al (2005) used toxicology data to look at trends in crack-related homicide victims using data on accidents as a control. They concluded that although cocaine-related homicides fell as total homicide fell, their proportion stayed quite constant suggesting

¹¹ It is worth noting that although gun homicides involving younger people drove the homicide peak, non-gun homicides and those involving over-25s still fell through both the rise and the fall in crack markets, meaning that other drivers must have been in operation too pushing down on these types of homicide. This point, made by Rosenfeld (1995), also fits with the short and long wave pattern proposed in the conclusion to this study.

that other factors were more important. However, the study did not test homicide *offenders* and hence their conclusions need to be treated with caution.¹²

Taken together, the Blumstein studies and those that have followed them offer some, albeit not universal, support for the notion that crack markets have been an important driver of US homicide trends over the last 30 years. Several other conclusions have also emerged from this body of research:

- As a driver of trends, crack-cocaine markets were probably more influential on the rise rather than the fall in US homicide, though it is also possible that drug-market indicators are better at capturing their rise than their decline. In particular, arrest statistics, which are much used in this research, are likely to be a better indicator of the police response to drug markets than the markets themselves.
- Though the evidence is not conclusive, US crack markets appear to be more strongly linked to homicide than has been the case for other drug epidemics, both in the US and elsewhere. The effect of drug epidemics on homicide may therefore be contingent on other factors including structural deprivation, inequality, the level and aggressiveness of enforcement and gun availability.
- If Blumstein is correct that crack markets in the US led to a diffusion of guns from individuals involved with the markets to non-involved individuals – and it needs to be acknowledged that this is probably the aspect of his hypothesis that has been least tested - then it is possible that the arrival of crack markets may have played a causal role in the rise of drug-related *and* non drug-related homicides.

iii) Cartel violence in Mexico and other remaining short-listed studies

This section considers the 14 remaining short-listed drugs-homicide studies, which are shown in Table A4.3:

¹² Another short-listed study: Cook and Laub (2002), which is described in more detail in the Character annex, also used descriptive statistics to examine the Blumstein hypothesis. Like other studies in this section, it concluded that the crack epidemic offered the best explanation for the marked rise in youth homicide levels between 1985 and 1993 but it questioned whether the hypothesis was consistent with data on the fall. In particular, Cook and Laub (2002) showed that through the 1993-98 decline in homicides, the proportion of gun homicides remained quite constant, which is not necessarily consistent with a fall driven by declining crack markets.

Table A4.3: Studies on Mexican cartel homicides and other remaining short-listed studies

Study	Area and time period	Drug variable	Method and finding
Baumer, 2008	114 US cities from 1980 to 2004	The overall arrest rate for cocaine/heroin possession/sale and the percentage of persons arrested for possession or sale of cocaine/heroin who were under 18	Two-way fixed-effects panel models with linear and quadratic time trend. Concludes that 20-40% of the rise in US homicide from 1985-93 can be attributed to crack markets but that their effect on homicide's decline was far smaller.
Browne et al., 2010	91 cities of the 100 largest cities in the U.S. for the years 1984-2006	Proportion of narcotics-related homicides.	Multi-level regression models: hierarchical linear modelling was used for the main results with pooled cross section time series analysis employed as a robustness check. Found that drug markets predicted within-city change in youth homicide rates in some model specifications but not others. Deprivation and gang activity were more consistent predictors.
Calderon et al., 2015	2,049 Mexican municipalities between 2006 and 2010.	Captures/kills of cartel leaders	Combination of difference-in-difference and synthetic control group methods. Found a significant relationship between captures or kills of cartel leaders and both drug and non-drug related homicides. Concluded that inter- and intra-cartel violence increases after the successful removal of a leading trafficker which may also weaken cartel control over non-drug related criminal groups, raising non-drug related homicide.

Castillo et al., 2013	Mexican municipalities from 2006 to 2010	Number of cartels present in an area, cocaine seizures (in both Mexico and Columbia).	Instrumental variable approach. Found a significant relationship between number of cartels and homicides, but also between Colombian seizures and homicide. Found that the impact of drug trafficking on homicide increased after 2006. Concluded that both trafficking displacement from Columbia and Calderon's enforcement action increased homicide.
Correa-Cabrera and Nava, 2015	30 Mexican states, 2007-2010	Level of drug enforcement, measure of conflict between cartels.	Regression with controls. Found significant relationship between drug enforcement and drug-related homicides.
Dell, 2011	2,456 Mexican municipalities from 2006 and 2009	Election of drug enforcement minded mayors	Regression discontinuity design. Found that homicides increased significantly after the close election of a National Action Party (PAN) mayor and that this was mainly due to drug trade violence. Concluded that the homicide rise reflects takeover attempts by rival cartels after PAN mayors increased enforcement action against incumbent cartels.
Enamorado et al., 2014	Mexican municipalities (2,372) from 1990 to 2010	Inequality (gini coefficient)	Instrumental variable approach. Found a significant relationship between inequality and drug-related homicides between 2005 and 2010, and a much smaller effect of inequality on general homicides prior to 2005. Concluded that drug wars amplify the effect of inequality by both providing displays of ample wealth (achieved via violent criminality) and by lowering the costs of entry into that criminal world.

McCall et al., 2008	83 US cities from 1970 to 2000	Drug arrests (possession and supply for all types of drug)	Fixed effects regression for repeated cross-sections (1970, 1980, 1990, 2000). Finds a significant relationship in the opposite direction from that predicted - the more drugs arrests, the lower the homicide rate.
Phillips, 2015	Mexican states from 2006 to 2012	Leadership decapitation (measured by arrests or kills of cartel leaders).	Fixed effects model with controls and two measures of drug homicides. Found that homicides reduced temporarily after leaders of trafficking groups were arrested but that cumulatively over time these arrests increased homicides.
Rios, 2013	Mexican states from 2006 to 2010	Drug enforcement action, inter-cartel aggression (measured using dataset of 'narco-messages'.	Fixed effects model with case studies of individual areas using correlation and ethnographic evidence. Found that the rise in Mexican drug homicides can be explained by a combination of inter-cartel wars and enforcement action and that the two are mutually reinforcing.
Sarrica, 2008	Tests the US and US states separately from 1980-2000. Also tests 12 European nations including the UK from 1993-2003.	Heroin and cocaine prices.	Regression with controls. Found that heroin prices were related to homicide trends in the US and 4 European countries (not the UK), with higher prices driving increased homicide. There was no relationship with cocaine prices.
Snyder et al., 2009	Mexico (1920s-present) and Burma (1980s-present).	Not applicable.	Narrative analysis. Concluded that Mexico's homicide rise in the 2000s was mainly due to the destabilisation of drug markets caused by government attack on the cartels and by an in-flux of violent Columbian traffickers.

United Nations Office on Drugs and Crime, 2011	Uses data from 22 UN regions including multiple countries and multiple time periods.	Mostly drug seizures.	Descriptive statistics and correlational analysis mostly. Concluded that drug trafficking has been a 'root cause' of the increase in homicide in Central America in recent years.
Wilbanks, 1984	Miami, 1920-1985	na	Descriptive statistics. Found that the majority of the increase in homicide in Miami at that time was primarily due to gun homicides of young Hispanics. Concluded that the drug wars between Columbians and Cubans were a factor but not the defining one.

Sarrica (2008) was one of the few short-listed papers to use UK data, along with data from 11 other European nations and the US. Rather than examining the rise and fall of drug markets it sought to test whether drug prices drove homicide trends with the hypothesis being that higher prices offer a rationale for increased violence in order to make profits. Results were equivocal. Regression analysis suggested a relationship between homicide and heroin prices in the US and four European countries (higher prices meaning more homicides). But there was no significant relationship with cocaine prices and no relationship for either drug for the UK.

Three of the studies from Table A4.3, looked at the relationship between drugs and crime in the US over a period that included the crack epidemic but went beyond it. Perhaps as a result these had more equivocal results than the crack-specific studies. All three employed robust methodologies in that they looked at within-city change using panel data and a high number of observations and control variables. Of the three, Baumer (2008) adopted an approach most appropriate for testing the Blumstein hypothesis and also found the most support, though with an important caveat. Using panel-data regression for 114 US cities for the period from 1980-2004, Baumer tested two measures of drug markets: the overall arrest rate for cocaine/heroin and the percentage of persons arrested for possession or sale of cocaine/heroin who were under 18. Both yielded significant positive effects on homicide and were strongest for youth homicide. Using these results, Baumer estimated that between 20 and 40 percent of the rise in overall homicide, could be attributable to changes in drug markets. However, his calculated impact on the *fall* in homicide was negligible. Importantly though, this was not because the drug-market estimates were insignificant but rather because they did not decrease markedly through the period 1993 to 2004. In other words, despite ample ethnographic evidence of crack's declining popularity over that time (see for example Golub et al.,

2006), Baumer's market indicators did not reflect this. Hence it is hard to say whether the rather lop-sided effect of crack markets detected in this, and other, studies is genuine or due to the choice of indicators.

The findings from McCall et al., (2008) suffer from a similar issue. Using panel data from 83 cities for the period 1970-2000, McCall et al. found that while there was some evidence of a positive link between drug arrests and homicide rates through the 1980s, the general relationship between the two was in the opposite direction. That is, more drug arrests predicted *lower* rates of homicides. They concluded that crack markets may have played some role in the rise in homicide but were irrelevant for the fall. However, their descriptive statistics show that drug arrests in 2000 were only 10% lower than they were in 1990 and were actually 51% higher than in 1980, when other evidence suggests the US was suffering a powder cocaine epidemic (Golub et al., 2006). In other words, decade-long change in drug arrests may reflect arrest priorities as much as actual drug-market activity.

Browne et al., (2010) employed a similar methodology but extended the period to 2006. This is important because the juvenile arrest rate for homicide showed a slight uptick from 2005, so Browne et al.'s analysis was able to examine whether the factors that drove youth homicide during the crack era were the same as those that drove the more recent increase. Their proxy measure of drug market activity – the proportion of narcotics-related homicides – was significantly related to within-city youth homicide variation in some specifications, but not others. They concluded that structural disadvantage and levels of gang activity were more important predictors. Taken together, the Baumer, McCall et al. and Browne et al. studies rather suggest that while drug markets may have been important drivers of US homicide trends through the crack era, they have been less important since.

The study by Wilbanks (1984) is interesting because it is one of the few that attempts to explain an earlier peak in US homicide: that in Dade County (which contains the city of Miami) in 1980/81. At that time Miami had the highest homicide rate of all US cities at 65.5 per 100,000 people, and, having experienced a 54% increase in homicide between 1979 and 1980, the city's rising rate was an important factor in driving the 1980 homicide peak in the US as a whole. Though he did not attempt any causal analysis, Wilbanks showed the increase in homicide in Miami at that time was primarily due to gun homicides of young Hispanics (the rates for Anglos and Blacks increased only slightly) and that although the most frequent motive was 'domestic or other argument' the fastest rising category was 'drug rip-offs'. Indeed, 20% of the homicides in 1980 were directly attributable to "disputes over narcotics", which is considerably more than for the US generally that year (2%) and far more than Miami experienced in 1974, when an earlier study had revealed an "insignificant number" of drug-related homicides (Wilbanks, 1979 cited in Wilbanks, 1984).

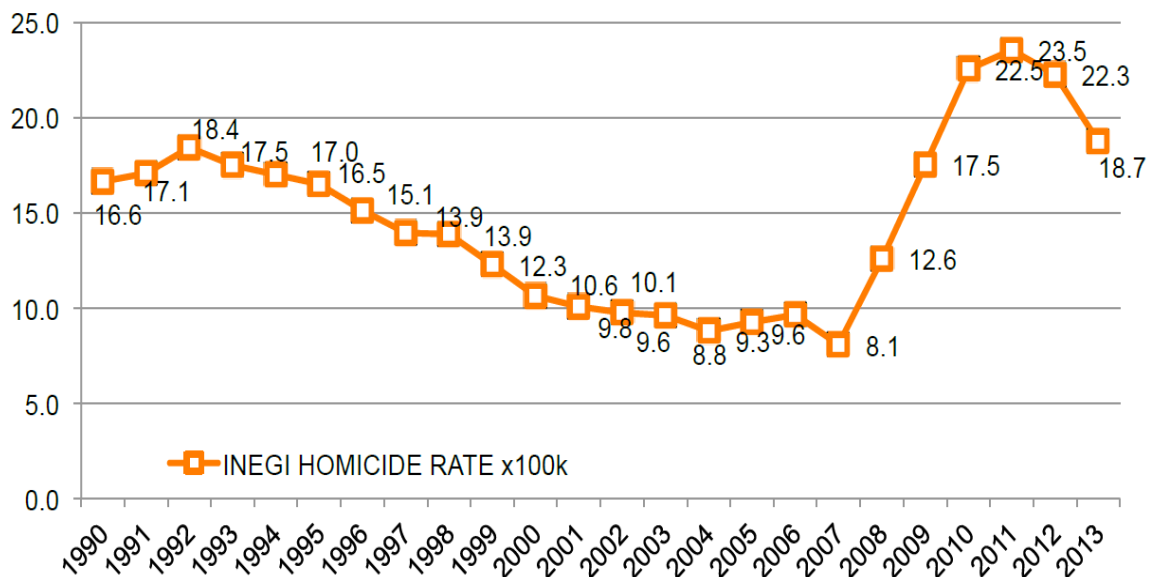
Wilbanks' results are interesting when considered alongside the later studies on crack-cocaine. That the sharp spike was associated with gun homicides involving young men is a common theme but there is also another link. The street-level crack-cocaine markets of the late 1980s were largely populated by Blacks – and the homicide increase was also focused among Blacks – but the *powder* cocaine markets that flourished in Miami in the late 1970s and early 1980s were dominated by Hispanics. Indeed, there was a well-documented war for control of the market between Cubans and Colombians that occurred at the end of the 1970s (see Gugliotta and Leen, 1989 and Eddy et al., 1988). These groups also dominated the homicide statistics at that time – the increase in Hispanic homicide victimisation from 1974 to 1980 in Dade County was over 300% compared with 65% for Anglos and 16% for Blacks (Wilbanks, 1984). However, Wilbanks concluded that the cocaine wars were only a partial explanation for the homicide spike given that non-drug-homicides increased too. He concluded instead that the drug wars, plus other factors like the Cuban 'Mariel' immigration¹³ and worsening economic conditions created a "temporary culture" in which killing was briefly rationalized and condoned.¹⁴

Nine of the papers in Table A4.3 looked wholly or partially at Mexico, which had a sharply rising homicide trend from around 2007, see chart below. Descriptive statistics suggest that drugs were the primary driver. Drug-related homicides increased 453% between 2007 and 2010 compared with a 70% rise in non-drug-related homicides (Castillo et al., 2013). The homicide rise was also highly focused in a few regions with intense drug activity. Rios (2013) showed that four of Mexico's 32 states accounted for 84% of all murders between 2006 and 2010.

¹³ Just before homicide peaked in Miami, there was a major in-flux of (Mariel) refugees from Cuba, including many offenders from Cuban jails. In a separate study that did not make our short-list as it did not involve homicide trends over time, McBride et al., (1986) found that 1980 homicide statistics in Miami showed disproportionate numbers of drug-related (cocaine) murders involving Columbians, but like Wilbanks (1984), they felt that the Mariel refugees contributed to the spike too.

¹⁴ Others disagree. Inciardi (1990), citing Gugliotta and Leen, linked Miami's 1981 homicide peak directly to the 'wars' over powder cocaine distribution that occurred at that time. Eddy et al., (1988) documented these 'wars' in their book. They argued that Columbian dealers, who had previously been content to supply cocaine to the Cuban street-level dealers in Miami, decided they wanted to take over all aspects of distribution. So they sent violent individuals from Medellin, Columbia, which had an extremely high homicide rate at the time, to the US to wrestle control of the street-level market from the Cubans. Their analysis was built on media and police reports and only looked at the effect on homicide tangentially, so it did not make our short-list. But they concluded that the ensuing 'cocaine wars' were the main reason for the sharp increase in homicide rates in Miami and the surrounding Dade County from 1979 to 1980. Their historical account also suggested that the 'wars' were more complex than simply Cubans fighting Columbians for control. For example, one of the most violent shootings, the so-called 'Dadeland battle' was actually between two rival Columbian groups.

Figure A4.3: The homicide rate in Mexico, 1995 to 2013



Source: INEGI. Authors' calculations based on INEGI homicide data and CONAPO's 2010 population estimates for all years. Results vary when revised CONAPO population estimates from later years are applied.

An important aspect of the research on Mexico is that many studies attempted to quantitatively test the impact of different *enforcement* approaches, something that does not feature so strongly in the US literature. This is partly because, although Mexico supplanted Columbia as the main supplier of illegal drugs to the US in the late 1990s (according to Rios, 2013), the marked rise in homicide did not begin until around 2007 and coincided with the arrival of Felipe Calderon as president. In December 2006, ten days after becoming president, Calderon began a new drug policy by sending thousands of troops into one of the most drug-affected Mexican states, Michoacan, to battle the cartels and suppress drug trafficking activity (Castillo et. al.,2013). That homicide increased sharply for around four years after that point led many to conclude that the enforcement actions were primarily responsible.

Testing the effect of enforcement requires overcoming a methodological problem: endogeneity. This arises because government crackdowns were not random. They took place where violence was escalating or where there were pre-existing turf wars among cartels, so there is a danger of reverse causality. As a result, many of the studies used rigorous quasi-experimental designs to try and control for endogeneity.

For example, both Rios (2013) and Phillips (2015) used fixed effects models to test the relationship between Mexican enforcement activity and homicide from 2006. Rios showed that when homicides involving confrontation between traffickers and the authorities increased, so did homicides between rival trafficking groups. She also used historical and ethnographic analysis to chart the progress of drug wars in specific states and found that homicide peaks coincided with documented conflicts between trafficking groups *and* with enforcement actions. She concluded that both were important in driving up violence in Mexico and that the two reinforced each other. That is, when authorities killed or arrested a leading trafficking figure it

destabilized the group of which they were a part, encouraging others from within the group or from a rival group to use violence to take control.

Phillips (2015) reached a similar conclusion. He found that drug homicides between 2006 and 2012 reduced temporarily after leaders of trafficking groups were arrested but that cumulatively over time these arrests increased total homicides and that the enforcement goal of 'decapitation' of cartels (i.e. going after their leaders) was a contributing factor to the rise in homicide. This finding was echoed by Calderon et al., (2015) who used difference-in-difference and synthetic control designs. They also found that inter- and intra-cartel homicides increased after the successful removal of a leading trafficker. But they found that the enforcement policy increased non-drug homicides too, which they speculated may be due to weakened cartel control over non-drug-related criminal groups.

Dell (2011) also concluded that Calderon's enforcement campaign was an important factor in the escalating homicide rate, but she used a different approach. She employed a regression discontinuity design, comparing municipalities where the National Action Party or PAN, Calderon's party, won the local elections by a small margin with those municipalities in which the PAN lost by a small margin. She found that homicides increased significantly after the close election of a PAN mayor and that this was mainly due to drug violence. She concluded that higher homicide rates were driven by takeover attempts by rival cartels after PAN mayors increased enforcement action against incumbent cartels.

Two less robust studies reached a similar conclusion. Using historical analysis, Snyder et al., (2009) argued that years of one-party rule to 2006 meant officials could make long-term pacts with drug traffickers to reduce enforcement in exchange for minimised violence. But political competition exposed this and meant enforcement had to fight cartels more directly. The authors argued that this, along with an in-flux of violent Columbian dealers, drove up Mexican homicide rates in the late 2000s. Correa-Cabrera et al., (2015) tested this hypothesis using a regression model and data from 30 Mexican states from 2007 to 2010. While economic variables, corruption, and a measure of fighting between cartels did not show a significant relationship with drug homicides, the level of drug enforcement did.

Not all studies blamed enforcement for the homicide increase. Poire and Martinez (2011) found that targeting leading traffickers did not increase violence and Villalobos (2012) argued that while Calderon's enforcement strategy caused short-term homicide rates to increase, it was necessary from a long-term perspective to eliminate drug-related violence and pave the way for a longer period of homicide decline.¹⁵ Neither of these studies were short-listed because they are in Spanish.

One that was short-listed, and which also reached a more equivocal conclusion was Castillo et al., (2013). They used an instrumental variable approach to test the relationship between drug trafficking and homicide at the municipality level in Mexico

¹⁵ This argument has become harder to justify given that Mexico's homicide trend turned upwards again from 2016, reaching a new record high in 2018.

between 2006 and 2010. They found a significant relationship between the number of cartels in an area and the number of homicides, with rates increasing particularly when the number of cartels was two or more. However, they also found that as cocaine seizures in *Colombia* increased so did homicides in Mexico. They also found that the overall impact of drug trafficking on homicide increased after Calderon came to power. Their conclusion was that drug trafficking was a crucial driver of Mexico's homicide increase and that Calderon's enforcement action exacerbated the situation, but that the simultaneous change in drug policy in Colombia also had an important impact. In July 2006, Juan Manuel Santos became defence Minister in Colombia. He switched Colombia's drug policy from targeting coca growing to intercepting cocaine shipments and destroying processing labs. Castillo et al., (2013) argued that this drove up cocaine prices in the US and meant that cartels moved their base of operations from Colombia to Mexico, displacing violence there.

In addition, Enamorado et al., 2014 found a strong relationship between inequality and homicide during the period of the drug war in Mexico from 2005 to 2010. They concluded that drug activity and extreme inequality interacted to drive up homicide rates. Specifically, they argued that drug wars amplified the effect of inequality on homicide by both providing displays of ample wealth that might be achieved via violent criminality, and by lowering the costs of entry into that criminal world.

The UN's Homicide Report, 2011 also looked at Mexico. It showed that the increase in Mexican drug enforcement through the 2000s led to a surge and then a decline in drug seizures. The latter was seen as a sign that enforcement had reduced cocaine smuggling through Mexico and diverted it through other Central American countries. However, the homicide rise increased at that time both in Mexico and in the countries drugs were diverted through (e.g. Ecuador). The authors concluded:

“When looking at increases in homicide rates... it appears that at least part of the pattern... is attributable to changes in cocaine trafficking flows..... higher levels of homicides are not only associated with increases in drug trafficking flows, but also with decreases in drug flows that lead to turbulence in established markets, more competition between criminal groups and more killings.”

However, the UN report also argued that enforcement could have long-term beneficial effects on homicide citing the example of Columbia, which saw a 50% decline in its homicide rate between 2002 and 2010 following a sustained enforcement campaign. This review did not examine Columbia because it is not an OECD country.¹⁶

¹⁶ A number of studies have investigated the link between drug trafficking activity and homicide in Columbia. Most concluded that competition between drug trafficking groups and battles between traffickers and authorities were important drivers of high homicide rates in Columbia. See for example Mejia and Restrepo, 2013. No studies could be immediately located that tested the proposition that while enforcement may have been a short-term driver of higher homicide rates it might have ultimately given rise to Columbia's currently far lower rate.

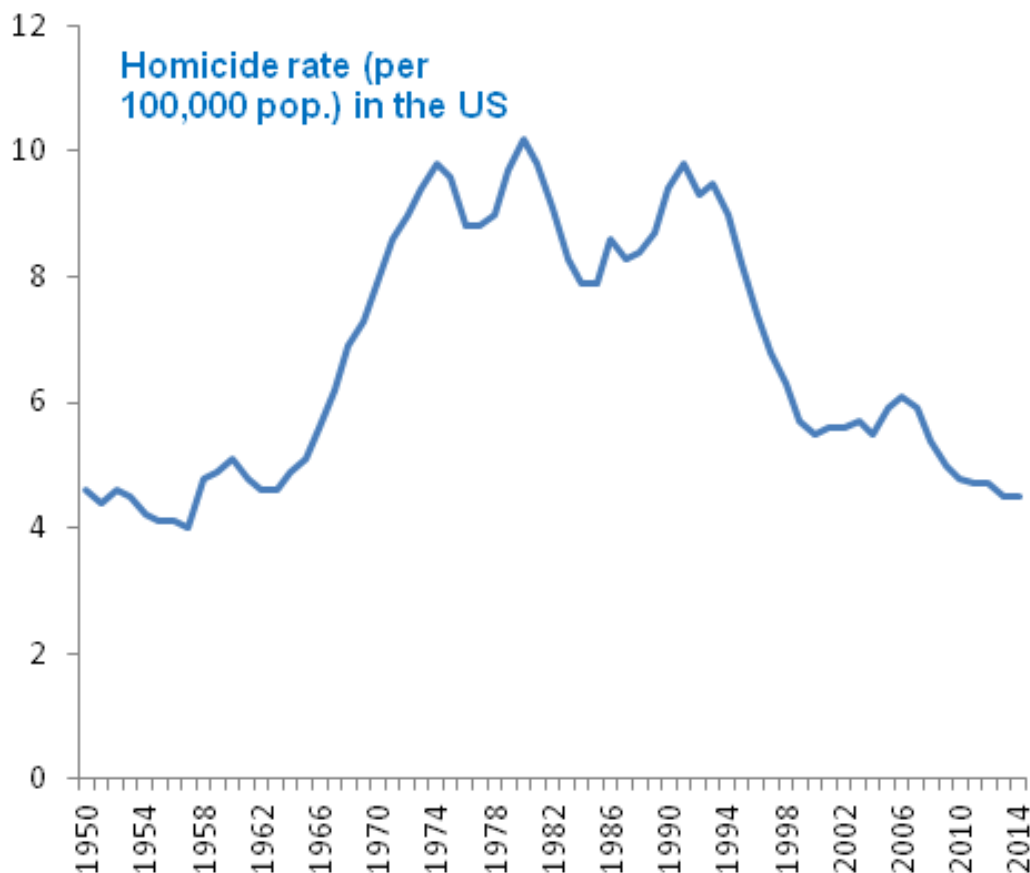
Secondary evidence

This section examined evidence from studies that did not meet all the selection criteria but which offered some useful information either in relation to the Blumstein hypothesis, its applicability to trends in England and Wales or to the possible link between drugs and homicide in England and Wales more generally. It is divided into three sub-sections.

i) Further evidence on drug markets and homicide peaks in the US

Several of the studies reviewed in the initial section identified that the three peaks in homicide seen in the US since 1945 coincided with peaks in different drugs markets: heroin in 1974, powder cocaine in 1980 and crack-cocaine in 1991, see Figure A4.4.

Figure A4.4: Homicide trend in the US



Source: Crime in the United States, FBI, Uniform Crime Reports.

No studies could be located that formally and quantitatively tested the relationship between homicide and drug use or drug markets for the two earlier homicide peaks, though Eisner (2014) does show a strong relationship between the popularity of the word 'drugs' (which increased particularly sharply from about 1963) and homicide trends (see Character annex).

Many other researchers have also suggested a link based on descriptive statistics, or historical/ethnographic evidence. For example, Wilson (2013) in analysing the rise in homicide through the late 1960s noted that "something happened" in around 1963 in the US (before Vietnam or the outbreak of race riots and when economic conditions were generally flourishing) that led to a marked and longstanding rise in crime rates of all kinds, including homicide. Though he highlighted other possible drivers including the rising youth population and a lessening of Victorian-era values like self-control, he also suggested that increasing heroin use was likely to be factor. He noted that in the 1950s the number of drug-related deaths in New York City was around 100 per year. This rose to 200 in 1960 and then to over 300 in 1961 and had reached more than 1200 by the end of the 1960s. Similar rises were recorded in Atlanta, Boston, Los Angeles and Washington alongside marked rises in homicides.

Kleinknecht (1996) argued that alongside burgeoning heroin use there was also a fracturing of the distribution market. The Mafia had controlled the US market in a monopolistic fashion from the end of the 1930s through to the end of the 1950s, according to Kleinknecht. But mass migration of Blacks into the inner cities coupled with suburbanization of many Italians, who had previously lived there, meant that it was harder for the Mafia to sell directly to their customers. Increasingly therefore, the Mafia sub-contracted street-level dealing to Black gangs, which were smaller, more fractious and which, in Kleinknecht's words, "*spread violence like a virus.*"

Figure A4.5: Drug epidemic trends in New York

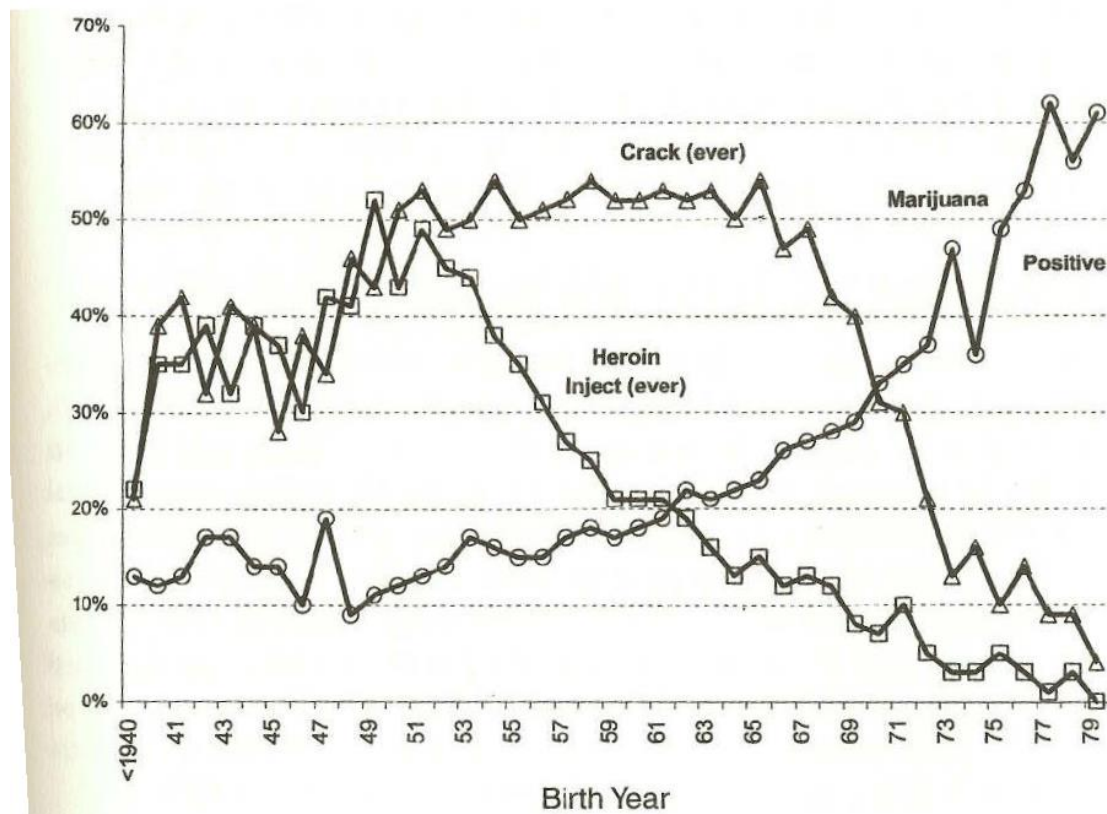


Figure 6.1. Key drug use indicators by birth year (ADAM-Manhattan age 18 plus from 1987–1997, $n = 13,084$).

The 30-year ethnographic project summarised by Johnson, Golub and Dunlap (2000) also examined, to some extent, the degree to which heroin might have been involved in the early 1970s US homicide peak. They outlined the rise and fall of different drug epidemics in New York City. Figure A4.5 demonstrates in particular how heroin use peaked in cohorts born around 1950, who would have been likely to reach their crime peak in the late 1960s and early 1970s. It also shows the rapid drop-off in heroin use among cohorts born after 1960 and an even steeper decline in crack use for cohorts born after 1967, who would have been 24-or-under at the 1991 homicide peak.¹⁷ The researchers do not, however, directly link these trends to subsequent declines in homicide. In relation to the 1974 homicide peak, the authors do suggest that rising demand led to market instability by fracturing the monopolistic hold that one particular organized crime group had on heroin distribution and that this fuelled violence as rival groups fought for dominance. But they do not attempt to quantify an effect on homicide (Johnson, Golub and Dunlap, 2000).

¹⁷ These data are from the Arrestee Drug Abuse Monitoring Program (ADAM), which collected urine test results and survey responses from over 13,000 ADAM-Manhattan arrestees between 1987 and 1997. The measures shown in the chart are any lifetime self-reported use of heroin, any lifetime self-reported use of crack and recent marijuana use as detected by urinalysis.

Other studies documented that heroin users were disproportionately likely to feature among the victim statistics for homicide at that time. McBride et al., (1986) cited a Philadelphia study showing that in 1972 the leading cause of death among illicit drug users was homicide, rather than overdose or any other cause. One of the states that experienced the fastest growth in homicide up to 1974 was Michigan, and Monforte and Spitz (1975) found that during the early 1970s two-thirds of the homicide victims in Wayne County (which contains Michigan's main city of Detroit) were involved in illegal drug use or drug dealing.

Other ethnographic studies bolstered the Blumstein hypothesis. For example, Curtis (1998) conducted a ten-year (1987-1997) ethnographic study spanning nine different research projects in Brooklyn, New York. It concluded that as crack demand rose and then fell, drug markets altered in a way that was instrumental in both the rise and fall in violence:

"....the reconfiguration of drug markets in the mid-1990s appreciably reduced the level of neighbourhood violence. As distribution retired indoors, turf battles were eliminated. Since organizers of drug businesses hired a few trusted friends rather than easily replaceable workers, there was less conflict between them."

Further evidence comes from studies that surveyed crack-involved individuals (Fagan, 1990; Inciardi, 1990; Dembo et al., 1990; Mieczowski, 1990 and Sterk and Elifson, 1990). The general conclusions from these studies were as follows:

- i) There was considerable overlap between crack users and crack sellers – often they were the same people and those who had been selling crack longer and were more involved with the business were more likely to be users (Inciardi, 1990; Dembo et al., 1990)
- ii) Generally those who dealt crack frequently self-reported more systemic violence than those who dealt other drugs, but their violence was not limited to the drug-selling context (Fagan, 1990; Mieczowski, 1990)
- iii) It was unclear whether or not crack use or selling was associated with the onset of violent criminality (or criminality generally). Some studies (e.g. Fagan, 1990) suggested that criminality often preceded involvement in crack markets, while other studies (e.g. Inciardi, 1990) found that the two frequently began in tandem. There was more consistent evidence that violence tended to accelerate after the onset of crack use though it was unclear whether this was due to psychopharmacological effects or increased immersion in the drug market system (Fagan, 1990; Mieczowski, 1990; Dembo et al., 1990). While the psychopharmacological effects seemed clear in some studies (e.g. Sterk and Elifson, 1990 and, in an England and Wales context, Miles, 2012), reviews generally concluded

that it explained only a fraction of crack-related violence and that systemic violence was more important overall (Goldstein, 1985; Kuhns et al., 2009)

- iv) As well as violence, crack users/sellers self-reported a variety of other crimes (Inciardi, 1990).
- v) Crack user/sellers self-reported a high level of weapon-carrying. One study found that 88.4% of a sample of 611 drug-involved (mainly crack) youth reported carrying weapons most or all of the time, and more than half of these carried handguns (Inciardi, 1990).

There were also secondary studies that challenged the crack-violence hypothesis to some extent. These studies did not meet our criteria because none specifically tested the relationship between crack and homicide. Kelling and Sousa (2001) found no link between crack and *violent crime* at the precinct level in New York, while Farrell et al (2014) rejected the crack hypothesis on the grounds that European crime rates fell without the influence of any documented crack epidemic. Zimring (2011) looked in detail at crack-related trends in New York and found mixed evidence for an effect on violence and homicide. He noted that trends in crack-related overdoses and emergency room visits stayed fairly constant through the 1990s crime decline, which does not immediately suggest that crack played a significant role in that decline. However, he also acknowledged that these data may not be the best indicators - overdose risk increases with age, so an ageing but decreasing drug-using population could have a reasonably constant overdose risk. Indeed, his analysis of drug testing on arrest data does show a clear decline in cocaine use (the urinalysis test is unable to distinguish between crack and powder cocaine) in the second half of the 1990s, particularly in younger age groups. His conclusion is a complex one. He argues that crack markets were probably involved in a nexus of factors that drove crime up and then down in New York City but, because homicides fell by more in New York than elsewhere (76% between 1990 and 2009 compared with 64% for the median of the nine next largest US cities) that it is also fair that some credit for the crime fall must go to specific policing practices adopted in New York that drove the drug trade from the public to the private space.

ii) *The applicability of the crack hypothesis to England and Wales*

To our knowledge, no studies have tested the crack-market hypothesis in England and Wales. Zimring and Hawkings (1999) noted that the rapid rise of UK heroin markets in the 1980s did not correlate with rising homicide rates, but they did not look at crack trends (and they did not disaggregate trends by gender which would

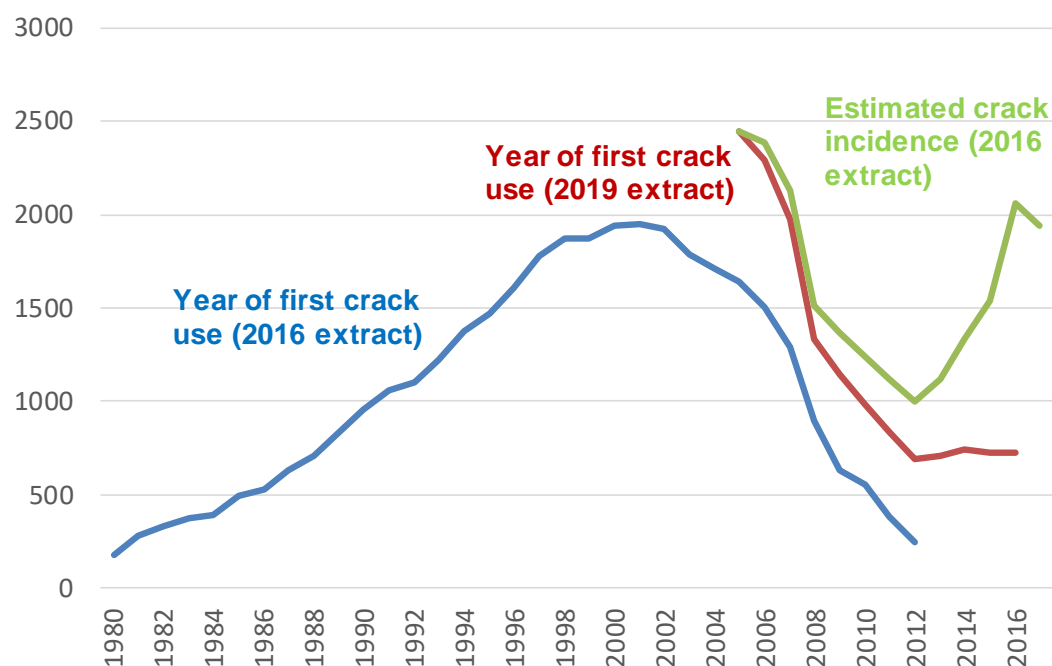
have revealed that the gradually rising homicide trend in England and Wales in the 1980s – which contrasted somewhat with the ‘epidemics of homicide in US cities – masked a flat/falling trend in female victimisation and a rapidly rising trend in male victimisation).

Dorn et al (1992) argued that UK heroin markets gradually shifted from the 1960s onwards from being what they labelled ‘trading charities’ (informal, reciprocal, non-violent, non-profit-seeking arrangements) to ‘retail specialists’, which were more fractious and more violent due to profit-driven competition between lots of small-scale groups and little overall market organisation. They noted that this process really accelerated in the 1980s and 1990s, as homicide became more volatile and more male-dominated, but the authors themselves did not attempt to quantify the effect that changing drug markets might have had on homicide rates. In addition, because they were writing in 1992, their analysis did not look extensively at crack-cocaine. Overall, the lack of studies examining the link between crack and homicide in England and Wales can probably be attributed to the fact that research examining crack in the UK generally concluded that it never reached the same epidemic scale as in the US (see for example Reuter and Stevens, 2008).

However, there is some evidence that crack markets increased and decreased in England and Wales at around the time of the 2002/03 homicide peak. For example, Schifano and Corkery (2008) showed that a range of crack indicators increased sharply during the late 1990s¹⁸ and data from the National Drug Treatment Monitoring System also suggests a rise in crack initiation during the 1990s followed by a rapid fall from the early 2000s and then a rise again recently (Jones et al., under review).

¹⁸ Specifically, Schifano and Corkery (2008) produce time series data on numbers of crack seizures, numbers of individuals cautioned by the police or dealt with by the courts for drug offences involving crack, last-year use of crack as measured by the Crime Survey of England and Wales (formerly the British Crime Survey), price and purity of crack, and crack-related deaths. With the exception of price and purity all the indicators rise between 1995 and 2000 with the rise in deaths and last-year use being particularly marked. However, many of the indicators continue to rise after the 2002/03 peak in homicide, particularly the deaths measure. All these measures have limitations. Evidence shows that there is a relationship between drug-related deaths data and age, so it is possible that whilst deaths may be a good indicator of the arrival of crack markets it may not capture their decline or maturation if the initial surge in use leads to a gradually ageing cohort of persistent users.

Figures A4.6: Estimates for crack incidence, 1980 to 2017



Lupton et al., (2002) in their investigation of eight local drugs markets in the UK also noted the rapid emergence of crack during the late 1990s/early 2000s and that this often destabilised existing markets. These points are further reinforced by studies that have interviewed police and community workers involved with crack users and crack houses. For example, one typical interviewee from Cragg (2003) noted both the rapid rise in crack markets up to around 2001/2002 – when homicide peaked – and the fact that some areas saw rapid declines in crack demand after that point:

“It (crack) reached crisis in Brixton in 2001, 2002. That was the point at which it really became absolutely obvious and there was a sense that the streets had been lost and that the whole thing was massively out of control. I think in Lambeth the whole thing is just starting to turn the corner actually.”

These studies also offer tentative evidence of a ‘culture of violence’ surrounding crack markets in England and Wales, particularly in relation to gun crime, which we know was an important driver of the homicide peak in England and Wales (see Annex 1). Many of the interviewees in Cragg’s study, for example, suggested that crack was more associated with violence than heroin. They blamed differing psychopharmacological effects, different market structures (notably shorter highs and a higher frequency of transactions) and the types of dealers who specialised in crack.

However, as with the US evidence, there were also a smaller proportion of interviewees who questioned the psychopharmacological link between crack and violence, and many also pointed out that it was far from true that all crack users and

sellers in London were involved with gun crime during the period (Cragg, 2003). Even so, studies that have analysed the rise in gun crime in England and Wales in the early 2000s have found that drug markets were probably implicated. For example, the conclusion reached by Hales et al., (2006) is one that echoes part of the Blumstein hypothesis in the US:

“Illegal drug markets appear to significantly underpin the criminal economy and represent the single most important theme in relation to the illegal use of firearms, characterised by systemic violence that appears to increase towards the street (retail) end of the market.”

Furthermore, in a survey of 80 firearms offenders, the authors concluded that:

“Illegal drugs markets represent the single most important theme in relation to the use of illegal firearms – in effect a ‘golden thread’ that runs through all the interviews to some degree.”

Hales et al., 2006.

Interviewees described violence relating directly to drug dealing activity, including turf wars, but also to more long-standing conflicts and tit-for-tat violence (Hales et al., 2006). In that sense, the authors noted that involvement in drug dealing may explain the presence of a firearm but have nothing to do with the context in which it is used. A study by the Metropolitan Police Authority (2004) came to an identical conclusion. In a survey of over three hundred and fifty relevant individuals and organisations, respondents were asked to define the root cause of gun crime. An overwhelming majority said drugs.

Journalistic and police accounts, though anecdotal, also suggest that crack-cocaine markets were linked to many of the homicides that occurred at around the time of the homicide peak in England and Wales – just as they were in the US. In fact, some even suggest a degree of displacement. i.e. that as markets declined in the US some of the Jamaican dealers, who were instrumental in introducing crack into the US, moved to the UK to try and set up new markets there (Mieczkowski, 1990; Johnson et al., 1992; McLagan, 2013; Keeble and Hollington, 2010). Several studies have examined the influence of Jamaican gangs or ‘posses,’ as they were known, on the US homicide rise of the late 1980s (see for example McGuire, 1988; Lyman and Potter, 1998; Gunst, 1995; Small, 1995, Williams and Roth, 2011). According to Lyman (1989) and other accounts, much of the initial migration was into the city of Miami where there were approximately 1,000 posse members by the mid 1980s. From there, the posses spread throughout the US such that by the mid-1990s the Bureau of Justice Assistance estimated that there were 40 different posses spread across 35 states and with around 22,000 total members (Williams and Roth, 2011). Law enforcement reports suggested that their primary activities were crack dealing and firearms trafficking and that homicides were often a bi-product (McGuire, 1988).

The Bureau of Alcohol, Tobacco, Firearms and Explosives reported that drug wars between a single posse and rival gangs resulted in between 300 and 500 murders between 1985 and 1987 (Lyman and Potter, 1988). The US Department of Justice (DOJ) estimated that overall the posses were responsible for at least 1,400 drug-related murders in the US between 1985 and 1988 and Small (1995) calculated that more than 5,500 US homicides between 1985 and the early 1990s were linked to Jamaican posses. Williams and Roth (2011) pointed out that, according to UCR data, the DOJ figure represents nearly 2% of all homicides in the US over that period. More importantly perhaps, the total increase in US homicide over that period was only 1,699 homicides. In other words, it is not implausible, given the limited quantitative information available, to suggest that the arrival of the Jamaican dealers and their expansion throughout the US could have had an impact on the overall US homicide trend.

It is important to point out that Jamaican immigration to the US from 1980 was extensive: Gunst (1995) reported that 213,805 Jamaicans came to the US between 1980 and 1990 which equated to 9% of Jamaica's population. Only a small minority were posse members and only a proportion of those were likely to be involved in homicide. The vast majority were law-abiding. But there is some evidence that a minority were incredibly violent, having been trained and armed for street warfare in the political clashes that took place in Jamaica through the late 1960s and 1970s before escaping to the US when violence escalated in Jamaica in 1980 (Gunst, 1995, Small, 1995). Within the crack markets, some became designated enforcers or hitmen. For example, Kirk "Black Tony" Bruce of the Shower posse confessed to 87 separate murders when he was arrested in the US in 1988 and another member Karl Dunstrom was estimated to have committed more than 100 murders, according to the Bureau of Alcohol, Firearms and Tobacco (Gunst, 1995).

Silverman (1994) argued that successful law enforcement operations against the Jamaican posses in the US, coupled with gradually saturated crack markets, led some posse members to switch their attention to the UK in the interest of establishing a new market. He noted that several posse members who had been active in setting up crack markets in Kansas City from 1985-87 were arrested in London in 1989 on drug charges (one of whom was wanted for murder in New York) in what he called the first "attempt to gain a bridgehead" in the UK. As the 1990s progressed, there is some evidence that displacement of posse members from the US to the UK increased as the opportunities for drug-market profits in the US appeared to have dried up. One Jamaican trafficker who operated in New York before shifting to London in 1989 is quoted in Silverman (1994) as saying:

"For Jamaicans the American crack market is broken now. Many people are in jail, others have been deported, and the price of coke is not high enough to make it worth the risk anymore. It is finished. The best shot is Europe....Over the next two to three years you will see more Jamaican dealers coming to England because it is safer for

them there. The police don't carry guns and the sentences are not as tough as in the US."

Source: Silverman (1984)

If this account is correct, there are two important conclusions for this review. Firstly, it suggests that while drug enforcement may have played some role in destabilizing markets and hence increasing violence, it may also have played an important role in stemming the number of homicides in the US. The second conclusion is that there may be a link between the homicide rise in the US and the later homicide peak in England and Wales. Indeed, McLagan (2013), cited an unpublished Metropolitan Police Service report to demonstrate that UK police were also aware that the US crackdown on Jamaicans involved with the crack trade led many of the same individuals to come instead to the UK in search of new profits and that much of their violence travelled with them.¹⁹ Using media and police reports of numerous tit-for-tat shootings involving Jamaicans and the British-born gangs they competed with, McLagan concluded that the posse members – or Yardies as they became known in the UK - were the leading force behind the rise in crack markets and gun violence that occurred in England and Wales in the 1990s/early 2000s. The police reached a similar conclusion. A 2004 Metropolitan Police Authority report cited work carried out by the Association of Chief Police Officers which concluded that *"the spread of crack cocaine throughout Britain has coincided with the spread of Jamaican groups, who move into areas with established class A drug markets and drive off competition, often using converted air weapons."*

An explanation of the homicide peak in England and Wales that incorporated migration patterns of Jamaican gangsters and crack cocaine markets fits with two results from Annex 1: the rise and fall in homicides involving Jamaicans either as victim or suspect and the concurrent rise and fall in shootings. Both of these played some role in driving the homicide peak in England and Wales. However, the overall supporting evidence for such an explanation needs to be put into context. It is comprised largely of scattered descriptive statistics and a series of qualitative accounts, largely from enforcement or media sources. Other commentators have warned against drawing strong conclusions from such accounts (see for example

¹⁹ While it is hard to verify McLagan's account of displacement of Jamaican crack dealers to the UK directly, there is some evidence that Jamaicans featured heavily in police drug crackdowns in the US, but also later in the UK. Barnes (2009) showed that the US, Canada and the UK accounted for a combined total of 96% of all deportations to Jamaica between 1990 and 2004, with the USA representing 59%, and the UK 26%. Of all deportations, close to 70% were due to criminality, with drug-related offenses representing more than two thirds of those persons deported in relation to criminal activities. Given that drug offences could refer to possession of marijuana rather than trafficking of crack cocaine, this does not prove they were all violent posse members, but Barnes (2009) does go on to point out that the trend of criminal deportations correlates with a rise in Jamaica's homicide rate, which more than doubled from 1990 to a peak in 2004.

Hallsworth and Young, 2008). We therefore consider this a hypothesis only at present and recommend it be tested further.

iii) Other evidence relating to England and Wales

Although no studies could be located that directly tested whether drugs or drug markets have driven homicide trends in England and Wales, there have been studies that examine drug use among victims and perpetrators of homicide in England and Wales.

The general conclusions from the studies are summarised in an international review by Darke et al., (2010), which included data from England and Wales. It found that drug use among victims and offenders of homicide was less common than alcohol use, but that it was still at levels far higher than for the general population and that substance users had higher homicide rates than the population generally.

Homicide Index data supports this. Combined data for year ending March 2016 to the year ending March 2018 showed that 20% of homicide victims and suspects had consumed alcohol at the time of the homicide, 6% of victims and 7% of suspects had consumed both alcohol and an illicit drug and 5% of victims and suspects had consumed an illicit drug only (ONS, 2018).

However, the international evidence has been clear in demonstrating the importance of `systemic' mechanisms linking drugs and homicide, rating them more important than psychopharmacological mechanisms. So being under the influence may not be the best way to measure whether a homicide is `drug-related'. Since 2007/08 data are available on other drugs measures, like whether the victim or suspect were a known drug dealer or user and whether the homicide was directly motivated by competition for illicit drug profits. Combining these data with those on whether victims/suspects were `under the influence' produces the trend for drug-related homicides shown in Annex One. This shows an increase from 217 such cases in 2014/15 to 320 in 2017/18, which accounts for more than 60% of the overall homicide increase over that period (if terrorism and corporate manslaughter cases are removed). Overall then, these data appear to show that illicit drugs have been an important driver of homicide trends recently. Two caveats exist though. The first is that the definition of `drug-related' in these figures is broad. If the victim is a known cannabis smoker but that fact has absolutely nothing to do with his or her homicide it would still be counted as drug-related in these statistics. On that basis, the importance of drugs may be over-estimated (though also note that Ryan et al., (1990) compared police measures of `drug-related' to social science categorisation and found that police statistics systematically under-estimated the degree of drug

involvement). The second caveat operates in the opposite direction. Annex One showed that many of the additional homicides since 2014/15 have been no-suspect cases where no drug-related information is available for suspects. If some of these involve a suspect linked to illicit drugs markets, then the explanatory figure of 60% would be an under-estimate. On the whole then, it seems likely that drugs *have* been an important driver of homicide trends since 2014.

Explaining *why* drug-related homicides have risen since 2014 is more difficult, though various data show a few, possibly-linked, hypotheses. One thing that can seemingly be ruled out is that it was driven by increased drug enforcement. Between 2010/11 and 2014/15 drug trafficking offences fell by 15%. More plausible is a shift in supply and demand and/or a change in the structure of the market, particularly in relation to crack-cocaine. Columbia, the main source country for cocaine in the UK, had a surge in coca cultivation from 2013 to 2016, according to a UN report (UNODC, 2016). In line with that, purity of powder cocaine and crack-cocaine increased sharply in England and Wales. Street-level purity of crack, for example, increased from 36% in 2013 to around 75% in 2017 (UK Government, 2018). Use of crack also increased from 2013 to 2018 as shown by multiple indicators.²⁰ This may be linked to a change in market structure and an increased use of 'county lines' dealing methods, which has been documented by the National Crime Agency (NCA, 2018) The county lines method involves transportation of illicit drugs, mainly heroin and crack, from major urban hubs out to towns all over the country using vulnerable individuals both as runners/drug carriers and as sources of accommodation (many older users have their properties taken over to use as dealing dens in exchange for drugs, a process known as cuckooing). Evidence shows that when an area switches from local dealers to county lines dealers, violence generally increases (Hallworth, 2016).

However, it is important to recognise that other hypotheses for the rise in drug-related homicides exist. Before 2014, statistics showed a slightly falling level of demand for drugs like heroin and crack. Data show that from the year ending March 2007 to year ending March 2014 the number of crack and heroin users dropped by 29% in the major urban centres in England and Wales (London, Manchester, Birmingham and Liverpool) but rose by 0.2% in the rest of the country (PHE, 2019). Maybe this led urban dealers to seek out markets elsewhere, driving the apparent increase in County Lines activity. Some have also suggested that displacement to dark web sales may have been a factor (Kirchmaier and Villa-Llera, 2018). It is also possible that growth from 2014 in vulnerable groups, like school-excluded children,

²⁰ Hay, G., Rael dos Santos, A. & Swithenbank, Z. (2017). Estimates of the Prevalence of Opiate Use and/or Crack Cocaine Use, 2014/15: Sweep 11 report. Public Health England. (2017a). Adult substance misuse statistics from the National Drug Treatment Monitoring System (NDTMS), 1 April 2016 to 31 March 2017. Public Health England. (2017b). Shooting Up: Infections among people who inject drugs in the UK, 2016: An update, November 2017.

children in care and the homeless, contributed. Studies suggest these populations are at higher risk of being drawn into drug use, drug selling and serious violence (Lloyd, 1998; Farrington et al., 2012; MOJ/DFE, 2016).

There is also a high degree of uncertainty about the link between drugs and homicides prior to 2007/08, because the relevant Homicide Index data do not go back prior to that. Earlier estimates for the number of drug-related homicides do exist but they employ different methodologies, meaning that it is hard to know whether differences over time are due to genuine changes or changes in methodology. For example, Miles (2012), using data from police files and interviews from the period 1995-2005, found that 35% of homicides involved drug intoxication of either the victim or offender or both. This is a higher than recorded by the Homicide Index (HI) for the more recent period. But it is not clear whether this is a real change or an artefact of differing methods.

Interestingly, Miles also studied the antecedents and situational/cultural factors associated with the homicide. This led her to two conclusions. Firstly, she found that while alcohol-related homicide were quite heterogeneous in nature, including spontaneous dispute killings in public places, domestic homicides and economically-motivated homicides, drug-related homicides were more homogenous. They were "*largely characterized by long-term feuds between acquaintances*" (Miles, 2012). Secondly, she noted how many of the homicides seemed to involve a psychopharmacological effect that *interacted* with more situational or systemic factors.

Other notable England and Wales studies include Shaw et al., (2006), who matched homicide perpetrator information from the Homicide Index (1,579 cases between 1996 and 1999) to National Health Service (NHS) data and recorded any instance of alcohol or drugs misuse. They found that in the twelve months before the homicide, 40% were misusing drugs and 9% had an NHS record for drug dependence. Dobash et al., (2001), using offender surveys, found that 14% of homicide offenders in UK prisons were using illegal drugs at the time of the offence.

These data, like the more recent ONS figures, suggest that drugs and/or drug markets might be involved in a reasonably high proportion of overall homicides. But unlike the more recent ONS figures, they reveal almost nothing about the dynamic relationship between drugs and homicide. Prior to 2007/08, It is not clear whether the proportion of drug-involved victims and/or offenders shifted in line with rises or falls in the homicide rate.

Conclusion

A total of 45 studies were short-listed which examined the link between homicide trends and drugs. Many looked at US homicide trends during the 1980s and 1990s and the extent to which they were driven by the rise and fall in crack-cocaine markets. This hypothesis, proposed by Blumstein, is summarised below:

- That the shift from powder to crack cocaine created a new, low-income market which markedly increased the number of drug transactions.
- This led to the recruitment of many young, mainly African-American, drug sellers, who armed themselves with handguns for protection and to settle disputes
- The handgun culture spread to non-crack-involved youth who wanted to protect themselves from the drug violence. As a result, homicide rates rose markedly.
- As quickly as they increased, homicide rates fell due to the rapid drop-off in crack demand as youth cohorts realised the harm it could cause. Fewer new users meant market relationships became more established and less violent.

About three-quarters of the studies that examined or tested this hypothesis found a reasonable degree of support. Generally though, the studies were only able to demonstrate that there was a relationship between available proxies for the rise and fall of crack-cocaine markets and the rise and fall in homicide. They were not able to empirically prove all the specific links in the causal chain above. As a result, the exact mechanism by which crack markets may have driven homicide trends remains debated. In particular, it is hard to say for certain whether crack markets spread gun culture to those beyond the markets and whether this contributed to homicide trends. Similarly, the evidence does not allow us to say for certain whether the arrival of crack led to homicide increases in the US directly or whether it was the enforcement response and its destabilisation of markets that was the key factor. Finally, though evidence was generally stronger for crack markets driving the rise in homicide rather than the fall, it is hard to say whether this was a genuine relationship or an artefact caused by the likelihood that crack proxies are better at capturing the market's initiation than its decline.

Another issue – mentioned in passing by several authors though not, to our knowledge, studied in depth by anyone to this point – is that Canada's homicide trend (if not its level) was extremely similar to the US's through the 1980s and 1990s yet it does not seem to have been affected by crack-cocaine to the same degree.²¹

²¹ This latter point is not totally clear. Many ethnographic or media reports on groups connected to crack dealing in the US also mention links to Canadian cities like Vancouver and Toronto, see for example, Silverman (1994) and Kleinknecht (1996). Kennedy et al. (1989) claimed that there was crack market violence in Canada but it did not reach the same level of "all-out lethality" as in the US.

Even so, by comparison with alternative theories, the evidence that drugs have been an important driver of the recent rise and fall in US homicide is reasonably strong, certainly for the period of the crack epidemic (1985-95) but also possibly before then too, when powder cocaine and heroin were more important. Drug markets appear to be less important *after* the crack era although this may be changing again given the current increase in heroin use and the homicide spikes that have followed it (see Rosenfeld, 2016 for more on this).

Most of the crack-related studies concluded that the biggest effect on national-level homicide trends came from the *systemic* violence that accompanies illegal drug markets because participants have no legal dispute resolution system, rather than through the effects of the drugs themselves. But it is hard to dismiss such effects entirely given that so many drug dealers were also users and that crack markets seem to have had much stronger links to homicide than markets in other drug types.

Of the non-crack studies, most looked either at drug-related violence more generally in the US or at cartel-related homicide in Mexico. The Mexican studies generally found drugs to be a strong driver of the homicide increase from 2007 due to competition between drug trafficking groups, displacement from drug violence in Columbia and the aggressive enforcement response of the Calderon government.

Overall then, the evidence from the US and Mexico strongly suggests that drugs and drug markets can play an important role in driving up homicide rates. Furthermore, while the exact mechanism remains somewhat debated, it's clear that the following four inter-related factors are important:

- ***the structure of the market:*** in particular whether it is monopoly-dominated at the street-level or operates on a freely competitive basis with lots of small groups vying for dominance. The latter seems to imply more violence.²²
- ***the type of drug:*** to the extent that psychopharmacological effects contribute (and on this the evidence is quite conflicted), cocaine and particularly crack-cocaine seem to be more associated with homicide than marijuana or heroin. But also, drug-type affects the structure of the market. The faster cycle of crack use has tended to give rise to more small-scale dealers than heroin use, which may make markets more competitive and less monopolistic.
- ***the level of demand:*** as demand increases, so does potential profit which is likely to feed greater competition and violence within the market. Periods of stable, low-demand are likely to favour more monopolistic structures and hence less violence. But more difficult is a period of declining demand after the epidemic peak. It is possible this might lead to increased violence initially as different factions compete for a shrinking market, before stabilising once a monopoly or oligopoly has been established.

²² This is a point made by Lane (1999) in his historical analysis. He also argued that alcohol prohibition and early drugs markets were mostly monopolies but that the nature of newer drug markets means it is harder to form a monopoly and hence the potential for violence is greater.

- ***the level of enforcement:*** the evidence from Mexico in particular demonstrated that enforcement levels can contribute to market de-stabilization and hence to homicide spikes and that particular aspects of enforcement activity may have perverse incentives (for example, the fact that young teenagers would not face custodial sentences if caught carrying drugs in the US may have contributed gangs' willingness to use 10-17 year-olds in the drug trade and hence to their sharp increase in homicides). Importantly though, this review has uncovered other examples of enforcement activity ultimately having a dampening effect on homicide by killing, arresting or deporting the most involved individuals. This seems to have occurred in relation to the crack-trading Jamaican posses in the US and, eventually, with the cartels in Columbia. In both cases, however, there was also evidence that the high homicide levels associated with these individuals simply shifted elsewhere because the demand for drugs remained.

Ultimately, this entanglement of factors creates a challenge for quantitative research as data is rarely available on all them. Furthermore, other studies discussed in this review suggest that, irrespective of these drug-related factors, levels of deprivation, inequality and gun availability are also likely to affect whether a homicide spike will accompany a rise in hard drug use.

Furthermore, more robust categorisation of homicides as 'drug-related' may not necessarily make the picture clearer. If Blumstein's hypothesis is correct, burgeoning drug markets might be considered a long-term cause but not necessarily the short-term trigger for a sizable subset of homicides. For example, an individual may carry a gun due to their participation in, or fear of, a drug-trafficking gang, but the argument that results in that individual using the gun to kill someone may have nothing to do with drugs. In that instance we might expect homicides to correlate with drugs over time but not for this to be reflected in drug-related homicide statistics.

All of this is important for our ultimate question – to what extent did drugs and drug markets drive homicide trends in England and Wales. There were very few short-listed studies that robustly attempted to test the relationship between drugs and homicide in England and Wales and applying review findings from the US or Mexico requires caution. A crucial aspect of the crack hypothesis involved the availability of guns, which is totally different in England and Wales; and while Mexico is a producer/supplier of illicit drugs, England and Wales is largely a receiver, meaning it is hard to know whether findings concerning aggressive enforcement and the rise in Mexican homicide are applicable.

The emergence of recent statistics on the proportion of drug-related homicides in England and Wales suggests that drugs *have* been important in the recent rise, accounting for around 60% of the rise in homicides since 2014/15 (when terrorism and corporate manslaughter cases are removed). But these data are not available prior to 2007/08 making it hard to draw strong conclusions about drugs as a driver of homicide trends in England and Wales prior to that.

No study – to our knowledge – has quantitatively tested the relationship between homicide trends and changes in drug markets in England and Wales. All that is available is qualitative evidence about how drug markets have shifted in England

and Wales set against homicide statistics. This kind of 'narrative correlation' does arguably generate an argument for drugs being a strong driver of trends. As in most developed nations, illicit drug markets exploded in England and Wales in the 1960s, in line with the first big increase in homicide in the 20th Century. Through the late 1970s and 1980s as England and Wales was gripped by a heroin epidemic, homicide, like drug-markets, became male-dominated. And from the late 1980s, homicide trends seem to have followed trends in crack-cocaine use, to the extent that these can be determined. Indeed, it is even possible that some of the same individuals responsible for spreading crack in the US later turned to UK markets bringing their lethal brand of gun-related violence with them. This would fit with the evidence from Annex One showing that shootings played a key role in driving homicide trends around the 2002 peak in England and Wales.

However, significant caution is required. Narrative correlation as a technique is likely to be prone to confirmation bias. Further research is certainly needed to cement or disprove any of these associations.

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Annex 5: The Criminal Justice System and Homicide

The search conducted for this review identified 80 studies which met the proposed criteria investigating the effect of the Criminal Justice System (CJS) on homicide rates. The research question for this section was: to what extent has the effectiveness of the CJS driven homicide trends?

Each short-listed study on this topic generally fell into one of three categories:

- studies that examined the relationship between homicide and core CJS functions like the clearance rate, the incarceration rate and the severity of punishment;
- studies that examined the relationship between homicide and policing resources or policing practices; and
- studies that examined policing or CJS legitimacy and its effect on homicide.

We therefore structured this review accordingly with three separate sections. There was a lack of studies investigating England and Wales. Most of the studies focused on the United States. Therefore, as with other annexes, we also gathered secondary evidence which did not meet the initial criteria, but which included data or analysis relating to England and Wales. This is included at the end of each section.

The Criminal Justice System and homicide

This section examines studies that have looked at the relationship between homicide trends and various aspects of the CJS including: incarceration rate, clearance rate and the severity of punishment, particularly the use of the death penalty. There were 45 papers identified for this section.

1) *Theoretical considerations*

Theoretically, there are at least three ways in which CJS effectiveness might influence homicide trends: via deterrence, incapacitation or rehabilitation:¹

¹ Other channels of influence have also been suggested. For example, it is possible that whether individuals trust the CJS to be legitimate and fair may also influence the number of homicides, see the third section of this review.

- Deterrence: Deterrence refers to the possibility that the threat of being caught and punished will put people off committing the offence. Theorists have proposed two types: general and specific (Bailey, 1997). General deterrence involves the deterrent effect being felt by the offending population as a whole. This supposes that the process of one person being caught and punished for a crime will dissuade others from committing similar crimes. Specific deterrence refers to the deterrent effect on a specific individual who has been caught and punished, which may influence them to be more law abiding in the future. It is important to note that theoretically the level of deterrence can be influenced by both the likelihood of being caught and the severity of any resulting punishment (and even the swiftness with which it is meted out).
- Incapacitation: This refers to the fact that imprisoning an offender prevents them from committing crime on the streets for the duration of the time they are incarcerated.² Its effect on national-level homicide trends will therefore be influenced by the number of individuals that are incarcerated and the typical length of incarceration.
- Rehabilitation: This refers to the possibility that activity taken during the punishment process, like receiving counselling or drug treatment or educational services reduces the individual's propensity to offend.

In practice it can be methodologically difficult to separate these effects. For example, many of the short-listed studies in this section analysed the relationship between the number of incarcerated individuals over time (often as a per capita rate) and homicide rates, the proposition being that as incarceration rates increased we might expect homicide rates to decline. Yet even if such a relationship is established, the mechanism may be unclear. It could be that higher incarceration rates give rise to greater deterrence amongst the potential-offender population. Or it might be that the crime-reduction effect comes by incapacitating previous offenders and hence preventing repeat offending, or via rehabilitation etc.

Another issue relates to studies that examined the relationship between homicide clearance rates and homicide offences. Again, it is hard to separate the mechanism. If a relationship is established, that could be because a higher certainty of punishment creates general deterrence. Or it could be that a higher certainty of

² It does not, of course, prevent them from violent behaviour inside the prison and homicides do occur inside prisons. There are on average one or two murders in UK prisons each year, according to Ministry of Justice figures.

punishment leads to more offenders being incapacitated. But in addition, there is a potential problem of reverse causality. It is not clear whether lower clearance rates lead to increased homicide through reduced deterrence (or some other mechanism) or whether there is something specific about the additional homicides which make them harder to solve therefore reducing clearance rates. For example, if the true cause of a rise in homicides is a war between two gangs, which leads to a higher proportion of difficult-to-solve street murders relative to easier-to-solve domestic murders it may appear that there is a causal relationship going from clearance rates to numbers of homicides when in fact the relationship operates in the reverse direction.

This review will therefore attempt to indicate where these issues exist and to draw out meaningful conclusions as a result.

2) Incarceration and homicide

There were nine short-listed studies that examined the relationship between homicide and incarceration. Of the nine studies identified; eight performed some form of quantitative analysis, mostly regression. The remaining study used descriptive statistics and/or historical analysis to form its conclusions. Across the studies the most widely used source for homicide statistics was the police/FBI. Some studies specified the 'Office of the Chief Medical Examiner' as the source for their figures; this is independent from law enforcement but part of the Government in America.

Geographically this was not a very diverse sample; seven of the nine studies identified in the primary evidence used data from the USA, with the remainder being international comparisons.

None of the studies included in the primary evidence looked solely at England and Wales, however in two of the cross-country comparison papers England and Wales was included as one of the nations studied. A key question, therefore, is how relevant the results are for England and Wales given the marked difference in incarceration rates between the USA and England and Wales. The USA imprisons 698 per 100,000 whereas in England and Wales the corresponding figure is 148 per 100,000 (Walmsley, 2015).

There were no studies included with methods that would score a 4 or a 5 on the Maryland Scale; none included RCTs or sufficiently matched controls. A description of the studies identified and their findings is displayed in the table below.

Table A5.1: Short-listed studies examining the relationship between incarceration and homicide trends

Study	Area and time period	CJS variable	Method and findings
Baumer (2008)	114 US cities 1980-2004	Incarceration. Stock and flow of prisoners.	2-way fixed effects panel regression. Both stock and flow had an impact on homicide rates in 1980 and 1990s. Suggest imprisonment can have impact on homicide rates.
Baumer and Wolff (2014)	86 countries 1989 - 2008	Imprisonment rates per 100,000 population	Mixed model regression approach. Found limited role of imprisonment in driving homicide trends
Harcourt (2011)	50 US states 1934 - 2001	Institutionalisation rate = summed prison and mental health institution population and dividing by total population	Clustered regression model. Significant link found between institutionalisation rate (incl. mental institutions) and homicide rate.
Karmen (2001)	New York 1970 - 2001	Prison population	Descriptive, no new analysis. No changes of CJS had real effect on crime

Lappi-Seppala and Lehti (2014)	Multiple countries (235) sub grouped 1950-2010	Imprisonment relative to population and number of police in relation to population.	Descriptive analysis of multi-nations over time including cross sectional regression. Find no deterrence effect no test for incapacitation; imprisonment does not reduce homicide rates.
Marvell and Moody (1997)	USA 1930 – 1994	Imprisonment growth. Prison population changed into yearly percentage changes.	Time series analysis, multiple regression. Speculate that their findings support incapacitation effect. Increase in prison pop. associated with reduction in homicides
Marvell and Moody (1998)	USA (48 states) 1929 - 1992	Prison population	Time series regression. Evidence of free-riding but not displacement. Prisons reduce homicide by incapacitation.
Marvell and Moody (1999)	USA 1930 – 1995	Imprisonment	Time series analysis. Gender differences in homicide victimisation, findings suggest increased incarceration is a good strategy to reduce HVRs.
McCall et al. (2008)	83 US cities 1970 – 2000	State level imprisonment rates. Also lagged one year.	Pooled cross-sectional time series. Fixed effects regression model at 4 points in time. Some support for criminal justice policy changes and changes in homicide rates.

The strongest studies from Table A5.1 employed panel data and hence analysed multiple areas over multiple time periods. However, these studies have inconsistent findings. For example, Baumer and Wolff (2014) investigated 65 countries using a two-level hierarchical linear model over the period 1989 to 2008. They found that there was a convergence of homicide trends in the late 1990s and early 2000s, prior to this point there was significant variation in homicide rates between regions. Their multivariate analysis suggested that incarceration rates were not related to homicide trends. However, they speculated that this result may be due to a possible interaction between imprisonment and perceived legitimacy of the criminal justice system: *'we acknowledge that possibility...increases in imprisonment could yield homicide reductions in nations where the justice system is considered legitimate, while they could yield increases where there is deep suspicion regarding government authority'*. Legitimacy is explored later in this annex.

By contrast, Baumer (2008) found a strong relationship between homicide and incarceration using two-way fixed-effects panel regressions and data for 114 US cities between 1980 and 2004. Baumer also found that both the *stock* of prisoners and the *flow* of prisoners (numbers of newly incarcerated individuals each year) affected homicide rates and that the relationship strengthened through the 1980s and 1990s. He concluded that increases in incarceration could explain over half the fall in adult homicide in the US.

This pattern – finding a significant relationship in US-based studies but not in international comparisons – is somewhat typical of the other evidence. For example, in a series of studies using US data Marvell and Moody generally found a significant relationship between incarceration and homicide. In their first short-listed paper, Marvell and Moody (1997), they used state-level data on incarceration rates and homicide for the years 1930 to 1994. Different states often have different law and policies impacting on the effectiveness of the criminal justice system, hence examining the variation across time can be used to examine potentially causal effects. Marvell and Moody concluded that increased imprisonment rates led to reduced homicide and that a 10% increase in imprisonment led to a 13% reduction in homicides. They acknowledged that their methodology was unable to determine whether this was predominantly an incapacitation or deterrence effect.³

In a second study, Marvell and Moody (1998), the same authors expanded their study to examine spill-over effects. They noted that criminals move around and

³ It is also important to point out that the data they included both the years of WW2 and the Vietnam War. They included a dummy variable for WW2 as the true data on homicide and imprisonment rates will have been affected by the vast numbers of men both voluntarily joining the armed forces and being drafted for service, but they did not use a dummy for the Vietnam War, which may have affected their results.

commit crimes in a variety of locations hence a high incarceration level in one state might also benefit neighbouring states. However, they found no support for this effect but did re-iterate the earlier finding that a state's own incarceration level affected its own homicide rate. In a third paper, Marvell and Moody (1999) noted that US trends in male and female homicide victimisation rates have been similar despite the huge differences in levels between them. Their research also showed that men who attack women have criminal records similar to those males who commit other crimes. They argued that these findings fit with incarceration being an important driver of homicide trends.

Another purely US-based study was McCall, Parker and MacDonald (2008). They used a pooled cross-sectional time series model, which examined the relationship between homicide and incarceration at four time points (1970, 1980, 1990 and 2000) in 83 US cities. They found a small but significant relationship between increases in imprisonment and reductions in homicide. Similarly, Cohen and Land (1987), created a time series model for the US from 1946 to 1984. They found that high incarceration rates led to lower homicide rates. However, they did not find incarceration rates to be the largest predictor in their model. There were other more significant factors such as age structure.

Overall then, the US-based studies suggest that increased incarceration has played a role in the fall in homicide. But international studies generally reach a different conclusion. For example, Lappi-Seppala and Lehti (2014) looked across 235 countries for the years 1950 to 2010. Using descriptive statistics and historical analysis, they showed that those countries which had similar cultural, political and social traditions often had more similar crime trends. Importantly, this was true even when they had differing capital punishment and imprisonment philosophies. The authors cited Finland as an example. Compared with other Nordic countries (Denmark, Sweden and Norway) Finland has had a similar homicide trend but a very different trend in imprisonment. As homicide decreased in all the nations imprisonment fell in Finland while it was rising in the other Nordic countries.

They also examined the relationship cross-sectionally and concluded that globally the relationship between imprisonment and homicide was slightly positive, with higher rates of incarceration and homicide tending to be found in the same location. They found a stronger positive relationship between capital punishment and homicide rates (i.e. the more capital punishment the more homicide). Neither of these findings would support the proposition that greater imprisonment or harsher punishment drives down homicide rates. However, the cross-sectional nature of the analysis mean that it cannot really be used to suggest or deny causality, and the authors acknowledge that the data may be skewed by some of the outlier nations like the US and former Soviet Union countries.

Some authors also point out that the US-based relationship seems to be dependent on the time period used. For example, Karmen (2001) noted that imprisonment was unlikely to be the main reason for the fall in homicide after 1991 because incarceration rates began growing in the 1970s and the 1980s. Karmen suggests that there are ample alternative explanations for the reduction in homicide, such as the decline of the crack epidemic. Other researchers pointed out that the main impact of an increased incarceration rate would have been on older offenders, yet both the rise and fall in homicide through the 1980s and 1990s was focused in young offenders (Blumstein & Rosenfeld, 1998).

Though not short-listed, because they didn't specifically look at homicide, several other studies are worth mentioning here. In two books, Frank Zimring (2006, 2011) dismissed incarceration as a reason for the crime drop by pointing out that during the 1990s, when homicide fell at its fastest, prisoner numbers in New York were also falling, in contrast to many other cities. Yet New York generally saw larger drops in crime than anywhere else during this period. Though compelling, it is important to point out that much of this evidence is based on descriptive statistics and correlation rather than more complex statistical modelling. And there are descriptive accounts that take an alternative view. Kleiman (2009) suggested that the reason US crime stopped briefly falling in 2004 was due to the large cohorts of prisoners who were imprisoned in the high incarceration period of the 1990s starting to be released.

Overall then, the evidence on incarceration and homicide is rather split geographically and temporally. One study that acknowledges this and attempts to resolve it is Harcourt (2011). He suggested that the incapacitation effect will apply not just to prisoners but to individuals in mental health institutions and that more consistent results might therefore be obtained by combining the two populations and comparing with homicide rates. Using national-level data from the US, Harcourt noted that "*rates of imprisonment were not a good predictor of violent crime for any period prior to the 1990s but are a good predictor after 1991*".

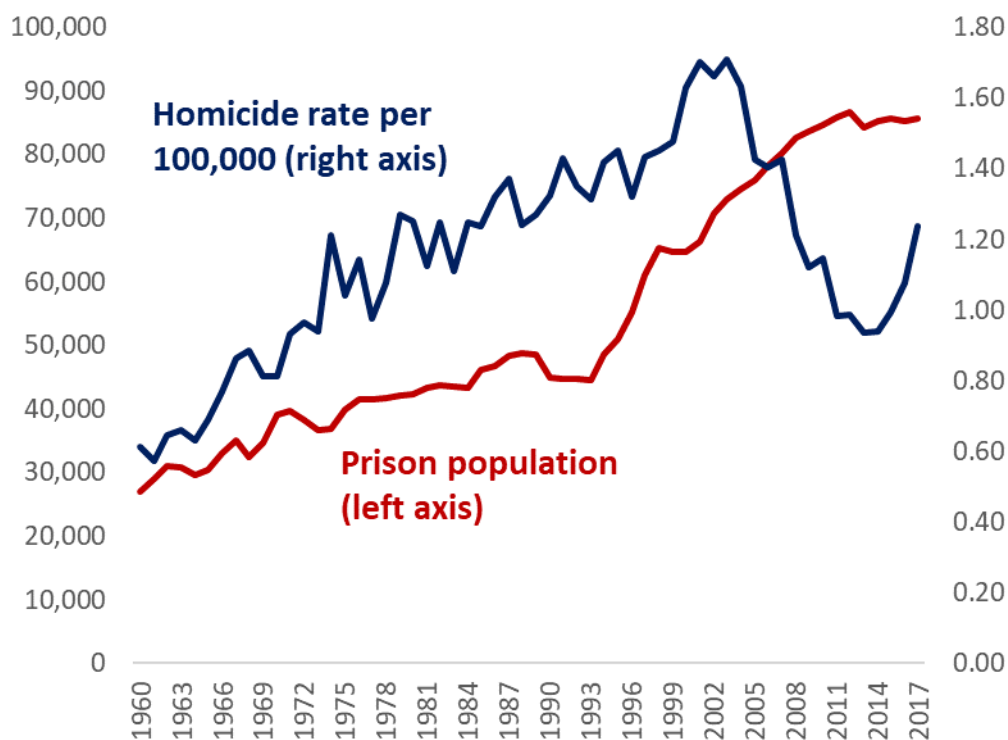
Before the late 1970s the incarceration rate in the US was relatively stable, yet homicide increased markedly in the late 1960s. But Harcourt pointed out that the homicide rise did coincide with a marked fall in the number of people in mental health institutions and that homicide trends might therefore be better explained by adding the two populations together and forming an 'institutionalization rate'. He showed graphically that the total institutionalisation rate has a better correlation with US trends in homicide than the simple incarceration rate.

To further test this hypothesis, Harcourt collated state-level data from prisons and mental institutions. He used a fixed effects regression model with time-varying controls and found a significant link between the total institutionalisation rate and the

homicide rate. However, as far as we are aware, Harcourt has not tested this proposition internationally.⁴

To help judge the relevance of the reviewed studies for England and Wales, available data and evidence was gathered even if it did not directly meet our criteria. The graph below shows the trends of the prison population and homicides in England and Wales. These offer little immediate evidence to suggest that the size of the prison population has been the main driver of homicide. The two series increase together between 1967 and 1988, which is the opposite of what might be expected if increased prison numbers decreased homicide rates. There is a sharp rise in the prison population from about 1993 so it is possible to argue for a lagged effect, given that homicide started falling around a decade later. But overall there doesn't seem to be a strong argument that incarceration rates can explain why homicide stopped rising and started falling in the early 2000s in England and Wales.⁵

Figure: A5.1: Trends of prison population and homicides in England and Wales from 1967 to 2017(/18)



Sources: Police recorded crime homicide series (excluding Shipman and Hillsborough); ONS mid-year population estimates and MOJ Offender Management Statistics.

⁴ Further evidence about mental health and its relationship to homicide can be found in Annex 8.

⁵ There is a spike in the number of homicides in 2003, this is due to the findings of 'The Shipman Inquiry' looking into those who may have been murdered by Dr Harold Shipman. Homicides are entered into the statistics in the year they are discovered not backdated to the year they occurred.

There have been studies focusing on England and Wales that have examined the relationship between incarceration and crime, but not homicide specifically. For example, Bandyopadhyay (2011) found that there was no observable relationship between the prison population and crime levels in England and Wales. However, in a later paper using a panel of police force area level data, Han, Bandyopadhyay and Bhattacharya (2013) reversed this conclusion to some extent. They found that the prison population had a significant relationship with some crimes but not others. Again, homicide was not tested.⁶ There are also some published statistics that provide context on the degree to which incapacitation might affect homicide rates in England and Wales. The Office for National Statistics (ONS, 2016) show that for the 10 years between March 2005 and March 2015, 48 people convicted of homicide had a previous conviction for homicide. While this is not a negligible figure, it also represents only 1% of all homicides, suggesting that mandatory life sentences for all homicide offenders would only prevent a minority of homicides via direct incapacitation.

Also relevant here is an investigation by Soothill et al. (2002). They examined the prior criminal history of homicide offenders in England and Wales using a matched case control approach. They found that 32% of first time homicide offenders had no previous convictions but of those who did have a conviction over half had a conviction for violence. However, the most common previous convictions for homicide offenders were for handling stolen goods and robbery (which is interesting given the high correlation between robbery and homicide trends - see Annex 1). The researchers did not find a clear difference between homicide perpetrators who had previous convictions and those who did not. There were no obvious differences in methods or circumstances of homicide. They did find that of those with a previous conviction, those who had received a custodial sentence for it were *more* likely to commit homicide subsequently.⁷ Also, three offences were found to be significant predictors of later homicide: kidnapping, manslaughter and blackmail. They also found different risk factors for different homicide offenders. For example those who committed homicide against a family member were found to be more likely to have a previous conviction for 'threats/incitement to murder', a relatively rare offence.

⁶ Specifically, Han et al. found that higher prison populations were generally linked to lower levels of crime, but that the opposite relationship existed for police recorded 'violence against the person', They suggested the latter may not be a robust finding and may instead be due to model specification issues.

⁷ There are various ways to interpret this finding. It could simply mean that those sentenced to custody are more dangerous offenders and hence more likely to commit homicide in the future. But it could also be interpreted as a failure in (specific) deterrence and/or rehabilitation.

Overall, the evidence on imprisonment is inconclusive. Several studies have found a relationship between incarceration rates and homicide rates in the US, but this doesn't seem to hold internationally. And even with the US, there are time periods when homicide and incarceration trends have moved in the opposite direction from what would be expected if imprisonment was the main driver. Harcourt's theory that patients in mental health institutions need to be incorporated (along with prisoners) in an overall 'institutionalization rate' is intriguing. But its relationship with homicide has not been tested outside the US. Direct evidence relating to England and Wales is sparse and what there is does not immediately suggest that changes in imprisonment have been the main driver of the rise and fall in homicide.

3) Clearance rates and homicide

There were just three short-listed studies that examined the relationship between clearance rates and homicide. These are shown in Table A5.2 below:

Table A5.2: Short-listed studies examining the relationship between clearance rates and homicide trends

Study	Area and time period	Homicide looked at separately?	CJS variable	Method and findings
Lattimore et al. (1997)	8 US Cities 1960 – 1995	Y	Clearance rates, % of homicides cleared by arrest.	Qualitative results, interviews. Spearman's Rho significant relationship between clearance and homicide rates. Incarceration effects.
Merriman (1988)	Japan 1934-1982	Y	Probability of conviction and execution	OLS regression with controls and time trend. Small increase in homicide rate attributable to change in certainty and severity of punishment. Other factors more important

Roberts and LaFree (2004)	Japan 1950 – 2000	Y	Certainty of punishment, measured by clearance rates.	Time series analysis, no effect of changes in certainty of punishment on homicide, only on robbery.
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Two of these studies used data from Japan. Japan has a low homicide rate compared with other countries and was also one of the few nations not to experience a homicide rise from the mid 1960s. Therefore, it is intriguing for researchers to try and establish why this is and whether there is something other nations can copy to reduce their own crime rates. In particular, it has been suggested that Japan's lower rate of homicide has been driven by its high clearance rate. Japan's police have solved a very high proportion of all homicides since the 1950s.

Roberts and LaFree (2004) investigated this proposition using a time series regression model for the years 1950 to 2000. They found that clearance rates only had an effect on robbery, not homicide. They suggested this may be because robbery is a more rational act and hence more conducive to calculations about the certainty of punishment. They speculated that homicide may be less susceptible as it is often more of a 'heat of the moment' crime.

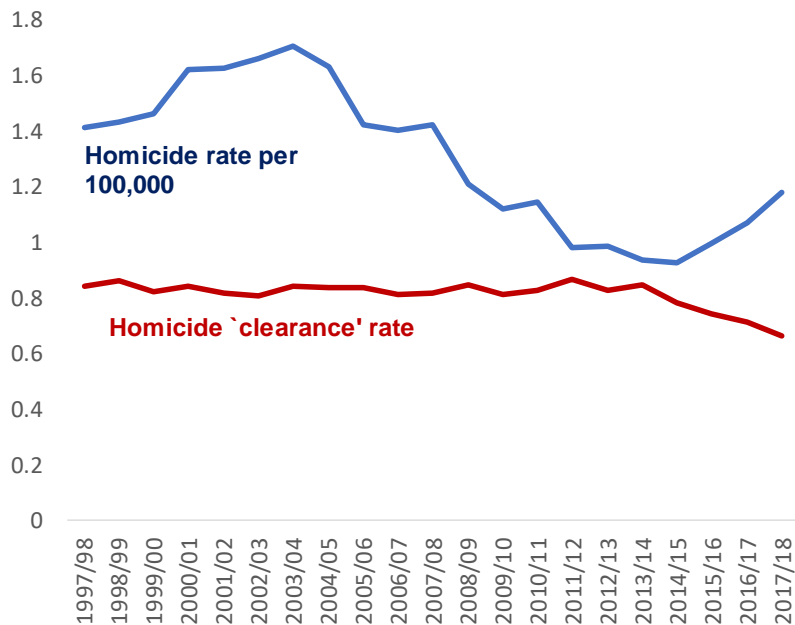
Merriman (1988) also looked at Japan and, using regression with time trend controls, found that certainty and severity of punishment did have an impact on the homicide rate. However, he also identified that there were other more influential factors and concluded overall that simply the amount of time which had passed since the end of World War II had a large effect.

Lattimore et al. (1997) also looked at the relationship between clearance rates and homicide, but in eight US cities during the 1980s. Using rank correlation, they found a strong negative relationship between clearance rates and homicide rates. That is, as clearance rates declined, homicide rates increased. To try and control for the reverse causality problem mentioned earlier, the researchers lagged the homicide data by one year and the relationship remained.

Overall, the studies on clearance rates are sparse, contradictory and sometimes not methodologically strong. None of the studies mentioned tried to identify whether the effect of clearance rates might have come via deterrence or incarceration. There were also no studies that looked at England and Wales. As a result, other available data and evidence was gathered. The homicide clearance rate for England and Wales is not straightforward to calculate. Figure A5.2 shows a 'clearance rate' which includes cases in which a suspect was convicted, cases where the suspect

died/committed suicide/was ruled insane and cases in which a charged suspect is awaiting trial.

Figure A5.2: Homicide in England and Wales and the homicide clearance rate, 1997/98 to 2017/18



Sources: Home Office police recorded crime homicide series, excluding the Shipman cases; Home Office Homicide Index for 'clearance' rate.

Figure A5.2 reveals no evidence to suggest that the change in homicide trend has been driven by shifts in the clearance rate, which has remained at around 80% since 1997/98. The apparent correlation from 2014/15 will be at least partly caused by the fact that clearance rates operate with a time lag. Many homicide cases in more recent years are still being investigated so it is likely the values will increase with time.

It is worth noting that homicide trends could be affected by clearance rates for other crimes. To the extent that homicides occur as a result of robberies or violent incidents that get out of hand, or that offenders progress from less serious crimes to homicide, this is theoretically possible. Clearance rates for most crimes, notably robbery, have fallen sharply in England and Wales since 2014 as homicide is risen and this is unlikely to have been driven entirely by the time lag effect, as mentioned above.

Han, Bandyopadhyay and Bhattacharya (2013) did find an inverse relationship between police recorded violent crime and clearance rates but did not test homicide.

4) Severity of Punishment – The Death Penalty

Many studies have used the presence or absence of the death penalty as a way of testing whether differences in the severity of punishment for homicide affect the number of homicides committed. A full list of studies can be found in the appendix.

The studies identified are almost all US-based. Studies concerning the deterrent effect of the death penalty do not automatically seem applicable to recent homicide trends in England and Wales given that the last executions in England and Wales took place in 1964. There is no reason to believe, therefore, that these studies are relevant to the fall in homicide from 2004 to 2014 or the rise from 2014 to 2017. For this reason we have summarised the capital punishment studies much more briefly than the other literature and have focused on recent reviews rather than looking in significant detail at individual studies.

Arguably the most important paper in death penalty research was Ehrlich (1975). While US-based research examining the effectiveness of the death penalty existed well before then, Ehrlich was the first to investigate its effect on homicide using multiple regression. Using national data for the US from 1933 to 1969 and multiple control variables, Ehrlich found a significant relationship between the execution rate and the homicide rate (in log-linear form). He concluded that one execution might prevent seven or eight murders a year. His results provoked controversy and were subsequently challenged by multiple authors (Baldus and Cole, 1975; Bowers and Pierce, 1975). They pointed out that the conclusions were sensitive to the time periods used, the control variables and their functional form.

Many subsequent papers followed Ehrlich's basic approach but produced differing results. For example, Cochran and Chamlin (2000) found evidence for a brutalization effect. i.e. that state executions led to an *increase* in homicides. Whereas Dezhbakhsh, Rubin and Shepherd (2003) concluded that 18 lives were saved for each execution. As Gerritzen and Kirchgassner (2013) pointed out, on some occasions different conclusions were reached even though the same data was used. They looked at 102 studies and suggested the differences may be due to the assumptions made about the data. They suggested that those assumptions are influenced by the preconceived notions of the researchers; those that believe there is a deterrent effect will either consciously or subconsciously choose assumptions that will lead to the data supporting their theory.

Yang and Lester (2008) attempted to make sense of the differing findings by conducting a meta-analysis of 104 studies which assessed the possible relationship between homicide rates and capital punishment. Many of these were also short-listed for our review. The authors found different findings depending on the methodology used. The deterrent effect was found to be statistically significant in

those studies which used time series or panel data. However, studies which used cross sectional data, single executions or media coverage showed mixed findings with limited statistical significance.

Given that time series and panel data approaches are generally reckoned to be stronger tests of causality than cross-sectional models, this finding appeared to offer quite strong support for the death penalty being a deterrent. However, more recent studies have generally questioned the strength of any relationship again. For example, Kovandzic, Vieraitis and Boots (2009) used state level panel data from 1977 to 2006 and found no solid evidence for the deterrent effect of capital punishment. The authors argued that previous research finding an effect generally failed one of three methodological tests, they either:

- i) failed to address adequately omitted variable bias by failing to include year dummies and or state-specific trends in the regression model;
- ii) failed to adjust standard errors to correct for serial correlation, and/or;
- iii) failed to use reliable and valid instruments to address potential simultaneity bias between execution risk and homicide.

Source: Kovandzic, Vieraitis and Boots (2009)

They also noted that a substantial volume of the research assumes that potential offenders engage in cost/benefit analysis before undertaking any crime (including homicide), but that other research would not support this conclusion.

Chalfin, Haviland and Raphael (2012) also reviewed the empirical research into the death penalty. Generally, they also found that the research which claimed to find strong links between capital punishment and the homicide rate had extensive methodological issues and that any findings were therefore inconclusive.

This was echoed by Chalfin and McCrary (2015) in another recent review. They acknowledged that there have been mixed findings with several high-profile papers on either side of the debate. Like other authors, they pointed out the sensitivity of findings depending on the statistical method used and also the inclusion of different time periods and geographical areas. In particular they showed that the inclusion or exclusion of particular states (e.g. Texas) can have a substantial impact on any findings. Overall, they concluded that there was no concrete indication of a deterrence effect for capital punishment.

Policing and homicide

There were 40 short-listed papers that examined the relationship between policing and homicide. These divided into two groups: those that looked at police numbers or resources and those that looked at police practices. This section is divided into two parts accordingly.

1) Police numbers/resources and homicide

There were 11 short-listed studies that examined the relationship between police numbers and homicide trends. All used data from the US only.

Table A5.3: Short-listed studies examining the relationship between police numbers and homicide trends

Study	Area and time period	CJS variable	Method and findings
Chalfin and McCrary, 2013	242 US cities from 1960 to 2010	Numbers of sworn in police officers. Data drawn from multiple sources.	Panel data analysis correcting for measurement bias. Found significant negative relationship with homicide and concluded that a 1% rise in officer numbers leads to a 0.67% drop in homicide.
Evans and Owens, 2007	2074 US cities from 1990 to 2001	Police numbers	Instrumental variable regression with size of COPS grants as an instrument for the size of the police force. Found significant negative correlation between police numbers and homicide.
Heaton (2010)	US	Projected benefits of additional police numbers.	Literature review. A 1% increase in police numbers leads to a 0.93% reduction in homicides.

Levitt, 2002	122 US cities from 1975 to 1995	Police numbers	Instrumental variable regression with numbers of fire-fighters used as an instrument. Found significant negative relationship with homicide and concluded that a 1% rise in officer numbers leads to a 0.91% drop in homicide.
Lin, 2009	51 US states from 1970 to 2000	Police numbers	Instrumental variable regression with variations in state tax rates as an instrument. Found significant negative relationship with homicide and concluded that a 1% rise in officer numbers leads to a drop in homicide of close to 3%.
McCall et al. (2008)	83 US cities 1970 – 2000	State level imprisonment rates. Also lagged one year.	Pooled cross-sectional time series. Fixed effects regression model at 4 points in time. Some support for criminal justice policy changes and changes in homicide rates.
McCrary, 2002 (following Levitt, 1997)	59 US cities 1970 to 1992	Police numbers	Instrumental variable regression with election cycles as an instrument. Found significant negative relationship with homicide and large elasticity.
O’Flaherty and Sethi (2010)	Newark 2000 to 2006	Changing police numbers/tactics	In-depth analysis of changes to homicide rates and CJS variables. They found that all aspects of the CJS declined at the same time and that this may have caused a non-linear effect on homicide. That is, the rise in homicide was sharper than would have been predicted by the size of the effects on their own.

Pearson-Nelson (2008)	USA, 1979 to 2001	Police numbers	Spine regression to determine cities experiencing epidemic then Tobit regression to measure factors that predict an epidemic and its magnitude and duration. Findings suggest that police numbers were not significant in explaining the epidemic homicide patterns seen in many US cities in the 1980s and 90s.
Spelman, 2016	59 US cities from 1970 to 2013.	Police numbers	Regression with lags of homicide rates included. Found significant negative relationship with homicide, but a smaller elasticity than other studies (-0.2)
Worrall and Kovandzic (2010)	5,000 US Cities from 1990 to 2001	Police numbers	Instrumental variable regression using two types of federal law enforcement grants as instruments. Found significant negative relationship with homicide and concluded that a 1% rise in officer numbers leads to a 0.76% drop in homicide.

Theoretically, having more police officers should lead to less crime. However, it has been hard to prove this in practice. This is mainly due to the problem of reverse causality. When crime rates increase there is likely to be a call for more police officers, meaning that crime and police numbers are often positively correlated. To see whether police actually reduce crime it is necessary to break this 'endogeneity' problem using a natural experiment or other sophisticated techniques. Many of the studies in this section attempted to do that, but the methodological difficulties mean results remain much debated.

Many of the studies in Table A5.3 employed an instrumental variable approach to try and isolate the police effect on homicide. An instrumental variable is one that is correlated with the independent variable of interest (in this case changes in police numbers) but is otherwise unrelated to the dependent variable (homicide). For example, McCrary (2002), following Levitt (1997), used election years as an instrument because police numbers typically increase in election years for political reasons irrespective of crime. Therefore, if there is a negative relationship between election cycles and crime, the only plausible explanation is that the extra police

officers reduced crime. We would not expect crime to be lower in an election year for any other reason, the authors argue.

Generally, these instrumental variable studies showed a significant, large, negative effect of police numbers on homicide. For example, Evans and Owens (2007), using the size of police grants as an instrument concluded that the elasticity between police numbers and homicide for US cities was -0.84. This implies that a 1% rise in police officers leads to a 0.84% decrease in homicides.⁸ Worrall and Kovandzic (2010), following a similar approach produced an almost identical result: an elasticity of -0.76. Similarly, Levitt (2002) using numbers of fire-fighters as an instrument found an elasticity of -0.91. Lin (2009), using variations in state tax rates as an instrument, found a very large elasticity of -2.73, though he used state-level data, which may explain the difference. Levitt (1997)/McCrary (2002) also produced similar findings.

Heaton (2010) summarised this evidence and combined the estimates from five studies to conclude that a 1% increase in the number of police officers leads to a 0.93% reduction in homicides. He therefore argued that hiring more police is a cost-effective strategy. O'Flaherty and Sethi (2010) also concluded that reductions in police numbers were a factor in the homicide rise in Newark from 2000 to 2006.

However, more recent papers have argued that there are limitations with the instrumental variables approach. Chalfin and McCrary (2013) used panel data from 242 US cities from 1960 to 2010 to show that there is considerable measurement error within the police numbers data. They found that correcting for this changed the relationship between police numbers and crime generally. However, their elasticity for homicide (-0.67) was comparable to many of the previous studies.

Spelman (2016) argued that previous studies were flawed because they failed to incorporate lagged homicide rates, which he showed were strongly predictive of current police numbers. In essence then, his critique was that studies were still failing to deal with the reverse causality issue. He used regression on a panel of 59 large US cities and tested models with and without lagged crime variables. Police numbers were a significant predictor of homicide rates in both versions, but the size of the estimate was much reduced in the version that included lagged homicide rates (-0.2). He concluded that increases in police officer numbers are not the most cost-effective method to reduce homicides and that changes in police tactics would have a greater impact.

Though Spelman's estimate suggests a much smaller effect size, all the studies examined so far produced findings consistent with the hypothesis that hiring more police will reduce homicide rates. However, there were two short-listed studies that found no relationship. McCall, Parker and MacDonald (2008) used a pooled cross-

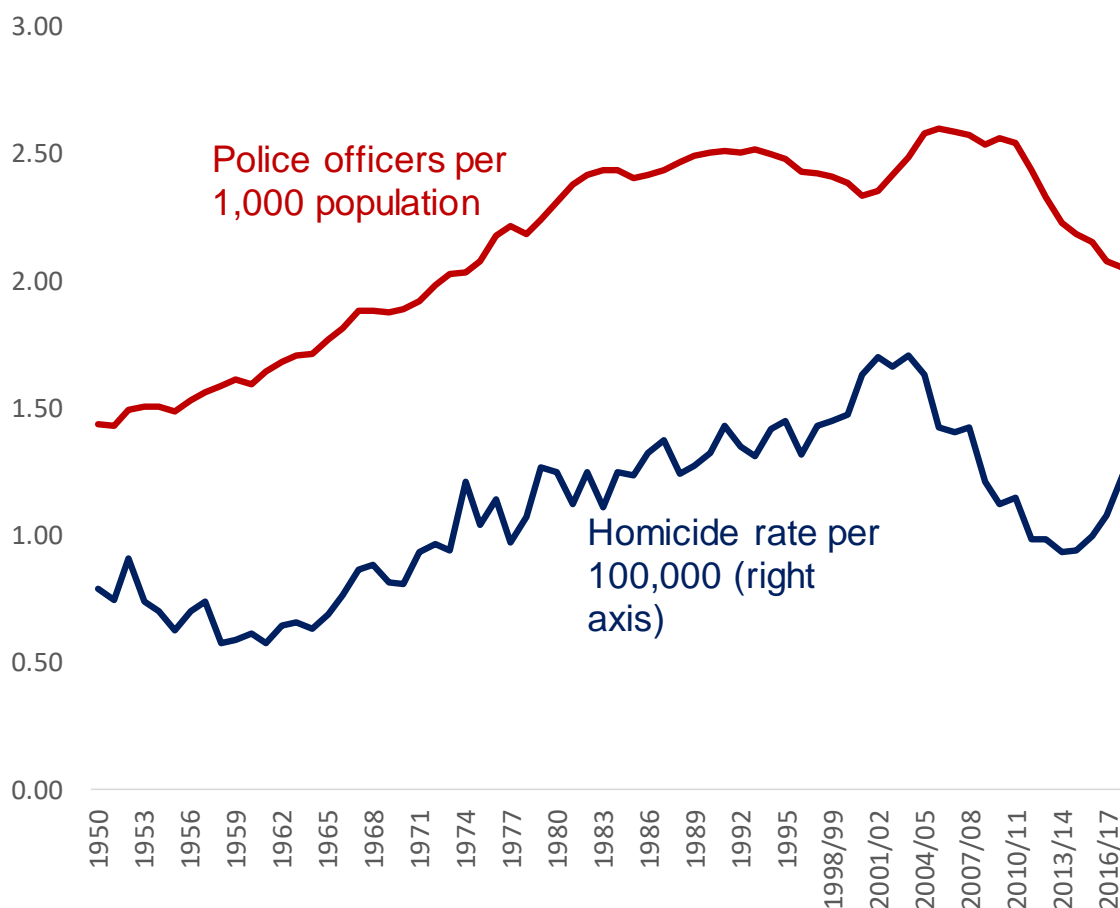
⁸ The coefficient was only significant at the 10% level.

sectional time series with data from 83 US cities at four times points between 1970 and 2000. Their design would be less likely to correct for reverse causality than others mentioned, which may explain their result. Similarly, Pearson-Nelson (2008) found no effect in his study, though his focus was the epidemic-like shifts in homicide in the 1980s and 1990s, which arguably moved too fast for police numbers to be a driver.

Overall, there is a reasonable body of evidence to suggest that changes in police numbers have influenced homicide trends in the US. However, the size of the effect is much debated. Given that police numbers generally do not fluctuate markedly from year-to-year, this makes it hard to determine whether shifts in police numbers might play a significant role in driving aggregate-level homicide trends.

Nevertheless, it is worth looking briefly at the available data from England and Wales. Figure A5.3 shows trends for police numbers and homicide rates in England and Wales.

Figure A5.3: Homicide and police officer rates, 1950 to 2017/18



Sources: Police recorded crime; Home Office police strength data.

Notes: Rates for police officers are in calendar years, so figures shown as 2017 are actually 2017/18. The police numbers series had two changes in recording practice, in 1996 and 2007, so caution is required for interpreting trends across the whole period.

At first glance, Figure A5.3 shows little support for the idea that homicide trends have been sensitive to changes in police numbers. From the 1960s to 2010, officer numbers increased fairly consistently through both the rise and fall in homicide and the early 2000s peak occurred when police numbers were at their highest point ever and were still rising. However, this simple line chart is not strong evidence and likely suffers from the endogeneity issue explored above (i.e. that more homicides will raise calls for more officers).

Overall then, the evidence in this section tentatively suggests that, *all else equal*, having fewer police resources is likely to exert some upward pressure on homicide rates. But an equally tentative conclusion is that all else is rarely equal and generally it doesn't immediately appear from the trends that changes in police numbers have been the biggest driver of homicide trends in England and Wales over the last 70 years. A very crude application of the elasticities from the short-listed US studies illustrates this. Between 2013/14 and 2017/18, police numbers per capita fell by about 8% and homicide increased by 32%. Estimated elasticities for homicide and police numbers (discussed above) range from -0.9 to -0.2. So, applying these to the figures for England and Wales would suggest that the recent decrease in police numbers might have driven a rise in homicide of between 2% and 7%. Given the actual rise was over 30% suggests that other factors were likely involved to a greater degree.⁹

2) Police practice and homicide

There were 29 short-listed studies examining the relationship between police practice and homicide trends. These are shown in Table A5.4.

⁹ It is possible that police resources might affect homicide rates with a lag. It could therefore be argued that the 19% fall in per capita rates of police officers from 2010 to 2017/18 is more appropriate to use in conjunction with the elasticity estimates. This would equate to a rise in homicide of between 4% and 17%.

Table A5.4: Short-listed studies examining the relationship between police practice and homicide trends

Study	Area and time period	CJS variable	Method and findings
Blumstein and Rosenfeld, 1998.	USA 1985 – 1997	Stop and Frisk	Descriptive. Changes in police tactics may have reduced number of guns on streets therefore reduced homicides.
Bowling, 1999	New York 1985-1997	Bratton's police changes	Interviews, changes in policing may have changed drug markets. Likely policing changes did influence homicide
Braga et al, 2001	Boston, 1991 to 1998	Boston ceasefire intervention	Pre/post comparison and generalized linear models with Poisson regression. Found that Boston's fall in youth homicide was significantly greater than in other comparable cities.
Braga et al, 2002	Baltimore, 1991 to 1998	Pulling levers intervention	Pre/post comparison. Showed a large fall in homicide after the implementation of the intervention.
Braga, 2008	Stockton, California, 1990 to 2005	Pulling levers intervention	ARIMA model with numerous controls. Found that the intervention was responsible for a 42% drop in monthly gun homicides.
Cerda et al., 2009	New York 1990 – 1999	Misdemeanour policing	Bayesian hierarchical model. Weak relationship between misdemeanour policing and homicide rate.
Chauhan et al., 2011	NY Police precincts 1990-1999	Misdemeanour policing	Bayesian hierarchical model looked at ethnic groups separately. No link between misdemeanour policing and homicide.

Chauhan and Kois, 2012	New York Precincts 1990-1999	Misdemeanour arrests	Review of previous research. Gun related homicides. Small number of precincts helped drive city wide homicide rates. Modest relationship between misdemeanor policing and homicide rates
Coleman et al., 1999	High Point, North Carolina, 1997 to 1998.	Pulling levers intervention	Pre/post comparison. Found a marked reduction in homicides after the intervention though numbers were low.
Corman and Mocan, 2002	New York 1974-1999	Broken windows	Model. No impact of broken windows policing on homicide.
Corsaro and McGarrell, 2009	Indianapolis 1997-2001	Pulling levers	ARIMA Time series analysis. Gang homicides had statistically significant decline after intervention
Dugan 2003	48 US cities 1976 – 1996	Mandatory arrests	Panel data set model. Concluded more aggressive arrest policy is related to fewer deaths of unmarried intimates not spousal homicide.
Fagan, 2002	8 US cities, 1980 to 2000	Boston ceasefire intervention	Case study approach. Concluded that the success of the programme was uncertain as youth homicides began falling before it was implemented.
Fagan et al., 1998	New York City 1950-1996	Police strategy	Review of data; suggest gun homicides in NYC may have been influenced by police changes.
Goertzel et al., 2013	8 nations over various time periods	n/a	In-depth qualitative examination of 8 nations combined with statistical data. Concluded that policing strategy played a role in homicide declines but did not resolve the underlying conditions preventing a future rise.

Greenberg, 2014	New York 1988 to 2001	Misdemeanour arrests.	Multiple methods including generalised method of moments estimation using panel data. Found no evidence that misdemeanour arrests reduced homicide rates in New York.
Karmen, 2001	New York 1970 - 2001	Broken windows and misdemeanour policing	Descriptive, no new analysis. Changes in NYPD aren't reflected in other forces which also experienced fall in homicides.
Kennedy and Braga, 1998	Minneapolis in the 1990s	Pulling levers intervention	Pre/post comparison. Showed that a large concentration of homicides was among a small number of gang-related individuals and that these decreased after the intervention.
Papachristos et al., 2007	Chicago police beats, 1999 to 2004	Project safe neighbourhoods intervention	Used propensity score matching and individual growth curve models to compare intervention area with controls. Found that the intervention drove homicide declines in the treatment neighbourhoods relative to the control neighbourhoods.
Piehl et al., 2000	Boston 1992-1997	Boston gun project	Poisson regression/time series analysis. Gun project did have positive effect on homicide rates.
Piehl et al., 2003	Boston 1992-1998	Boston gun project	Structural change analysis. Found that there was a structural break in Boston's youth homicide trend in 1996 and that the intervention provided the only credible explanation for it.
Ransford et al., 2010	Chicago	Chicago Ceasefire	No statistical analysis present. Thought new police activities, aggressive prosecution strategy and violence prevention programmes played a role

Rosenfeld, Fornango, and Baumer, 2005	95 large U.S. Cities from 1990 to 1999	Boston's Operation Ceasefire, Compstat, and Richmond, Virginia's Project Exile	Growth-curve analysis. Found no effect for Compstat and an inconclusive result in relation to Boston Ceasefire. But argued that Project Exile was effective.
Sherman and Harris, 2013	Milwaukee, 1987 to 2010	Mandatory arrest for domestic violence	Randomised control trial with 23-year follow-up. Found that mandatory arrest for domestic violence led to an increased homicide victimisation risk for those arrested.
Skogan, 2008	Chicago, 1991 to 2007	Chicago Ceasefire	Pre/post comparison with matched control areas. Found a significant drop in shootings but was not able to determine whether it had caused a reduction in homicide due to lack of data.
Tita et al., 2003	Los Angeles, 1998 to 2000	Pulling levers intervention	Pre/post comparison. Found decreasing numbers of homicides after the intervention began in Hollenbeck and increasing numbers of homicides elsewhere in Los Angeles.
Wakeling, 2003	Stockton, California in the 1990s	Pulling levers intervention	Pre/post comparison. Found that gang-related youth homicide fell by just over 75 percent following the intervention.
Webster et al., 2013	39 police posts in Baltimore from 2003 to 2010	Replication of Chicago Ceasefire	Matched control areas and negative binomial regression. Found that the intervention was associated with a significant homicide fall in two areas but had no effect in another area and drove an increase in a fourth.
Wilson and Chermak, 2011	Pittsburgh, 1997 to 2007	Replication of Chicago Ceasefire	Propensity score matching and poisson regression models. Found no significant difference in trends between intervention and control areas.

Ten of the above studies looked specifically at policing in New York City during the 1990s. They aimed to assess the effectiveness of the policies which find their roots in the 'broken windows' theory proposed by Wilson and Kelling (1982). In an article written for 'The Atlantic', Wilson and Kelling suggested that high-harm crimes like homicide might be prevented by tackling small, low level crimes. They reasoned that tackling criminal damage and low level 'nuisance' crime police sent the message that crime of all kinds was not tolerated. This gave rise to the 'zero tolerance' or 'misdemeanour' policing championed by New York Mayor Rudy Giuliani and his police commissioner Bill Bratton during the 1990s. Given that New York saw a larger drop in crime than most other cities, many have suggested these police practices made an important contribution.¹⁰ (See for example, Zimring 2006; 2011)

However, short-listed studies examining trends in homicide and misdemeanour policing in New York offer mixed support. In arguably the most robust study, Greenberg (2014) analysed homicide in New York using three separate approaches: time series analysis for New York alone, a panel analysis of the city's precincts, and a panel analysis for a sample of US cities. Greenberg also employed a variety of methodological approaches including generalized method of moments estimation. Overall, he found no evidence that misdemeanour arrests reduced homicide.

Chauhan et al. (2011) used a Bayesian hierarchical model which separated homicide victimisation into three categories: White, Black and Hispanic. They found that there was no link between misdemeanour policing and homicide levels for any of the groups. In a later paper however, Chauhan and Kois (2012), which examined gun related homicides in New York police precincts between 1990 and 1999, the researchers showed that results were sensitive to fluctuations in a small number of precincts which drove homicide trends for the whole city. When this was accounted for, they concluded that there was a modest relationship between misdemeanour policing and homicide rates. Cerda et al (2009) also found a weak relationship using a Bayesian hierarchical model, while Corman and Mocan (2002), looking at broken windows policing in New York, found no evidence of an impact on homicide rates.

Fagan, Zimring and Kim (1998) also examined New York data but over a longer time frame: 1950 to 1996. They found evidence to suggest that levels of gun related homicides have been influenced by changes in police strategy, particularly changes in patrol strength and aggressive enforcement.

Bowling (1999) provided a view of policing effectiveness in New York from 1985 to 1997 using a more ethnographic approach. He saw drug markets as the primary driver of homicide through that period but argued that policing probably impacted

¹⁰ New York's homicide decline was particularly impressive. In 1993 there were 1,946 homicides in New York and by 1998 there were 633, a 67% fall. By comparison, Los Angeles and Chicago had 60% and 17% falls over the same period.

drug markets at that time and therefore indirectly influenced homicide rates. However, he also suggested that there were unlikely to be useful lessons for British police to learn from New York because much of the emphasis was on gun-related murders. (While Bowling was correct that gun homicides are much rarer in England and Wales compared with the US, Annex One showed that they did play a role in the rise and fall in homicide immediately around the 2002/03 peak.

There is a close link between the broken windows policing espoused by Kelling and Wilson and trends in stop and frisk (which is the US term for stop and search). Many saw stop and frisk as an essential aspect of the broken windows strategy. Blumstein and Rosenfeld (1998) showed that as stop and frisk increased, homicides generally fell and they attributed this to a reduction in guns on the street. They speculated that this may have been due to a contagion effect, rather than specific deterrence. That is that once people became aware of the increased risk of being stopped and searched, they refrained from bringing guns out with them. However, the analysis was based on correlation only.

Another less robust study that examined this issue was Karmen (2001), who questioned the strength of the relationship between New York policing and homicide. Karmen did this by pointing out that changes to the New York police department, including the development of the more data-driven approach known as CompStat and increasing numbers of offices and misdemeanour arrests, were not undertaken in other police forces that also experienced a fall in homicides at that time.

Goertzel et al. (2013) also used a narrative approach combining qualitative evidence with statistical data for eight nations. They found similarities between the New York situation and similar homicide 'busts' in Brazil and Columbia. They concluded that changes in policing were a factor in the homicide declines but only because underlying social conditions were favourable.

Other short-listed studies looked at the effect of different policing interventions, including the Boston Gun Project, Operation Ceasefire and Project Safer Neighbourhoods. These were mainly forms of 'pulling levers' interventions or 'focused deterrence' strategies. They are implemented on a specific group of offenders (e.g. gang members) and these offenders are made aware that all sanctions (or 'levers') will be applied if they offend. Another key factor can be the idea of collective responsibility. In many of these interventions, the police made clear that the whole gang would be held to account for the actions of any one of its members. The aim was to increase the certainty and severity of punishment.

The most famous of these interventions was Boston Ceasefire, which has been the subject of multiple evaluations. The first of these, Piehl et al. (2000), used a quasi-experimental design and poisson regression because it is more suitable for modelling low-number event counts, which is typical of homicide levels in a single area. They found a 63% fall in monthly youth homicides attributable to the

programme between 1991 and 1998. This was supported by Braga (2001), who found that Boston's fall in youth homicide was significantly greater than in other comparable cities, and Piehl et al. (2003), who found that there was a structural break in Boston's youth homicide trend in 1996 and that the intervention provided the only credible explanation for it.

However, because the intervention was not designed with evaluation in mind, the studies did not have robust control groups, and other researchers have been less supportive. For example, Fagan (2002) suggested that there was a downward trend in gun violence that began before Operation Ceasefire was implemented. Rosenfeld et al., (2005) concluded that Boston's drop in youth homicide was sharper than in other areas, which could indicate success, but that the small numbers of homicides prevented strong conclusions.¹¹

Even so, other US cities replicated the Ceasefire model and evaluations showed broadly supportive results, although methodological robustness varied markedly. Simple pre/post evaluations demonstrated that large falls in homicide followed the implementation of pulling levers interventions in Baltimore (Braga et al., 2002); Minneapolis (Kennedy and Braga, 1998); Stockton, California (Wakeling, 2003); and High Point, North Carolina (Coleman, Holton, Olson, Robinson, & Stewart, 1999).

Some evaluations have employed slightly more rigorous designs. For example, Tita et al. (2003) employed a quasi-experimental design to evaluate a replication of Operation Ceasefire in East Los Angeles. They found a significant reduction in violent crime (including homicide) in targeted areas relative to matched comparison areas. Braga (2008) evaluated a 'pulling levers' intervention in Stockton, California, using ARIMA modelling and numerous controls including violent crime (so the model tested whether homicide fell over and above violence generally). He found that the intervention was associated with a 42% reduction in monthly gun homicides. Corsaro and McGarrell (2009) assessed the evidence for a pulling levers intervention in Indianapolis using very similar methodology. They compared gang and non-gang homicides and found that after the intervention had taken place there was a statistically significant decline in gang homicides. A much smaller decline took place for non-gang homicides. They concluded that the extra reduction in gang homicides was likely due to the intervention as it was only targeted at gang members.

In Chicago, Papachristos et al. (2007) used propensity score matching and individual growth curve models to compare areas receiving various homicide interventions with control areas. They found a significant homicide reduction in treatment neighbourhoods relative to control neighbourhoods and that the largest effect was

¹¹ This study also found that Project Exile, in Richmond, Virginia, drove a successful reduction in homicides in the 1990s by increasing sentences for violent or drug-related crimes involving firearms. However, other studies have questioned the evidence for such approaches (e.g. Ludwig, 2005).

associated with preventive tactics based on the pulling levers strategy, including offender call-in meetings.

Another set of studies evaluated an earlier Chicago programme, Chicago Ceasefire, which involved a different approach to Boston Ceasefire but which has also been replicated elsewhere. It involved the use of outreach workers to work directly with gang members and troubled youth to provide access to services and mediate disputes before they become violent. However, evidence for success was mixed. For example, Skogan et al. (2008) found a significant drop in shootings but was not able to determine whether it had caused a reduction in homicide due to lack of data. Ransford et al., (2010) found that the program was associated with significant reductions in shootings and retaliatory homicides in four of seven neighbourhoods that received the intervention. Wilson and Chermak (2011) found no positive effects from a version of this intervention that was tried in Pittsburgh, and for a version in Baltimore, Webster et al., (2013) found that it reduced homicide in some areas but increased it in others.

The strongest evidence for a police effect on homicide comes from a series of randomised control trials that assessed mandatory arrest for domestic violence. Mandatory arrest has been adopted in many US states. A response to perceived police inaction in relation to domestic violence, it mandated police arrest for minor domestic assaults even if these were not witnessed by police. The policy was rolled out after initial randomized trials suggested that it reduced domestic violence. However, a longer follow-up study revealed that this effect was temporary and that measured over the long run there was no difference between the treatment group and controls (Sherman and Harris, 2013). In relation to homicide, the intervention fared even worse. A 23-year follow-up of the randomized trial in Milwaukee, the most rigorous of the experiments, found that those arrested had increased rates of homicide compared with controls. There was not enough data to suggest the exact mechanism for this effect but using available examples, the authors speculated that arrest might lead to raised levels of “frustration and defiance” which may drive an increased rate of ‘victim-precipitated homicide’.

Dugan (2003) found slightly more positive results, though using a less rigorous design. She used panel data on intimate partner homicide/violence across six time periods and 48 large US cities from 1977 to 1996. She concluded that the presence of a mandatory arrest policy did not reduce the numbers of spousal homicides but did reduce homicides between unmarried intimates.

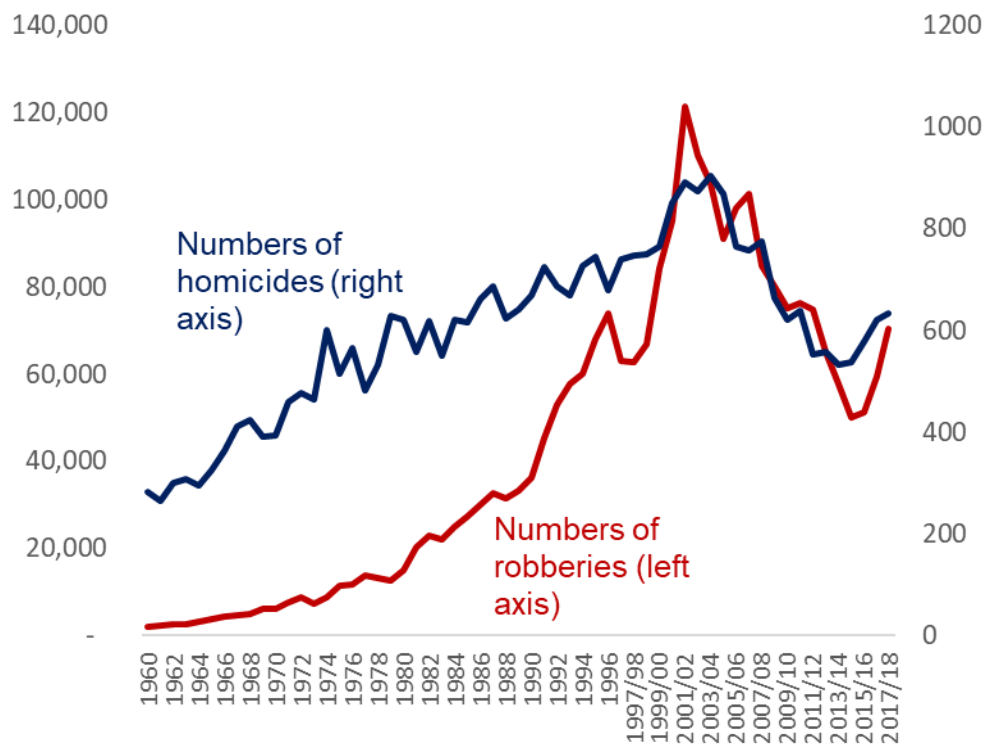
Once again, the majority of the studies in this section contained data from the US. It is questionable how applicable this evidence is to homicide trends in England and Wales. Many of the studies finding an effect for policing practice tested gun homicides specifically. Given the far lower percentage of gun homicides in England and Wales, these policing practices may have less relevance. However, Annex One

did show that gun homicides did to some extent drive both the rise in homicide in England and Wales up to 2002 and the fall thereafter.

There were some interventions based on the ‘pulling levers’ approach which were trialled in the UK in the early 2000s. For example, ‘Operation Chrome’ in Manchester was based on the Boston Ceasefire model. However, the evaluation of the intervention in Manchester conducted by Bullock and Tilley (2008) highlighted that it had drifted from the path laid out by Ceasefire and had attempted to tackle the problem of gang membership rather than simply aiming to reduce the violence gang members engaged in. The authors also found that in Manchester, police were not able to utilise the power of multiple agencies to put pressure on the gang members to stop the violence as had been done in Boston. As such, it is hard to attribute any of the homicide decline to the intervention even though it coincided with the turning point in offences. More recently, an evaluation showed that Operation Shield in London, which was also modelled on US-style ‘group violence intervention’ approaches, suffered similar issues (MOPAC, 2018).

Another intervention that occurred at about the time homicide peaked in England and Wales, and had more favourable results, was ‘The Street Crime Initiative’. The primary focus of the intervention was robbery rather than homicide, but as Figure A5.4 shows, trends in the two crimes are highly correlated.

Figure A5.4: Recorded crime trends in robbery and homicide in England and Wales



Source: ONS police recorded crime homicide series (excluding Shipman and Hillsborough cases); ONS police recorded crime robbery series.

Machin and Marie (2005) conducted a quasi-experimental review of the street crime initiative based on the fact that the scheme gave additional funding to some areas and not to others, which could therefore be used as controls. They concluded that the intervention caused a significant reduction in robbery. They did not test homicide so no firm conclusions can be drawn but given the correlation shown in Figure A5.4, it is not inconceivable that the street crime initiative played some role in the fall in homicide.

Overall then, there is some evidence that police practices can influence homicide trends, particularly by following a 'pulling levers' approach in response to escalating levels of gang/gun killings.¹² There is less consistent evidence for 'broken windows' or 'zero tolerance' style policing. However, there is no strong evidence to suggest that shifts in policing practice drove the homicide decline in England and Wales. Pulling levers approaches were attempted in at least one police force in line with the start of the homicide decline, but evaluations suggested limited success and as annex one demonstrated, the homicide fall was common to many areas. More successful was the Street Crime Initiative, which had a demonstrable effect on robbery across multiple areas, but its impact on homicide is unknown.

¹² Though it was not short-listed because it did not consider homicide specifically, a Campbell Systematic Review by Braga and Weisburd (2012) found that combining ten of the most robust pulling levers studies into a meta-analysis produced a statistically-significant, medium-sized crime reduction effect.

Police/CJS legitimacy and homicide

In a number of recent studies, homicide trends have been linked to CJS effectiveness via a completely different mechanism: legitimacy, see Table A5.5.

Table A5.5: Short-listed studies examining the relationship between police/CJS legitimacy and homicide trends.

Study	Area and time period	CJS variable	Method and finding
Baumer and Wolff, 2014	86 countries 1989 to 2008	Social trust and confidence in government, measured via national survey responses	Two-level hierarchical linear models using overall and age-specific homicide rates. Found no significant effect.
Eisner and Nivette, 2013	Various	Legitimacy	Literature review. Concludes that there is enough evidence to suggest that legitimacy could be a factor in driving homicide trends but that effect sizes are generally quite small and more methodologically robust studies are needed.
Lafree, 1998	1946-1997, US	Trust in government and other social institutions	Descriptive statistics and historical analysis. Concludes that the legitimacy of social and economic institutions, particularly government, the criminal justice system and family institutions like marriage offer the best explanation for the rise in crime (including homicide) in the US during the 1960s to the 1990s.
Lafree, 1999	US, 1946 to 1997	Trust in government and other social institutions	Descriptive statistics and historical analysis. Concluded that evidence for the legitimacy hypothesis was stronger for the period of the homicide rise in the Us rather than the subsequent fall.
Lafree and Drass, 1997	US, 1955-1991	Events of collective political action associated with the civil rights movements, measure by New York Times articles.	Correlation analysis including recursive correlation analysis to detect change points. They find that a positive statistically significant relationship between homicide and collective action in the US from 1955 to 1970 but a negative relationship thereafter.

Messner et al., 2011	Panel of nations from 1950 to 2005	Family legitimacy (divorce rate)	Fixed effects regression with controls. Finds a significant relationship between homicide and the divorce rate and suggests this offers support for Lafree's legitimacy hypothesis.
Rosenfeld, 2016	56 US cities	Police use of deadly force against minority citizens	Descriptive statistics and correlation analysis. Finds some support for a connection but a 'police legitimacy crisis' and recent homicide spikes in certain US cities, but ultimately concludes that data isn't sufficient to be definitive.
Roth, 2009	US, long-term homicide trend	Belief in government stability, trust in government, patriotism and belief in the legitimacy of the social hierarchy.	Historical/narrative analysis using homicide statistics based on capture/recapture methods. Concludes that legitimacy has been an important correlate of long-term homicide trends in the US and Western Europe.
Stamatel, 2008	10 post-communist nations from 1985 to 2003	n/a	Narrative study with descriptive statistics. Finds that post-communist nations had middling homicide rates by Western standards with a sharp increase post-1989. Suggests the reason may be a 'political legitimacy' crisis.
Stamatel, 2014	33 nations from 1990 to 2005	Political freedom, regional dummy.	Feasible generalized least squares regression. Finds significant relationship between political freedom and female homicide but also that post-communist regional dummies remain significant despite controls which may suggest an uncaptured legitimacy issue.

The 'legitimacy hypothesis' was most fully articulated by Lafree (1998; 1999). He pointed out that theories relating to economic conditions or the treatment of minorities could not explain why homicide rates in the US rose markedly in the 1960s and early 1970s. At that time, economic conditions were favourable, educational opportunities were expanding and unprecedented gains were being made in extending rights to minorities (compared with the low-homicide 40s and 50s when

the US was much more discriminatory).¹³ Instead, Lafree concluded that: “*the most plausible explanation for the crime patterns observed in the postwar United States is the strength of American social institutions.*” To support this, Lafree produced a series of correlations, the most striking of which is between the homicide rate and survey results showing the level of distrust in the US government. The two series show a close correlation through multiple upward and downward trends between 1950 and 2000. However, the correlation disappears after 2000.

Subsequently, Lafree’s hypothesis has been tested mostly using measures of government or police legitimacy (see below), but the original hypothesis emphasised trust in economic and family institutions too. Lafree pointed out that trends in inequality; inflation; civil litigation (which he claimed indicated citizens’ unwillingness to accept the decisions of institutions); divorce rates; incidents of collective action (riots/protests etc); and the proportion of time individuals spent away from traditional families correlated with rises in street crime, including homicide.¹⁴ His analysis of collective action reflected the results of an earlier paper, Lafree and Drass (1997), which showed that collective action and homicide had a positive statistically significant relationship between 1955 and 1970 but a negative relationship thereafter.

Ultimately, although Lafree’s hypothesis is built upon a wide range of descriptive statistics and in-depth historical analysis, for the most part he does not formally test any of the relationships in statistical models. Furthermore, as the chart above demonstrates, the hypothesis appears stronger for the period 1960 to 2000 than for more recent years. As Eisner and Nivette (2013) pointed out, by only testing for correlations, Lafree does not rule out the possibility of reverse causality (i.e. that rising crime may cause lower legitimacy rather than the other way around). Perhaps partly as a result of these issues, more recent researchers have emphasised *police* legitimacy rather than government, family or economic legitimacy (see below).

Roth (2009) reached a very similar conclusion to Lafree but using different data and a much longer time period. He used capture-recapture analysis to construct long-term homicide data for the US and compared it with similar data from Western Europe. He found that homicide rates have generally correlated with four factors:

- The belief that government is stable

¹³ Lafree also dismissed internal migration as an explanation for the crime rise. He argued that many of the large US cities that saw surges in crime – NY, Chicago, Philadelphia, Detroit – gained little or no African American population through migration in the rising crime period (citing Wilson and Dunbar, 1984).

¹⁴ Lafree also argued that the breakdown in legitimacy of traditional institutions lessened informal social controls. An important statistic quoted in this regard was that unmarried men living alone or with non-relatives increased from 1% to 13% from 1950 to 1980.

- Trust in government and a belief in its legitimacy
- Patriotism and fellow feeling arising from racial, religious or political solidarity
- Belief in the legitimacy of the social hierarchy; i.e. that one can command respect without resorting to violence

Like Lafree, Roth (2009) does not test these correlations for causality using statistical models or quasi-experiments, so similar methodological concerns apply, as does the failure to explain trends post-2000.

A number of studies have sought to test the theory proposed by Roth and Lafree, but so far they have mainly been cross-sectional (to our knowledge) hence were not short-listed for this review. There are two exceptions. One was Messner et al., (2011), which tested Lafree's hypothesis using a cross-national panel of data from 1950 to 2005 and fixed effects regression. However, though Messner et al. found a significant relationship between homicide and the divorce rate in nations over time (their measure of family legitimacy), they did not test measures of government, criminal justice system or police legitimacy. Baumer and Wolff (2014) did analyse social trust and confidence in government using survey response data for a large panel of nations (n=40) over the period 1989 to 2008. They tested a number of models but found no significant relationships.

Eisner and Nivette (2013) reviewed the other literature on this topic. They noted that Chamlin and Cochrane (2006) also found no relationship between homicide rates and survey responses to questions of political and economic legitimacy in a sample of 33 countries. But Nivette and Eisner (2013) did find a significant relationship using a larger dataset of 65 nations and a broader definition of legitimacy, including a measure for confidence in the police. Overall, Nivette and Eisner (2013) concluded that legitimacy was a promising concept to explore in relation to drivers of homicide but that it needed more rigorous empirical testing.

Some very recent studies have extended the research on legitimacy and homicide in two very different contexts: the homicide spikes that accompanied the transition from communism in Russia and other Eastern European nations in the 1990s; and the recent homicide spikes in certain US cities.

In relation to Eastern Europe, Stamatel (2008) showed that many East European nations had a sharp homicide increase following the transition out of communism in the early 1990s. She argued that this may have been due to a 'political legitimacy' crisis. She cited the examples of Albania and Macedonia as supportive of this hypothesis. Unlike most Eastern European nations, which had short-term spikes in homicide at the time, these countries had higher rates for longer. Stamatel showed how they also had longer political/economic crises. For example, Bezemer (2001) outlined how Albania had a much slower transition out of communism and a severe

economic collapse in 1997. Even so, no quantitative analysis was performed to reinforce these conclusions.

In a later paper, Stamatel (2014) did show that rates of female homicide were significantly higher in post-communist nations even when numerous structural control variables were included. This is consistent with a 'legitimacy hypothesis' in the sense that it could explain these 'extra' homicides. But Stamatel acknowledged that other explanations are also possible. She noted that the age structure of Eastern European homicide has been very different from the UK or the US, with middle-aged men, rather than young men, being the most likely victims. This may suggest a link with alcohol use (see alcohol annex for more on this). Another possibility cited was a difference in cultural attitudes towards women (see character annex).

The legitimacy hypotheses of Lafree and Roth have also been cited as potential explanations for the recent homicide rise in certain US cities like Baltimore and Chicago. One theory for these sharp increases is that they are a reaction to the well publicised police killings of individuals like Michael Brown in Ferguson, Missouri, and Freddie Gray in Baltimore. As Rosenfeld (2016) has pointed out, there are two mechanisms by which these events may have driven homicide spikes. The first is simply via de-policing. i.e. that because of the public condemnation of their actions, police disengaged from vigorous enforcement and that this has led to rising homicide. The second echoes Lafree's legitimacy hypothesis. i.e. that the shootings have markedly reduced public confidence in the police causing long-term discontent to erupt into violence.

These explanations concern very recent trends and no papers could be located that test them robustly, but Pryrooz et al. (2016) did find that the homicide rate in the year after Brown's shooting was not significantly different from the rate the year before it in 81 large cities. Rosenfeld (2016) updated this analysis in 56 cities and found that the increase had become significant for the calendar year 2015 compared with 2014. Neither study was able to test the potential mechanism for such an effect. However, in relation to the 'de-policing' hypothesis, Rosenfeld showed that in St. Louis arrest rates dipped for a few months after Brown's shooting but returned to normal by the end of 2014, yet homicide rose 18% there in 2015.¹⁵ He found more support for the legitimacy hypothesis, noting that the increases have been focused in cities with higher than average proportions of Black residents and that Black citizens have consistently lower confidence in the police than White residents. He goes on to suggest that:

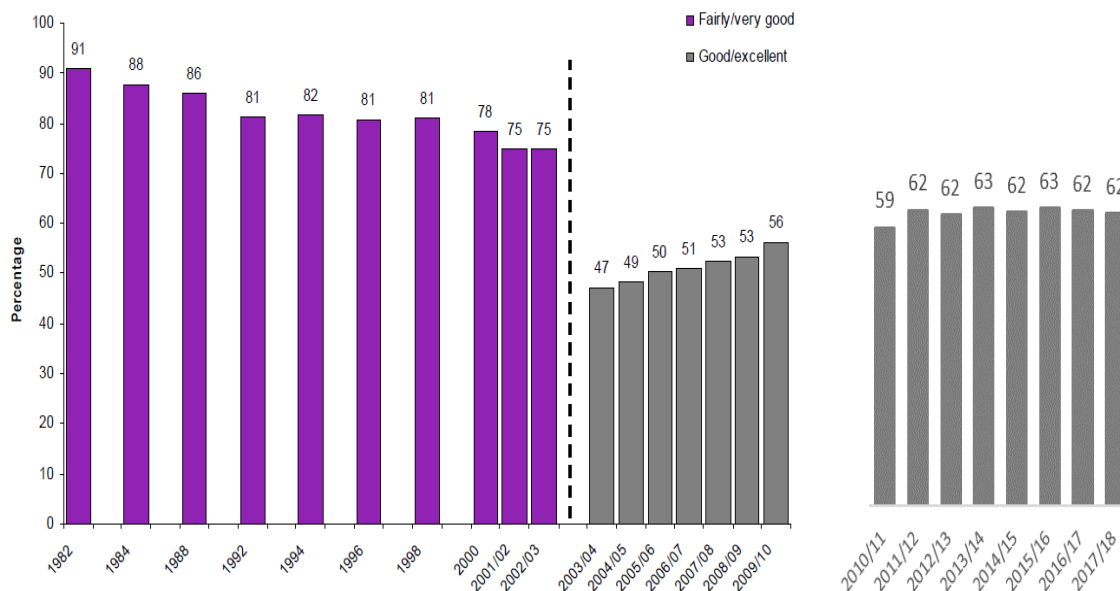
"Lack of confidence in the police among African-Americans predates the recent police killings in Ferguson, Cleveland, New York, and elsewhere. But it is likely to be

¹⁵ In an earlier paper, Rosenfeld (2015) also found some evidence that the homicide increase in St. Louis began before Brown's shooting.

activated by such incidents, transforming longstanding latent grievances into an acute legitimacy crisis.”¹⁶

In relation to England and Wales, it is possible to create trends in confidence in the police and victim satisfaction with the police, see below

Figure A5.5: Trends in confidence with the local police in England and Wales

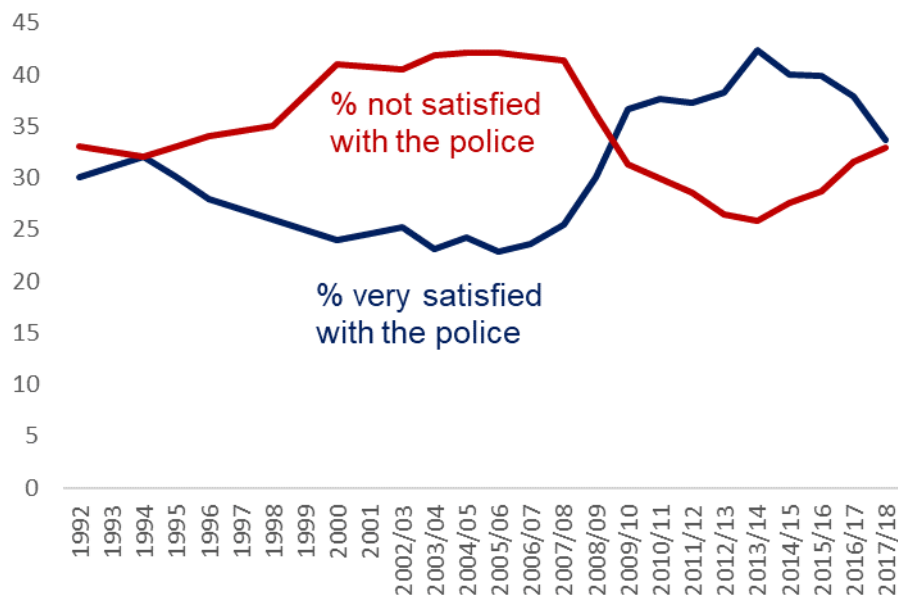


Source: Office for National Statistics - Crime Survey for England and Wales

Notes: Estimates for 1982 and 1984 have been revised and may differ from previously published figures. Question wording changed in 2003/04 interviews. Data from year ending March 2012 CSEW onwards are not directly comparable with those previous; the methodological note published alongside Focus On: Public Perceptions of Policing, 2011/12 provides more information. A small change to the weighting procedure has been incorporated into all historic datasets. The effect of this change will only have a negligible impact on the estimates in this table from year ending March 2012. Following changes to data affecting a small number of police force areas, estimates have been revised between year ending March 2012 and year ending March 2018. Consequently, there may be a small change on the unweighted bases and estimates in this table.

¹⁶ Rosenfeld (2016) also noted the possibility that changes to the US prison population could provide another reason for recent homicide increases. After rising continuously for several decades, the number of state and federal prisoners in the United States peaked in 2009 and began to decline modestly thereafter. However, he concluded there was insufficient data available at present to assess the impact this might have had.

Figure A5.6: Trends in victim satisfaction with the police in England and Wales



Source: Office for National Statistics - Crime Survey for England and Wales.

Notes: A small change to the weighting procedure has been incorporated into all historic datasets. The effect of this change will only have a negligible impact on the estimates in this table and therefore historic data have not been re-calculated using the new weights, except where direct comparisons have been made between years. This question is asked of all victims of crime (excluding fraud and computer misuse) who reported that they informed the police of the matter.

Though it is not conclusive, there is some correlation with homicide trends. Victim satisfaction with the police clearly declined between 1994 and the mid-2000s before improving again. And confidence in local police also shows evidence of a fall to 2003/04 and a rise thereafter, though the change in the question makes strong conclusions problematic. These trends may be linked to certain signal crimes like the murders of Stephen Lawrence in 1993 and Damilola Taylor in 2000 and the inquiry/reviews that followed, which highlighted failures in the police investigations and cultural issues with policing more generally (Foster et al., 2005).¹⁷ However, there have been more recent signal crimes – like the shooting of Mark Duggan in 2011. This was the trigger for the 2011 riots but did not cause either a spike in homicide or an appreciable effect on trends in satisfaction with the police.

Overall then, there is some evidence that shifts in the legitimacy of government, the criminal justice system and other institutions may be linked with trends in homicide. But nearly all the evidence is correlational, and the few studies that have attempted more sophisticated causal analysis have generally not found significant results. This means that, although trends in England and Wales are also somewhat suggestive of a link, much further testing is required.

¹⁷ See also: <http://library.college.police.uk/docs/met-police/Damilola-Taylor-Murder-Investigation-Review-2002.pdf>

Overall conclusion

Overall, the evidence from this section suggests that the criminal justice system can have an impact on homicide trends, but that it probably has not been the *main* driver of the homicide increases and decreases in England and Wales or the US over the last 70 years.

The annex began by examining the short-listed evidence on incarceration and homicide. In general, studies that used US data found a small but significant effect, with higher prison populations associated with lower homicide rates. But studies that looked across multiple nations, including England and Wales, tended to find no effect. And even with the US, researchers have shown that there are periods when homicide and incarceration trends have moved in the opposite direction from what would be expected if imprisonment was the main driver. In England and Wales, homicide increased for another decade after the sharpest increase in the prison population.

There is even less evidence to suggest that changes in clearance rates or the severity of punishment have been major drivers of homicide trends. However, this evidence needs to be caveated in two important ways. Clearance rates in England and Wales have been fairly constant through both the rise and fall in homicide. So, it is unlikely that they drove the trend, but that does not mean that a big change in rates would have no effect. It might have a large effect, but studies have been unable to test this. For severity of punishment, virtually all the short-listed evidence related to examining whether the death penalty lowers homicide rates. It is therefore of limited relevance to recent homicide trends in England and Wales.

The evidence is somewhat stronger in relation to policing. There is now a reasonable body of evidence suggesting that changes in police numbers influenced homicide trends in the US. However, the size of the effect is much debated and may be quite small. Given that police numbers in England and Wales generally increased through both the 1960 to 2000 rise and the 2004 to 2014 fall in homicide, it doesn't appear to have been the main driver of the long-term trend in the UK.

Shifts in police practice or legitimacy are arguably better candidates, although in both cases more rigorous research is required. While so-called 'pulling levers' interventions seemed to have reduced gang and gun homicides in the US, they are mostly seen as contributors to a general decline rather than as the driving factor. And in England and Wales, these types of interventions have not yet been implemented successfully. It is possible that other police interventions like the Street Crime Initiative had an impact, but this has not been examined in relation to homicide. And for police legitimacy, there are some suggestive correlations from a

variety of nations, including England and Wales. Several major homicide spikes have coincided with `crises' in governmental or police legitimacy. But only a limited number of studies have attempted to test this link in a more robust way.

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Appendix – Death penalty studies

Title	Authors
Some further evidence on imprisonment vs. the death penalty as a deterrent to murder	Bailey
Death penalty and crime – empirical studies	Shin
Deterrent Effect Of Capital Punishment - Reply (From Evaluation Studies - Review Annual, V 3, 1978 By Thomas D Cook Et Al - See Ncj-51598)	Ehrlich
Deterrence Controversy - A Reconsideration Of The Time Series Evidence (From Capital Punishment In The United States, 1976, By Hugo A Bedau And Chester M Pierce See Ncj-46351)	Passell and Taylor
Effect of Executions Is Brutalization, Not Deterrence (From Challenging Capital Punishment: Legal and Social Science Approaches, P 49-89, 1988, Kenneth C Haas and James A Inciardi, eds. -- see NCJ-113635)	Bowers
Analysis Of The Deterrent Effect Of The Death Penalty In North Carolina	Bailey
Assumptions matter: model uncertainty and the deterrent effect of capital punishment	Durlauf, Fu and Navarro
Brutalization Effect - Execution Publicity And The Incidence Of Homicide In South Carolina	KING
Capital Punishment and Deterrence - Conflicting Evidence?	Forst,
Capital Punishment and Deterrence: Examining the Effect of Executions on Murder in Texas	Sorensen, Wrinkle, Brewer and Marquart
Capital Punishment And Homicide In England - A Summary Of Results	Wolpin
Deterrence Versus Brutalization: The Case of Arizona	Thomson, E
Deterrence, Brutalization, and the Death Penalty: Another Examination of Oklahoma's Return to Capital Punishment	Bailey,
Deterrent Effect Of Capital Punishment - A Cross-State Analysis Of The 1960's	Forst
Deterrent Effect Of Capital Punishment - A Question Of Identification	Hoenack, Kudrle and Sjoquist
Deterrent Effect of Capital Punishment in Florida: A Time Series Analysis	Decker and Kohfeld
Deterrent Effect Of The Death Penalty For Murder In California	Bailey
Do execution moratoriums increase homicide? Re-examining evidence from Illinois	Ahrens, A, Kovandzic, T V and , Vieraitis, L M.

Does the Death Penalty Save Lives?: New Evidence From State Panel Data, 1977 to 2006	Kovandzic, Vieraitis and Paquette Boots
Execution and Deterrence: A Quasi- controlled Group Experiment	Cloninger and Marchesini
Execution Publicity and Homicide in Georgia	Stack
Execution Publicity and Homicide in South Carolina: A Research Note	Stack
Homicide and deterrence: a reevaluation of the United States time-series evidence	Layson
Homicide And The Death Penalty: A Cross-National Test Of A Deterrence Hypothesis	Archer
On the Measurement of the Deterrent Effect of Capital Punishment and the Theory of Deterrence	Ehrlich and Gibbons
State Executions, Deterrence, and the Incidence of Murder	Zimmerman
Testing the Deterrence Effect of Capital Punishment - A Reduced Form Approach	Yunker
Does Capital Punishment Have a Deterrent Effect? New Evidence from Post-moratorium Panel Data	Dezhbakhsh, Rubin and Shepherd
Effects of an Execution on Homicides in California},	Thomson
Estimating the Impact of the Death Penalty on Murder	Donohue and Wolfers
Homicide and Deterrence: Another View of the Canadian Time-Series Evidence	Layson
The Deterrent Effect of Death Penalty Eligibility: Evidence from the Adoption of Child Murder Eligibility Factors	Frakes and Harding
Messing Up Texas?: A Re-Analysis of the Effects of Executions on Homicides.	Brandt and Kovandzic

Annex 6: Opportunity and Homicide - Literature Review

Findings

Introduction

This section aims to summarise the literature review evidence relating to opportunity and homicide. As with other annexes, this is supplemented by available data and secondary evidence for England and Wales.

On first inspection, opportunity appears less linked with homicide than some of the other drivers. Whereas the words 'drugs', 'alcohol' and 'police' appear commonly alongside 'homicide' in study titles, there was no study in our short-list that had the word 'opportunity' alongside 'homicide' in the title.

It is therefore important to explain what is meant by 'opportunity' and why the studies in this section have been included under its heading. Our concept of opportunity is grounded mostly in the routine activities approach developed by Cohen and Felson (1979). They reasoned that crime requires the confluence of a willing offender, a susceptible victim and a lack of guardianship. Applying this logic, they argued that crime trends might be driven, not just by the number of willing offenders, but also by the number of instances in which this confluence occurs. Or to put it another way – by the level of opportunity.

Cohen and Felson (1979) used this theoretical framework to examine whether changes in routine activities over time helped to drive crime trends in the US. For example, they noted that the marked increase in women's employment through the 1960s and 1970s would have left more houses vacant during the day, effectively increasing the supply of victims or targets. They reasoned that this raised the opportunity for burglary. To demonstrate this effect they showed that burglary not only increased but also shifted from being a mostly night-time crime to being more evenly split between day and night.

In their original study Cohen and Felson also applied this logic to homicide and the results are detailed in section one below. However, very few studies have followed this up directly. Instead the opportunity framework has more often been used as a basis for examining three other potential drivers of homicide. These are dealt with in sections two to four below.

The first of these is demographics. As Land et al., (1990) pointed out: suggesting the existence of a relationship between numbers of young people in the population and homicide rates is entirely consistent with the routine activities approach if young

people are over-represented in homicide statistics, as both victims and perpetrators. In this scenario, more young people implies a greater potential supply of victims and offenders which means more opportunity for homicide. Section two investigates the evidence for this proposition.

Section three looks at the relationship between divorce and homicide. Researchers have linked this relationship with opportunity in several ways. Firstly and most simply, divorce might reduce the opportunity for domestic homicide by separating two conflicted parties (Browne et al., 1999). In this framework, divorce would have a negative relationship with homicide trends. More divorces would imply fewer domestic homicides. But other approaches consistent with the opportunity framework imply the opposite relationship. For example, it could be that divorce reduces informal guardianship in two ways: of children by their parents, given that one parent is likely to leave the family household (Beaulieu and Messner, 2009); and of husbands by their wives (McCall et al., 2011). Taken together, these examples suggest the importance of investigating the relationship between divorce and *different categories* of homicide.

Section four looks at gun availability, ownership and related issues. Several researchers have linked this to the opportunity framework via the supply of potential offenders. The main argument is that, regardless of criminal propensity or motivation, a conflict in which one of the participants is armed with a gun will be more likely to result in homicide than otherwise (Clarke and Mayhew, 1988; Clarke 1995). Hence the availability of guns increases the opportunity for homicide to occur.

It is very important to point out that although we have bracketed these studies under the heading of 'opportunity' there could be other theoretical linkages. For example, finding that the proportion of young people is a significant predictor of homicide could be caused by 'opportunity' in the sense that more young people means more opportunities for people of the most crime-prone ages to come together as victims and perpetrators. But it could also be caused by some other factor unrelated to opportunity. For example, other evidence shows that being born into a large family is a risk factor for crime, which might be due to reduced parental investment (either economically or emotionally) as parents have to divide their time and resources between a greater number of individuals (Farrington et al., 2006). In some studies, this possibility – which is explored in the character annex – is not distinguishable from the opportunity effect described above.

Similarly, a positive relationship between divorce and homicide may be due to the mechanical reduction in parental or spousal monitoring and hence the greater opportunity for adolescents and divorced husbands to get into trouble. But, as Beaulieu and Messner (2009) explained, divorce might also act as “a reflection of the breakdown of traditional institutions” and hence give rise to greater homicide through an entirely different mechanism. As such, the sections below attempt to make clear

when the evidence supports a clear opportunity effect and when other explanations are also possible.

1) Routine activities and homicide

There were four short-listed studies that examined the relationship between routine activities and homicide trends. These are shown in table A6.1 below:

Table A6.1: Short-listed studies examining the relationship between routine activities and homicide trends

Study	Area and time period	Opportunity variable	Method and finding
Aebi and Linde, 2014	15 European nations (including England and Wales) from 1960 to 2010	Rise in female employment/switch from public space to cyber space	Descriptive/correlation analysis. Found no correlation between homicide trends and unemployment, GDP and demographics. Concluded instead that lifestyle change provides the best explanation for the rise and fall in homicide with growth in female employment explaining the rise and a shift from spending time in the public space to cyberspace explaining the fall.
Baumer and Wolff, 2014	86 countries from 1989 to 2008	Routine activities: trends in home computing and mobile phone subscriptions	Two-level hierarchical linear models using overall and age-specific homicide rates. Found no relationship between homicide trends and growth in home computing or mobile phone ownership.
Cohen and Felson, 1979	US, 1947 to 1974	Household activity ratio (an estimate of the number of at-risk households)	First difference and autoregressive regression models with controls. Found a significant positive relationship with homicide. Concluded that shifts in the opportunity structure for homicide was an important driver of trends.

Cohen and Land, 1987

US, 1947 to 1984

Demographics and household activity ratio

Log-linear time series regression models. Concluded that shifts in the age structure were a primary driver of post-World War II murder rates in the US and that opportunity was also an important but secondary driver.

Given that it was Cohen and Felson's 1979 paper that really kick-started the routine activities approach to crime, it makes sense to start with a description of that study. Like other commentators, Cohen and Felson began by noting that the rise in US crime during the 1960s and 1970s was not well explained by other factors like urbanisation, immigration, unemployment or poverty. They suggested instead that the rise was at least partly due to changes in routine activities which created the opportunity for greater victimisation. They grounded their analysis in what has become known as the crime triangle, which states that crime requires the confluence of a willing offender, a susceptible victim and a lack of guardianship.

Cohen and Felson (1979) used this framework to test a number of hypotheses. For example, they reasoned that people whose routine activities were centred around the home (e.g. housewives) would have lower than average victimisation rates because they would be less likely to come into contact with other people hence reducing the opportunity for victimisation. Similarly, they suggested that people who lived alone and adolescents/young adults who spend more time with peers than family will have higher victimisation rates. They confirmed these and other similar hypotheses using victimisation survey data from the US.

Based on these results, Cohen and Felson (1979) reasoned that if people's routine activities changed markedly at the aggregate level, this could drive crime trends. In relation to homicide, the researchers argued that social changes through the 1960s and early 1970s meant that people spent a much greater amount of time outside the home and hence put themselves at higher risk of certain types of homicide. For example, they showed that female participation in higher education and employment increased markedly. They used US census data to show that the percentage of the population consisting of female college students increased by 118% from 1960 to 1970 and that married female labour force participation rates rose by 31%. Cohen and Felson also showed that the number of single-person households rose 34% during the 1960s. People living alone – the researchers argued – would be more likely to socialise outside the home.¹

¹ Cohen and Felson also highlighted many other structural changes relevant to criminal opportunity but most related to property crime. For example, they showed that more houses were left unattended during the day and that consumer goods became lighter and relatively more valuable.

They cited some descriptive statistics to support their link between routine activities and homicide trends. For example, they argued that their theory was consistent with the fact that felony-homicides in the US rose more than five times faster than domestic homicides between 1963 and 1975. But for the main test of their hypothesis, Cohen and Felson (1979) created a trend in, what they called, the 'household activity ratio'. This consisted of the number of married households with women in the labour force plus the number of non-husband-wife households, divided by total households. They argued that the increase in this ratio was indicative of more people being "*highly exposed to risk from personal and property victimization due to the dispersion of their activities away from family and household.*"

Using both a first-difference and autoregressive regression model, they found that the ratio had a significant positive and cumulative relationship with homicide rates in the US between 1947 and 1974. They concluded that the structural changes in society that altered people's routine activities were likely to be an important driver of the US homicide increase.

However, there are some limitations of Cohen and Felson's approach. In line with many other studies, their model had limited control variables and none for changes in drug markets, gangs or organized crime. Also, their approach rather pre-supposes a clear difference between victims and offenders. For example, they argue that: "*the interdependence between offenders and victims can be viewed as a predatory relationship between functionally dissimilar individuals or groups.*" Yet other evidence would suggest that victims and offenders often have similar characteristics (Broidy et al., 2006).

Another issue is that structural change in routine activities tends to be fairly gradual whereas homicide trends often change very quickly (including in the period studied by Cohen and Felson). To account for this, the researchers argued that the overall effects of structural changes might be "*multiplicative rather than additive*". In other words, several small changes in routine activities could act as a 'tipping point' for homicide trends, creating a step-change effect.

Finally, as other authors subsequently pointed out, whilst increases in female employment and single-person households correlated well with the rise in US homicide, they did not correlate that well with the sudden fall in homicide from 1991 (Lafree, 1999).² Indeed, other studies have found that the likelihood of violent

² Others also noted that the routine activities approach may be subject to the ecological fallacy – i.e. presuming that macro-level changes are matched by individual-level patterns. For example, Pratt and Turanovic (2016) noted that: "*Just because the household activity ratio was intended to capture aggregate patterns of activities that take place away from the home does not mean that when an individual leaves his or her house they are, by definition, engaging in "risky behavior" that could result in victimization.*"

victimisation actually increases with additional people in the household (Miethe et al., 1990; Garius, 2016).³

For the purposes of this review, it is also important to point out that theoretically, Cohen and Felson's results could be explained by other mechanisms. For example, it could be argued that the household activity ratio is as much a measure of family disruption as it is of routine activities. Hence the mechanism for any potential effect is somewhat uncertain.

Although Cohen and Felson's study was hugely influential, only a handful of studies have used their approach to study homicide *trends*. Mostly, studies that have adopted the routine activities framework to examine homicide were cross-sectional and hence weren't shortlisted for this review. Some simply tested the relationship between homicide and the household activity ratio based on cross-sectional data and were generally supportive of a relationship (see for example, Jackson, 1991; Pratt and Cullen, 2005)⁴. Others adopted a different approach. They categorised individuals in relation to their 'opportunity' for different types of homicide victimisation and then tested whether actual homicide data matched their predictions. For example, Messner and Tardiff (1985) used data from recorded homicides in Manhattan to test a whole series of predictions, such as that females, the young, the old, and the unemployed will suffer a greater proportion of homicides at home compared with other groups and will be more victimised by relatives than friends or strangers. Results for this and other similar studies were mixed, but broadly supportive (for example Parker and Toth, 1990). Individuals hypothesised to spend more time at home were precisely those most likely to be victimized at home and to be killed by family members. But not all hypotheses were supported. The time of day at which homicides occurred did not seem to be linked with routine activity patterns (Messner and Tardiff, 1985).

Though supportive, these studies did not make any attempt to test the relationship between routine activities and homicide trends. In fact, the only other study located in our search that tested the relationship between the household activity ratio and homicide trends was Cohen and Land (1987). Using a log-linear time series regression model with US data from 1947 to 1984, they also found a positive

³ However, Garius (2016) also finds that individuals who spend more time outside the home are at greater risk of certain types of violence.

⁴ The Pratt and Cullen (2005) study was actually a meta-analysis. They found 37 studies that tested the relationship between the household activity ratio and crime in general (not necessarily homicide). They were a mixture of cross-sectional and longitudinal studies. They found a consistent positive relationship across the studies, but the effect size varied considerably according to the control variables included and whether the research was cross-sectional or longitudinal.

relationship between the household activity ratio and homicide rates.⁵ The age structure of the population and levels of unemployment and incarceration were also significant and together explained most of the change in homicide rates over the period, with age structure being the most important factor (see next section). The authors concluded that these results provided support for the routine activities approach and the crime triangle because they would all be likely to affect the supply of potential victims and motivated offenders.

Despite these supportive findings, more recent studies have not generally included the household activity ratio in their list of explanatory variables for homicide trends. This may be because – as mentioned above – the sudden fall in US homicide rates through the 1990s did not seem to fit with Cohen and Felson's approach. Trends in female employment and/or people living in single-person accommodation did not suddenly reverse in line with the homicide decline. However, a few researchers have attempted to use routine activities, or the related 'lifestyle approach' (see Hindelang et al., 1978) to examine the falls in homicide.

For example, Aebi and Linde (2014) concluded that changes in lifestyles provided the best explanation for the rise and fall in homicide that was generally common to the 15 European nations they studied (including England and Wales) between 1960 and 2010. Using simple correlations and historical analysis, they found no longitudinal relationship between homicide trends and three structural variables: GDP, unemployment and demographics. They concluded instead that opportunity was the most important correlate and that the rise in homicide was mostly due to changes in lifestyles which resulted in more individuals becoming involved in potentially homicidal situations. In particular they noted the increase in young people socialising in the night-time economy and the rise in female employment which brought more women into the public space, where the majority of homicides occur.

Aebi and Linde (2014) argued that the homicide fall was most likely due to increases in private security in the night-time economy and a move from the public space to cyber space. However, they produced no longitudinal data to test this hypothesis.⁶

Baumer and Wolff (2014) attempted a stronger test of one of Aebi and Linde's lifestyle changes. They also reasoned that the use of computers and later the

⁵ They called the ratio the 'residential population density ratio' rather than the 'household activity ratio'.

⁶ Aebi and Linde's conclusion, that opportunity was the leading correlate of homicide, was drawn from studies like Grasmick et al (1993) and Wikstrom (2006). Grasmick et al., (1993) found that having the opportunity to commit fraud and violence predicted involvement in these crimes both on its own and in interaction with self-reported self-control, whereas self-control on its own was not predictive. Wikstrom (2006) also demonstrated the importance of opportunity at the individual-level by showing that unsupervised time spent by youths in crime hot spots in Peterborough was a predictor of crime rates. However, neither of these studies examined homicide.

internet might have caused a second shift in routine activities, reversing the trend towards greater time spent outside the home that Cohen and Felson demonstrated. They also argued that the spread of mobile phones may have played a role in reducing the opportunity for homicide by creating an additional layer of guardianship. Adolescents could keep in touch with their parents much more easily facilitating greater parental monitoring. However, using two-level hierarchical linear models and data from 86 countries between 1989 and 2008, Baumer and Wolff (2014) found no relationship between homicide trends and growth in home computing or mobile phone ownership.

Overall then, while the routine activities approach appeared to offer an important reason for the rise in homicide, no one has yet made a strong quantitative case that it has also contributed to the fall in homicide. However, relatively few studies have tested the proposition, particularly in relation to reduced participation in the night-time economy, which we know has occurred in England and Wales (see below).

2) Demographics and homicide

Demographics have been one of the most studied potential drivers of homicide. Around half of the quantitative studies in this overall review include some measure of demographics either as the variable of interest or as a control. This is likely because demographic data is freely available and because demographics appear to have a common-sense link to homicide trends via the age-crime curve. A large body of literature has shown that, while there are some exceptions, crime generally peaks in adolescence/young adulthood and declines thereafter (Hirschi and Gottfredsen, 1983; Farrington, 1986). This means that the proportion of young people in the population could be a driver of homicide trends via a simple opportunity effect. More people of the most crime-prone ages means more potential homicide victims and offenders.

The aim of this section is to review the short-listed studies that have examined this proposition, shown in Table A6.2. To make the exercise manageable, we have focused on the studies that specifically analysed demographics rather than those that included a demographics variable as a control. The latter are covered indirectly by the inclusion of reviews and meta-analyses.

Table A6.2: Short-listed studies that examined the relationship between demographics and homicide

Study	Area and time period	Opportunity variable	Method and finding
Barnett et al., 1975	50 US cities from 1963 to 1972	Change in population structure	Various mathematical models. Found that changes in population structure explained no more than 10% of the rise in homicide in the US during the late 1960s and early 1970s.
Baumer, 2008	114 US cities from 1980 to 2004	Proportion aged 15-24	Two-way fixed effects panel regression. Found a significant positive relationship between proportion of young people and homicide.
Baumer and Wolff, 2014	86 countries 1989 to 2008	Ratio of persons aged 45-64 to persons aged 15 to 24, which they call 'youth oversight'	Two-level hierarchical linear models using overall and age-specific homicide rates. Found significant relationship between the youth oversight measure and homicide.

Cohen and Land, 1987	US, 1947 to 1984	Proportion aged 15-24 (logged)	Log-liner time series regression models. Concluded that shifts in the age structure were a primary driver of post-World War II murder rates in the US.
Fox and Piquero, 2003	US from 1965 to 1999	Change in population structure, proportion aged 18-24	Descriptive statistics and analysis. Found that demographics would have driven homicide lower even if the rate of youth offending had stayed the same. Concluded that demographics can explain 10% of the 1990s crime drop in the US.
Marvell and Moody, 1991	Various	Proportion of young people (often just young males, ages vary by study reviewed).	Review of quantitative studies testing the relationship between demographics and homicide. Found that demographics was a consistent predictor of homicide trends. 16 of 24 longitudinal studies found a moderate or strong positive relationship.
Nunley et al., 2011	US, 1934 to 2006	Proportion aged 15-29	Co-integrating regression model. Found that the proportion of young people was a robust predictor of homicide over the long term and that short-term deviations from the trend predicted by demographics could to some extent be explained by changes in the 'misery index'.
Pampel and Williamson, 2001	18 nations from 1955 to 1994	Age structure of the population, percentage aged 15-24.	Feasible generalized least squares models. Found that homicide victimisation rates peaked at ages 25-34 and that youth homicide generally increased over time particularly in the 1990s. This effect was strongest for the US, but was present for UK males too. But in a multivariate model, % aged 15-24 was not a significant predictor of youth homicide victimization when an index for family change was included.
Rogers, 2014	55 nations from 1979 to 2005	Proportion aged 15-24	Exploratory data analysis. Found that no nation had a consistently higher rate of homicide for the 15-24 age group compared with other age groups and some nations, particularly those in Eastern Europe, had significantly higher homicide rates among those aged 25-34 and 35-44.
Rogers and Pridemore, 2016	55 nations from 1999 to 2004	Proportion aged 15-24	Literature review and OLS regression. Found that only 13% of cross-national studies that tested the relationship between proportion of young people and homicide found a positive significant effect. Also found no support for a relationship in their own model.

Sprott and Cesaroni, 2002	Canada, 1974 to 1999	Population structure change	Tested effect of population structure change on age-specific homicide perpetration rates. Found that 14% of the trend in Canadian homicide rates could be explained by population change.
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Before proceeding, it is important to make a general point about the methodology employed. For the most part, the studies in Table A6.2 examined the role of demographics by including a variable relating to the percentage of young people in the population (the exact age group varies). A significant positive finding could therefore indicate an opportunity effect – more young people means more potential victims and offenders. But there are other possible mechanisms too. For example, a related body of literature examines the hypothesis that individuals born into large cohorts will be likely – all else equal – to have a higher propensity for crime (Easterlin, 1980). If larger cohorts suffer greater competition for parental, educational, employment-related or marital resources, then those who lose out may see crime as a more tempting option (ibid.). It's also possible that the fertility spikes that create large cohorts are linked to crime via evolutionary mechanisms that affect individuals' appetite for risk (Wilson and Daly, 1997). Both these approaches might imply that eras in which there are large proportions of young people in the population might have higher rates of homicide *over and above any upward pressure driven by the simple supply of extra potential victims and offenders alone*. Or to put it another way, it is possible that large cohorts cause more homicide both because there are more people (an opportunity effect) and because being part of a large cohort causes those individuals to have a higher propensity for homicide (a potentially non-opportunity effect).

Easterlin's theory and other related hypotheses are explored in the character annex. Here we simply note that the method used by most studies in this section cannot distinguish between the opportunity and the non-opportunity hypotheses. In other words, studies finding that the proportion of young people is a significant predictor of homicide trends could be demonstrating an opportunity effect, but they could also be demonstrating that large cohorts have higher crime propensity for some other reason.

Given the large body of evidence in this area, it is helpful to begin with the studies that have reviewed this literature. For example, Marvell and Moody (1991) reviewed 24 studies that examined the relationship between demographics and homicide trends. The studies varied in terms of the exact variable used (i.e. the exact age group and whether it was all young people or just young males), and in their geography. Most were from the US but there were also some Canadian studies and one from England and Wales. The results were reasonably consistent. 16 of the 24 studies (including the England and Wales study) found a moderate or strong positive

relationship: more young people in the population meant more homicides. However, the authors found a less consistent picture among the studies that looked at the relationship using cross-sectional analysis, and the results for other crime types were also mixed. Overall, they concluded that demographics were at most only a minor driver of crime trends.

Gartner and Parker (1990) reached a similar conclusion. Whilst they found a relationship between demographics and homicide in some nations during some time periods (including the US and England and Wales), their overall results were inconsistent.

A more recent review by Rogers and Pridemore (2016) was even less supportive of a relationship. They located 32 cross-national studies that tested the relationship between homicide and the proportion of young people across 146 different model specifications. In only 13% of cases was the demographics variable positive and significant. It was negatively significant in 5% of cases (a higher proportion of young people was associated with *fewer* homicides) and non-significant in 82% of cases. In their own model, using panel data for 55 nations between 1999 and 2004, Rogers and Pridemore also found no evidence of a relationship.

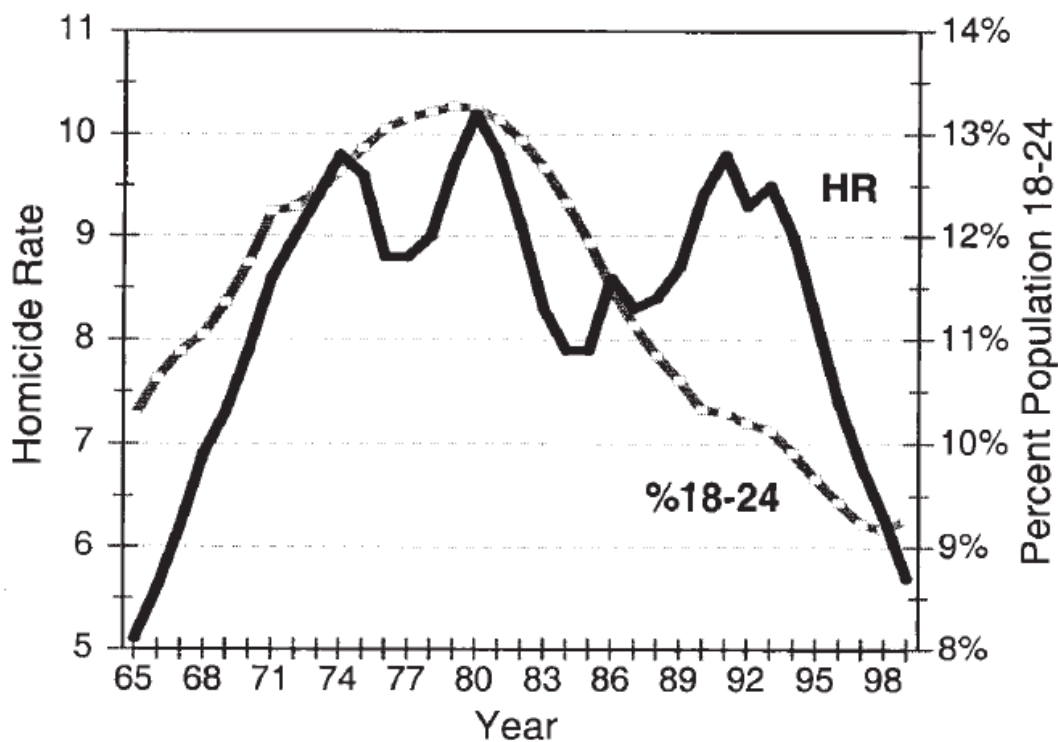
A possible reason for these findings was suggested by Rogers in an earlier paper, (Rogers, 2014), in which she investigated the underlying assumptions for using the proportion of young people as a predictor in the first place. She reasoned that for the proportion of young people (most often classified as those aged 15-24) to be a theoretically sound predictor of homicide, it should be consistently the case that 15-24 year-olds should have the highest rates of homicide victimization. However, her review of data from 55 countries revealed that this wasn't the case. Instead, the 15-24 age group did not have a significantly higher homicide rate in any of the nations overall and in only ten nations (including the US and the UK) was the 15-24 group the most victimised for more than a few years in a row. In fact, many nations, particularly those in Eastern Europe, had a significantly *lower* homicide rate for the 15-24 age group relative to the 25-34 and 35-44 age groups. Also, trends in the proportion aged 15-24 did not correlate with homicide rates in 75% of the nations. Overall, she concluded that there was very little evidence in favour of an opportunity-based demographic effect.⁷ (See Annexes 1 and 2 for more on how homicide age distributions vary systematically cross countries and ethnicities.)

⁷ Rogers also argued that her results cast doubt over the Easterlin hypothesis too, reasoning that if large birth cohorts gave rise to higher crime propensity through competition effects, we should see a stronger relationship between percentage young and homicide than we do. However, she also acknowledged that different statistical techniques would be required to dismiss this hypothesis entirely. Perhaps the most obvious limitation of Rogers' study is that she uses only victimization rates. It remains possible that an effect would become visible if perpetrator data was used instead.

Pampel and Williamson (2001) also found that rather than peaking in the 15-24 age group, homicide victimization in their sample of 18 nations was highest for those aged 25-34. They also found that while youth homicide victimization rates increased generally between 1955 and 1994, there was huge variation. The effect was biggest in the US and was prominent for UK males too. However, the pattern was reversed in Japan and France and overall the proportion aged 15-24 was not a significant predictor of youth homicide victimization when an index for family change was also included in the model.

Despite these results, a number of short-listed studies focusing on the US alone found that demographics played a limited role in the rise and fall in homicide since 1960. For example, Fox and Piquero (2003) concluded that demographics explained around 10% of the 1990s homicide drop in the US. Importantly, and unlike Rogers, they used perpetrator data rather than victim data and showed that had the rate of youth offending stayed constant, demographic change alone would have driven a drop in homicide of almost 10%. But they also noted that while demographic trends correlated with the rise in US homicide in the 1960s and the general fall after the mid 1970s, it could not explain the 1991 peak, see Figure A6.1. Rather than being caused by extra *numbers* of young people, this was driven by a higher *rate* of offending among youths. In other words, it is not consistent with a simple demographic opportunity effect.

Figure A6.1: Homicide rate and percentage of the population aged 18 to 24 in the US



Source: Fox and Piquero, 2003

These results were mirrored almost exactly by those of Barnett et al. (1975). Using a similar constant-rates method, as well as other mathematical techniques, they showed that changes in the population structure could only explain about 10% of the homicide rise in US cities from 1963 to 1972. Spratt and Cesaroni (2002) performed a similar calculation for the Canadian homicide rate between 1974 and 1999. They found that 14% of the trend could be explained by population change.

Cohen and Land (1987) concluded that the proportion of young people could explain a far larger percentage of the US homicide trend, but their analysis stopped in 1984, just when the bivariate correlation shown in Figure A6.1, began to break down. Nunley et al. (2011) found that the proportion of young people was a robust predictor of homicide over a longer time period in the US (1934 to 2006) and that short-term deviations from the trend predicted by demographics could to some extent be explained by changes in the 'misery index', which is a combination of unemployment and inflation and is designed to capture levels of economic distress. The proportion aged 15-24 was also a significant predictor of homicide in Baumer's (2008) panel data study of 114 US cities. Even more significantly perhaps, Baumer and Wolff found that the ratio of young to old (45-64/15-24) predicted homicide rates in a cross-national sample of 86 countries between 1989 and 2008. They concluded that:

"Though many prior studies have considered more basic shifts in the proportion of the population that falls in high-crime age groups (e.g. 15-24s) we suggest that the potentially important role of age structure imbalance has been underappreciated....one consequence of such shifts is a progressive reduction in the sizes of cohorts that tend to exhibit the highest crime rates, but another that we think may be even more important is that the ratio of older people who provide significant social control to younger people has increased considerably."

In other words, the opportunity effect from demographics may not just be about supply of victims and offenders but also about the degree of guardianship provided by larger cohorts of older people relative to youths.

Overall though, the balance of evidence in these studies suggests that demographics has been at most a minor driver of homicide trends. So increased opportunity, via the supply of potential victims/offenders, is perhaps unlikely to be a major explanatory factor in recent trends in England and Wales. However, the evidence also (arguably) suggests that the strength of any effect may vary by time and place. Greater youth populations may have played a bigger role during the period 1960 to 1980 and were a stronger influence in the US and England and Wales than elsewhere.⁸

⁸ In this light it is worth noting Aebi and Linde's (2014) finding that as homicide rates go lower, the average age of victimization generally goes up. This may suggest that lower homicide rates imply higher proportions of interpersonal homicide (which generally have a higher average age profile) and

Several caveats to these conclusions should be mentioned. Most of the studies looked just at victimization data, whereas arguably perpetrator data is what's needed to fully test for demographic effects. And there are still promising avenues to explore for opportunity effects in this area. Most obviously, the studies showed that simply looking at the 15-24 age group may not be the best way to capture the potential supply of victims/offenders given that homicide seems to affect the 25-34 age group more in most nations. Also though, if demographics affect homicide via the opportunity for the confluence of both (young) victims and offenders, it may be that the mechanical model looking at linear population change may be too simplistic and that larger effects are possible. This would be the case if a one unit increase in the size of the youth population gives rise to a more than one unit increase in the degree to which young people congregate and interact. Finally, as the Baumer and Wolff (2014) result showed there may also be a demographic opportunity effect through the guardianship provided by older people. Certainly their 'youth oversight' ratio feels worthy of further exploration.

lower proportions of homicide relating to other criminal activities (which generally involve young males).

3) Divorce and homicide

The literature on divorce and homicide is highly complex. This is mostly because there have been a large number of different mechanisms suggested by which changes in divorce rates might lead to changes in homicide trends. Several of these are linked to the opportunity approach, which is why the topic has been included in this section.

However, even within the opportunity framework the effect of divorce is somewhat ambiguous and is likely to depend on the type of homicide being considered. For example, in relation to domestic homicide divorce might be expected to have a *negative* relationship with homicide (more divorces would imply fewer homicides), because divorce generally reduces the interaction between two conflicted parties (Browne et al., 1999). But for other types of homicide, divorce could have a *positive* relationship with homicide trends by reducing guardianship, either of husbands by their wives (McCall et al., 2011), or of children by their parents (Beaulieu and Messner, 2009).

Other researchers have proposed links between divorce and homicide that are unrelated to opportunity. One of the most prominent is the `social disorganization perspective. This is explained by Beaulieu and Messner (2009) as follows:

"...divorce can be regarded as both a sign of social disorganization and a source of social disorganization... the widespread prevalence of divorce is a reflection of the breakdown of the traditional institutions, including but not limited to the family.... the traditional institution of the family is characterized by strict regulation of behaviours"

In this formulation then, the effect of divorce on homicide comes not from the physical fact of confluence (or lack of it) between husband and wife or between parents and their offspring. It comes instead from a change in beliefs about the merits of traditional institutions like marriage. For supporters of this theory, divorce acts as a marker for the rejection of traditional values and it is this, rather than any change in opportunity, that would be likely to drive homicide. Linked to this, is an explanation based on informal social control. That is, control provided not so much by physical proximity or monitoring (the opportunity hypothesis), but by the shame of letting someone else down or being seen as irresponsible.

The situation is further complicated by the timing of possible effects. For example, if the effect comes chiefly via divorce's impact on the two adults involved (either by opportunity, social disorganization or informal social control), then an immediate effect might be expected. Changes in divorce rates should affect homicide trends more or less contemporaneously. But if the effect of divorce comes instead through children, it might be felt with a lag, depending on the child's age, and this could be

positive or negative. For example, population-level studies find that children of separated parents generally have poorer life outcomes (Nagin et al, 1997). This would suggest the possibility of a lagged crime-increasing relationship between rising divorce and homicide, which could be based on opportunity (divorce reduces parental monitoring) or another type of negative effect like the child's experience of a traumatic event (the divorce itself). However, looking at the overall average effect of divorce masks the role it can play in separating highly conflicted partners. By comparing children with divorced parents with children from all marriages, the studies that find negative effects from divorce fail to address an important question, which is, if the marriage is conflicted, is it better or worse for the child if the parents divorce? A review of the evidence is unequivocal: "*When discord is high, divorce appears to benefit children, but when discord is low, divorce appears to harm children*" (Amato, 2001). So, for certain individuals (arguably those with the greatest risk of becoming involved in homicide) divorce could have a long-term *beneficial* effect.

Linked to this, some researchers suggest that changes in divorce legislation played an important role in increasing women's status, and that this could have affected homicide trends. In 1971, the Divorce Act abolished the concept of 'matrimonial offences' and hence the idea that to get a divorce a person had to prove that an 'offence' had been committed by their spouse. This markedly increased numbers of divorces in England and Wales (see Character annex for a chart). Data show that the newly requested divorces were overwhelmingly requested by women, many claiming abuse (see Character annex). For the purposes of this discussion the key point is that, if increased gender equality reduces violence against women, then the changes in divorce legislation might have reduced domestic homicide directly and reduced all homicides over the long-term by ensuring that fewer individuals grew up in homes affected by domestic violence.

To summarise, there are a whole series of potential links between divorce and homicide and there is no clear consensus about exactly how or when any relationship would manifest.

Arguably studies that examine the non-opportunity approaches should be included under alternative drivers of homicide. It could be argued, for example, that evidence in favour of the social disorganization perspective reflects changes in character as much as anything, given the importance of belief systems and feelings of shame and responsibility within that framework. But the evidence has been included here because many studies actively pitted opportunity approaches against other possible drivers within the same analysis, so it would not make sense to split this research into separate sections. However, every effort has been made to be clear about the proposed mechanisms, so that readers can judge the importance of different drivers.

The short-listed studies that examined the relationship between divorce and homicide trends are shown in Table A6.3 below.

Table A6.3: Studies examining the relationship between homicide and divorce or gender equality

Study	Area and time period	Opportunity variable	Method and finding
Baumer and Wolff, 2014	86 countries from 1989 to 2008	Divorce rate	Two-level hierarchical linear models using overall and age-specific homicide rates. Found a marginally significant positive relationship (at the 10% level) in some models but not all, and overall the authors concluded that it was not one of the major drivers of homicide.
Beaulieu and Messner, 2009	113 US cities from 1960 to 2000	Divorce rate	Seemingly unrelated regression (SUR) analyses. Found no sign that the effect of divorce on homicide had reduced over time. Concluded that effect of divorce is less about stigma and signal of social disorganization and more about the reduction in social control.
Browne et al., 1999	US, 1980-95	n/a	Narrative analysis only. Looks at trends for intimate partner homicides by type and shows that both male and female perpetrated IP homicide fell sharply from 1980 to 1982 but between 1982 and 1992 female perpetrated IP homicide continued to fall while male-perpetrated IP homicide rose in line with male-perpetrated homicide generally. Concludes that changes to the policing of domestic violence and legal rights for women played a role in the initial fall but that other factors must explain the male rise thereafter.
Dawson et al., 2009	Canada from 1976 to 2001	Divorce, female employment	Arima models with controls. They found a significant positive relationship between divorce rates and spousal homicides, while increased female employment only predicted declines in spousal killings of women and increased education predicted reduced spousal homicide of men.
Franke et al., 1977	US, 1950 to 1964	Divorce	Correlation analysis. Finds a positive correlation between homicide and suicide for Whites and that being divorced predicts both.

Gartner et al., 1990	18 nations (including Eng & Wales) from 1950 to 1985	Family disruption, gender equality	Pooled time series modelling. The find that variables associated with non-traditional family roles (divorce, illegitimacy, female employment) reduce the gender gap in homicide victimisation and that rises in these variables may have put short term upward pressure on female homicide. But the simultaneous rise in women's status widens the gender gap and has a more long-term downward effect on female homicide.
Lehti et al, 2012	Finland, 1960-2009	n/a	Uses descriptive statistics and homicide analysis to suggest that the decline in child homicides in Finland was due to the medicalization of child birth, which increased the level of informal social control in children's earliest years, and social change linked to women's equality.
McCall et al., 2010	932 US cities from 1970 to 2000 (though fewer cities were included for some years)	Percentage of divorced males	Four separate cross-sectional analyses with differences over time discussed. Finds significant positive relationship between divorced males and homicide in all time periods though the effect lessens over time.
McCall et al., 2011	157 US cities from 1976 to 2005	Percentage of divorced males	Latent trajectory analysis. Divided cities into four groups based on homicide trajectory and found that cities with the highest homicide rates also had the highest percentage of divorced males but that the effect weakened over time.
Messner et al., 2011	Multiple nations, 1950 to 2005	Divorce rate	Found that the divorce rate was a significant, robust predictor of homicide rates in fixed-effects models.
	178 US cities from 1989 to 2001	Domesticity, domestic violence services.	Pooled time series model. Tested variables explained change in male-victim intimate partner (IP) homicide but not female-victim IP homicides. Concluded that opportunity was important - higher marriage and lower divorce predicted increased wife-on-husband homicides but not husband on wife killings. They found no support for a backlash hypothesis and increased female status was also a poor predictor of change in IP homicide.

Stamatel, 2014	33 nations from 1990 to 2005	n/a	Feasible generalized least squares regression. Finds that post-communist regional had higher rates of female homicide victimisation even when structural variables were controlled. Concluded that this may be due to a deterioration in women's status.
Wells and DeLeon-Granados, 2004	US, 1976-1996	n/a	Reviews trends and interventions relating to intimate partner homicide and concludes that policy interventions have probably reduced homicides in the aggregate but have been more beneficial for some groups than others.
Whaley et al., 2013	208 US cities, 1990 and 2000	Gender equality (index of female-to-male ratios including over 25s with 4yrs of college, median income etc)	Negative binomial models with controls. Find significant curvilinear relationship between gender equality and male homicide against women and men.

Many of the studies referenced in Table A6.3 note the fact that there has been a reasonable level of correlation between homicides rates and divorce rates in the US over the last 50-60 years, see Figure A6.2 below.

Figure A6.2: Trends in divorce rates and homicide rates in the US, 1960 to 2012

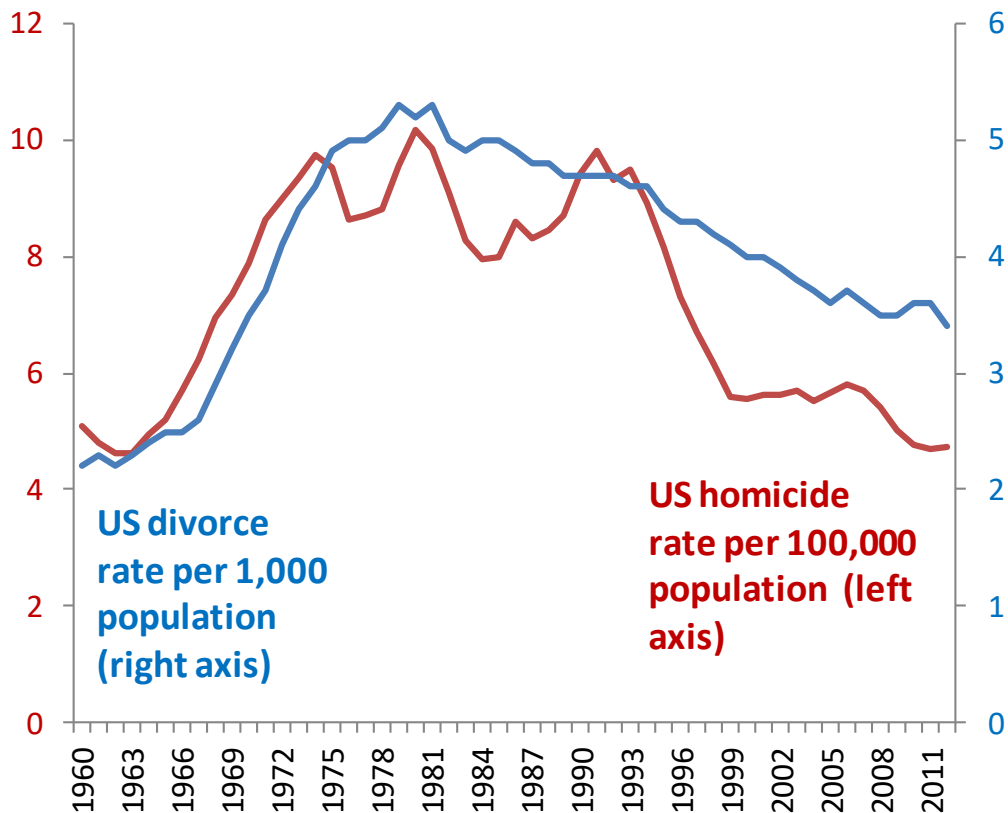


Figure A6.2 suggests the possibility of a positive relationship between divorce and *overall* homicide in the US. Like crime, divorce rates increased sharply from the mid 1960s to the mid 1970s, and have declined since, although there was no peak in divorce to match the early 1990s peak in homicide. Eight of the short-listed studies tested this relationship in multivariate models. Generally, they also found a positive significant relationship, though methodological quality varied.

The more robust of these studies used panel data and thus examined the relationship within multiple areas over time rather than simply over time in one area or in multiple areas at one point in time.

For example, Baumer and Wolff (2014) tested the relationship between homicide and divorce in 86 countries, including England and Wales, from 1989 to 2008. The coefficient on divorce was marginally significant in some models but not all, and overall the authors concluded that it was not one of the major drivers of homicide. By contrast, Messner et al., (2011) found that the divorce rate was a significant, robust predictor of homicide rates in their cross-national fixed-effects models, though they examined an earlier period: 1950 to 2005.

Other studies used data just from the US. Beaulieu and Messner (2009) tested the effect of divorce rates on homicide using data from 113 US cities between 1960 and 2000. They found that higher divorce rates predicted higher homicide rates and that the effect was consistent across the period. They concluded that this constancy was important for explaining the mechanism by which divorce might affect homicide. If rising divorce rates were simply a proxy for a wider rebellion against institutions generally and the nuclear family in particular (which is one formulation of the social disorganization perspective), then Beaulieu and Messner reasoned that the effect on homicide might be expected to wane over time. They argued that divorce no longer carried the same stigma by 2000 and was more socially accepted. They concluded instead that the effect of divorce was likely to be more mechanical and opportunity-based. Divorce meant more single-parent families which meant fewer resources available for parental monitoring of children and adolescents.

Arguably, there are issues with Beaulieu and Messner's conclusions. Firstly, their finding that more divorces predicted more homicide consistently over the period doesn't necessarily rule out the social disorganization explanation, as we understand it. Certainly, divorce in the 2000s no longer carried the stigma it did in the 1960s and cohabitation has become a widely accepted alternative to marriage. So, the fact they found a consistently strong relationship between divorce and homicide probably rules out the explanation that divorce acted as a symbol of the rejection of traditional institutions. By the 2000s this clearly wasn't the case. But the element of the hypothesis related to informal social control is perhaps harder to dismiss on these grounds. The potential for married individuals to feel a sense of responsibility due to their connection to wives and/or children would not wane – it seems to us – even

with the cultural acceptance of divorce. As such, the consistent relationship could imply either a mechanical opportunity effect (falling divorce means more couples stayed together hence more resources available for parental monitoring); or, a kind of character effect (falling divorce means more husbands retained that sense of responsibility and fewer adolescents experienced family break-up).⁹

McCall et al., (2010) used almost identical data and methodology to Beaulieu and Messner except they employed a different divorce variable. Instead of using the divorce rate by city, they used the percentage of divorced males in the population. This gave a slightly different result. The variable was again positive and significant for all four time periods, 1970, 1980, 1990 and 2000, but the size of the effect declined through the decades. Therefore, whilst they agreed with Beaulieu and Messner that divorce rates did appear to be a driver of homicide trends, they disagreed about the mechanism. They found in favour of the social disorganization model that changes in homicide were linked to divorce via a rejection of traditional institutions. This finding was reinforced by a second paper on the same subject, which used a latent trajectory model (McCall et al., 2011). This paper concluded that increased divorce drove up homicide because it reflected a rejection of the social bonds provided by traditional institutions like marriage. But that over time divorce became more commonplace and less stigmatizing making it less a symbol of that kind of rejection. Hence the relationship between divorce and homicide weakened.

Franke et al., (1977) also found a positive relationship between US homicide and divorce. However, their analysis simply involved bivariate correlation with no control variables, so was less robust than other studies.¹⁰ It is worth noting that none of the papers in this section had a complete set of control variables because of the difficulty in getting data for many potential drivers of homicide, like levels of gangs, organized crime or drug markets. This raises the possibility that the apparent effect of divorce rates on homicide is spurious and would disappear if additional control variables were included. It could be, for example, that surges in drug use and drug markets raise divorce rates *and* homicides.

But overall, these papers suggest the strong possibility of a positive relationship between divorce rates and homicide (which may have waned over time), although they disagree about whether the main mechanism involves opportunity or social disorganization. Before moving on it is also worth noting that, although our short-

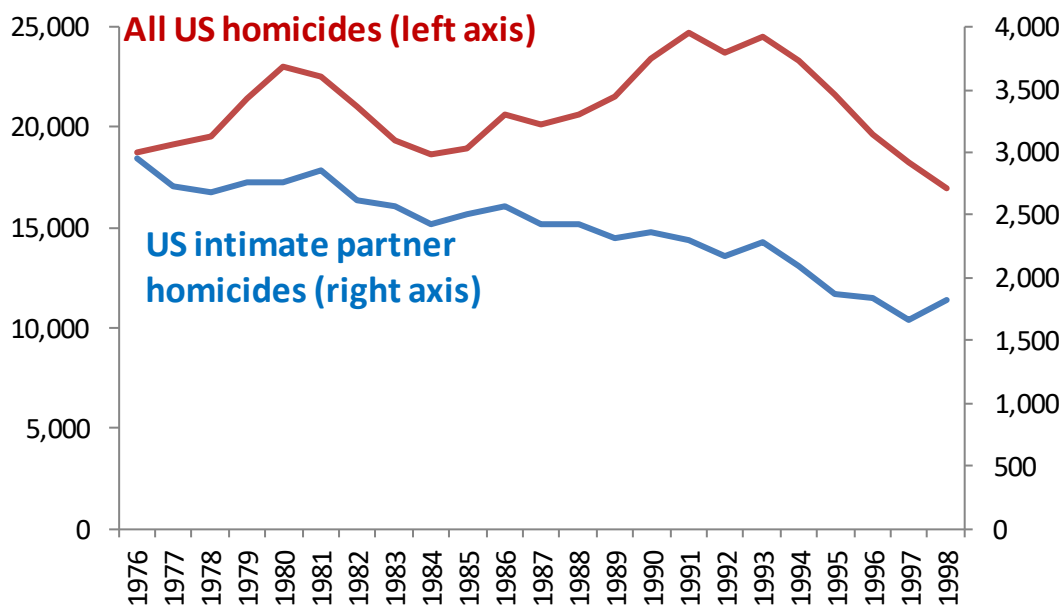
⁹ A further point is that the decline in divorce stigma and growth in cohabitation perhaps imply that a better measure to test against homicide (for both the opportunity and informal social control explanations) would be the rate of couple break-ups (both married and cohabiting). Splitting by those with and without adolescent children would also be informative.

¹⁰ Franke suggested that rather than divorce causing a reduction in parental monitoring or informal social control over the divorced male, a simpler explanation might be that the stress of divorce increased aggression in those with a predisposition for it.

listing process removed purely cross-sectional studies, much of the research in Table A6.3 noted that divorce rates are a robust predictor of homicide rates cross-sectionally in the US (see for example Land et al., 1990). That makes divorce relatively rare among potential explanatory variables in that it predicts homicide both cross-sectionally and over time.

A separate set of studies tested the effect of divorce not on homicide overall, but on a specific sub-set of homicides: those involving spouses or intimate partners. Related to this is an important fact about US homicide rates, pointed out by Rosenfeld (2000). He noted that the fastest falling homicide category in the US between 1980 and 1995 was family homicides. This was because numbers of homicides by intimate partners fell consistently from 1976 through two homicide peaks, see Figure A6.3. (Note the similarities here with the different male/female trends in England and Wales – see Annex 1 – and the gradually falling trend in intimate relationship homicides in sharp contrast to male-on-male acquaintance homicides. These facts are consistent with the short- and long-wave hypothesis set out in the conclusion to the main report.)

Figure A6.3: US trends in homicides and intimate partner homicides



Wells and DeLeon-Granados, (2004) showed that the fall in intimate partner homicide was driven by a fall in homicides among married couples. Homicides among cohabiting and separated couples increased through the period, reflecting wider societal changes towards greater willingness to cohabit before marriage and greater acceptance of divorce and separation. As such, several of the short-listed studies examined this falling trend and whether divorce rates and other related factors were involved.

At least three different potential mechanisms were proposed. The first is consistent with the opportunity approach, and is simply that by splitting up conflicted relationships, more divorce might be expected to reduce domestic homicides by separating potential victims from potential offenders.

A direct alternative, which would suggest the opposite relationship, is the so-called 'backlash' hypothesis. This suggests that divorce will have a positive relationship with intimate partner homicide because – as much separate evidence has suggested – while separation may reduce the frequency of domestic abuse it can also, at least initially, increase its seriousness (Gartner et al., 1999; Goetting, 1995). So, in this framework, more divorce might result in increased domestic homicide due to separation-related escalation of violence.

There is also a third hypothesis, which is most complex. It states that, increased divorce could result in decreased homicide, but with a possible time lag, due to changes in women's rights and bargaining powers. To understand this hypothesis it is important to know that – as in England Wales - the large increase in US divorce rates that preceded the fall in intimate partner homicide coincided with a change in divorce laws. The US introduced 'no-fault' divorce laws in 1969. This legislative change allowed women to leave unhappy or violent relationships. Previously both partners had to agree to a divorce, which in practice left many women unable to escape controlling and abusive husbands (Wolfers, 2006). Browne et al., (1999), Pinker (2011) and others have noted that divorce laws were just one aspect of the women's rights 'revolution' that occurred in the late 1960s and 1970s. Another major aspect was the changing attitude of the police. Browne et al., (1999) showed that before the early 1970s assaults against wives were considered misdemeanours rather than felonies in most US states meaning police were not empowered to arrest perpetrators. However, this changed through the 1970s along with other laws and practices like the introduction of emergency protection orders and the opening of help-lines and shelters for battered women.

Many authors suggest that this wider social change, linked to increasing rights for women, is a likely reason for any relationship between homicide and divorce rates. They argue that falling intimate partner violence in part reflected women's increased bargaining power. The change in divorce laws (coupled with the cultural recognition of the pervasiveness of domestic violence) provided a credible threat for those suffering abuse, and indeed, for those who might otherwise potentially have suffered it in the future. The law-change provided a culturally acceptable escape route for the first time. As many have noted, this might be expected to reduce levels of domestic abuse, and hence domestic homicide, even if the actual escape route was never used. In other words, it is possible that the change in divorce and increases in women's rights could reduce domestic homicide without any change in the opportunity structure of the relationship between intimate partners.

In trying to assess the validity of these three different approaches, a simple comparison of trends (see Figures A6.2 and A6.9 below) suggests that the opportunity-based explanation can be dismissed immediately. In both the US and England and Wales, the bivariate correlation is positive rather than negative. Divorce and homicide increased together in the late 1960s and as divorce rates decreased from their peak, so did intimate partner homicides. If the relationship were based on the physical confluence of intimate partners, we'd expect the opposite. Hence the basic trends appear to offer more support for the backlash and women's rights hypotheses: that divorce causes serious separation violence; or that the surge in divorce in the late 1960s helped to usher in an era of improved status for women, which reduced domestic violence thereafter.

However, the short-listed studies in this area reached differing conclusions. The most robust study, due to its quasi-experimental design, was probably Stevenson and Wolfers (2006), but they tested only whether the effect of adopting a no-fault divorce law affected subsequent homicide rates in US states. They exploited the variation in timing of divorce laws across states in a difference-in-difference model. Their results showed a 30 percent decline in domestic violence and a 10 percent decline in intimate-partner homicides of women in the decade after states enacted no-fault divorce laws. However, results also suggested that the decline in homicides may have started before the law's enactment. Overall Stevenson and Wolfers concluded that their results offered support for the women's right/bargaining hypothesis, but that opportunity may also have played a role via a lagged effect (i.e. that the surge in divorces reduced the opportunity for domestic violence over a longer time period.)

Reckdenwald and Parker (2012) found somewhat similar results using a different type of model and a different time period. They used a pooled time series model for 178 US cities and looked at the change from 1990 to 2000. Whilst they found no support for the notion that improvements in women's status predicted changes in intimate partner homicide, they did find that having fewer domestic violence services in a city predicted increased wife-on husband killings between 1990 and 2000. And they also found support for an opportunity effect but only in relation to intimate partner homicides of males. Higher marriage rates predicted increased wife-on-husband homicides between 1990 and 2000 but not husband-on-wife increases.

The latter finding is interesting because many of the more descriptive studies point out that the downward trend in intimate partner violence in the US was not evenly spread between male and female victimisation (Browne et al., 1999, Wells and DeLeon-Granados, 2004). It was made up of a large and consistent fall in female-on-male homicides and a smaller fall in male-on-female cases (which then reversed partially in the late 1980s in line with homicide generally). Mostly this was taken as evidence in favour of the women's rights hypothesis (or a lagged opportunity effect), given that backlash was seen largely as a male-perpetrated phenomenon. For

example, Browne et al., (1999) concluded that the fall in female-perpetrated homicides was due to the better availability of escape for women in abusive marriages. They cited Totman (1978), who conducted a prison survey which showed that female intimate partner murderers had often suffered repeated male aggression prior to the homicide.

Two studies examined Canadian data. Leenars and Lester (2001) found no relationship between divorce and male victimisation, but divorce was the only significant predictor of female victimisation. Dawson et al., (2009) found support for the opportunity framework in their results testing homicide trends against female education and employment levels. As these variables increased, the gap between female and male victimisation decreased, which is consistent with Cohen and Felson's theory that increased female orientation in activities outside the home would increase their victimisation levels. However, in relation to divorce, they found – like other studies - a positive significant relationship with spousal homicide. They noted that this was not consistent with the opportunity framework and suggested instead that the backlash or women's rights hypotheses provide better explanations.

Like virtually all the other studies in this section, Gartner and Pampel (1990) also found a positive relationship between divorce and homicide using data from 18 nations, including England and Wales, from 1950 to 1985. However, they also found that while higher rates of divorce and other measures of what they called 'non-traditional family roles' (divorce, illegitimacy, female employment) were associated with higher rates of female victimisation, variables associated with women's status predicted lower rates. Women's status also modified the adverse effect of women's non-traditional roles, which only affected female homicide victimisation in contexts of low female status. They concluded that the rise in non-traditional family set-ups and the raising of women's status may have put short-term upward pressure on female homicide rates but lowered them over the long-term.

The results of Whaley et al., (2013) reinforced this conclusion. They found that gender equality had a significant curvilinear relationship with male-on-female homicides across 208 US cities in 1990 and 2000. In other words, they found that the effect of women's status varied with the initial status. At very low levels, increasing women's rights led to rising male-perpetrated homicide due to male backlash at women's greater ability to exit abusive relationships. But once equality reached a certain level, further increases led to falling male-perpetrated homicide.

Similarly, Stamatel (2014) suggested that attitudes towards women may explain why post-communist nations had higher rates of female homicide victimisation even when standard structural variables were controlled for. She cited Nikolic-Ristanovic (2004) as evidence that the political transition from communism led to the deterioration of women's rights:

“...reproductive rights secured during socialism have been challenged; women’s domesticity is widely portrayed as a social virtue; pornography has come to symbolize freedom, and the marketing of women’s bodies is rising.

(Nikolic-Ristanovic, 2004)

Stamatel concluded that certain ‘values and beliefs shaping gender roles and status’, might explain the extra homicides in Eastern European nations which cannot be accounted for by structural variables. Pinker (2011) also found that shifts towards more ‘female-friendly’ values coincided with declines in violence and homicide and that the geographic regions in which women’s status remains relatively poor also have the highest rates of violence.

There were very few studies that analysed the potential long-term effect on homicide via the impact on younger children. One exception was Lehti et al., (2012) who argued that changing gender roles within the family contributed to a “*change in the moral climate of society*”. They found that expanding women’s rights (including in relation to divorce) and providing more control over fertility via birth control and abortion legalization contributed to the decline in child homicides in Finland. But they did not test whether it had a lagged effect on overall homicides.

To conclude, there are both consistencies and differences in the literature on divorce and homicide. The most consistent finding is that there was a positive, significant and contemporaneous relationship between divorce rates and homicide in the second half of the twentieth century both temporally (in multiple nations) and cross-sectionally in the US. In other words, higher divorce rates consistently predicted higher rates of homicide in the same time period. However, studies disagreed about whether that relationship has weakened over time, and also about the possible mechanism involved. For some, the most persuasive mechanism was not opportunity, but social disorganization in which divorce was either a symbol of the rejection of traditional values and institutions, like marriage; or it represented a reduction in informal social control, and the sense of responsibility that marriage arguably brings. For others however, opportunity was likely to be involved via the effect divorce had on the immediate guardianship of adolescents.

The studies which analysed the specific effect on *domestic* homicides reached somewhat similar conclusions. More divorces predicted more domestic homicides. This argues against a direct and immediate opportunity effect given that rising divorce would *reduce* the opportunity for spousal homicide in general. As such, these studies tended to find support instead for a backlash effect initially (i.e. that divorce drove separation violence), or that rising divorce was part of a wider social change involving increased women’s rights and status, which put upward pressure on homicide initially (via backlash) but downward pressure over time.

4) Guns and homicide

Annex one showed that while knives remain the most commonly used weapon in homicides within England and Wales, guns may have played a reasonably important role in the homicide decline during the 2000s.

The link between guns and homicide may seem obvious, but in fact there are a large number of very different theories about the relationship between the two. Several are consistent with the opportunity approach. Most obvious of these is the so-called 'weapon instrumentality hypothesis' which implies that gun availability increases the likely lethality of any violent conflict thus raising the opportunity for homicide. This is summed up (with some irony) by Kates and Polsby (2000):

"The narrative embedded in the instrumentality theory is essentially as follows: Everyone gets angry from time to time and almost anyone might get angry enough to lose control and run amok. Armed with a kitchen knife or even a hatchet, such persons would of course be dangerous, but far less so than if armed with a gun. Consequently, the proliferation of guns among ordinary people must, in and of itself, be a major cause for murder."¹¹

A related possibility is that guns act as facilitators (Clarke, 1995). That is, they encourage individuals to attack even those physically stronger than them. Guns may also facilitate homicide due to the distance involved. Some individuals might be reluctant to use knives or blunt weapons to kill someone in close proximity but would be less reluctant to pull the trigger to kill someone from some distance away.

These opportunity-based hypotheses both suggest that increased gun availability is likely to result in more homicide. However, some researchers have invoked opportunity theory to argue the opposite (Kleck, 1997; Lott, 2000 Lott & Mustard, 1997). They reason that gun ownership increases victim guardianship (i.e. victims are better protected) and therefore may reduce homicide by deterring offenders.

It's also important to point out that guns could drive homicide trends through methods other than opportunity. For example, the 'triggering hypothesis' suggests that guns might trigger aggressive tendencies in those who carry them or come into contact with them (Hepburn and Hemenway, 2004).

¹¹ It is worth noting that Kates and Polsby do not support the hypothesis themselves, so there is an element of irony in the certainty of this description.

Gun availability studies

There were 15 short-listed studies that examined the relationship between gun availability and homicide trends. Broadly speaking, these were divided into two categories. The first set looked at gun availability in general, often by employing a proxy like gun sales or gun suicides in a regression model. These studies, detailed in Table A6.4 below, will be examined first. The second set of studies, which assessed the effects of changes in the law relating to gun ownership, are discussed in the next section.

Table A6.4: Short-listed studies that examined the relationship between gun availability and homicide trends

Study	Area and time period	Opportunity variable	Method and finding
Alzheimer and Boswell, 2012	43 nations from 2000 to 2005	Gun availability proxied by the rate of gun suicides per 100,000 inhabitants	Fixed effects models with controls including for time and autocorrelation. Found that lagged levels of gun availability significantly influenced levels of gun homicide, but not overall homicide. For every 1% increase in gun availability, gun homicide decreased 0.15%. But results varied hugely when broken down into different groups of nations. For example, the relationship with gun homicide reversed in Eastern European nations.
Baumer, 2008.	114 US cities from 1980 to 2004	County firearm prevalence, measured by the proportion of gun suicides	Two-way fixed effects panel regression. Found a significant relationship between gun availability and overall homicide but not gun homicide.
Block, 1975	Chicago, 1965 to 1973	n/a	Descriptive statistics. Found an increase in the proportion of homicides involving young Black males, robbery homicides, gun homicides and homicides in which victim and offender did not know each other. Also found that homicide was focused in economically depressed areas of the city. Concluded that poverty and the availability of guns explained appear to be the overriding much of the increase in homicide.

Dighton, 1996	Chicago, 1964 to 1994	n/a	Descriptive statistics. Finds that gangs were responsible for a marked portion of the rise in homicide from 1987 to 1994 and that the switch from handguns to semiautomatic weapons as the gun of choice for gangs played an important role.
Duggan, 2001	US states and (separately) counties from 1980 to 1998	Gun ownership proxied by sales of gun enthusiast magazine.	Found significant positive relationship between changes in gun ownership and changes in homicide rates. Concluded that reduction in gun ownership explained a third of the extra decrease in gun homicides relative to other homicides between 1993 and 1998.
Farley, 1980	US, 1940 to 1977	n/a	Descriptive statistics. Finds that if there had been no increases in firearm murders, the homicide rates for non-Whites in the mid-1970s would have been about the same as in 1960.
Griffiths and Chavez, 2004	831 census tracts in the city of Chicago from 1980 to 1995	n/a	Exploratory Spatial Data Analysis and a semi-parametric, group-based trajectory procedure. Found that communities that comprise the most violent group were also the most volatile in terms of temporal changes in homicide rate. Concluded that structural variables can be only part of the explanation - they show where homicide trend will be driven - but not the sharp increases/decreases. Opportunity must also be a factor - guns spread and act as facilitators.
Hepburn and Hemenway, 2004	n/a	n/a	Review of individual-level case control and ecological studies. Found from the individual-level studies that having a gun in the home was a risk factor for homicide and that most of the ecological studies found a positive relationship between gun availability and homicide.
Kates and Polsby, 2000	US, 1946 to 1994	Handgun ownership	Correlation analysis. Found little correlation overall. Although there were periods where homicide and gun ownership rose in tandem, there were more periods where the relationship reversed.

Kleck, 1979	US, 1947 to 1973	Gun ownership (domestic sales plus imports)	Two-stage least squares model. Gun ownership - both total guns and number of handguns - had a positive significant effect on homicide rates. Concluded that gun ownership was an important component of the 1960s rise in homicide in the US.
Kleck, 1984	US, 1947 to 1978	Gun ownership (domestic sales plus imports)	Simultaneous equation model. Found that the relationship between gun ownership and homicide was due to homicide driving up gun ownership rather than vice versa.
Leyton, 2011	England and Wales and the US, long-term trends	n/a	Ethnographic, narrative approach. Argued that gun availability does not adequately explain the difference in homicide rates between England and Wales and the US because Europe had higher homicide rates before guns became available and nations with gun ownership levels similar to those in the US, like Switzerland and Canada, have some of the lowest homicide rates.
McDowall, 1991	Detroit from 1951 to 1986	Gun availability (proxied by relative frequency with which firearms are employed in robberies and suicides)	Two-stage least squares models with controls and lagged variables to account for autocorrelation. Found a significant relationship indicating that a 1% increase in the gun density index is associated with an increase of just over 1% in the homicide rate.
Sorenson and Berk, 2001	California, 1972 to 1993	Handgun sales	Time series analysis by ethnic and demographic group. Found that lagged handgun sales were positively related to homicides for virtually every age group of Black, Hispanic, and White males. There was no relationship for female homicides.
Zimring, 1977	Detroit, 1962 to 1974	n/a	Descriptive statistics and analysis. Found that robbery homicides increased at a greater rate than robberies. Concluded that increasing gun availability partly explains the rise in robbery-homicides in Detroit at that time.

The main methodological issue with studying the link between gun availability and homicide is that there is no direct measure of availability. Researchers have therefore been forced to use proxy measures in their models, including hunting licenses per capita, the percentage of robberies/suicides in which guns are used, numbers of handgun licenses, and so on. It is beyond the scope of this review to assess the validity of these measures, but interested readers are referred to

Hepburn and Hemenway (2004) for a discussion. It should be noted though, that the use of proxies adds a layer of uncertainty to all the results outlined below.

Another issue is that there were relatively few short-listed studies that used panel data (i.e. data with cross-sectional and temporal components). Panel data are generally thought to provide the best basis for examining causality. In this case though, the limited panel data studies available produced somewhat contradictory results.

For example, Altheimer and Boswell (2012) used data from 43 nations from 2000 to 2005. They tested gun availability proxied by the rate of gun suicides per 100,000 inhabitants with fixed effects models, including controls for time and autocorrelation. They found that lagged levels of gun availability significantly increased levels of gun homicide for Western nations, including the US, but that the relationship reversed for East European nations and for the sample as a whole. Using data for all nations their results implied that a 1% increase in gun availability decreased gun homicides by 0.15%. They concluded that:

“...the strength and nature of the relationship between gun availability and violence is contingent upon the region of the world that is examined. These results suggest that the extent that guns are considered the weapon of choice for the commission of violence is largely shaped by cultural and socio-historical factors.”

In other words, they found potential support both for a positive ‘weapons instrumentality’ relationship between guns and homicide and a ‘negative’ deterrence relationship, depending on the region of the world being studied.

Other panel data studies looked just at the relationship within the US. Duggan (2001) used sales of gun enthusiast magazine *Guns & Ammo* as a proxy for gun ownership. He tested the effect of this variable on homicide using panel data models at the US state and county level between 1980 and 1998 with state/county-specific trend dummies. Both regressions showed a positive significant relationship between gun ownership and homicide, and results with lagged variables indicated that gun ownership had a much greater impact on homicide rates than homicide rates had on gun ownership. Duggan also found that the effect was mainly through its impact on gun homicides and that the reduction in gun ownership explained a third of the extra decrease in gun homicides relative to other homicides between 1993 and 1998.

Cook and Ludwig (2006) also used county-level data for a similar period (1980 to 1999), but they used the proportion of suicides involving guns as their proxy for gun ownership. Their panel model also found a significant positive relationship between gun availability and both gun homicides and total homicides. This result and those of Duggan (2001) are consistent with Altheimer and Boswell’s finding that homicide and gun availability may be related positively in the US but not elsewhere.

However, Baumer (2008) obtained more equivocal results using panel data for 114 US cities and the proportion of gun suicides as the proxy for gun availability. For the period 1980 to 2004 he found a significant positive relationship in line with the other studies. But the effect dropped to insignificance when the period was reduced from 1980 to 2000 to allow for the inclusion of extra control variables.

For the most part, these findings reflect the long history of research on gun availability and homicide, which has produced similarly mixed findings. Most of the early studies analysing the relationship employed a purely cross-sectional design and hence have not been included in this review. However, many of the short-listed studies built upon this evidence so it is worth reviewing briefly.

Generally, the initial cross-sectional studies found a significant positive relationship. A greater availability of guns was mostly associated with higher rates of homicide whether the analysis was conducted on different geographical units within the US (Lester, 1988; Miller et al., 2002; Gius, 2009) or whether data from different nations was employed (Killias, 1993a, 1993b; Killias, van Kesteren & Rindlisbacher, 2001; Hemenway & Miller, 2000; Hemenway, Shinoda-Tagawa & Miller, 2002; Hoskin, 2001).

However, there were exceptions (e.g. Kleck and Paterson, 1993) and subsequent authors also argued that the cross-sectional results did not prove causality for two reasons. Firstly, the finding that states or cities with more guns also had more homicides could mean that gun availability drives homicide, but it might mean that a higher homicide rate drives more people to buy guns for protection. Secondly, cross-sectional analysis may be biased by outliers. For example, Kleck's (1997) re-analysis of the Killias (1993a) data revealed that the relationship between gun availability and homicide became insignificant when the United States was excluded. Others then showed that there was still a significant cross-national relationship between gun availability and *gun* homicides that was robust to the exclusion of the US (Hepburn and Hemenway, 2004).

A few early studies did examine the relationship between gun availability and homicide *trends* and hence were short-listed for this review. However, they also had mixed conclusions. For example, Gary Kleck investigated the relationship between gun ownership and homicide in the US in two separate papers and reached differing conclusions in each (Kleck 1979; Kleck 1984). The first paper covered the years 1947 to 1973 and found a positive significant relationship between gun ownership and homicide. But in the second, Kleck extended the time period to 1978 and added additional controls, including the robbery rate (which is highly correlated with homicide). This time the analysis suggested that rising homicide increased gun ownership rather than the other way around.

Sorenson and Berk (2001) analyzed the relationship between handgun sales and homicide in California from 1972 to 1993. They found that handgun sales were

positively related to homicides a year later for almost all age groups of Black, Hispanic, and White males. There was no association with female homicides. They concluded that increasing gun ownership played an important role in the rise in homicide. McDowall (1991) reached a very similar conclusion using time series analysis for gun availability and homicide in Detroit. He found a significant relationship indicating that a 1% increase in the rate of gun robberies and suicides was associated with an increase of just over 1% in the homicide rate.

However, Kates and Polsby (2000) reached a different conclusion using a longer time horizon. They examined the long-term correlation (1946-1994) in the US between homicide and and-gun ownership using data from Kleck (1997). They found little correlation overall. Although there were periods where homicide and gun ownership rose in tandem, there were more periods where the relationship reversed. Their analysis was less robust – they did not use control variables. But nevertheless it remains striking that gun sales in the US increased consistently between 1973 and 1997 such that gun ownership was 103% higher by 1997 and handgun ownership 160% higher, yet homicide was volatile and ultimately fell 28%. This does not suggest that the simplest versions of the opportunity framework holds – i.e. more guns always equal more homicides.

Even so, other reviews of this evidence have generally concluded that there is a stronger case for a positive relationship between gun availability and homicide than a negative relationship. In other words, that the instrumentality and facilitator aspects of gun ownership outweigh the deterrence aspect. For example, the Global Study on Homicide 2011 (UNODC, 2011), which reviewed existing evidence and analysed cross-sectional data from around the world, concluded that:

“...a significant body of literature tends to suggest that firearm availability predominantly represents a risk factor rather than a protective factor for homicide. In particular, a number of quantitative studies tend towards demonstrating a firearm prevalence-homicide association.”

A review by Hepburn and Hemenway (2004) reached a similar conclusion. This was partly a result of the cross-sectional findings and partly a result of individual-level case-control studies, in which results generally showed that having a gun in the home was a risk factor for homicide, particularly for female victimisation. However, Hepburn and Hemenway (2004) did acknowledge that times series studies had more mixed results. They reasoned that this was likely due in part to the difficulty of controlling for all factors and the problem of reverse causality. But they also argued that aggregate-level studies may be too imprecise to capture effects relating to homicides involving a relatively select group of individuals. With that critique in mind, it is worth exploring in more detail studies that attempted a more in-depth look at localities within the US.

Griffiths and Chavez (2004) examined homicide trends in Chicago at the neighbourhood level using both spatial and temporal analysis. Their findings agreed with previous research that Chicago's increase in total homicide in the early 1990s was primarily attributable to a rise in street-gun homicides and that homicides by other means generally fell through the period (see also Block, 1977; and Farley, 1980). Also in line with other evidence they found that gun homicides were very concentrated within certain neighbourhoods. However, their analysis showed that as homicide numbers rose, higher levels of gun homicide spread to previously less violent areas that bordered the high-homicide neighbourhoods. They noted that this could be due to diffusion of guns (if fear of violence promoted rising gun ownership in surrounding areas); or, that it could be due to gang or drug violence spilling over into nearby neighbourhoods. Importantly they also cited evidence showing that the rapid rise in homicide in Chicago coincided with a marked increase in the proportion of all firearm homicides that were committed with semiautomatic pistols, which rose from 23 percent in 1985 to 60 percent in 1993 (Wintemute, 2000).¹²

Griffiths and Chavez (2004) concluded that their combination of findings offered support for opportunity theory because they were consistent with the proposition that guns act as 'facilitators', making any conflict between individuals more likely to result in homicide. Furthermore, they argued that their findings might help resolve one of the problems associated with opportunity theory. That is that changes in routine activities are mostly gradual, whereas homicide often shifts very quickly. They argued that gun ownership among the most likely offenders and victims can change very rapidly, with potentially multiplicative effects occurring if the spread of guns coincides with an increase in their lethality, as seems to have occurred in Chicago with the shift to semi-automatic weapons in the early 1990s.

Like Griffiths and Chavez (2004), Dighton (1996) also studied Chicago and also reached the conclusion that guns and their increasing lethality – notably the shift to gangs using semi-automatic weapons - played an important role in the homicide increase. However, he only cited descriptive statistics. For example, he showed that from 1987 to 1994 the number of street-gang homicides involving semiautomatic weapons in Chicago jumped from 11 to 150.

O'Flaherty and Sethi (2010) reached a subtly different conclusion based on their examination of the homicide rise in Newark in the early 2000s. They found that guns were involved but that the relationship was complex. For example, while gun homicides accounted for the entirety of the increase, total shootings (i.e. including non-lethal incidents too) did not increase and the rise in homicide was not correlated with the usual proxies for rising gun availability like gun suicides. Furthermore, the rise was focused in a particular demographic: African American men aged over 30,

¹² Braga (2003) also noted a "shift from six-shot revolvers to higher capacity semiautomatic pistols among all crime handguns recovered by the Boston Police Department between 1981 and 1995."

which was not consistent with a general rise in gun availability. Hence the authors concluded that the lethality of weaponry had increased (there were more semi-automatic weapons used) but also that certain individuals' intent to kill also rose (shots per kill fell). More specifically, they argued that criminal justice system failure led to an environment in which gang-involved individuals (many of whom were now older) literally felt they needed to kill in order not to be killed.

From an opportunity perspective this evidence is partially supportive. It seems that in these specific instances of rising homicide, guns *did* act as facilitators and that the spread of more lethal semi-automatic weapons made any conflict even more likely to end in homicide. But it also suggests that the importance of 'opportunity' may vary depending on the individuals involved. Indeed, what these 'deep-dive' studies perhaps show is that what mattered most (for the US) was the spread of guns and their degree of lethality within certain groups rather than at the aggregate level. And that the mechanism linking guns and homicide in these individuals may be about more than just opportunity – the spread of guns might have larger effects than implied by their numbers alone, if they also increase a 'kill or be killed' mentality.

Unfortunately, there have been no similar in-depth studies on localities within England and Wales, to our knowledge. However, some short-listed research did examine national trends for England and Wales, mostly by comparison with the US. For example, Leyton (2011) noted that the two nations had hugely different levels of homicide yet were similar on many of the metrics generally seen as drivers of homicide: poverty, inequality, individualism, family disorganization and so on. He noted that the most obvious metric in which the two nations differed was gun availability. Ultimately though he concluded that gun availability did not provide a completely satisfactory explanation for the different homicide rates because England had more homicides before guns became available and nations with gun ownership levels similar to the US, like Switzerland and Canada, have some of the lowest homicide rates in the world.¹³

Zimring and Hawkins (1997) also looked at the difference between homicide rates in the US and England and Wales using descriptive statistics. They noted that while overall assault rates were comparable there were a greater number of woundings involving deadly weapons in the US. In relation to homicide they cited Clarke and Mayhew (1988) who demonstrated that the rate of gun homicide was 175 times higher in the US than England and Wales in the 1980s, while the non-gun homicide rate was only four times higher. The American authors concluded that: "*a combination of the ready availability of guns and the willingness to use maximum*

¹³ In relation to Canada, Silverman and Kennedy (1987) showed that, like in the US but unlike England and Wales, Canada has more homicides involving guns than knives or other weapons. But in Canada the dominant firearms are rifles and shotguns rather than handguns. This is true for all categories of homicide except stranger homicides.

force in interpersonal conflict is the most important single contribution to the high US death rate from violence. Our rate of assault is not exceptional; our death rate from assault is exceptional.”

It is hard to draw firm conclusions from the evidence in this section, partly due to the mixed findings and partly due to methodological shortcomings. However, the next section examines studies that tested the effects of laws influencing gun availability. In theory, these should provide a better test of the relationship.

Studies assessing the impact of gun control laws

There were 14 short-listed studies that examined the relationship between gun control laws and homicide. These are listed in Table A6.5 below.

Table A6.5: Short-listed studies examining the relationship between gun control laws and homicide

Study	Area and time period	Opportunity variable	Method and finding
Aneja et al., 2012	US states and, separately, US counties from 1977 to 2006	Effect of laws granting citizens the right to carry concealed handguns.	Various difference in difference models using dummy variables, spline regression and a hybrid. Found that right-to-carry laws significantly increased aggravated assault but no significant relationship with homicide.
Baker and McPhedran, 2007.	Australia, 1979 to 2004	Effect of 1997 gun buyback programme	Arima time series modelling. Found that the buyback programme had no discernible effect on homicide trends.
Chapman et al., 2006	Australia, 1979 to 2003	Effect of 1997 gun buyback programme	Negative binomial regression. Found that declines in firearm-related deaths accelerated after the reforms. However, the change in the homicide trend on its own was not statistically significant.
Donohue and Ayres, 2009	50 US states from 1977 to 2006	Effect of laws granting citizens the right to carry concealed handguns.	Regression with controls, year dummies, and state-level trends. Found that right-to-carry laws significantly increased aggravated assault but no significant relationship with homicide.

Duggan, 2001	US states from 1978 to 1992	Effect of laws granting citizens the right to carry concealed handguns.	Found that the change in right-to carry laws had little effect on gun ownership. . Concluded that reduction in gun ownership explained a third of the extra decrease in gun homicides relative to other homicides between 1993 and 1998.
Gius, 2014	50 US states from 1980 to 2009	Gun availability (concealed weapons laws and assault weapons bans)	Used fixed effects regression with state and year dummies. Found that assault bans had no effect on gun homicides and that concealed weapons laws had a significant positive effect. Concluded that either guns act as a deterrent or the most murderous states had the toughest laws. Found no significant relationship between right-to-carry laws and homicide.
Grambsch, 2008	25 US states, 1976 to 2001	Effect of laws granting citizens the right to carry concealed handguns.	Fixed and random effects models with controls for regression to the mean. Finds that when regression to mean is not controlled for, there is no significant effect of the law but when this control was included there was a positive significant effect.
Lanza, 2014	50 US states from 2007 to 2010	Effect of gun control laws measured via an index of gun laws known as the 'Brady score'.	Ordinary least squares, lagged dependent variable, fixed and random effects regressions. Found a consistently significant relationship between most restrictive gun laws and homicide rates.
Leenars and Lester, 2001	Canada, 1969 to 1985	Effect of gun control law	Interrupted time series analysis with controls, including for serial correlation. Found that the law was associated with a significant decline in the overall homicide rate and a non-significant fall in gun homicides.
Leigh and Neill, 2010	Australia states from 1990 to 2003	Effect of 1997 gun buyback programme	Difference in difference models. Found that the programme had a large and significant effect on gun homicides and suicides though the estimate on homicide was imprecise.
Loftin et al., 1991	District of Columbia, US, from 1968 to 1987	Effect of 1976 law banning purchase, sale and possession of handguns.	Pre-post comparison using non-gun homicides and trends in neighbouring states as controls. Found that gun homicides and suicides dropped after the ban whereas homicides by other means were unaffected.

Lott and Mustard, 1997	U.S counties from 1977 to 1992	Effect of laws granting citizens the right to carry concealed handguns.	Found a significantly lower rate of violent crime, including homicide, in states after they adopted the law. But also found some substitution into property crime. Concluded that the laws deterred offenders through fear of reprisal.
Moody et al., 2014	US counties and US states from 1977 to 2006	Effect of laws granting citizens the right to carry concealed handguns.	Hybrid difference in difference models. Finds that adding additional controls (a full set of demographic controls and a lagged dependent variable to capture dynamic effects) changes the results recorded by others. They concluded that the only consistent result across models was that the laws reduced murder rates.
Seitz, 1972	US, 1968 to 1970	Effectiveness of gun control laws.	Correlation analysis and regression model. Found a strong correlation between firearms homicides and overall homicides and a relationship between gun control laws and homicide reductions that were greater for White victimisation than Black victimisation.

In theory, these might provide better evidence to support the existence of a positive or negative causal relationship between gun availability and homicide. None of the studies from the previous section were experimental because they lacked prospective control groups. But the studies in this section can be considered at least quasi-experimental, provided that:

- the implementation of the gun-control law resulted in a change in gun availability; and
- the reason for the law's introduction was unrelated to homicide trends.

The extent to which these conditions were met within each study is therefore discussed below. Regardless though, there is a different, but important, limitation with this evidence for the purposes of the current review. None of the studies in Table A6.5 used data from England and Wales. One looked at gun control policies in Canada, three examined a specific gun programme in Australia but most analysed policies or law-changes in the United States. Given the results from the previous section suggesting that cultural differences may play a role in the relationship between guns and homicide, the extent to which the results in this section are applicable to England and Wales is unclear.

The majority of the studies in Table A6.5 assessed the impact of so-called 'right-to-carry' (RTC) laws in the US. These concern how permits are issued to those who wish to carry concealed weapons, mainly handguns. There are four broad types of law, though in practice the first two are often grouped together. These are

unrestricted access – i.e. no permit is required – and ‘shall issue’ permits, which means that anyone who applies for a permit can have one. The third type of law is ‘may issue’ in which the decision to issue a permit is at the discretion of the state or local authority and the final type is an outright ban in which no citizens are allowed to carry concealed weapons. The studies take advantage of the fact that many states changed the type of law employed over the course of the last 30 years, which provides grounds for a quasi-experimental test of the relationship between gun availability and crime (given that the above conditions are met). Mostly states moved from ‘may issue’ to ‘shall issue’ laws. They therefore became *less* restrictive and so we might expect gun availability to have increased in these states after the change.

Unfortunately though, studies that have tested the effect of the law-changes differ both in methodology and results. For example, even though Aneja et al., (2012), Donohue and Ayres, 2009, Lott and Mustard (1997), Gius (2014) and Moody et al., (2014) use mostly the same data (for US states and counties from the late 1970s through to the 2000s), they reached opposite conclusions. The authors of the first two studies found that changes in RTC laws had no significant effect on homicide rates, while the latter three studies concluded that moving from may-issue to shall-issue laws *reduced* homicide rates. In other words, they found some evidence for a deterrence effect of handgun availability.

The difference in results is driven by different econometric methodologies and it is beyond the scope of this review to resolve this ongoing debate. But briefly, the chief issues concern whether individual-level state trends should be included in the model; which control variables are used; and the degree of aggregation of the data.

As such, it is hard to draw firm conclusions from the evidence on right-to-carry laws. However, a few points can be made. There is certainly no strong evidence that the move to may-issue laws led to a significant *increase* in homicide. Most studies found either no effect on homicide or a negative effect. Only one study, by Patricia Grambsch (2008), found a *positive* significant effect. She used fixed and random effects models with controls for regression to the mean. It appears to be the latter inclusion that drove her different results.

It is also important to point out that one possible reason why it has been so hard to reach a consensus on the law’s effect may be because it is not clear whether the law-changes actually had an effect on gun availability. For example, Duggan (2001) found that moving to the ‘shall issue’ law did not have a significant effect on gun ownership, measured via sales of gun enthusiast magazines. This removes one of the conditions for the quasi-experiment. If the law did not actually change gun

availability then the studies examining it are not really testing the proposition that more guns increase/decrease the 'opportunity' for homicide.¹⁴

Unfortunately, the studies in Table A6.5 examining the assault weapons ban in the US suffer from similar issues. In 1994 a law was passed in the US that banned for ten years the domestic manufacture, sale and possession' of certain types of semi-automatic weapons, particularly those designated as 'assault weapons' and those with ammunition feeding devices holding more than ten rounds (Koper, 2004; Koper, 2013). However, existing assault weapons were excluded from the ban and evidence suggested imports of the banned weapons made up for the drop in domestic manufacture (ibid.). Furthermore, only a relatively small percentage of gun crimes – about a quarter at most - involved the 'banned' weapons anyway (ibid.) In other words, it is not clear that this law-change had any significant effect on gun availability either. As a result, it is perhaps not surprising that the short-listed studies which evaluated the law all found no effect on US homicide rates (Duggan, 2001; Koper and Roth, 2002; Koper, 2004; Koper, 2013, Gius, 2014).

However, though the ban appeared to have no significant effect on homicide trends in the US, it is possible that it did have an effect on trends in Mexico. Two short-listed studies examined the effect that *lifting* the ban had on Mexican homicide rates during the period of the drug cartel wars in the 2000s (Dube et al., 2013; Chicoine, 2011). The authors reasoned that trafficking of newly available assault weapons from the US into Mexico may have helped fuel the rise in Mexican homicide that coincided with the ending of the assault weapon ban. Indeed Chicoine (2011) pointed out that after rising in the early 1990s Mexican homicide rates fell consistently through the decade of the US ban from 1994 to 2004 and then started increasing sharply from 2004 to 2010 after the ban was lifted. He also cited evidence showing that police recovered up to 85,000 weapons traceable to the US during the first few years of the Mexican drug wars. (For more on these, see the drugs annex.)

Both studies used difference-in-difference models to test for the effect though with slightly different identification strategies. Dube et al, (2013) exploited the fact that the state of California retained the assault weapons ban in 2004 when other states lifted it. They compared Mexican homicides in the border regions with California with those in other border regions and found that the regions bordering California had smaller increases. Chicoine (2011) instead divided all Mexican states into those affected most by cartel activity and those which were not. He reasoned that it was mainly cartels that would traffic assault weapons in from the US, hence any impact would be felt disproportionately. He also found a positive significant effect for assault weapon

¹⁴ Importantly, this does not mean that the law-changes had no homicide-relevant effects. For example if criminals believed more potential victims would carry guns as a result of the law it might be possible to still get a deterrence effect, though Duggan (2001) found no evidence for this and such an effect would be outside a purely opportunity-based framework.

availability and concluded that the lifting of the US ban might explain around 16% of the rise in Mexican homicide between 2004 and 2008. While the analytical strategies of these papers can be questioned (it could be argued that the Chicoine paper in particular tested the effect of cartel warfare as much as it did assault weapons¹⁵), other, more ethnographic, evidence also suggests that the importation of highly lethal weapons from the US played some role in the very large increases in Mexican homicide up to 2010 (see for example, Grillo, 2011).

There is another group of studies that examined specific changes in gun-related legislation in different locations. For example, Lanza (2014) noted that although the US congress did not renew the assault weapons ban at the federal level, many states did enact more restrictive gun laws in the latter half of the 2000s. He therefore used this variation, measured via the 'Brady score' (a state-level index of gun legislation created by the Brady Campaign to Prevent Gun Violence) in a number of panel-data models for the years 2007 to 2010. Results showed that tougher gun restrictions were consistently related to lower homicide rates.

Similarly, Leenars and Lester (2001) tested the effect of more restrictive gun control law in Canada using an interrupted time series design. They found that it drove a significant decline in the overall homicide rate and a non-significant fall in gun homicides. But they also noted that the law was accompanied by changes to the punishment for gun crime (making them more severe) hence it is possible that deterrence also played a role.

Loftin et al. (1991) found that gun homicides and suicides dropped after a 1976 ban on the purchase, sale and possession of handguns in the District of Columbia and Seitz (1972) found that the presence of gun control laws in a state reduced homicide by restricting gun availability but that this varied by group. There was more of a reduction in White homicides than Black victimisation. He concluded, like Altheimer and Boswell (2012) above, that cultural differences may affect the relationship between gun availability and homicide across groups.

Many argue that the best test of the effect of gun control laws on homicide was provided by Australia, because the Australian policy had a much clearer effect on gun availability. The reform was enacted following the murder of 35 people in Tasmania in 1996. The following year, the Australian government tightened firearm legislation across all Australian states including the banning of certain weapons (similar to the assault weapon ban in the US), but, unlike in the US, the existing stock of these weapons was not exempted. Instead the government offered to buy these weapons back at market prices. This resulted in the purchase and then

¹⁵ Chicoine did anticipate this critique and included a robustness check as a result. He removed the two states most affected by the war between the Juarez and Sinaloa cartels. The effect of assault weapon ban being lifted remained significant and of a similar magnitude.

destruction of about 650,000 guns, which reduced Australia's stock of firearms by about 20% (Leigh and Neill, 2010).

Three short-listed papers examined the effect of this policy on Australian homicide rates. Again, there was no clear consensus across the studies, but generally the balance of evidence seems to support the conclusion that the policy had a crime reduction effect. Chapman et al., (2006) used negative binomial regression and changes in death rates before and after the intervention. They showed that in the 18 years before the gun law reforms, there were 13 mass shootings in Australia, and none in the 10.5 years afterwards. They also found that declines in other firearm-related deaths accelerated after the reforms. However, the change in the homicide trend on its own was not statistically significant and another paper using Arima time-series modelling by Baker and McPhedran (2007) concluded that the buyback programme had no discernible effect on homicide trends.

However, two later panel-data studies, employing arguably stronger research designs, found in favour of the programme. Leigh and Neill (2010) used variation in the rate of buybacks across states and a state-level difference-in-difference model from 1990 to 2003. They found a negative relationship between the buyback rate and gun homicides and suicides. The more guns that were destroyed in a state, the more the overall death rate fell; and the effect was substantial. They estimated that overall the buyback drove an 80% reduction in suicides and homicides involving guns. However, the authors found that the effect on suicide was clearer than on homicide, partly because Australia had relatively few gun homicides before the ban – only around 0.37 per 100,000 people, which dropped to 0.15 per 100,000 a decade after the ban. Taylor and Li (2015) used a similar approach but obtained more precise estimates by testing the effect on the larger offence category of attempted murder rather than homicide. They found reasonable evidence that the buyback scheme reduced attempted murder offences.¹⁶

Summarizing the evidence from the last two sections, covering the relationship between gun availability and homicide, is not straight forward. There is much methodological disagreement and results are mixed. However, overall the balance of the evidence seems to suggest that gun availability can be a factor in driving homicide trends and that gun control can reduce homicide. From the perspective of the opportunity framework, this suggests that there is probably some truth to the instrumentality/facilitator hypotheses and that that these generally over-ride any deterrence effect.

However, the gun availability effect is often relatively small and seemingly can be over-ridden by other factors in certain places and in certain times. Also – for a gun control measure to be effective – it must actually affect gun availability in a significant

¹⁶ This was not one of the short-listed studies because it did not specifically test homicide.

way. The US experience provides clear evidence that banning one group of weapons will largely result in displacement if other similar types remain available or the banned weapon is obtainable through other means. Finally – the extent that gun availability matters clearly seems to change depending on the population of individuals and the type of firearms involved. In many ways this is common sense. The sudden proliferation of semi-automatic weapons among two warring urban street-gangs is likely to have a much bigger impact on the homicide rates than the proliferation of other types of guns among different populations. But if the effect of gun availability varies depending on which individual it is available to, this means that opportunity can only be part of the story and that other drivers like drugs or character must also play a role.

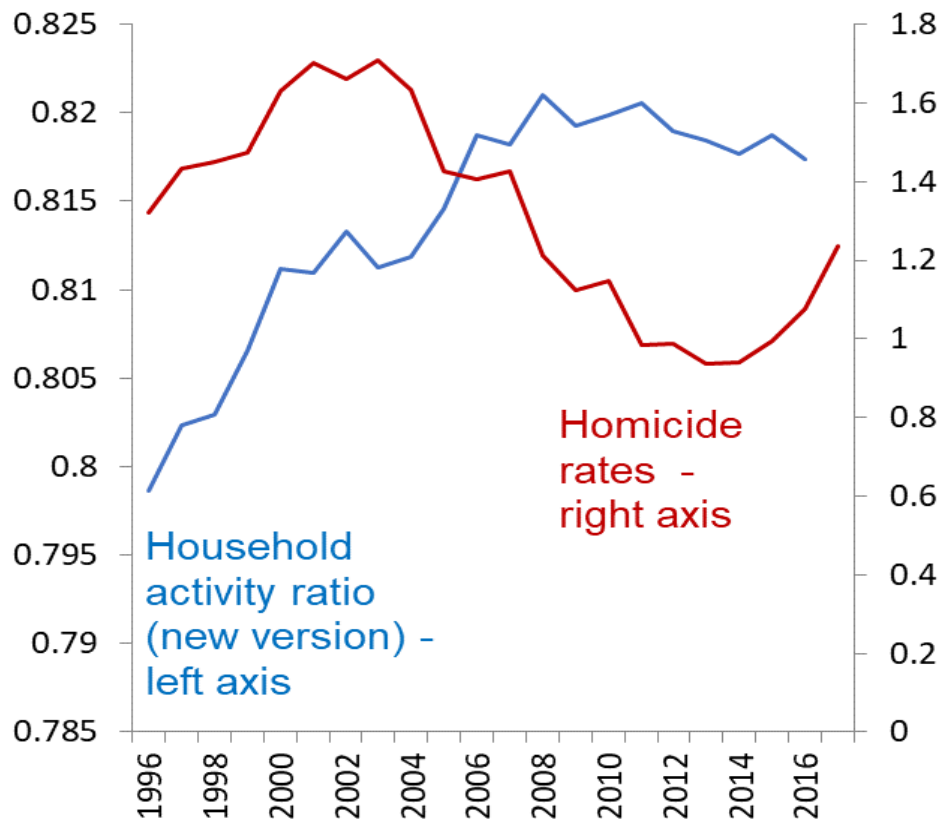
England and Wales evidence

This section takes the evidence reviewed above and applies it to trends for England and Wales. The aim is not to fully test any of the above hypotheses, but instead to briefly display available data and evidence to help judge which hypotheses warrant further investigation.

The evidence on routine activities highlighted changes in employment, household status and lifestyle as possible drivers of homicide via the alteration these caused in people's daily routines. In particular, the seminal study by Cohen and Felson (1979) suggested that increases in the number of households in which individuals were routinely engaged in out-of-home activities might increase the opportunity for violence and homicide. As such, we attempted to recreate their measure – the 'household activity ratio' - for England and Wales. Unfortunately, the exact data required could not be located. However, we have created what we hope is a measure that captures the spirit of Cohen and Felson's original. Our measure uses UK data from 1996 to 2015 from the Labour Force Survey, which divides up households by the type of families/individuals involved and whether they have dependent children. For the at-risk households we – like Cohen and Felson – include all non-couple households (so single-person households, households with two or more unrelated adults) as well as couple and lone parent households with women in the workplace.¹⁷ This was turned into a ratio by dividing by total households. The result is shown below alongside the homicide trend in England and Wales.

¹⁷ This was calculated by dividing the couple/lone parent households between those with dependent children and those without and multiplying the same-year employment rates for women with/without dependent children.

Figure A6.4: UK household activity ratio (new version) and homicides in England and Wales, 1996 to 2017

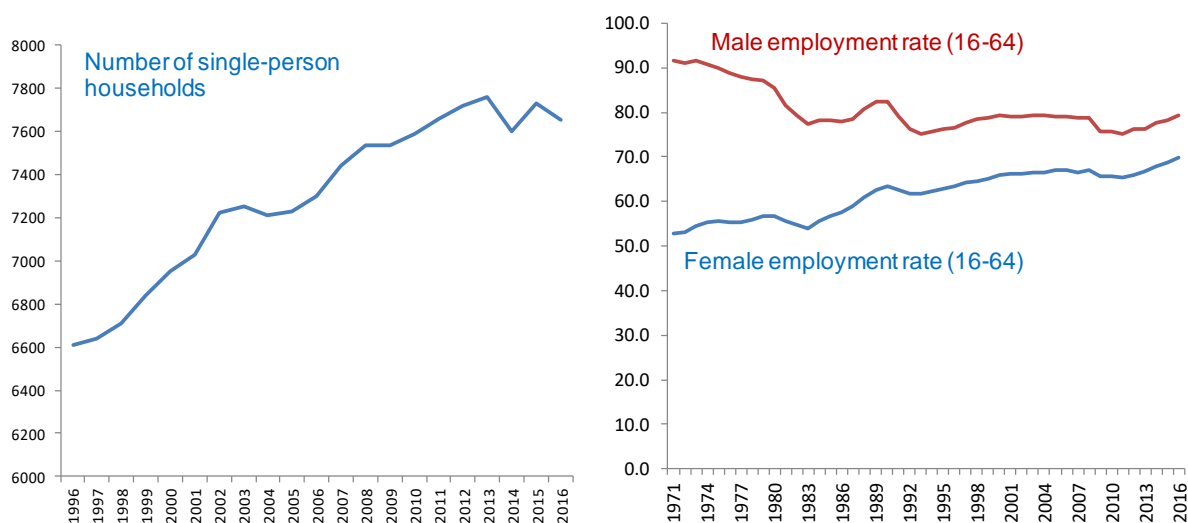


Sources: Police recorded crime homicide series (excluding Shipman and Hillsborough cases); ONS Labour Force Survey data.

Notes: From 1997/98 on the homicide series is measured in financial years. So the value shown as 1997 is actually 1997/98

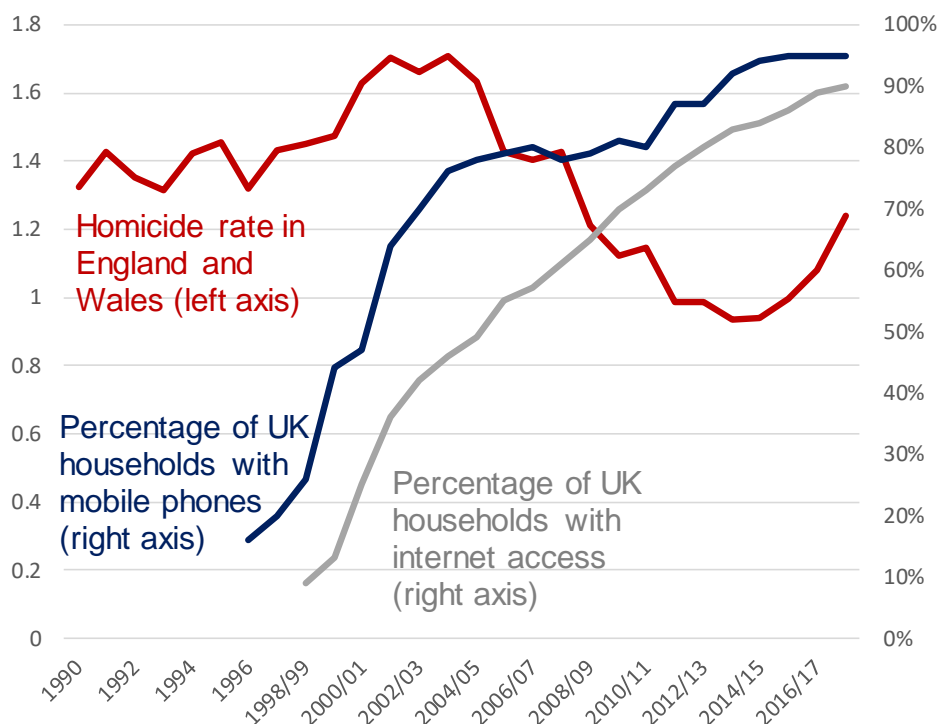
Figure A6.4 doesn't immediately suggest a strong relationship between our version of the household activity ratio and homicide in England and Wales. Whilst the proportion of at-risk households increased alongside homicide from 1996 to 2002, the ratio continued to rise for several years after homicide began falling. In addition, the ratio has largely remained at that high level from 2008 to 2016 as homicide has first fallen and then risen. It could be argued that our ratio is conceptually different from Cohen and Felson's, but it seems unlikely that the genuine measure would correlate well with the fall in homicide to 2014 given that two of its key components: single-person households and female employment continue to be at historically high levels.

Figure A6.5: Number of single-person UK households and UK employment rates



Other studies reviewed in the routine activities section looked at changes in lifestyle. Some suggested that changes in youth behaviour might help to explain the homicide decline, notably a switch from spending time outside the home socialising in the night-time economy to spending more time inside the home socialising online. Figure A6.6 explores trends in this area.

Figure A6.6: Mobile phone subscriptions, internet access and homicides



Sources: Police recorded crime excluding Shipman and Hillsborough cases; Statista¹⁸

¹⁸ See: <https://www.statista.com/statistics/275999/household-internet-penetration-in-great-britain/> and <https://www.statista.com/statistics/289167/mobile-phone-penetration-in-the-uk/>

Figure A6.6 suggests that mobile phones and/or increasing use of the internet could have played some role in the homicide decline. Both mobile phone subscriptions and the proportion of households with internet access were very low until around 1998, at which point they increased markedly. Shortly after that, homicide started falling after more than 40 years of increase. The literature-review evidence suggested that the theory that mobile phones provide greater guardianship is unlikely to be a strong explanatory factor, but increasing internet usage emerged as a stronger candidate, and cannot be ruled out on the basis of the trends above. However, the recent rise in homicide does cast some doubt on this hypothesis. Indeed, internet-driven social media use by gangs and drug selling groups (to incite violence and glorify weapons and proceeds from illicit drug sales) has been cited as a possible reason for the recent *rise* in homicide from 2014 (Irwin-Rogers et al., 2018). Possibly the advent of the internet has changed routine activities for most youth in a way that would drive homicide down, but that for a minority involved with gang or drug activity it has exacerbated violent tensions. However, at the moment this needs more robust testing.¹⁹

Other short-listed studies looked at shifts in night-time economy activity as possible reasons for both the rise and fall in homicide. There is a reasonable amount of relevant UK research in this area although it mostly examines violence generally, rather than homicide specifically. It is also mostly qualitative rather than quantitative. It links the routine activity approach of Cohen and Felson (1979) with situational crime prevention and the 'security hypothesis' that partly grew out of that framework (Farrell et al., 2011). This body of research suggests that crime will rise and fall in response to situational factors and hence that growth in security measures and/or situational changes in the night-time economy could have driven the rise and fall in violence and homicide. Summarising this literature, Garius (2016) cites the following factors in relation to the rise in violence:

- Post-war urbanisation, which drove a massive rise in night-time economy activity from the 1960s (Fischer, 1981; cited in Garius, 2016)
- De-industrialization in the 1980s and the birth of the "24-hour city" based on night-time entertainment (Bianchini, 1995; Hollands, 1997, Heath, 1997; Lovatt and O'Connor, 1995).

And for the fall:

- Policy and other changes aimed at pacifying the night-time economy. For example, the Public Entertainments Licences Act (1997), which allowed local authorities to revoke the licenses of clubs with substance and disorder problems;

¹⁹ An important point for this hypothesis is the general switch to smartphones that occurred from 2011 to 2014. That made social media access essentially permanent, which may have affected gang culture in such a way as to make it more violent.

and the 2003 Licensing Act, which aimed to spread out closing times to prevent the sudden confluence of lots of (potentially drunken) people exiting establishments at the same time;

- Changes to the physical environment of the night-time economy. For example, design changes within venues to reduce over-crowding and the removal of bottles and shatter-proof glasses to prevent them being used as weapons;
- Changes in security involved with the night-time economy including the installation of more CCTV and the proliferation of private security measures and staff;²⁰
- Growth in the off-trade relative to the on-trade meaning more alcohol consumption at home rather than in the night-time economy.
- Diversity in establishments and people. For example the adoption of a more European cafe-culture and a greater desire to attract women as well as men.

Most of the studies that have examined the hypothesis have simply noted the correlation between these things and the trends in violence and homicide in a qualitative way. Garius (2016) is a welcome exception in also using quantitative analysis. She looked at violence rather than homicide specifically. Garius used the Crime Survey of England and Wales to investigate trends in night-time economy violence and whether they correlated (amongst other things) with trends in bar/pub/nightclub visitation. Her research showed that an increasing number of young people have shunned bars and night-clubs since 1999.

²⁰ Garius cites Jayne et al., 2006 who noted that Nottingham city centre attracts about 30,000 people on Saturday evenings and is policed by just 15 officers yet has around 4,000 bouncers and private security guards.

Figure A6.7: Indexed proportion of CSEW respondents reporting zero visitations to a pub/bar in the last month (1997 = 100), by age group

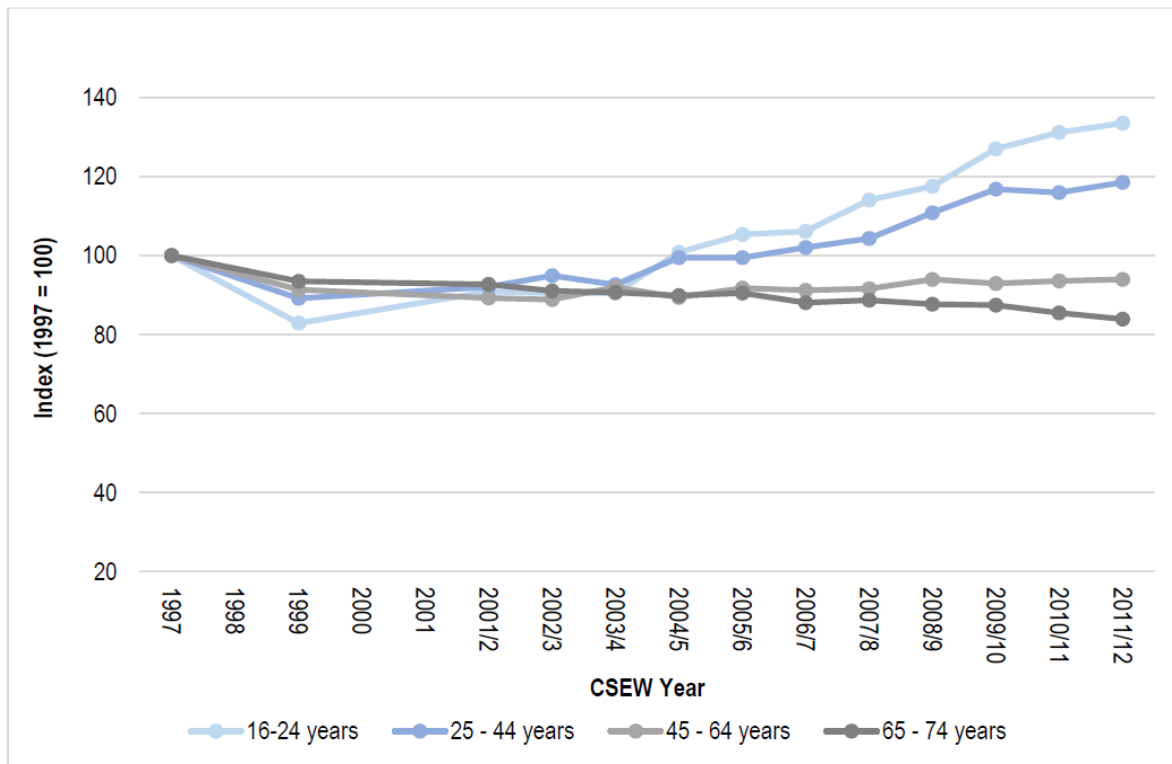


Figure 7.8. Indexed Proportion of CSEW Respondents Reporting Zero Visitations to a Pub/Bar in the Last Month (1997 = 100) by Age Group, 1997 – 2011/12⁷¹

From 1999, an increasing proportion of 16-24 year-olds reported that they hadn't been to a bar or pub in the last month and from 2003/04 levels of non-participation for 16-44s started rising markedly above their 1997 levels. Garius (2016) also showed similar trends for night-club participation and that both were matched by corresponding *downward* trends in the number of people visiting these establishments on a regular basis. Whilst the change in night-time economy activity from 2003/04 doesn't correlate particularly well with the turning point in CSEW violence (which was in 1995) it does fit with the turning point in homicide.

Garius also showed that lifestyle factors influence victimisation risk – i.e. people who spent more time outside the home and attended pubs and clubs more were more likely to be victims of night-time economy violence. In other words, she found some support for an opportunity-based explanation of trends in violence, if not homicide.

However, there are many further questions to be answered. For example, Garius acknowledged that the night-time economy itself may not have reduced in size as crime fell. The number of on- and off-licensed premises increased by 4% between 1999 and 2009 (DCMS cited in Garius, 2016). So what changed does not seem to

be the situational environment but people's willingness to engage with it. This could point to a character-related explanation as much as an opportunity-based one.

Furthermore, Garius noted that a fifth of all violent incidents in 2002/03 occurred around pubs or clubs (Jowell et al., 2005). But that means that four-fifths didn't. And although Garius showed that violence in the night-time economy (NTE) fell 55% between 1995 and 2011/12, total CSEW violence fell 58% over the same period so the overall trend wasn't being obviously driven by a fall in NTE violence (i.e. all other types of violence fell at a slightly faster rate). This perhaps implies either that another, non-situational factor, drove falls in all types of violence; or that situational changes in the NTE affected other types of violence as well through some as yet unexplained mechanism.²¹

This hypothesis also has only partial support during the recent rise in homicide from 2014. Alcohol consumption has increased only slightly as homicide has surged since 2014 (see Annex 3) and data suggest that the decline in NTE attendance has continued.²² Furthermore, Annex 1 showed that drug-related, rather than alcohol-related homicides, seem to be more important in driving current trends.

Overall then, the hypothesis that violence fell in part because young people's routine activities switched to some extent from the night-time economy (NTE) sphere to the online sphere has some support in the literature and in the England and Wales trends. But there are also gaps in the evidence, and much of it is non-quantitative, so further testing is required.²³ It also does not seem to explain the recent rise in homicide. There has been no great return to NTE activity.

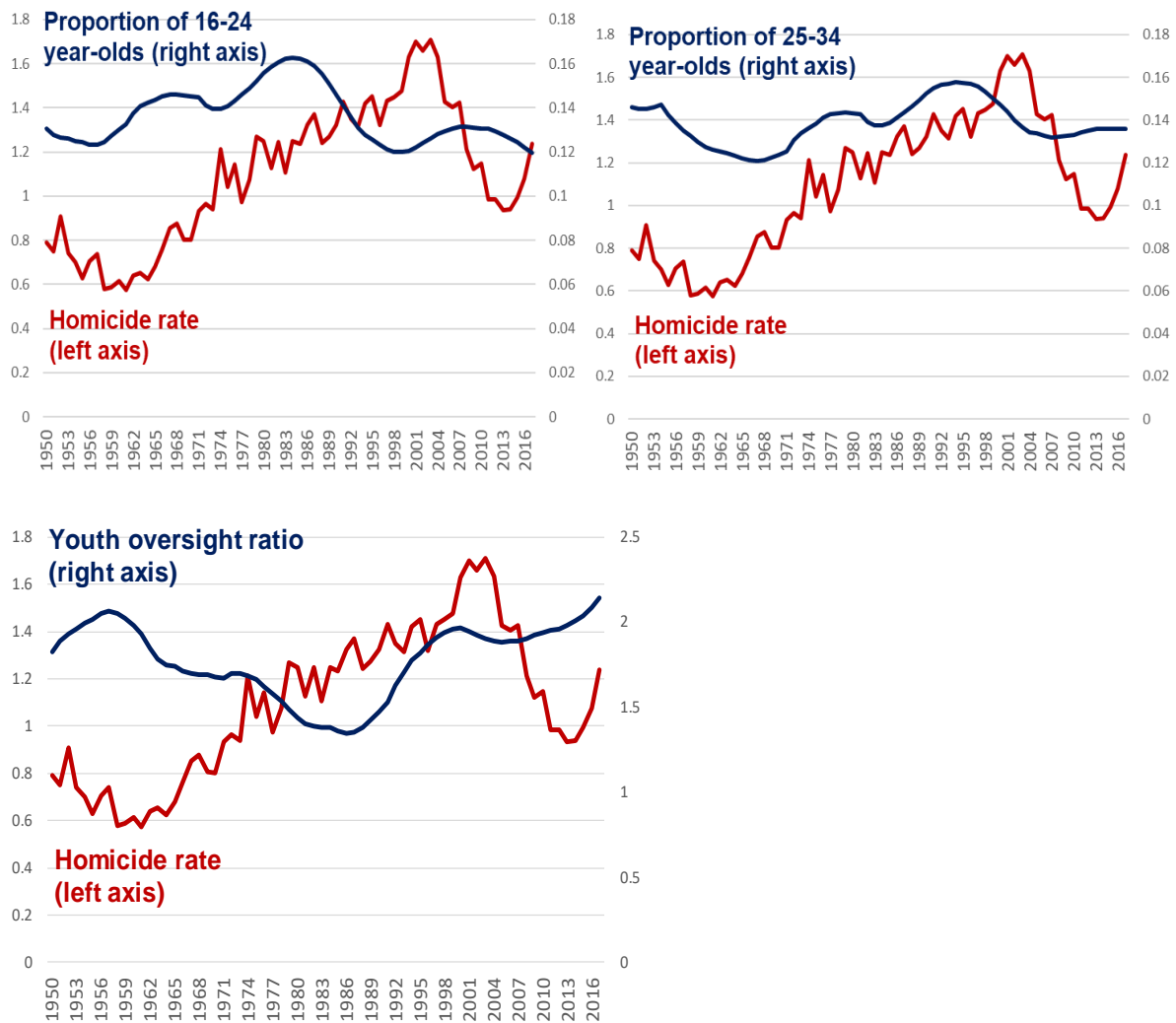
The second strand of evidence reviewed in this annex involved demographics. Relevant demographic trends for England and Wales are shown below.

²¹ Linked to this, the shift to the off-trade and home drinking should – from a situational perspective - have driven a rise in domestic violence/homicide incidents. Yet the figures suggest domestic incidents have fallen at a similar rate.

²² See for example: <https://www.theguardian.com/music/2018/dec/31/uk-nightclubs-suffer-young-people-look-for-less-hedonistic-pursuits>

²³ Related to this is an alternative opportunity-related theory, which links NTE violence to changes in the macro economy. Some researchers have argued that as the economy improves and disposable income increases, more people are likely to socialise in the NTE and consume more alcohol, thus increasing the opportunity for violence. This possibility is explored within the larger section on the economy in the 'Other' annex.

Figure A6.8: Demographic trends and homicide in England and Wales



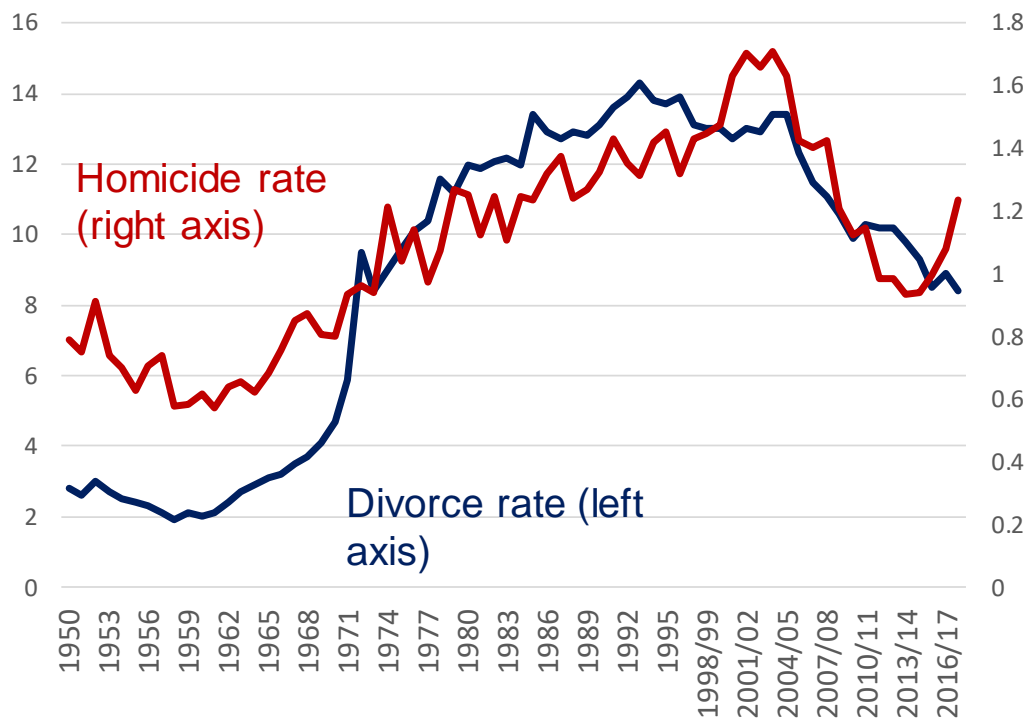
Sources: Police recorded crime; ONS population statistics

In line with the results from the literature review, Figure A6.8 doesn't offer a great deal of evidence to support the premise that homicide trends have been driven by the proportion of people aged 16-24. Indeed, the homicide peak occurs at one of the lowest points in that series. There is somewhat greater correlation with the proportion of 25-34 year-olds which did rise in line with homicide from around 1970 to the mid 1990s, though the trends diverge after that point. There is a similarly mixed picture for the youth oversight ratio. The first peak in that series correlates well with the homicide 'low' in the late 1950s and the decline in youth oversight fits with a homicide rise to the mid 1980s. But the trends after that point don't fit the theory particularly well. Youth oversight increased sharply between the late 1980s and late 1990s yet homicide also rose markedly. Overall then, these trends offer mixed support at best for the proposition that demographics have driven the homicide trend in England and Wales. In particular, these general population shifts do not seem to have any explanatory power for the recent homicide rise. The size of the population

aged 15-34 fell between 2014 and 2017 and the youth oversight ratio increased markedly.

The third section of the literature review looked at divorce as a driver of homicide. The England and Wales trend in divorces is shown in Figure A6.9.

Figure A6.9: Number of divorces and number of homicides in England and Wales



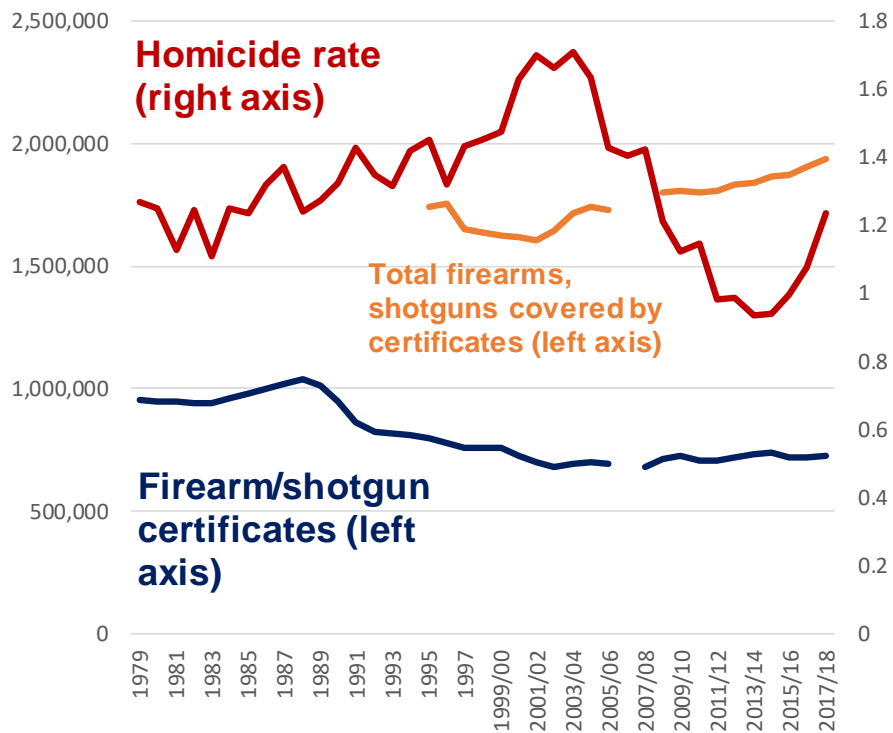
Sources: Police recorded crime; ONS divorce statistics

Figure A6.9 shows that, like in the US, there is a reasonable degree of correlation between the number of divorces and the number of homicides. Both series reached their lowest points at the end of the 1950s and rose markedly to the mid 1990s. The rise in divorce was particularly sharp following the change in divorce laws in 1971.²⁴ Whilst numbers of divorces peaked slightly earlier than homicide there was a smaller second peak more or less in line with the homicide high-point and both series fell by a similar proportion in the decade to 2014. Overall then, these trends – along with the literature – suggest that the relationship between homicide and divorce is certainly worth investigating further. However, there is no correlation for the recent homicide rise.

²⁴ This law change granted either party the right to request an end to the marriage; previously both parties had to agree. Statistics show that this new right was disproportionately exercised by women.

The final section of the literature review in this annex looked at the relationship between gun ownership/availability and homicide. Available trends for England and Wales are shown in Figure A6.10 below.

Figure A6.10: Gun ownership and homicide trends in England and Wales



Sources: Police recorded crime; Statistics on firearm and shotgun certificates, England and Wales: April 2018 to March 2019

Note: Firearm/shotgun statistics are calendar year to 2001 and financial year after that.

Figure A6.10 offers virtually no evidence to support the ‘opportunity’ theory linking gun availability to homicide in England and Wales. There is no correlation between the peak in certificates and the peak in homicide and the correlation between total firearms certificates and homicide is moderately strong but runs in the opposite direction from what would be expected within the opportunity framework. The homicide peak occurs when numbers of legally owned firearms are at their lowest point. This could offer tentative support for the alternative theory that the availability of firearms provides greater guardianship for potential victims rather than greater opportunity for offenders. However, given that the general level of gun carrying in England and Wales is very low and that the correlation has disappeared in the recent homicide rise, this seems unlikely. More likely perhaps is that the apparent correlation is simply spurious.

It is important to acknowledge, however, that another possibility is that our measures of gun ownership/availability do not accurately capture the true picture given that they do not include illegally imported firearms and that they deal with total certificates rather than actual numbers of different types of weapons. For the latter, certain policy changes may have been important. For example, Reuter and Mouzos (2004) pointed out that following the mass shootings in Hungerford in 1987 and Dunblane in 1996, certain types of weapons were banned. In 1988 the newly prohibited guns were certain self-loading and pump-action rifles and shotguns. Owners were offered compensation for turning these weapons in, which resulted in the buyback of 3,500 weapons (ibid.). In 1997 handguns of .22 caliber or higher were prohibited, resulting in the buyback of 162,000 handguns (ibid.). In 2007, the Violent Crime Reduction Act introduced in October 2007 made it illegal to import or sell imitation firearms and tightened the rules for the manufacture and sale of certain types of air weapon.

Based on simple correlation, it is hard to conclude that any of these changes had a marked effect on homicide trends in England Wales. Homicide continued to increase sharply after the two buyback schemes (including homicides with guns as Annex One showed) and the homicide decline was already well underway by the time of the Violent Crime Reduction Act.

Conclusion

This annex examined the short-listed literature on opportunity as a driver of homicide. Our concept of 'opportunity' is based for the most part on the 'crime triangle' which states that for a crime to take place, three things are required: a motivated offender, a potential victim or target and a lack of guardianship. Crime trends may therefore be driven by factors that make this confluence more likely or more frequent. This was broken down into four different themes:

- Routine activities: changes in people's daily routines might increase or decrease the opportunity for homicide by bringing more victims and offenders together or by increasing/decreasing guardianship;
- Demographics: changes in the number of people of the most crime-prone ages may increase the opportunity for victims and offenders to interact;
- Divorce: changes in divorce rates potentially impact the opportunity for homicide in two ways i) by splitting up conflicted parties divorce might reduce the opportunity for domestic homicide, ii) by reducing informal guardianship of

children by parents and of husbands by wives, divorce might increase the risk of other types of homicide;

- Gun availability: changes in the availability of guns increase the opportunity for homicide by making any confluence of victim and offender more likely to be lethal.

In relation to routine activities, there were only a limited number of studies and methodological robustness was generally quite poor. The seminal paper by Cohen and Felson (1979) offered a strong case that social change, like the increase in female employment, resulted in more routine activity taking place outside the home, and that this may have played some role in the rise in homicide in the US. But the case that routine activities also drove the fall in homicide either in the US or England and Wales appears weaker. Certainly, the same indicators that Cohen and Felson linked to the rise in homicide – like female employment and single-person households – did not turn-around and start falling in line with the decline in homicide. It is possibly that a different switch in routine activities – from socialising in the night-time economy to socialising online – may offer a stronger explanation, but this hasn't been explored much beyond simple correlations at this point, to our knowledge. It also does not fit well with the recent rise in homicide.

For demographics, the main conclusion from the short-listed studies was that it was likely to have been only a minor driver of homicide trends, at most, and this probably also varied by time and place. So whilst there was some evidence that the impact of the baby boom generation reaching their most crime-prone ages did influence homicide trends in England and Wales, the US and some other nations, any effect seems to have lessened in more recent decades. More recent studies have also shown that the most crime-prone age for homicide may be older than for crime generally and hence that many studies may therefore not have correctly tested the impact of demographics. Indeed, perhaps the most interesting results were those suggesting the possibility of a demographic opportunity effect through the guardianship provided by *older* people. This concept of 'youth oversight' certainly feels worthy of further exploration.

Of the four opportunity variables examined in this annex, divorce rates had the most quantitative support in terms of a relationship with homicide trends. Higher divorce rates consistently predicted higher rates of homicide, and there was quite a high degree of correlation between trends in divorce and trends in homicide for both the US and England and Wales. However, studies disagreed about whether the effect of divorce had weakened over time and about the mechanism for any effect. Some researchers argued that opportunity was important – particularly in the effect it had on reducing the resources available for parental monitoring. But others argued instead that the relationship was likely due to 'social disorganization' with divorce acting as a symbol for the rejection of the social bonds implied by institutions like

marriage. Another theory is that divorce affects informal social control by removing the sense of responsibility felt by young men towards wives and children.

Separately there was also some support in the literature for the argument that rising divorce rates in the 1960s and 1970s was part of a wider social change involving increased women's rights and status, which put upward pressure on homicide initially (via backlash) but downward pressure over time. And linked to this is the impact on children beyond any simple opportunity/parental monitoring effect. On the one hand divorce might have a traumatic, negative impact on children. But on the other, a society in which the availability for divorce means greater status for women might mean fewer children grow up in conflicted households. Evidence shows that divorce can have a positive effect on children if it splits up highly violent couples.

Overall then, the evidence suggests that the relationship between homicide and divorce is certainly worth investigating further.

The final section dealt with gun availability. Reviewing this literature revealed much methodological disagreement and contrasting results. Overall, the balance of the evidence seems to suggest that gun availability can be a factor in driving homicide trends but probably only under certain conditions. There was some evidence that the proliferation of highly lethal weapons among groups already inclined towards conflict was an important factor in certain local-area homicide spikes in the US (which links to the Blumstein hypothesis explored in the Drugs Annex and the short-wave theory set out in the conclusion to this report). This could have relevance for the distinct 'spike' in gun related homicides identified in annex one, which contributed to the England and Wales homicide peak. But the macro-level trends in England and Wales showed little evidence that population-level change in gun ownership was a factor.

One final point on this topic is that whilst security improvements have been strongly linked both to the opportunity framework and to the fall in acquisitive crime in England and Wales and other nations, there were no studies located that tested whether improvements in security may also have driven down trends in homicide (Farrell et al., 2011; Morgan et al, 2016). Some have suggested a possible relationship with the fall in violence generally – particularly in relation to the expansion of CCTV and private security services within the night-time economy – but a specific effect on homicide remains an avenue to be explored quantitatively (Farrell et al., 2010; Garius, 2016).

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Annex 7: Character and Homicide - Literature Review Findings

Introduction

This annex looks at the potential link between character and homicide trends. From the outset it is important to define exactly what is meant by 'character' and other related terms used in this annex:

- 1) Character: For the purposes of this research, 'character' can be taken to include what is generally defined as 'character' within the psychology literature *as well as* what is generally defined as 'personality' within that literature. So, within this annex, the term 'character' includes both values and beliefs, like the degree to which violence is seen as acceptable in certain contexts, *and* traits or characteristics like impulsivity and empathy (Lapsley, 1996; Kazdin, 2000; Zillig, Hemenover, & Dienstbier, 2002).
- 2) Aggregate character: To explain societal level trends in crime, we also need a term that covers the aggregate level of 'character' as defined above. That is, the sum total of all beliefs and traits within a given society at any point in time. The logic here is that if, for example, low self-control is a risk factor for involvement in homicide at the individual level, it seems possible that shifts in involvement in homicide at the individual level, it seems possible that shifts in aggregate levels of self-control at the societal level could drive trends in crime. For this concept we use the term 'aggregate character'.

The reason that character has been included as a potential driver of homicide is that evidence increasingly suggests certain characteristics are related to individuals' propensity to commit crime. Studies following people from a young age have demonstrated that peoples' level of self-control (Gottfredson and Hirschi, 1990; Moffitt et al., 2013), empathy (Joliffe and Farrington, 2004) and morality (defined by questions asking about the rightness/wrongness of behaviours like violence) are strong predictors of whether they go on to offend or not (Wikstrom et al., 2012).

This raises the possibility that homicide trends might be driven by shifts in these characteristics over time. It is possible that self-control, empathy, morality, belief in honour, or some other characteristic has changed over the last 15 years in such a way as to make individuals less likely to commit or be a victim of homicide.

This begs the question – how might a change in character arise at the population level? Or to put it another way, what is the relationship between the individual-level characteristics that seem to predict crime, and macro-level social and cultural

trends? Do the latter influence the former, and if so how? Related to this, is a question of timing. If some social or cultural change, call it X, placed a greater emphasis on, for example, self-control, how would this translate into change at the individual level? Would X affect individuals directly and immediately? Or would it operate via socialization? For example, would X encourage parents, schools and other care-givers to place greater emphasis on self-control when bringing up children? This latter question is important – we believe – for the study of crime trends because it relates to *when* effects should emerge. If X occurred in 1960, would we expect to see an effect on crime trends immediately, or a generation later when those individuals socialized under the new circumstances reached the age at which they most affect crime figures?

Research has certainly shown that the circumstances into which individuals are born and grow up can influence aspects of their character, including those that affect crime propensity like self-control (see for example Gottfredson and Hirschi, 1990; Neugebauer et al., 1999.) But what has been less well researched is the relationship between aggregate-level social and cultural trends and aggregate-level crime trends. Part of the reason is that individual characteristics, values and beliefs are very hard to measure over long time periods. Generally, very high-quality survey data is required.

This annex will attempt to wrestle with these questions using the homicide literature as a guide. As with other annexes, our aim is partly to extract any consensual conclusions from robust studies; but it is also to examine any plausible hypotheses that have been put forward so that these may be more formally tested in the future.

The systematic search¹ identified 46 studies that met the other inclusion criteria for this section. For ease of consumption, the studies are divided into six groups corresponding to different themes in the literature. These are listed below:

- The civilising process – changes in societal self-control
- Honour
- General cohort effects
- Specific cohort effect 1: relative cohort size, fertility, parenting and the family environment
- Specific cohort effect 2: the abortion hypothesis and its effect on individual-level characteristics

¹ See the Technical Annex for a detailed description of the technical details of the systematic search.

- Specific cohort effect 3: the lead hypothesis and its effect on individual-level characteristics

In some cases the link with 'character' is reasonably clear. For example, the first two topics summarise literature on the relationship between homicide trends and two distinct characteristics: self-control and a belief in honour. But for the remaining topics, the link with character needs more explanation. The third section deals with studies that have attempted to determine whether homicide trends show evidence of a cohort effect. That is, whether the trends seem to be driven by generational differences between cohorts of individuals rather than by events that affect individuals of all ages at a particular point in time. We have included this evidence because it goes directly to the question of how the effect of character might manifest itself in crime trends. Put crudely, if character is formed primarily via parental socialization or some other effect that occurs mainly in the earliest years of life, then the aggregate-level link between social trends and crime trends should come via a cohort effect. The absence of such an effect, therefore, would be strong evidence against character being a driver of crime (at least via those kinds of generational mechanisms). Equally, evidence of a cohort effect would be a necessary *but not sufficient* condition for proving the influence of character via socialization or some other early-years factor.

The remaining sections explore the evidence relating to three different character-related cohort effects that have been suggested in the literature as possible drivers of homicide. The first of these explores the possibility that generational differences in homicide propensity have been driven by changes in fertility, parenting or family environment. A prominent theory, particularly for explaining the homicide rise in the US during the 1960s, was that it was related to the coming of age of the baby boom generation (Easterlin and Schapiro, 1979). The original formulation of this theory had little to do with character. It had more to do with economic and social competition and the fact that people born into large cohorts suffered greater competition for resources, potentially making crime a more attractive option. However, more recently, evolutionary-based studies have linked high fertility rates (and hence large cohorts) to crime via the adoption of certain *life-course strategies*. It has been suggested for example, that certain events or environments cause individuals to adopt a greater or lesser appetite for risk and that this could affect both fertility and crime (Wilson and Daly, 1997; Potts and Hayden, 2010). The literature examining the relationship between homicide trends and societal-level shifts in parenting and the family environment are also examined in this section. Here the link to character is again clearer. To the extent that character is formed by an individual's upbringing, trends in parenting and the family environment might drive crime trends a generation later.

The next section looks at the abortion hypothesis proposed by Donohue and Levitt (2001). They suggested that the legalisation of abortion was an important factor in the homicide decline in the US, which began approximately a generation later. This literature has been included in this annex because part of the explanation Donohue and Levitt offered was to do with a societal level shift in characteristics; a change in “aggregate character”. They argued that legalisation of abortion reduced crime via two mechanisms. Firstly, they claimed that it resulted in fewer individuals being born, which would be expected to reduce crime a generation later, all else equal. This is a purely mechanical effect and hence unrelated to shifts in character. But they also argued that, on average, individuals born after the legislation would have fewer crime-prone characteristics than those born before. Note then that this explanation is not about the character of any one individual changing due to abortion legislation. It concerns instead a change in the average level of certain characteristics within all individuals.

Finally, we have included literature on the lead hypothesis in this annex because its main premise is that high levels of lead drove systematic biological effects on individuals, which produced, on average, a greater propensity for aggression in those who experienced the high lead levels at a young age.

As with other annexes, we also included secondary evidence: studies that didn’t meet the criteria, but which were judged relevant to the possibility that ‘character’ may have influenced homicide trends in England and Wales.

1) *The Civilising Process – changes in societal self-control*

The 'civilising process' was the title of a 1939 book by German sociologist Norbert Elias. Its central idea – in relation to this review - is described below by Cambridge University criminologist Manuel Eisner:

“...in a nutshell the theory of the civilising process holds that over a period of several centuries a type of personality has come to prevail that is characterised by ... higher levels of self-control.... which becomes manifest by lower levels of violent behaviour.”

Source: Eisner, 2001

Elias produced two inter-connected pieces of evidence to support his theory. In the first part of the book he charted the history of manners from medieval times through to the twentieth century. He argued that the importance of manners increased markedly through that period (though not always in a linear fashion) and that this reflected a trend in increased self-observance and ultimately self-restraint via the development of shame (Elias, 1939). Importantly, Elias emphasised that this change was driven not via rationality or concerns about hygiene, but instead via social pressure. Upper classes wanted to distinguish themselves from others and used mannerisms as a tool. Inevitably this led to their emulation by middle and lower classes and the gradual spreading of self-control from the elite to the masses (ibid.).

The second part of the book links that process to the formation of nation-states. Elias argued that the changing relationship between the monarchy, the nobility and other classes was crucial. Initially, a key element was the consolidation of power by the monarchy at the end of the medieval period, which drove a shift in the nature of the nobility. From being a class of knights constantly warring with each other for land, they became a courtly nobility, dependent on the monarchy for favour. The latter was a role that encouraged the development of manners and hence the regulation of impulses. Another important development was the growth in trade and market exchange, which promoted long-sighted planning and cooperation rather than expropriation by force. Elias also emphasised the shift of nation-states from private monopolies to public monopolies. He argued that central powers realised that to maintain their power, wealth had to be shared, which led gradually to the 'social contract' between the monarchy and all citizens, and the birth of democracy. This effectively extended a semblance of the need for courtly restraint to the entire population. Interdependence rather than 'every man for himself' gradually became the norm. Finally, the industrial revolution of the nineteenth century added the development of standardized paid employment and the self-regulation that entailed.

With each of these developments, Elias argued, more and more individuals would have felt the pressure to contain their `impulses and drives' including the willingness to resort to violence.

For Elias then, the drivers of the civilising process were both social/cultural change *and* individual-level personality development. The two constantly reinforced each other in an inter-related fashion. Other authors, like Stephen Pinker and Pieter Spierenburg, have adopted Elias's approach and even added to it. As well as social, political and economic institutions, Spierenburg and Pinker also emphasised the role of criminal justice institutions. They argued that the civilising process was helped along by state formation in part because this was accompanied by the establishment of the rule of law. This provided a system in which elites (initially, but eventually everybody else too) could seek redress, rather than extracting their own revenge. This, they argued, was another factor that encouraged restraint and self-control (Pinker, 2011; Spierenburg and Spierenburg, 2008).

Many researchers of homicide view the `civilising process' as an important underlying driver of homicide. Mostly though, it has been studied in the context of very long-term trends. Our focus is on trends since World War 2. This was the subject of six short-listed studies. These are shown in Table A7.1.

Table A7.1: Short-listed studies examining the civilising process and long-term trends in self-control/empathy as drivers of the fall in homicide

Study	Area and time period	Character-related variable	Method and finding
Eisner, 2001	9 nations over 800-year period	Civilising process (growth in self-control)	Descriptive statistics and historical analysis. Finds some support for the civilising process in that long-term violence trends reduced gradually and in the upper classes first. But also some historical periods did not fit the theory directly.

Eisner, 2008	17 European nations from 1840 to the present	n/a	Narrative approach with descriptive statistics. Argued that many theories of homicide are not consistent with the long-term trends and the fact that they are consistent across nations. Concluded that the best explanation is shifts in the 'cultural character' with periods of falling homicide being associated with greater self-control, public politeness and societal emphasis on parenting and socialization.
Eisner, 2014	19 nations, long-term trends	Popularity of words relating to hedonism and self-control. Self-control related survey responses.	Correlational analysis. Found a strong correlation between macro measures of self-control and homicide trends and an inverse relationship between macro measures of hedonism/cultural control and homicide.
Leyton, 2011	England and Wales, 1982 to 1990	n/a	Ethnographic approach. Finds that English killers show more remorse and commit suicide more often than their US counterparts. Concludes that England has lower homicide rates than US due its different cultural 'character', one which has moved further in developing self-control and with a lower tolerance for violence.
Pinker, 2011	Many nations, long-term trends	Interest rates (proxy for self-control)	Historical/narrative analysis. Uses interest rates to demonstrate a long-term increase in self-control, in line with long-term fall in homicide. Also concludes that civilising and de-civilising processes have been important drivers of homicide rates.
Roth 2012	US, long-term homicide trend	Trust/belief in institutions	Historical/narrative analysis using homicide statistics based on capture/recapture methods. Found some support for civilising processes like emerging statehood but also instances that did not fit the data. Concluded that trust and belief in institutions may be more important than self-control/empathy etc.

In a series of papers, Manuel Eisner examined the applicability of the 'civilising process' to both long- and short-term homicide trends. The first of these, Eisner (2001), demonstrated how key elements of Elias's theory lined up with available data. Eisner showed that homicide rates in England in 1200-1300 were at least 30 times higher than they are today and that particularly sharp falls in homicide tended to coincide with "*periods of rapid expansion and stabilization of state structures.*"

Using data from nine European nations, he showed that homicide rates dropped first in nations that were early adopters of modern state structures (England and Holland). He also found periods in which consolidation of state power did not correlate so well with homicide rates and suggested that other 'civilising' sources like religion and education might have been important.² Eisner showed that homicide rates fell first amongst the upper classes, who previously had rates of homicide that were as high or possibly even higher than lower classes.³ This is consistent with Elias's theory because the 'engines' of the civilising process - state power, trade, a functioning criminal justice system – benefitted the upper classes first and gradually diffused down the social spectrum. Eisner showed that homicide rates did the same.

More importantly for this review, Eisner concluded by briefly suggesting that the rise in homicide from the 1960s might have been due to a 'de-civilising process' driven by the shift from a modern to a post-modern society. This theme was taken up in a second paper, Eisner (2008), which used descriptive statistics from 17 European countries from 1840 onwards. Eisner used this data to outline two key points about homicide trends that any theory needed to explain:

- i) Homicide trends, and in particular their turning points, have been remarkably similar across nations. Though there is a small degree of variation, generally homicide rates fell from around 1860 to 1960; turned upwards until the mid 1990s, and then fell again.
- ii) The major changes in homicide rates have been driven by public-space killings involving young men.

Eisner argued that many theories could be dismissed on these grounds. He noted that industrialization, social disorganization, urbanization and the opportunity to socialise and drink alcohol – all factors used to explain the post-1960 homicide rise via the creation of alienation, anomie or exposure to potentially dangerous situations – increased *before* 1960 too. He also noted that the 1860 to 1960 homicide fall was common to nations regardless of their political system or economic fluctuations. Eisner dismissed criminal justice system approaches too, noting that many European nations had homicide turning points in the mid 1990s without following the expansive incarceration policies of the US; and that police forces were far bigger in the period 1960 to 1980, when homicide rates soared, than they were in 1860 when homicide rates began a century of decline.

² Despite this, no studies specifically investigating changes in religiosity or education and their impact on homicide were identified in our systematic search of the literature.

³ Eisner (2001) showed that for the period 1200-1400 homicide in England was probably as high if not higher among the upper classes compared with the lower, due to feudal systems and codes of chivalry in which upper classes embraced a culture of domination where violence was glorified.

Eisner (2008) concluded instead that shifts in the 'conduct of life' provided a better explanation. He argued that self-control was the dominant feature of the cultural character of Europe between 1860 and 1960. Citing Gay (2001) he found that the code of self-control was "*reiterated by parents and teachers and resounded through schools, churches, labour unions, and the abundant advice literature.*" He also suggested that the counter-cultural shifts of the 1960s brought this process to an abrupt end. Again though, he was able to offer little quantitative data in support.

He attempted to address the data shortcoming in a third paper, (Eisner, 2014). Using data from four nations he found a strong correlation between alcohol consumption and homicide between 1840 and 2010. Eisner argued that regardless of whether the correlation implied causation, the trends probably reflected cultural shifts in the "moral economy" and that as the elites of society emphasised sobriety and self-control, alcohol use and homicide fell. They rose again during periods in which hedonism and lack of control were the dominant virtues (for example during the 1960s and 70s). Eisner found evidence for this shift by examining the Google Books NGRAM corpus, a database of 8 million digitized books published between 1500 and 2008. Though Eisner acknowledged the limitations of this data⁴, he argued that it can pick up cultural trends via the popularity of words. For example, there is correlation between homicide rates and use of the words: 'sex', 'drugs' and 'narcissism'.

⁴ There are numerous limitations with this data which Eisner acknowledged but probably the most serious is that: "*it remains unclear whether change observed at the level of words used in books bears any relationship to beliefs and preferences in the general population. This would require survey data over long enough periods.*"

Figure A7.1: Homicide rates and the popularity of certain words

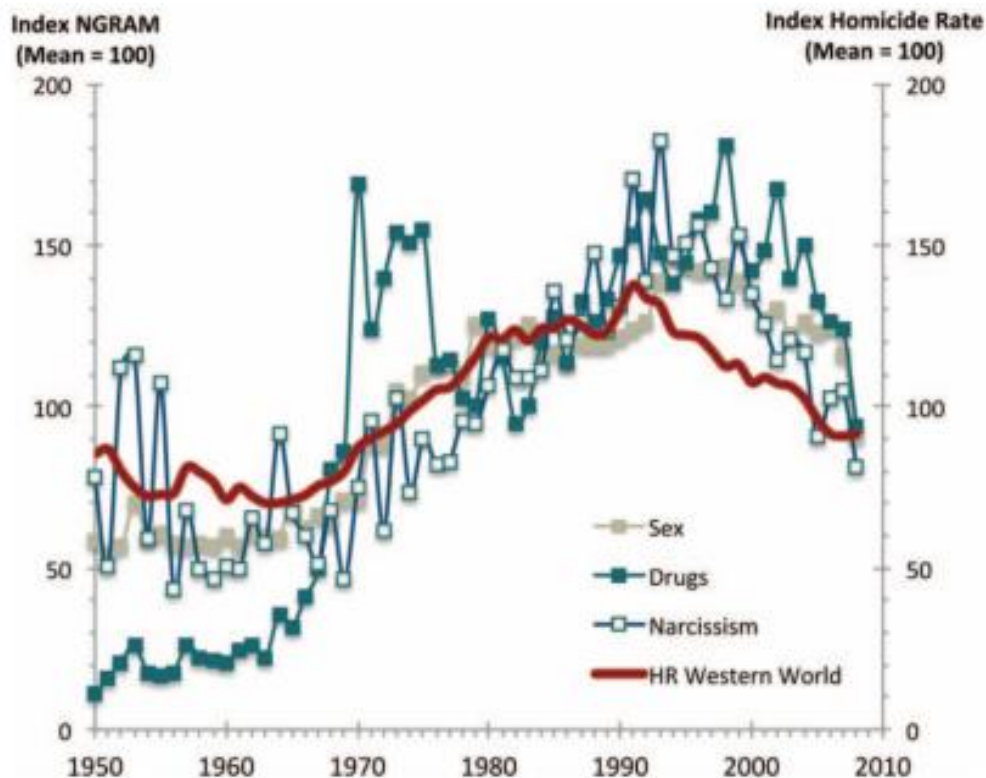


FIG. 16.—NGRAM frequency of “sex,” “drugs,” and “narcissism” versus indexed homicide rates, Western world, 1950–2008. Lexical entries used in NGRAM search: “drugs”: cannabis, marijuana, heroin, cocaine; “narcissism”: narcissism, narcissistic; “sex”: sex, sexual, sexually.

Eisner went on to show a similar, but inverse, relationship between homicide and the use of words related to self-control, like ‘shame’, ‘conscientiousness’, ‘honesty’ and ‘politeness’. He also offered evidence of a new ‘culture of control’ in the 1990s as concepts like ‘CCTV’, ‘anger management’ and ‘zero-tolerance’ become part of the lexicon. Eisner produced survey data from a consistent German series from 1967 to 2010, in which individuals were asked questions related child-rearing and self-control.⁵ These showed strong correlation with homicide rates (see below) and also – Eisner claimed - with similar UK results (Collishaw et al., 2012).⁶

⁵ Specifically respondents were asked how important they felt the following concepts were: “politeness and good manners,” “doing work diligently and properly,” and “being thrifty in money matters.”

⁶ Importantly the correlation emphasised by Eisner in Figure A7.2 is not lagged. If a parental emphasis on self-control drove lower homicide rates via its impact on young children’s upbringing, we’d expect a lag between the parenting variable and homicide trends. That there is no lag, perhaps suggests that changes in cultural emphasis on self-control have a more immediate effect.

Figure A7.2: Homicide rates in Germany and low self-control measured via a parenting survey

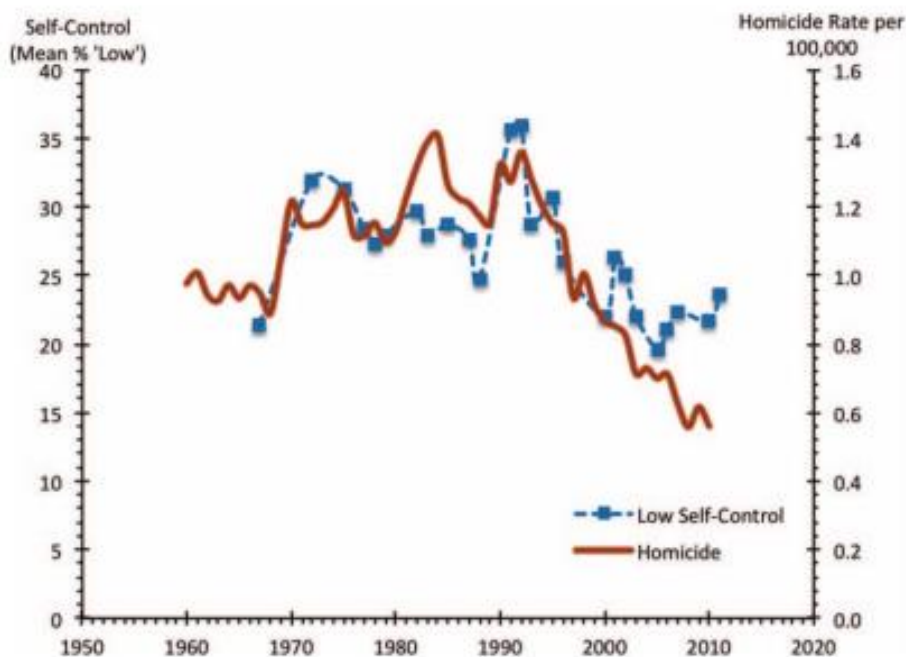


FIG. 19.—Promoting “self control” as a parenting value in Germany and mean homicide trends in German-speaking countries. The “low self-control” score is based on three items, namely, importance of promoting “politeness and good manners,” “doing work diligently,” and “being thrifty and saving money,” mean percentage not agreeing to these items. Source: Parenting values: Petersen (2011). Homicide rates are the unweighted average for Germany, Austria, and Switzerland.

Another researcher who used Elias’s framework to examine recent homicide trends was Leyton (2011). He noted that England and the US were similar on many metrics seen as drivers of homicide like poverty, inequality, individualism, and family disorganization, yet had vastly different homicide rates. He dismissed gun ownership as a possible explanation on the basis that nations with gun ownership levels similar to the US, like Switzerland and Canada, have some of the lowest homicide rates in developed nations. He also noted that Europe had higher homicide rates before guns were available. Instead, using ethnographic evidence, Leyton argued that the long-term fall in English homicide rates and the reason why English rates remain below those in the US was due to differences in aggregate character.

Leyton argued that England began the ‘civilising process’ much earlier than the US. England abolished the culture of “*blood feud and private revenge*” – of which the upper classes were the main participants – during the Middle Ages in Leyton’s narrative, and gradually replaced it with state-sponsored punishment. He argued that this led to a shift from glorifying violence to being revolted by it, in stark contrast to the US. He cited an example from the *Kansas City Times* in the late nineteenth

century in which bank robbers who shot a child were not vilified but “*admired*” for their “*diabolical daring*”. More concretely, he examined homicide cases in England and the US between 1982 and 1990 and found that a higher percentage of English murderers expressed remorse.⁷ Furthermore, about half of all English homicide offenders tried to commit suicide and a third succeeded, compared with just 3-4% in the US. For Leyton, this demonstrated that: “...*the English achievement has been to extend self-control to large sections of the working classes*” while in the US “*so much of the American ‘street’ culture... (means that) the underclass.. (continues to be) ...socialized for violence*”. Like Eisner, he viewed the rise in homicide from 1960 as most likely due to the counter-cultural challenge of that decade, which attacked traditional “*character-building*” institutions like family, church and schools.

Pinker (2011) also used the ‘civilising process’ as a framework for his argument that human character has changed so as to be less conducive to violence. He argued that violence is the product of five ‘inner demons’ (predatory violence, dominance, revenge, sadism and ideology) that have been dampened over time by four ‘better angels’: empathy, self-control, morality and reason. He cited the data from Clark (2008) showing a long-term decline in interest rates mirroring the fall in homicide. Pinker argued that interest rates are to some extent a measure of self control, given that in essence they are a measure of valuing the present relative to the future.⁸

Like Elias, Eisner and Leyton, Pinker emphasised the role of the state and trade in fostering anti-violent character traits. He also showed that the invention of the printing press and the growth of reading material sparked sharp declines in violence as the growing reader population learned to see things from characters’ perspectives, fostering empathy. Like the other authors, he emphasised the de-civilising forces of the 1960s in relation to the rise in homicide. For the 1990s fall he argued that there had been a re-civilising offensive, prompted by things like the outbreak of the AIDs virus, which renewed the emphasis on self-control. Importantly though, he produced no quantitative data to support these conclusions.

Several researchers have questioned the link between the ‘civilising process’ and homicide. For example, Roth (2012) argued that the higher homicide rates of the medieval period were better explained by the lack of medical care, which meant far more injuries resulted in death. He also noted that the attempt to explain higher US homicide rates by referencing a slower civilising trajectory was undermined by data suggesting that during the eighteenth century the US had homicide rates similar to Canada and Western Europe. It was only in the nineteenth century that trends

⁷ No exact numbers were quoted.

⁸ Others have pointed out that interest rates may measure uncertainty rather than lack of self-control, and it is an important difference whether people live in an uncertain world or whether people lack self-control (Eisner, personal conversation).

diverged. For Roth, state-building was important, but so was the legitimacy of that state. For him, trust in social and political institutions was as important – if not more so – than empathy and self-control (see the CJS annex for more on this).⁹

In summary, several researchers have argued that, viewed over centuries, homicide rates have fallen in line with political, economic, social or cultural advances promoting character traits like self-control and empathy. They also noted that the rise in homicide from the 1960s coincided with a counter-cultural movement that sought to replace these violence-dampening characteristics with a more hedonistic lifestyle. Methodologically however, the studies proposing this hypothesis are less quantitative than those supporting alternative theories. But this is largely due to the fact that data on character shifts is harder to come by. As such studies have generally employed narrative/historical approaches and used the limited data available for correlation only.

⁹ Others, like Pieter Spierenburg have attempted to defend the civilising process hypothesis from these attacks, see <http://chs.revues.org/1297> and <http://chs.revues.org/1296>. And in another paper Roth (2011) did suggest that his 'trust in government' hypothesis may be linked to changes in character traits like self-control via a biological mechanism. He cited studies showing that testosterone increases during stressful, unstable times and a hormone involved with self-control (serotonin) decreases. This, he suggested, may be why periods of governmental instability and lack of faith in institutions seems to prevent co-operation among young men and instead encourages battles for dominance instead.

2) Honour

Seven short-listed studies examined the relationship between honour and homicide, see Table A7.2 below. For many of the study authors, the concept of honour is closely related to the 'civilising process' explored above. For example, Spierenburg and Spierenburg (2008) write that:

"In an examination of the character of violence over the long term, the most important element is that of honour. It was involved in the overwhelming majority of murders in Europe – and not only there."

"...the honour perspective can easily be integrated into the theory of civilisation... we expect the murder rate to be highest, and traditional male honour to be most intense, when the monopolization of violence by state institutions and economic differentiation are at their lowest point."

In a sense then, authors like Spierenburg and Spierenburg emphasise the same social and cultural drivers of the civilising process as Elias – state formation and cultural competition between social classes. The only difference is that as well as encouraging greater self-control, these researchers also saw the process as affecting beliefs about honour, and that the latter may have had most impact on trends in homicide.

This section will examine the short-listed evidence for this proposition. Broadly, the identified literature divides into two types. Several of the studies in Table A7.2 examine very long-term changes in homicide using the available historical data and qualitative evidence. Due to the obvious restrictions imposed both by the long time period and by the lack of an easily available quantitative measures of honour, these studies rely mostly on simple correlations and qualitative conclusions. Another group of studies take a more quantitative approach by examining a slightly different issue: why homicide rates in the US South have generally been higher than those in other regions of the country. Whilst the main thrust of this literature is slightly removed from the central aim of this project, which is more about homicide trends than geographic differences, the studies that have taken a temporal perspective have been included here. If differences in beliefs about honour have driven differential trends in different parts of the US, it seems logical that similar changes could have driven rising and falling trends in England and Wales.

The literature in both these areas is extensive. Our systematic search only picked up seven studies because many of the historical studies did not examine post-war homicide trends (e.g. Shoemaker, 2001), and many of the studies on the US south used a purely cross-sectional design (e.g. Messner, 1983). However, in both cases, we have occasionally drawn on these extra sources for context.

Table A7.2: Short-listed studies that examined the relationship between honour and homicide

Study	Area and time period	Character-related variable	Method and finding
Lane, 1997	England and the US long-term trends	n/a	Historical analysis. Concluded that poverty and the criminal justice system have been less important drivers of homicide than alcohol, drugs, gun availability, inequality, family instability and a cultural character of 'honour'.
McCall et al., 2010	US cities in 1970, 1980, 1990 and 2000	Dummy variable on whether the city is in a Southern state or not.	Repeated cross-sectional modelling for four time periods. Results showed that the Southern dummy was significant in all periods with the size of the effect increasing slightly from 1970 to 1990 before falling markedly in 2000.
Muchembled, 2012	n/a	n/a	Historical/narrative analysis. Argues that the long-term fall in violence is due to the civilising process and particularly in the way it led to a change in masculine honour. But also argues that the 1960s rise was less a 'de-civilising process' and more about social and economic segregation.
Nisbett and Cohen, 1996	US cities from 1976-83 for regression analysis.	Southern culture of honour (measured using the percent of initial settlers who were of Southern origin)	Multi-method approach including cross-sectional regression analysis, survey statistics, psychological experiments and historical analysis. Concludes that 'southernness' is a predictor of White homicide and that this is due to a culture of honour brought by the original migration of herdsmen to the Southern states of the US.
Ousey and Lee, 2010	141 US cities, 1980, 1990 and 2000	Southern culture of honour (measured by percentage of residents born in a Southern region)	Multilevel regression models. Found that homicide types vary significantly across cities and that cities with a higher percentage of Southern-born residents have more argument-related homicides, but that the 'southernness effect' may have diminished slightly over time.
Pinker, 2011	n/a	n/a	Historical/narrative analysis. Concludes that a culture of honour may have been important in explaining divergent homicide trends in the US South because it helped to delay the civilising process, which has pushed long-term homicide rates down generally.

Roth, 2012	n/a	n/a	Historical/narrative analysis using homicide statistics based on capture/recapture methods. Finds no strong evidence that 'cultures of violence' have driven homicide trends based on specific historical periods that go against the hypothesis.
Spierenburg and Spierenburg, 2008	West European nations from the late Middle Ages to the present.	n/a	Historical/narrative analysis using available historical homicide data. Concludes that honour can be integrated into Elias's civilising process framework and that its change over time has been a major driver of the decline in homicide. However, also argues that in the more recent period other factors like the emergence of drug markets and immigration have also played a role.

Of the studies that examined long-term homicide trends, Spierenburg and Spierenburg (2008) made arguably the strongest case for 'honour' being an important driver of homicide trends. They noted that many homicides from the Middle Ages through to the early modern period had a ritualistic element that does not entirely fit with lack of self-control being the defining characteristic. For example, they showed that many murders in the period from around 1200 to 1550 came as a result of vendettas or long-running feuds and hence were carried out with a degree of delay between provocation and act, rather than immediately and impulsively. What was breached in these circumstances, Spierenburg and Spierenburg argued, was not necessarily a person's level of self-control, but their honour. In that sense, honour was more like a belief system than a personality trait and encompassed a willingness, even an expectation, to use violence in certain contexts. Linked to this, Spierenburg and Spierenburg also showed that, during that period, defending one's honour with violence was generally seen as a virtue, not a criminal act.

In line with the civilising process, Spierenburg and Spierenburg emphasised that violent cultures of honour thrived in the absence of state protection, and hence that the expansion of the state and the criminalization of individual vengeance was a major reason for the decline in homicide. However, a crucial element of Spierenburg and Spierenburg's approach is that rather than declining, honour *changed* over the centuries to become less physical and more spiritual, more "*associated with inner virtue*". And that this process was linked to class differentiation. Linked to this was a shift from vendettas to duelling, which was a major transition in the decline in male-on-male homicides. Duelling became, for the upper classes, the only socially acceptable form of violently extracting revenge or defending one's honour. Again, it's important to note that the nature of a duel stresses a ritualistic belief in the 'rightness' of violence in certain circumstances, rather than an immediate loss of situational self-control.

From 1800 to 1970, Spierenburg and Spierenburg found that European homicide trends divided in two. There was an inner zone featuring most of Scandinavia and Western Europe, in which rates fell fastest, and an outer zone featuring Ireland, Eastern Europe, Finland and Mediterranean areas, in which they fell more slowly. They argued that during this period, when figures became more reliable, differences in homicide rates became more clearly linked to cultures of honour. They showed that many of the most murderous parts of Europe at that time, like Corsica for example, were those in which state penetration was limited and feuding persisted as the only method to pursue personal justice.

For the rise in homicide in the latter part of the Twentieth Century, Spierenburg and Spierenburg argued that required a 'refinement' of the Civilising Process and its connection to honour, rather than a rejection of it. They said there had been a "*partial return of traditional male honour*" situated in enclaves where state control failed to reach. In particular they cited two methods by which this resurgence occurred. Firstly, through the development of drug markets, which meant pockets of the economy remained outside state control and hence codes of the street developed. Secondly due to globalisation and the movement of people, cultures mixed more frequently and some groups of individuals – Spierenburg and Spierenburg argued – brought with them honour-based cultures and the higher homicide rates that accompanied them.

Like Spierenburg and Spierenburg, Muchembled (2012) argued that the main explanation for the long-term decline in homicide was the 'civilising process' and its transformation of "*the masculine notion of honour.*" But his narrative diverged with Spierenburg and Spierenburg and others in terms of an explanation for post-1945 trends. Rather than seeing the 1960/70s as a period in which de-civilising forces briefly regained control, Muchembled attributed the bounce in homicide to the rise of youth gangs, which he said was due to economics and demographics. Gangs formed, he argued, partly because of friction between the generations brought on by demographic growth after WW2 and increased longevity. According to Muchembled, youths formed gangs to rebel against established adult culture. Linked to this was the inequality that accompanied economic growth after the war, which sharpened the distinction between the successful and those who could not "*get access to their share of the social cake*". Later, in the 1970s and 1980s, unemployment continued to feed gangs, he claimed. So rather than a general de-civilising process, Muchembled argued that the recent rise in violence was about the re-establishment of honour and "*the law of vengeance and the cult of manliness*" within pockets of disaffected youth and embodied within gang culture.

This was a theme that was also taken up by Lane (1997). Like the other authors, he traced the historical downward trend in violence, starting with the high figures recorded in England during the Middle Ages. But for the modern period, he focused his analysis on the US, arguing that a culture of honour was both a central reason for

America's high homicide rate relative to other developed nations, and the reason why there were persistently higher rates in the US South. Similar to Elias and Spierenburg and Spierenburg, Lane emphasised both the relationship between classes and a cultural tolerance of homicide among elites:

"What distinguished the South was that the "code of honor" was not primarily a matter for kids, or street toughs, or bottom rungs on the social ladder. Instead... it was endorsed and exemplified by community leaders, settled men, statesmen."

Lane also argued that a culture of honour was transmitted from the South to African Americans via the legacy of slavery. Citing the ethnographic work on US street-violence by Elijah Anderson, Lane drew a clear link between the older cultures of honour and the modern-day inner-city code of the street, where he argued that honour had been re-branded as respect (Anderson, 2000).

"Without recourse to a justice system-even a hostile one-with no other means of settling disputes, and with the master class setting an example, a premium on fighting in reaction to slights and insults became part of Black culture."

However, like Spierenburg and Spierenburg, Lane emphasised that more recent trends have probably been driven by a cocktail of factors of which the shift in 'honour' was just one. He also emphasised alcohol consumption, demographics, criminal justice policies, etc.

Whilst Spierenburg and Spierenburg, Muchemblad and Lane summoned a wealth of data and qualitative material to support their arguments, none quantitatively tested the relationship between honour and homicide in any formal way.

Other identified studies have used quantitative modelling to test the relationship between honour and homicide, but these are generally limited in two ways. Firstly, they have exclusively focused on the specific issue of the US South. In particular a whole series of studies have tried to test whether that region's higher homicide rate can be explained purely by socio-economic differences. This brings us to the second limitation. The general approach has been to see whether a variable denoting 'Southernness' remained a significant predictor of homicide once other factors were controlled for. A positive result therefore only indicates that Southern homicide rates are systematically higher for a reason that cannot be explained by deprivation, unemployment, divorce rates etc. It does not prove that honour (or aggregate character in general) is the explanation.

Nevertheless, the 'southern culture of violence' (SCOV) hypothesis, was the subject of many papers through the 1970s and 1980s. These studies generally used cross-sectional designs, so were not included in our short list. Findings were inconclusive. The 'southernness variable' (which was generally either a dummy to reflect Southern states/cities or something similar like the proportion of Southern born residents) was

significant in some models, but not in others. The difference depended on the controls included and the geographical resolution. For example, Loftin and Hill (1974) and Parker and Smith (1979) found no regional effect for 'Southernness' on homicide at the US state level once socio-economic and demographic controls were introduced whereas Messner (1983) did find an effect when using more granular data.

The most comprehensive case for the SCOV hypothesis was set out by Nisbett and Cohen (1996), who also briefly examined its temporal implications. Unlike other researchers, they conducted additional analyses specifically aimed at testing 'honour' rather than simply including it within the unexplained variance. The main conclusions of their studies are summarised below:

- Using cross-sectional regression at the city-level in the US, Nisbett and Cohen (hereafter NC) found that the percent of initial settlers who were of Southern origin was a significant predictor of homicides involving White victims but not Black victims for the period 1976-83.
- Using homicide rate comparisons across US cities, NC showed that homicide rates for Whites were generally higher the greater the degree of Southernness, but that this relationship only held for small cities and was much stronger for cities with herding rather than farming backgrounds.
- Using data from three separate attitude surveys, NC showed that Southerners do not have a greater tolerance of violence in general but tend to approve of its use more when insulted or when protecting family or property.
- NC devised their own experiments, one of which involved students being deliberately 'bumped' by a clumsy colleague (a stooge in reality) to see how they reacted. Results showed that Southern students reacted more aggressively and that this had a biological component: their cortisol and testosterone levels were elevated relative to other students.
- Based on these results, NC argued that the effect of Southern 'character' on homicide was real and caused by migration patterns. They noted that Northern US states were settled mainly by farmers, whereas Southern states were settled primarily by Scotch-Irish herdsmen. Herdsmen, they argued, were vulnerable to having their livelihoods, their animals, violently removed from them, so cultivated a culture of honour for deterrence: a signal that they were not to be messed with. This was compounded by the fact that herdsmen tended to operate in sparse, frontier regions, beyond the reach of criminal justice control.

- NC dismissed other explanations using geographical comparison. They noted that differing homicide rates in herding/farming regions could not be explained by high temperatures or a history of slavery, two factors often cited. They also pointed out that guns were equally common in the South and the central Mid-West, yet White homicide rates in the South were four times higher.

NC only speculated on the implications of their findings for homicide trends (see below), but Ousey and Lee (2010) conducted more formal analysis. They used repeated cross-sectional analysis for 1980, 1990 and 2000 and multi-level regression to show that US cities with a high proportion of Southern-born residents also had a greater proportion of argument-homicides, relative to other types. There was some evidence that the 'Southern' effect lessened by 2000. This was echoed by McCall et al., (2010), who used a similar approach with repeated cross-sectional models for US cities for the years 1970, 1980, 1990, 2000. Using a dummy variable to denote Southern cities, they found a significant effect in all four years but one that increased slightly from 1970 to 1990 and then dropped markedly in 2000.

Neither Ousey and Lee, nor McCall et al. offered any further analysis on the reasons for these temporal changes. Others have, but their explanations are generally speculative rather than supported by quantitative evidence. For example, NC concluded that the culture of honour was likely to be in decline, given that herding as a profession is now largely extinct and all states have a functioning criminal justice system. Yet they also acknowledged that Southern states continued to have higher rates of homicide long after these changes occurred. NC suggested several reasons for this. Firstly, they argued that herding may just be one example of an environment that favours honour and that in theory "*such cultures should be found wherever the possibility exists that scarcity will be produced by the predatory reactions of others, especially when the state is unwilling or unable to provide protection...*" So, whilst herding has declined, the pre-conditions for high homicide rates could easily vary over time, both up and down, due to other environmental changes.

NC also suggested that 'honour' could outlive the original (economic) reason for its existence if it became incorporated into socialization. They produced ethnographic evidence to suggest that Southern women and mothers endorsed the culture of honour within child-rearing. NC claimed that Southern women were more likely to endorse spanking, for example.

Pinker (2011) also linked the SCOV hypothesis to gender roles, but in the context of the civilising process. He argued that honour was an important driver of homicide trends in the US south because it served to prevent or slow the effects of civilising processes like the spread of formalized justice and feminization.¹⁰

¹⁰ Pinker's analysis of SCOV and feminization echoes the evolutionary psychology approach of Hasegawa. He emphasised that men can "allocate energy along a continuum from competing with

By contrast, Roth (2009) found that honour was a poor predictor of regional US homicide trends. He noted that, on its own, the SCOV hypothesis does not explain why homicide rates could change so quickly *within* honour-based societies. He also listed specific historical periods where the hypothesis does not seem to hold. For example, in the mid-eighteenth-century available evidence suggests that homicide rates in the US South were relatively low, despite a strong culture of honour.

Overall, while the evidence in this section has demonstrated a plausible link between honour and homicide trends, robust quantitative evidence is lacking. The studies that examined long-term trends made a persuasive case that a belief in honour conveyed a justification for lethal violence within certain situations, and that this was as important as self-control in determining societal levels of violence and homicide. But the only identified studies that tested the relationship quantitatively were those that examined the US South. Several of these studies produced evidence of a cross-sectional relationship in which Southern states or cities had higher rates of homicide for reasons that weren't explained by other factors. And Nisbett and Cohen made a persuasive case that this was due to the persistence of honour cultures within frontier-based, male-dominated herding societies in the US South. They also showed that, at the individual-level, a belief in honour seems to be linked to aggression via biological differences. But they did not test changes in aggregate homicide over time. As such it is not clear what drives trends within honour-based societies. Is it a change in the degree of honorific belief? Or is it due to some other factor? So, while this section has provided a plausible hypothesis for the rise in homicide from the 1960s – i.e. that it was to do with the traditional concept of male honour re-surfacing to some extent within street gangs or drug-markets that were outside state control - this remains to be robustly tested.

other men for access to women to wooing women themselves and investing in their children” (informally known as the “cads versus dads” spectrum). Hence, because Southern frontier regions were male-dominated areas with high male-to-female ratios the optimal allocation was likely to be towards the ‘cad’ end because “attaining alpha status is necessary to beat away the competition and a prerequisite to getting within wooing distance of the scarce women.”

3) The presence or absence of a cohort effect

This section summarises the short-listed studies that examined whether post World War 2 homicide trends show evidence of a cohort effect. That is, whether there is evidence that the trends have been driven to some degree by differences in the propensity for homicide across generations rather than purely by 'period effects', which are events or factors that affect different age groups at the same time.

These cohort studies have been included in this annex even though they were not overtly concerned with the relationship between character and homicide. The reason is that, on the whole, researchers who have drawn links between homicide trends and individuals' characteristics, values or beliefs have emphasised the role of parental socialization and the childhood environment.

For example, throughout 'The Civilising Process', Elias makes numerous references to the role of child-rearing. He argued that the characteristics associated with self-restraint and lower levels of violence "become rooted" within individuals "*through their upbringing..*" (Elias, 1939). For that reason, Elias was clear about the need to study cohort effects:

"We shall only gain a fuller understanding of the personality structure of the individual, and of the historical changes in its moulding over successive generations, when we are better able to observe and analyse long chains of generations."

Similarly, some of the studies relating to 'honour' suggested that it was transmitted via child-rearing practices rather than simply existing. Pinker (2011) noted that:

"In every era, the way people bring up their children is a window into their view of human nature. When they believed in the child's innate depravity, they beat them when they sneezed. When they believed in their innate goodness, they banned dodgeball."

If these researchers are correct in believing that parenting and other early-years experiences can affect characteristics relating to homicide, this would imply a generational lag between cause and effect. If shifts in the cultural character of a nation resulted in a greater emphasis on self-control and this became embedded in child-rearing practices, we might only expect to see the effect on homicide once these children grew up. Hence the presence or absence of a cohort effect is important in establishing the validity of this kind of link between 'character' and homicide.

It is vital to emphasise at this point that the presence of a cohort effect would not *in isolation* prove that character is an important driver of homicide. There are other possible cohort effects that have nothing to do with the development of

characteristics, values or beliefs. Similarly, the absence of a cohort effect does not totally rule out a relationship between character and homicide. It is possible that character could drive homicide via period effects too. In relation to the rise in homicide from the 1960s, Pinker and Eisner seem to suggest that the cultural shifts of the period affected character in a more immediate way. For example, Pinker argued that the celebrity role models of the 1960s – rock stars, models and sportsmen – encouraged a hedonistic lifestyle that revelled in relinquishing self-control. And that young people emulated this directly rather than it being learned via parenting (Pinker, 2011). Similarly, Eisner included no lags in his correlational analysis of self-control related variables and homicide (Eisner, 2014).

Three of the short-listed studies tested for the presence of a cohort effect within homicide data. These are shown in Table A7.3.

Table A7.3: Studies testing for the presence of a cohort effect

Study	Area and time period	Character-related variable	Method and finding
Baumer and Wolff, 2014	67 nations from 1989 to 2008	n/a	Produced aggregate homicide trends by victim age and gender to detect a possible cohort effect. They found that age trends tended to rise and fall together. Concluded that homicide trends were driven more by period effects than cohort effects.
Shahpar and Li, 1999	US, 1935-1994	n/a	Age-period-cohort analysis using mortality data. Concludes that the homicide victimisation rise in the US from the mid-1960s can be explained by a period effect but that the rise from 1985 was a cohort effect.
Smith, 1986	US, 1952-1976	n/a	Age-period-cohort analysis using homicide arrest data. Concludes that the homicide rise in the US from the mid-1960s can be explained largely via a cohort effect. Those born between 1943 and 1961 had significantly higher homicide rates than those born before and retained those higher rates as they aged.

Distinguishing period and cohort effects is not easy. A simple test is to inspect age-specific trends. If homicides among all age groups rise and/or fall at the same time, this is generally good evidence of a period effect. But if homicide rates amongst 20-year-olds are high in 1990, and then rates for 30-year-olds are high in 2000, this would be evidence instead of a cohort effect. That is, that the group of individuals born in 1970 have a particular propensity or 'character' for homicide.

This is essentially what Baumer and Wolff (2014) did using panel data from 67 nations including the UK. They produced age- and sex-disaggregated trends in

homicide victimization from 1989 to 2008. These trends showed strong homogeneity. That is, trends for all ages tended to move up and down together – the classic sign of a period effect. They concluded that there was no evidence that “*unique early life experiences*” drove a particular cohort of individuals to be more homicidal or more vulnerable to homicide. However, Baumer and Wolff’s analysis aggregated many nations’ data into a single set of trends. And others argue that cohort effects may be too subtle to detect via graphs and that more sophisticated methods known as age-period-cohort analysis may be required. These models are complicated but in essence they attempt to control for both age and period effects, leaving just the potential cohort effects. Often this is done with dummy variables for each age and period. The age dummies aim to remove the effect of the typical age crime curve. The period dummies remove effects common to a particular year. This just leaves effects particular to cohorts. Unfortunately though, the best way to implement age-period-cohort models remains contested, which means there has been much disagreement about results.¹¹

For example, Smith (1986) used age-period-cohort analysis to analyse the rise in US homicide in the 1960s. He concluded that the rise could be explained largely via a cohort effect. Those born between 1943 and 1961 had significantly higher homicide rates than those born before and retained those higher rates as they aged. However, Smith’s analysis only went up to 1976 and is therefore of limited value in studying trends through to the present. Shahpar and Lee (1999) performed a similar analysis on *victimisation* data for a longer period: 1935 to 1994. They came to the opposite conclusion regarding the 1960 to 1974 rise in homicide, finding that it could be explained by a period effect, but that the rise from 1985 was mainly a cohort effect. These differences highlight another issue with investigating cohort effects. The best test probably involves offender data, yet this generally comes in the form of arrest rates, and these can be affected by police practice. It is possible that arrests for all ages might go up in periods in which homicide is deemed high priority or given extra resources.

This rather limited collection of studies doesn’t really allow for strong conclusions about the presence or absence of a cohort effect within homicide data. To supplement these findings, therefore, we conducted our own brief analysis of US arrests data (see Appendix 1) and examined other studies that have tested for cohort effects within crime data more generally. The latter were not included among the short-listed studies because they did not specifically test for an effect on homicide.

¹¹ It is beyond the scope of this review to go into these methodological difficulties in detail. But briefly, the issue is that there is a linear dependency between the dummy variables for age, period, and cohort – i.e. if one know two of the three the other can also be determined. This means the coefficients cannot be estimated simultaneously. See O’Brien and Stockard (2009) for more on this.

Appendix 1 contains graphical analysis of US arrest trends to see whether they demonstrate obvious signs of a cohort effect. The main finding was that although there was some evidence of a potential cohort effect for crimes like burglary and robbery, with those born between about 1947 and 1965 having a higher propensity for these crimes than those born before or after, there was no immediate evidence of such an effect within the US homicide data for 1980 to 2012. This is somewhat different from the situation for England and Wales, where Dorling (2006) – using similar methods – did find some evidence of a cohort effect within homicide data and other studies, (for example Prime et al, 2001; Francis et al., 2004; Farrell et al., 2015; Matthews and Minton, 2018) have found cohort-like patterns in UK crime data more generally. However, it is important to recognise most of these analyses were largely observational. More robust testing is required.

Findings from the non-homicide studies were also somewhat mixed. Fabio et al., (2006) found no evidence for a cohort effect on self-reported violence perpetration using data from the Pittsburgh Youth Study, which tracked delinquency and risk factors in youths from 1987 to 2000. In contrast, Kim et al., (2016) did find evidence of a cohort effect using arrest data for New York State. Those born between 1956 and 1965 had particularly high rates and those born after 1970 had consistently lower rates. They concluded that the drop in arrests from 1990 to 2010 was mostly due to this cohort shift, rather than a universal drop in arrests across all age groups. Similarly, Rivara et al., (2009) found that the younger cohorts in their study (those born from 1966 to 1975) were at a lower risk of intimate partner violence compared with older cohorts. Also of relevance is the study by Porter et al., (2016), which analysed data from the Survey of Inmates in State Correctional Facilities from 1974 to 2004. They found that the US prison population had aged markedly over that period (median age rose from 27 to 34) but that – contrary to popular wisdom - this was not because sentences got longer. Instead they found that it was due to a cohort effect. Those individuals born in the 1960s tended to offend at higher rates even as they aged. The authors found that drug use significantly mediated the relationship between cohort and incarceration. They therefore concluded that the cohort effect was driven not perhaps by early years factors in the 1960s but because that age group came of age in the 1980s when certain types of substance abuse (notably crack-cocaine) reached its peak (Porter et al., 2016).

Overall, the evidence from this section has not provided a clear answer to the question of whether homicide trends since World War 2 have been driven to any great extent by cohort effects. The available studies and data have mixed results. However, two tentative conclusions seem justified. Generally, the case for a cohort effect seems stronger for crimes *other than homicide*. And the case for an effect on homicide seems stronger for England and Wales than for the US. Ultimately though, it is worth reserving judgement on this issue until the evidence in the following sections has been reviewed. These sections summarise studies that have assessed

the evidence for specific cohort effects. They therefore contain evidence both on the presence or absence of a cohort effect *and* on what might have driven such an effect.

4) Specific cohort effect 1: cohort size, fertility, parenting and family environment

A prominent theory, particularly for the rise in homicide from the 1960s in the US, was that it was linked to the coming of age of the baby boom generation. Bigger cohorts have more people hence there is an argument that cohort size will affect homicide rates in a mechanical fashion. A higher proportion of people of the ages most affected by homicide would raise overall homicide rates, all else equal. This possibility is explored in the opportunity annex.

However, other researchers suggested that larger cohorts may have higher homicide rates *over and above* the demographic effect alone. Initially, those who argued for this kind of cohort effect did not emphasise character. Instead, the theory was that larger cohorts faced greater competition for pro-social resources which meant crime became a more attractive counter option (Easterlin and Schapiro, 1979). More recently however, researchers have drawn links between homicide and fertility patterns (and hence cohort size) for different reasons. One school of thought, based on evolutionary theory, is that individuals brought up in stressful, unpredictable environments adopt a faster 'life-course strategy' (a concept with considerable overlap to 'character') which emphasises both a greater appetite for risk, and hence violence, as well as a higher fertility rate (Wilson and Daly, 1987). The basic theory is that when life expectancy is unpredictable and could be cut short, it makes more sense to take risks and to have a greater number of children in order that at least some will survive to reproductive age. In this way, violence and fertility are yoked together in a 'live fast, die young' mentality.

Might this be linked to trends in homicide? Individual-level studies typically find that large family size is a robust predictor of criminality, including homicide (Farrington et al., 2012). But again, there are other possible explanations that have nothing to do with evolutionary theory or character. It could be that larger families have fewer economic resources per child and that this affects later behaviour. But equally it is possible that the resources that matter for the development of characteristics associated with later violence are wholly or partly *emotional*. Studies have linked many aspects of parenting like parental warmth and/or parenting style to both the development of characteristics associated with later offending (like low empathy, low self-control etc) *and* to offending itself (Kimonis et al., 2013; Williams and Steinberg, 2011). Furthermore, studies show that the adoption of a faster life-history strategy not only implies a higher fertility rate and more offspring but also lower emotional investment in each. In other words, links between fertility and homicide may be partly due to adaptations that make both a greater appetite for violence and a higher fertility rate more evolutionarily beneficial; but these adaptations may also be magnified by a lack of parental investment. Potts and Hayden (2012) have noted that:

“Possibly the most important cultural influence in our lives is the emotional investment of our parents, especially our mothers...this investment is rarely as great in a large family as a small one.”

In this annex, we have chosen to include all studies that investigate the relationship between homicide and cohort size or fertility, regardless of whether they explicitly reference the Easterlin/economic hypothesis or an evolutionary/character-based one. One reason is that in many instances the studies simply test for a relationship between relative cohort size and homicide. They do not test the mechanism. So, a positive relationship could indicate an Easterlin effect based on competition, and hence be nothing to do with character. But it could also indicate some other kind of fertility effect linked to the development of individual characteristics associated with violence and homicide, as described above.

Studies examining possible parenting or family environment effects on homicide trends are also included here. Shifts in parenting style or typical family environments could of course exert their own direct effects on the characteristics of individuals as they grow up and hence homicide trends. But it is also possible that trends in fertility and cohort size are linked to parenting via the life-course strategy approach or a similar concept.

All the studies examined in this section are briefly summarised in Table A7.4.

Table A7.4: Studies testing the effect of relative cohort size on homicide

Study	Area and time period	Character-related variable	Method and finding
Baumer, 2008	114 US cities from 1980 to 2004	Non-marital births, proportion of youth born to teenage mother	Two-way fixed-effects panel models with linear and quadratic time trend. Found significant positive lagged effect for teenage motherhood but not for non-marital births. Concluded that trends in teenage motherhood explained 5-10% of the change in homicide.
Cook and Laub, 2002	US, 1985 to 1998	n/a	Uses descriptive statistics to test cohort and period explanations for rise and fall in homicide from 1985 to 1998. Concludes that there is little evidence for a cohort explanation of the homicide epidemic and that of the possible period explanations the crack hypothesis explains most of the facts regarding the rise in homicides but is less consistent with the fall.

Easterlin and Schapiro, 1979	US, 1910-1977	Cohort size, fertility rate	Correlational analysis. Found strong negative correlation between homicide rate and fertility rate, and strong positive correlation between cohort size and homicide rate in the period after, but not before WW2. Concluded that cohort size restricted economic/family-building opportunity leading to higher homicide rates.
Heide, 1997	US 1968 to 1993	n/a	Narrative and correlation analysis. Found correlation between family variables and rising youth homicide. Concluded that family breakdown and poor parenting were among the causes of the rise in youth homicide.
Johnson, 2006; Johnson 2008	Japan, 1988-2003	n/a	Narrative analysis with descriptive statistics. Shows that Japan's homicide decline has been almost entirely due to a fall in homicides by young males. Rejects economic, high clearance rate and demographic explanations. Concludes that Hasegawa's social-psychological explanation is promising but flawed.
Leenars and Lester, 2004	Canada, 1970 to 1988	Relative cohort size	Regression analysis with limited controls. Finds significant effect between relative cohort size and homicide.
O'Brien et al., 1999	US, 1960-95	Relative cohort size and percentage of non-marital births.	Age-period-cohort characteristic models. Finds that age and period effects explained most of the variation in homicide but that the cohort variables did explain a small proportion of the variation with non-marital births a far stronger predictor than relative cohort size.
O'Brien and Stockard, 2002	US, 1930-1995	Relative cohort size, percentage of non-marital births	Age-period-cohort characteristic models. Finds two positive cohort effects: large birth cohorts and those with more non-marital births have higher risk of dying from homicide. The effect was stronger for non-marital births.
O'Brien and Stockard, 2006	US, 1930 to 2000	Relative cohort size, percentage of non-marital births	Age-period-cohort characteristic models coupled with Seemingly Unrelated Regression. They show that homicide and suicide trends in the US are correlated once age and period effects are controlled. They also show that more than 50% of this correlation can be explained by the cohort effects of relative cohort size and non-marital births.

O'Brien and Stockard, 2009	US, 1965 to 2005	Relative cohort size, percentage of non-marital births	Age-period-cohort characteristic models coupled with an estimable function approach. They show that variations in the age-crime curve for US homicide can partly be explained by the cohort effects of relative cohort size and non-marital births and partly by a surge in youth homicide in the late 80/early 90s that is consistent with the crack-cocaine hypothesis.
Pampel and Gartner, 1995	18 nations (inc. UK) from 1951 to 1986	Relative cohort size, collectivism,	Pooled cross-sectional time-series analyses models. Conclude that collectivism reduces the effects of cohort size on homicide.
Pampel and Williamson, 2001	18 nations (inc. UK) from 1955 to 1994	Relative cohort size, index of traditional family roles (created from fertility, marriage, divorce and female participation rates), collectivism.	Feasible generalized least squares models. Finds that after the US, the UK has one of the highest youth-to-elderly victimization rates (and one which increases through the period. They conclude that the UK has a violent youth culture relative to nations like Finland, Switzerland and Belgium. Overall, family factors emerge as the strongest predictor of having a higher ratio of youth homicide relative to elderly homicide.
Pinker, 2011	Many nations, long-term trends	n/a	Historical/narrative analysis. Concluded that giving women more control over their own fertility is an effective method of reducing violence.
Roth 2011	US, long-term homicide trend	Fertility rate	Historical/narrative analysis using homicide statistics based on capture/recapture methods. Found an inverse relationship between fertility and child homicide. Concluded that during hard times women choose to have fewer children and may neglect the ones they have if they cannot afford the resources to bring them to maturity. He also argued that this may be partly biologically driven.
Savolainen, 2000	US, 1960 to 1995	Relative cohort size, family structure and racial composition	Savolainen used age-period-cohort characteristic models to test whether the effect of relative cohort size is conditional on family structure and racial composition. Results were equivocal. Although in one specification of the model, relative cohort size was significant once family structure and racial composition were controlled, in another specification it was not.

Wilson and Daly, 1997	77 Chicago neighbourhoods from 1988 to 1993	Life expectancy, teenage pregnancy	Correlational analysis. Found that life expectancy was a stronger cross-sectional correlate of homicide than economic variables and that it was in turn strong correlated with earlier reproduction. Concluded that a high-stress, shorter-life-expectancy existence may consciously or unconsciously drive individuals to adopt a riskier approach to life that manifests in faster reproduction and violence.
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As discussed, many of the studies in Table A7.4 examine the relationship between 'relative cohort size' and homicide trends. Before discussing the findings of these studies, it is important to deal with a methodological issue so that it is clear *exactly* what these studies are testing. There are two main ways that researchers have tried to examine the effect of large cohorts. The first is simply to include a variable for the size of the youth cohort – say, the proportion of the population aged 16-29 – into a regression model with homicide as the dependent variable. For these models, a significant result could indicate a simple demographic effect – i.e. that more youths mean more potential homicide victims/offenders, all else equal – or it could indicate that being born into a large cohort also increases an individual's propensity for homicide. Or a mixture of both. The method cannot distinguish between the two. Hence, we have included these studies in the opportunity annex, where we investigate the effects of changes that would have increased the opportunity for homicide by increasing the number of potential victims and offenders.

The studies in Table C4 generally use an alternative method: age-period-cohort models. These studies attempt to isolate the propensity effect from the demographic effect. In other words, a positive effect in these models indicates that individuals within larger cohorts have a higher propensity for homicide and that this affects trends over and above the mechanical impact of having more people. What these results don't tell us, however, is *why* individuals from larger cohorts might have a higher average propensity for homicide and whether this is character-related.

One of the first studies to suggest a reason was Easterlin and Schapiro (1979). They found that fertility rates and homicide rates were inversely related throughout the period 1910 to 1977 in the US. As fertility rates rose, homicide rates tended to fall and vice versa. They explained this with reference to post WW2 shifts in relative cohort size. After the war there was a relative lack of young men in the population due to war deaths and falling birth rates in the decades before the war. But at the same time there was a surge in birth rates: the so-called baby boom. Easterlin and Schapiro's argument (formalised more completely in Easterlin et al, 1980) was that:

"...an increase in the relative proportion of young men.... weakens labour market position and thereby ability to realise economic aspirations. The result is to increase psychological stress... and to encourage antisocial behaviour."

In other words, immediately after the war, homicide rates were low because there were relatively few young men in the population but rates increased sharply when the baby boomers came of age. This was due, the authors suggested, to the stress brought on by increased competition for jobs and sexual partners. Being excluded from these pro-social processes made crime a more attractive counter-option.

This proposition was tested in four studies by O'Brien and colleagues (O'Brien et al., 1999; O'Brien and Stockard, 2002; O'Brien and Stockard 2006; O'Brien and Stockard 2009). In the first two papers the researchers used age-period-cohort characteristic models that incorporated dummy-variable controls for age and period effects. In the first paper they examined rates of US homicide *arrests* for those aged 15 to 49 from 1960 to 1995, and in the second paper they repeated the analysis looking instead at homicide *victims*. Their results suggested that although age and period effects explained most of the variation in homicide rates there was some evidence of a cohort effect on both homicide perpetration and victimisation in the US. They then tested whether this could be explained by relative cohort size. This revealed a small but significant effect. They also tested an alternative cohort variable related to family environment: the proportion of non-marital births. This was also significant and had a larger effect on homicide trends.

These results were criticised by Cook and Laub (2002), who argued that they were inconsistent with descriptive data for the period 1985 to 1998. Cook and Laub argued that the marked shift up and down in US homicide rates that occurred at that time showed all the hallmarks of a period effect rather than a cohort one. That is, although the rise in rates was almost entirely due to an 'epidemic of youth homicide', crime rates within that group rose and fell together. So the rate for 16-year-olds increased at the same time as the rate for 22-year-olds, rather than six years later, which is what a cohort explanation would suggest. The problem with O'Brien et al.'s regression specification, they claimed, was that it forced the period effects to have the same proportional effect across all age groups. But the data suggested instead a 'youth-specific period effect'. That is a period effect which affected all ages within a certain range (i.e. 16-25) at the same time. For Cook and Laub (2002) then, the data for that period were more consistent with the crack-cocaine hypothesis (see the drugs annex) than a cohort explanation.

O'Brien and Stockard adjusted their analysis in a third paper (O'Brien and Stockard, 2006). Using data from 1930 to 2000, they found that, once age and period were controlled, there was a significant change in the age distribution of both US homicide and suicide trends and that the latter would have been less affected by the crack epidemic. For both, the age distribution had a higher proportion of younger individuals in 2000 compared with 1930. They found this was due to a cohort effect and that relative cohort size and the proportion of non-marital births could explain more than half of it.

In O'Brien and Stockard (2009), the two researchers addressed Cook and Laub's critique more directly by examining in more detail the age distribution shift in US homicide rates. Looking at rates every five years, they agreed that there was a significant shift towards younger individuals in the 1990 and 1995 rates. But they still argued that the cohort variables – relative cohort size and proportion of non-marital births – could explain a significant proportion of this upturn, though not all of it. As such, they concluded that their results supported both a cohort replacement hypothesis and a crack-cocaine hypothesis.

To some extent these results agree with the findings from the previous section, which looked at the presence or absence of a cohort effect rather than the reason. On the whole, there is some evidence that US homicide trends have been partly driven by a cohort effect. That is, different generations have had slightly different propensities for homicide. However, generational differences seems to have played a far smaller role in trends between about 1985 and 2000 – at that point, some other effect caused a sharp spike in homicide offending for all youth age groups simultaneously. The results of O'Brien and colleagues also suggest that the mechanism for a cohort effect (i.e. the reason why certain generations might have higher average homicide propensity) may be more to do with family environment than economic competition. Generally, their results suggested that the proportion of non-marital births exerted a greater cohort effect on homicide trends than the size of the cohorts.

Two studies by Pampel and colleagues also examined these issues. In an initial study of 18 nations, including the UK, Pampel and Gartner (1994) found that relative cohort size influenced youth homicide rates. However, they also found that the size of the effect was modified by the level of 'collectivist' policies, like the extent to which those outside the job market were protected by welfare. This supports Easterlin's hypothesis. If the relationship between large cohorts and homicide comes via economic competition, it makes sense that welfare policies will moderate the relationship. However, in a later paper using similar data but focusing on the age distribution rather than the level of homicide, Pampel and Williamson (2001) reached a different conclusion. They found that rather than modifying the effect of cohort size, low levels of collectivism exerted a separate effect. This separate effect is of course interesting, but we examine welfare impacts in more detail in the economics section of the 'other' annex. Here, the result of interest is that the relationship between cohort size and homicide was not modified by economic policies. Arguably, this contradicts Easterlin's hypothesis and suggests the possibility of some other mechanism.

The findings from Savolainen (2000) are also consistent with many of the tentative conclusions reached so far. Like other researchers, Savolainen found that relative cohort size provided a much better explanation of US homicide trends up to 1980 but seemed to fail after that because age-specific crime rates did not decline with the

ageing of the baby boom generation. He tested whether the explanation could be that family environment and structure was more important than the size of the cohort. He noted that although cohorts decreased in size after the baby-boom generation, they contained a higher proportion of single-parent, female-headed households, particularly in Black communities. Could this explain the sharp rise at the end of the 1980s? Overall his results suggested that these shifts in family environment had only a minimal effect. Savolainen concluded that cohort effects could at best explain only part of the homicide rise from 1985 to 1995 and that, "*a more plausible explanation is suggested by the processes associated with the crack epidemic, which affected American inner cities during this period.*"

To this point, we have only summarised studies that examined trends in the US or multiple nations. One short-listed paper, Leenaars and Lester (2004), found that relative cohort size also predicted homicide trends in Canada for the period 1970 to 1988. However, their methodology was quite weak. They used a simple regression model rather than an age-period-cohort analysis and included limited control variables.

In two short-listed papers (Johnson, 2006; Johnson 2008), David Johnson explored trends in Japan. Japan is an interesting test-case because it is one of the very few nations with reliable homicide data which did *not* have a homicide rise in the late 1960s.

Johnson showed that, consistent with a possible cohort effect, the fall in Japan's homicide rate was almost entirely due to a decline in homicides by young males, which were a tenth as large in the 2000s as they were in the 1950s. This meant that in the early 2000s, 40-50 year-old males were more likely to kill than younger men, something that is essentially unique to Japan. Johnson rejected previous explanations for Japan's homicide decline based on post-war economic success because the country has experienced a slump since the early 1990s yet the homicide rate has remained low. He also rejected explanations based on high clearance rates or demographics. He suggested that Japan's commitment to post-war pacifism may be part of the reason, but that this has not been properly tested.

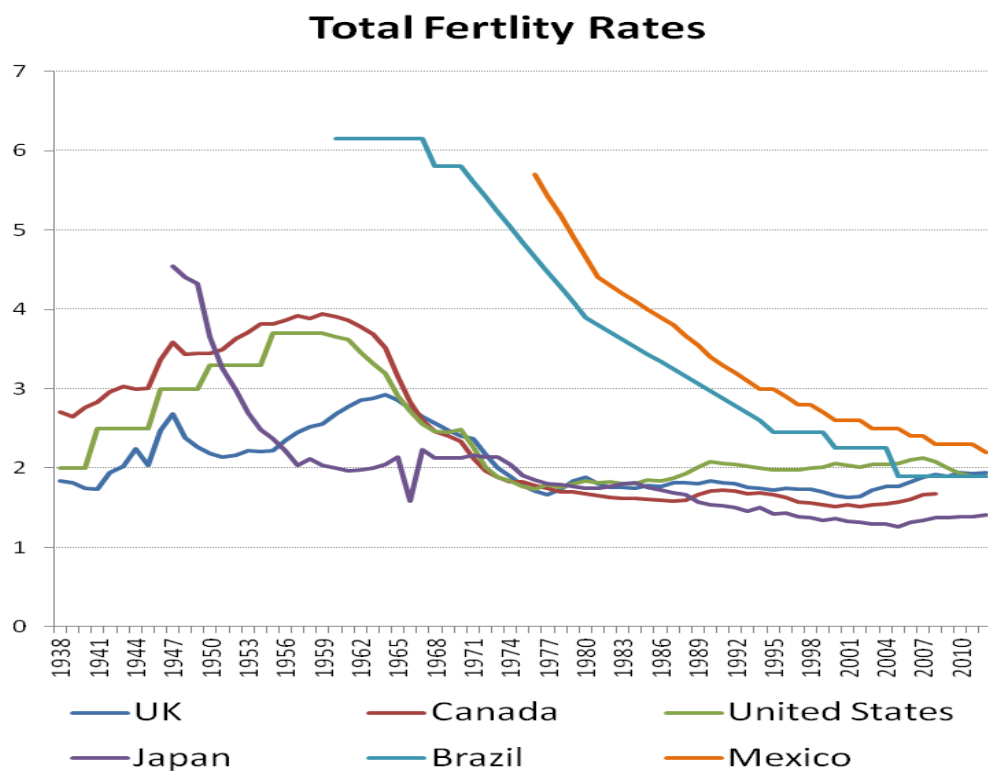
Johnson's analysis also incorporated a cohort-based explanation, suggested by Hasegawa (2005). Based on evolutionary psychology, Hasegawa's argument was that young males' propensity for homicide is likely to depend on how it affects their reproductive fitness, which will in turn depend on access to resources. In times of plenty, there is no need to obtain resources through violent means but in times of hardship, violence becomes a more attractive means of obtaining resources and hence enhancing reproductive fitness. In this framework, the Japanese homicide decline can be explained, Hasegawa argued, in terms of the post-war trends showing increases in average household income, decreases in family size (which means more income per person within the family) and improving educational levels.

In other words, Japanese male youths were socialized during the post-war period in an atmosphere of relative plenty making violence a less attractive option for obtaining resources.

This has obvious overlaps with Easterlin's relative cohort size hypothesis. Both emphasise competition for resources, although Hasegawa adds at least two factors to the debate. Firstly, that relative cohort size will not be the only thing affecting access to resources, other conditions clearly matter too. And secondly, that education might act as a protective factor.

Though Hasegawa's hypothesis is based only on correlations, Johnson found it promising because it directly addressed the issue of why homicides have fallen disproportionately among young males. It also fitted with data showing declines in risky behaviour of all kinds among Japanese youth, including smoking, drinking, truanting and accidents. But he also suggested that the theory had flaws. He pointed out that other nations saw a similar post-war improvement in resources and education levels for young males yet had different trends in homicide. This critique ignores one crucial fact. Japan was unique because its economic prosperity was not accompanied by increased fertility. Fertility rates in Japan *fell* sharply in the post-war period as the US, Canada and England and Wales were experiencing their baby boom bulge, see Figure A7.3.

Figure A7.3: Total fertility rates in six nations with different homicide trends



The correlation with lagged homicide rates is striking (and perhaps might also help to explain why the homicide rates in the 2000s have been highest in Latin American countries like Mexico and Brazil).¹² So, while many nations enjoyed a period of prosperity after WW2, Japan was unique in that it shared that prosperity amongst fewer individuals. In that sense, it is possible that the approach of Hasegawa and Easterlin might help to explain the uniqueness of Japan's homicide trend.

But Johnson had a second criticism of Hasegawa's theory. He argued that the kind of risk assessment implied by the economic argument doesn't fit with the irrational, reactive nature of many homicides. In relation to this, others have suggested a possible link between fertility and homicide that is less to do with a rational decision to undertake crime in order to win resources and has more to do with the unconscious development of certain characteristics.

For example, Wilson and Daly (1997) used data from 77 Chicago neighbourhoods between 1988 and 1993 to show that life expectancy had a very strong correlation with homicide (-0.88) even when the socio-economic characteristics of areas were controlled and even though only a small percentage of all deaths were due to homicide. They explained these results in evolutionary terms. In high-stress, shorter-life-expectancy environments, they argued that it makes more sense to adopt a riskier approach to reproduction and resource accumulation, also known as a 'fast life history' strategy. The theory predicts that areas where life expectancy is lower or more unpredictable will have higher homicide rates as males compete for dominance, but also higher fertility rates and more teenage births as individuals prioritise higher numbers of offspring hoping that at least a few survive. This contrasts with a slow life-history strategy in which greater predictability and life expectancy lead to increased parental investment in fewer children. In that light, it is important that Wilson and Daly also found that life expectancy and homicide were correlated strongly with earlier reproduction. For example, the birth-rate for 15-19 year-old mothers was 190 in the ten neighbourhoods with the lowest life expectancy compared with 45 in the ten neighbourhoods with the highest life expectancy.

This hypothesis turns the relative cohort size theory on its head. Instead of a large cohort causing competitive stress and hence violence; these authors argue that stress and unpredictability result in large cohorts comprised of individuals with a greater appetite for risk and violence. Or to put it another way, that a large cohort is simply a sign that an increase in societal-level stress has tipped the population towards a faster life history strategy on average.

This version of the relative cohort size approach also deals, perhaps, with Johnson's rationality critique. According to the fast life history hypothesis, adopting a riskier

¹² The fact that fertility trends in Brazil and Mexico have dropped sharply, largely converging with those of the other nations by 2010, arguably bodes well for homicide rates in the 2020s and 2030s.

approach to life is not so much a rational choice, but something that is ingrained to some extent. In that sense, it acts like a personal characteristic.¹³ Follow-up studies have not only shown strong cross-sectional correlations between fast life history variables and homicide (Hackman and Hruschka, 2013; Rushton and Templar, 2009; Templar and Rushton, 2011). They have also suggested that growing up in stressful, unpredictable environments is one factor that influences character traits associated with violence. For example, Dunkel et al. (2013) showed that individuals with fast life history traits tend also to have less self-control and higher crime propensity. They explain their results as follows:

“The causal sequence that materializes is as follows: a dispositional fast life history strategy, which is both the product of genetic inheritance and early childhood experiences, combined with environmental cues suggesting a short life expectancy, cause an individual to develop low levels of self-control. Low levels of self-control in conjunction with an opportunity cause criminal behaviour.”

For these authors, violence can be viewed not as a pathological, irrational behaviour, but as an evolutionarily sensible adaptation, either to unpredictable surroundings or to highly patriarchal societies. Potts and Hayden (2012), Daly (2017), Raine (2013) and others who have made this case noted many examples from the animal kingdom of species in which traits associated with male dominance (both against other males and over females) are of immense evolutionary benefit. Studies have shown that in highly patriarchal species, high-ranking males generally have higher numbers of offspring than low-ranking males (Ellis, 1995; Raine 2013).

Some studies have reported similar patterns in human populations. Potts and Hayden cited a 2003 study which found that 8 percent of men in central Asia have virtually identical Y chromosomes, meaning they probably descended from the same man, which was almost certainly Gengis Khan (Zerjal et al., 2003). He was a warrior Mongol Emperor who saw women as the spoils of war. According to one Chinese historian he had 20,000 descendants (ibid.). So, it's not difficult to see how traits favouring violence might have been evolutionarily adaptive and hence passed down the generations. Raine (2013) offered the Yanomamo tribe as a further example. He cited evidence to show that 30% of all male deaths among the Yanomami are due to violence and that 44% of all Yanomami men over the age of 25 have killed someone. The men who have killed someone have an average of 1.63 wives and 4.91 children compared to 0.63 wives and 1.59 children for non-killers. However, others have argued against the proposition that violence can confer an evolutionary advantage (for example Miklikowska and Fry, 2012), noting that the original Yanomami study conducted by Chagnon (1988) had many analytical flaws.

¹³ In addition, Daly (2017) argued that given high unpredictability and winner-takes-all environments adopting a risky violent strategy may be a perfectly rational approach for young men.

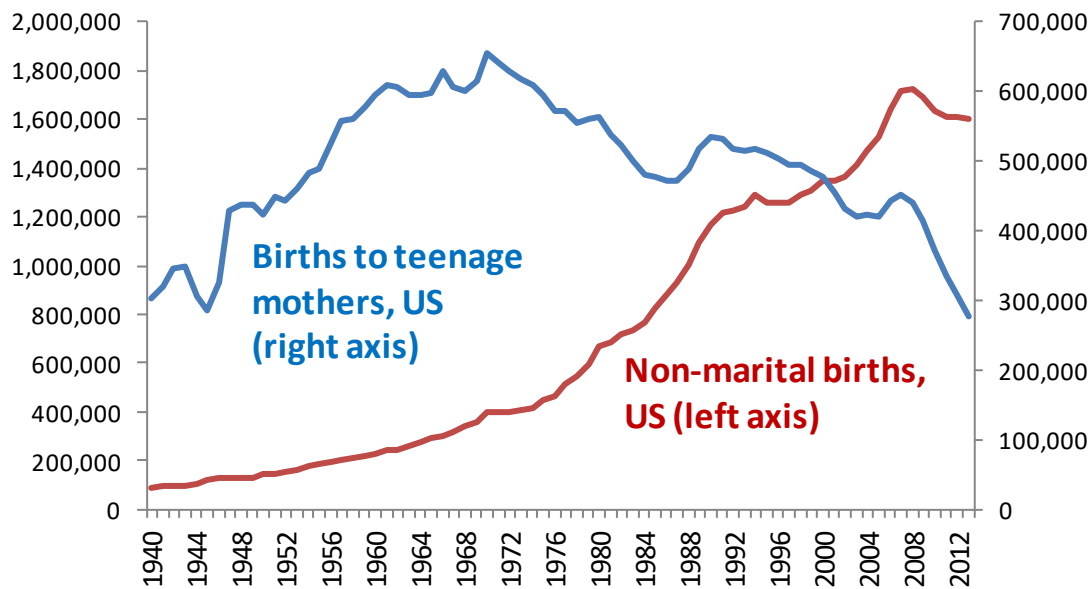
A closely related framework that may also be relevant is offered by Belsky and colleagues (Belsky et al., 1991; Belsky, 2012). They also take an evolutionary approach but argue that children use early life experience to form a personal model of the availability and predictability of resources, the trustworthiness of other people, and the nature of interpersonal relations. Early adversity fosters expectations that resources will be unavailable and other people will be untrustworthy, which may promote behaviours like aggressiveness, low agreeableness and an orientation to material incentives over social ones. (Carver et al., 2014)

Unfortunately, most research in this area has been geographic rather than temporal. Wilson and Daly showed that areas with low life expectancy were also areas of high homicide. The same logic may apply to time periods of lower life expectancy, but this has not been well tested yet. However, one implication of these theories is the link between early reproduction, reduced parental investment, risky behaviour, and violence. Other short-listed studies have tested aspects of this. Baumer (2008) used data from 114 US cities and fixed effects regression. He found that the percentage of youth born to a teenage mother predicted homicide rates a generation later and explained 5-10% of the change in homicide trends.¹⁴

Indeed, teenage motherhood is perhaps emerging as a stronger family-related cohort predictor than non-marital births. The latter was significant throughout the studies by O'Brien and colleagues. But it was not significant in Baumer's study and, unlike teenage motherhood, more recent trends seem to contradict a cohort hypothesis, see Figure A7.4.

¹⁴ Hunt (2006) also found a strong relationship between lagged teenage motherhood trends and violent crime in the US. But she did not test homicide specifically.

Figure A7.4: US trends in non-marital births and births to teenage mothers



The fact that non-marital births in the US continued to rise until around 2009 led O'Brien and colleagues, along with others like Heide (1997) to predict continued upward pressure on youth homicide. We now know that this prediction was flawed. US homicides have fallen sharply since the mid-1990s, which fits better with the decline in births to a teenage mother that occurred a generation before.

Roth (2011) also found a link between fertility and homicide rates, using long-term data for England, the US and other nations, but only for child homicides by parents or their care-givers. Roth cited numerous historical periods, like late-sixteenth-century England, in which severe economic stress (real wages dropped by more than a third for the poor) coincided with lower birth rates, lower life expectancy, less pre-marital pregnancy and higher rates of child homicide (neonaticide jumped five-fold). He argued that this may reflect economic calculation. In hard times extra children may be too much of a burden. But it may also be partly biologically driven. Roth cited studies showing that new mothers in high-stress situations produce more of the stress hormone cortisol and are also less attentive and attached to their babies.

Pinker (2011) also emphasised fertility in his narrative of the long-term decline in violence. He noted that some of the highest rates of violence were to be found in patriarchal societies, where men largely controlled fertility levels. He cited Potts and Hayden's 2009 book *Sex and War*.

"...giving women more control over their reproductive capacity (always the contested territory in the biological battle of the sexes) may be the single most effective way of reducing violence in the dangerous parts of the world...."

These authors argued that societies with high ratios of young to older men are particularly prone to conflict and that the best solution is to empower women. In computer simulated war/resource games, men were five times more likely to launch unprovoked attacks than women (Johnson et al., 2006). Again, though, there are no studies – to our knowledge that have applied these theories to recent homicide trends. Certainly, women's status and fertility trends changed markedly from 1970 on, but whether this helped to drive the decline in homicide remains an open question (though see the Opportunity annex for some studies that looked at gender equality and the ratio of young to old men).

Taken together these studies suggest that generational differences in homicide propensity may have less to do with economic competition and be instead due to complex inter-relationships between environmental conditions, fertility strategies, parenting, patriarchy and appetite for violence. Evidence suggests that harsh conditions drive fertility down through lack of resources, but also encourage faster life history strategies like reduced parental investment, earlier reproduction and risky behaviour. Advances in prosperity, education and women's status (see the opportunity annex) appear to push in the opposite direction, towards slower life history strategies typified by greater parental investment in fewer children and higher levels of self-control. But at the moment the degree to which this approach is linked to recent homicide trends remains unclear. The Great Depression and World War 2 were certainly events that would have caused greater stress, unpredictability and lower life expectancy. So perhaps the subsequent rise in fertility and the accompanying homicide rise is linked in some way to them. But no studies have really tested this mechanism – to our knowledge – and a simple look at dates suggests an instant problem. Homicide started rising in England and Wales and the US in the early 1960s, which might fit with a theory proposing that those born during wartime are most likely to be adapted for faster life-course strategies. But generally, cohort studies (and Appendix A) have found that the highest crime propensity was to be found in the cohort born immediately after the war ended, from around 1946 to 1970.

A solution to this temporal issue has been proposed by Peter Vronsky (2018), who argued that – in this context - the main impact of the war was a crisis in fatherhood which continued and perhaps worsened after conflict ceased. War obviously created many families without a father, but Vronsky also cites evidence that witnessing the atrocities of war (including those perpetrated by soldiers on one's own side) would have created terrible trauma that would have affected the men's ability to parent successfully on their return. However, Vronsky's hypothesis was actually invoked to explain a rise in serial killers rather than homicide as a whole. It therefore requires much further research and testing.

To summarise - this annex has attempted to synthesise many disparate and complex studies. Overall though, three findings were reasonably consistent:

- **On the presence of a cohort effect:** Adding to the evidence of the last section, most studies reviewed here found some evidence of a cohort effect. i.e. that different generations have had different average homicide propensities and that this has affected homicide trends. However, few studies tested UK or England and Wales homicide data, and those that looked at the US found that cohort effects were not a strong driver of homicide from about 1985 to at least 2000.
- **On cohort size/fertility as a driver of the cohort effect:** Studies were consistent in finding a small but significant relationship between cohort size and homicide propensity. It is also striking that Japan seems to have been unique among developed nations in having neither a baby boom generation nor a rise in homicide in the 1960s.
- **On family environment as a driver of the cohort effect:** Studies were consistent in finding that family variables like proportion of non-marital births and proportion born to a teenage mother exerted significant cohort effects, and that these were generally more important than cohort size, although the effect of non-marital births seems to have waned over time.

Whilst these results are reasonably clear, their meaning is far less so. In relation to character and the hypothesis that characteristics developed in the early years go on to affect homicide trends a generation later – the first result suggests this cannot be dismissed. However, the fact that most studies found some evidence of a cohort effect also does not prove the hypothesis, and clearly the generational development of characteristics associated with homicide does not provide a satisfactory explanation for US trends after 1985. Most authors suggested the crack-cocaine epidemic was more important during that period.

Things get even more complicated in relation to the second and third results. These suggest the possibility that cohort size/fertility and family upbringing/environment could be linked to the development of characteristics that drove homicide trends. But they do not prove it. It is possible that both these results are driven by lack of access to economic resources. That is, that larger cohorts and certain types of families suffer greater economic strain and that this leads to the effect on homicide rather than character.

And even if these results are due to a connection between fertility and/or family environment and the development of characteristics associated with higher homicide rates, exactly how this might operate and what might have caused these shifts remains unclear. In particular, whilst individual-level studies tend to suggest that the quality of familial relationships is more important than family structure in predicting offending, the studies in this section only really tested structural variables. Child-rearing fashions changed markedly in the twentieth century (see below), so it seems logical that parental/child relationships may have changed markedly too. Yet no

studies, to our knowledge, have attempted to quantitatively test this in relation to homicide trends.

Finally, another set of studies offered the possibility that any relationship between family and/or fertility and the development of homicide-relevant characteristics may be ultimately driven not by changes in child-rearing fashions, but by deep underlying biological and evolutionary effects. For example, the results of studies like Wilson and Daly (1987) suggest that stressful or unpredictable environments affect individuals' evolutionary strategies, which in turn affects parenting and the development of characteristics like self-control. However, the application of this theory to aggregate-level homicide trends remains in its infancy. Much further testing is required.

5) Specific cohort effect 2: the abortion hypothesis

One fertility-related hypothesis that has been thoroughly tested is the so-called 'abortion hypothesis' proposed by Donohue and Levitt (2001). They argued that the legalization of abortion decreased all crime (including homicide) a generation later. This cohort hypothesis is the subject of nine short-listed papers, shown in Table C5.

Table C5: Studies examining the relationship between abortion and homicide

Study	Area and time period	Character-related variable	Method and finding
Berk et al., 2003	US 1970 to 1998	Abortion	Interrupted time series. Found that the legalization of abortion had a lagged effect on male, youth homicide, but had little effect on homicides of young women.
Brzezinski and Halber, 2012	US states, 1985 to 1997	Effective abortion rate	They combine fixed effects regression including state-level crime controls with an algorithm for generating perturbed data sets to test stability of previous abortion-crime estimates. They find that Donohue and Levitt's original approach does not provide computationally stable regression coefficients, and therefore, that their estimates of the abortion-homicide relationship are unreliable.
Dills and Miron, 2008.	20 nations, 1950-2001	Abortion legalization	Simple correlation analysis comparing abortion rates with homicide trends 20 years later. Finds while the data in some countries supports an abortion hypothesis, the opposite is true for a roughly equal number of nations.

Donohue and Levitt, 2001	US, 1973 to 1999	Abortion legalization	Fixed effects regression. Finds that legalization of abortion led to a sharp increase in abortions and that states which legalized abortion earlier also had earlier drops in crime a generation later. Also found significant relationship between effective abortion rate at the state level and homicide. Concluded that legalized abortion accounted for about half the decline in crime in the United States between 1991 and 1997.
Francois et al., 2014	16 Western European nations, 1990 to 2007	Abortion rate, abortion legalization	Regression with country and year fixed effects, country specific time trends and multiple time-varying controls. Finds significant effect on homicide for both changes in abortion rate and year of legalization.
Joyce, 2009	Multiple nations, 1960 to 2000	Abortion legalization	Review with examination of age-specific homicide trends. Finds that age-specific homicide trends support a period effect rather than a cohort effect. Concludes that abortion was unlikely to have a marked effect on homicide trends through the 1980s and 1990s.
Kendall and Tamura, 2010	32 US states, 1957 to 2002	Unmarried fertility	Used fixed effects regression with controls and found that an increase of 10 non-marital births per 1,000 live births is associated with a 2.5% rise in homicide and hence that this has been an important driver in overall US homicide trends.
Lott and Whitley, 2001	US states from 1976 to 1998	Abortion legalization	Fixed effects regressions (over 6,000 of them!). Concludes that abortion legalization drove significant if very small to modest increases in murder rates: legalizing abortion would increase murder rates by around 0.5 to 7 percent.
Sen et al., 2012	50 US states plus Washington DC, 1983-2002	State restrictions on abortion	Panel data models with state and year fixed effects with time-varying controls. Found that state-level restrictions on abortion were associated with a 13% increase in homicides of under-5s.

In their original paper, Donohue and Levitt (hereafter referred to as DL) outlined the hypothesis, which is summarized below:

- The legalization of abortion led to a sharp increase in abortions. DL noted that seven years after the Roe v. Wade case resulted in legal abortion, over 1.6 million abortions were performed annually, almost one for every two live births.
- The increase in abortions would have reduced crime a generation later in two ways. Firstly, by mechanically reducing the number of individuals in society.
- DL also argued that legalized abortion decreased crime propensity amongst remaining births. This in itself could occur in at least two ways: i) If women who have abortions tend to be those most at risk of giving birth to children who would engage in criminal activity. They cited evidence that teenagers, unmarried women, and the economically disadvantaged were all substantially more likely to seek abortions in the US after legalization, and more likely to have criminal offspring; ii) if women use abortion as a tool to delay childbearing so as to provide a more conducive environment for their child's upbringing.

To test the overall hypothesis (rather than the individual elements), DL showed that five states which legalized abortion in 1970, three years prior to the remaining states, also saw earlier and more pronounced drops in crime a generation later. They also employed panel data analysis with state-level controls to show that higher rates of abortion in a state in the 1970s and early 1980s were linked to lower crime (and lower homicide, which was tested separately) from 1985 to 1997. Using these models, they estimated that legalized abortion accounted for about half the decline in crime in the US between 1991 and 1997.

There have been many subsequent studies that added to or tested the abortion hypothesis. Some have been included here because they specifically tested the effects on homicide trends. Others were not included because they only tested the hypothesis in relation to total crime or a crime type other than homicide. However, the latter were also briefly reviewed for completeness.

A number of the follow-up studies either questioned or defended DL's econometric methodology. It is beyond the scope of this study to exhaustively analyse this debate though the reader is directed to Joyce (2009) for a review. Briefly though, DL have been criticised for, amongst other things:

- omitting important variables, for example, their original analysis did not include a variable related to crack cocaine (Joyce, 2009);¹⁵

¹⁵ DL intended to control for an effect like crack-cocaine by including state-year fixed effects. However, due to an error they omitted these in the original paper. In a follow-up they showed that including these decreased the size of their estimates by around 50%. However, in the same response

- the choice of years included in the analysis (Joyce, 2009);
- the fact that they don't recognise potential endogeneity in the abortion-crime relationship¹⁶ (Kahane et al, 2008);
- the type of model employed: Joyce (2009) argued that DL should have used an age-period-cohort characteristic model, not a pooled panel data regression; while Anderson and Wells, (2008; 2010) argued that a Bayesian hierarchical model would have been preferable and showed that when this was used there was no relationship between abortion and violent crime (they do not test homicide).
- the functional form of the dependent variable, i.e. whether the log of homicides or the log of homicide *rates* is used. When rates are used the size of estimates reduces markedly and often become insignificant. (Foote and Goetz, 2008);
- the functional form of their abortion variable (Foote and Goetz 2008);
- the fact that DL did not adjust the standard errors for serial correlation within-states over time in their regressions of age-specific arrest rates (Foote and Goetz, 2008; Joyce, 2009);
- that DL's approach does not provide computationally stable regression coefficients (Brzezinski and Halber, 2012);
- The fact that DL ignore illegal abortion and the wider historical context around other changes in fertility occurring at the same time. e.g. growth in use of the pill and Title X¹⁷ (Berk et al., 2003; Joyce 2009; Ananat and Hungerman (2012).

While these critiques appear damning, many of the other quantitative papers in this review would be shown to suffer from at least some of the same issues, were they to

DL also changed their measure of abortion from abortion by state of occurrence to abortion by state of residence – which everyone agrees is an improvement – but they also instrument it with abortions as reported by the Center for Disease Control and Prevention. Joyce (2009) argued that this is flawed and served to inflate their estimates back to the original level.

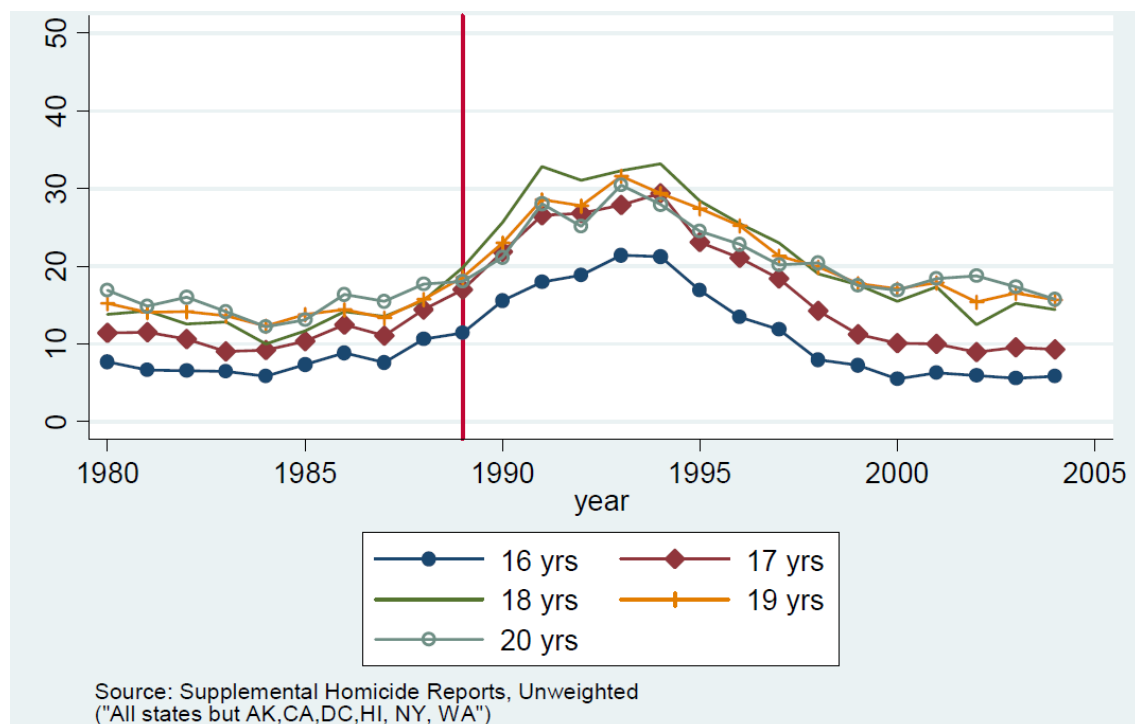
¹⁶ This refers to the possibility that other factors might influence both the rate of abortions and the crime propensity of those individuals. As Kahane et al., (2008) note: "*Consider, for example, a social change that (given constant access to abortion) leads to more births and fewer abortions amongst women in poor socio-economic circumstances in a particular region. In this case we would be likely to observe a spurious relationship between decreases in abortion rates in that area and increases in crime in subsequent years.*"

¹⁷ According to Berk et al. (2003) Title X was "*a comprehensive federal program that provides family planning services to low income women*". It was signed into law in 1970 and "*grew rapidly*" thereafter providing contraceptive counseling and dissemination services. Berk et al (2003) cited evaluation studies claiming that the Title X program substantially reduced the number of unintended pregnancies (Forrest & Samara, 1996), by one estimate, over 20 million unintended pregnancies were averted between 1970 and 1990.

be given the same scrutiny. Econometrics is an evolving scientific method and debate about the best approaches continues to rage.

In a sense then, perhaps the more serious challenge to DL's hypothesis, and certainly a simpler one, is that it largely ignored age-specific rates. That is, if the effect of abortion on crimes, including homicide, were as large as DL suggested, data on arrests by age should show a clear cohort effect with different age groups rising and falling at different times. However, DL do not include these trends in their analysis. In an echo of Cook and Laub's critique of the initial O'Brien et al., cohort analysis (and of our own analysis in Appendix A), Joyce (2009) showed that these plots do not reveal any evidence of a cohort effect (caused by abortion or anything else), see Figure A7.5.

Figure A7.5: Homicide rates by age for 45 US states



Arrest rates for homicide rise from 1985 and fall from around 1992 (which Joyce attributed to crack cocaine markets) but they do so for each year group more or less simultaneously.

Joyce's analysis applies not just to the abortion hypothesis but to any theory proposing that a cohort effect has driven homicide trends. As such, we conducted our own analysis of US arrest rate trends (and similar data that was available for England and Wales). The full results of this are contained in the Appendix (see below), but the main finding was that although there may be some evidence of a potential cohort effect for crimes like burglary and robbery, with those born between

about 1947 and 1965 having a higher propensity for these crimes than those born before or after, there was no evidence of such an effect within the US homicide data for 1980 to 2012. In relation to the abortion hypothesis then, our analysis tentatively suggests that it is not an important explanatory factor in relation to US homicide trends since 1980, but it may have been for other types of crime.

Even so, around half the studies that followed up DL's hypothesis still found some support for the original proposal and in some cases this *did* include an effect on homicide trends. For example, Berk et al. (2003) found that the legalization of abortion was associated with a lagged reduction in homicides of young men but had little effect on homicides of young women using an interrupted time series approach. They also argued that simple trends of homicide by age – as above – may not register a cohort effect because:

“...age differences of a few years or less do not provide social boundaries as clear as ethnicity or gender. It would not be statistically aberrant, for instance, to find a 16-year old male killed by a 19-year-old male.”

Sen, Wingate and Kirby (2012), using panel data and fixed effects models for all US states between 1983 and 2002, showed that state-level abortion *restrictions* were associated with a 13% increase in homicides of under-5s.

Francois et al., (2014) used panel regressions with country and year fixed effects, country specific time trends and multiple controls to test whether the year of abortion legalization and the changing rate of abortion over time affected homicide rates a generation later (from 1990 to 2007) in 16 Western European nations. They found a significant effect on homicide for both changes in abortion rate and year of legalization. However, they admitted that their results were not robust to all model specifications and they were unable to look at age-specific trends due to lack of data.

Dills and Miron (2008) also looked at nations other than the US although they only examined simple correlations between rates of abortion and homicide trends 20 years later. Using data from 20 nations they found that while the trends from some nations supported the abortion hypothesis, the data from an equal or perhaps even larger group of nations offered little support.

Several other papers also find little or no abortion effect. Joyce (2009) and Lott and Whitley (2001), cited evidence to question the fundamental relationships on which the DL hypothesis was built: i.e. that abortion legalization led to fewer births and that the remaining-born individuals would have had a lower propensity for crime. Whilst a consensus has been reached on the first point: that abortion legalization did reduce total births, this was probably not on a one-to-one basis. In other words, for every extra abortion it was *not* the case that total births reduced by one. That is because, as Lott and Whitley pointed out (citing Akerlof et al., 1996), legalizing abortion probably increased the number of pregnancies and hence decreased the ratio of

births to pregnancies. By giving couples the option not to take pregnancies through to birth, legalized abortion probably resulted in less birth control of other types. Some of these extra pregnancies may have subsequently been aborted but many probably weren't. Thus, the consensus estimate is that although legalized abortion caused a dramatic increase in abortions, its effect on births was more modest and in the order of a 5% reduction (Gruber et al., 1999; Ananat et al., 2009; O'Flaherty and Sethi, 2014).

This also affects DL's second fundamental relationship: that abortion legalization decreased crime propensity in the remaining-born. If the increase in pregnancies were concentrated in unmarried and/or single-parent families, as Lott and Whitley suggested, it is not clear that the outcomes, including propensity for crime, would be improved. Lott and Whitley's fixed effects model, using US state-level data, found that abortion legalization actually *increased* subsequent homicide by about 0.5 to 7 percent. However, their method has been criticised by others, even those who disagree with the abortion crime link (see Joyce, 2009). And other studies suggest that while the effect of abortion legalization on child outcomes was not as clear-cut as DL's original hypothesis suggested, overall outcomes did improve. For example, studies have found moderate post-abortion legalization improvements in cohort-level infant mortality, welfare use, likelihood of college graduation, and the odds of being a single parent (Gruber, Levine and Staiger, 1999; Ananat et al, 2009; Molland, 2016).

Lin and Pantano (2015) also find that abortion legalization drove a strong decline in the prevalence of unintended births in the US and that because 'unwantedness' is a robust predictor of crime in individual-level studies it is likely that crime propensity would also have fallen. But others argue that the evidence on this point remains unclear (see for example Joyce, 2009 and O'Flaherty and Sethi, 2014).

Kendall and Tamura (2008) approached the same issue in a different way. They claimed that unmarried fertility was a better measure of 'unwantedness' than abortion rates. They noted that 88% of pregnancies to unmarried women were 'unwanted' in a 1987 US survey (Ventura and Bachrach, 2000). They therefore used fixed effects regression to test for a cohort effect of unwantedness, proxied by unmarried fertility, on homicide using US state-level data from 1957 to 2002. They found that an increase of 10 non-marital births per 1,000 live births was associated with a 2.5% rise in homicide and hence that this has been an important driver in overall US homicide trends. However, like most other studies in this section, Kendall and Tamura do not test their hypothesis using age-specific homicide arrest rates, which may undermine their results.

Other abortion-crime studies were not short-listed because they did not specifically test homicide trends. Of these, Kahane et al., (2008) is worth mentioning because it examined the abortion hypothesis in relation to England and Wales, where abortion was legalized in April 1968. The researchers agreed that, as in the US, legalization

led to a rapid increase in abortions and that numbers of births were almost certainly reduced as a result. But they also noted that the earlier (1968) legalization in England and Wales does not fit with DL's hypothesis, given that crime (especially homicide) began falling later in England and Wales. Unlike DL, Kahane et al., (2008) attempted to control for endogeneity in the abortion-crime link (see footnote 13 for an explanation) and found that when this was done there was no effect on overall crime, though they did find an effect for violent crime.

Buonanno et al., 2011 also found no abortion effect on crime in a panel of seven nations. By contrast, Sen et al., (2002) found positive evidence for an abortion effect on crime reduction in Canada, though homicide was not specifically tested and a follow-up paper by Kang (2013) found no consistent evidence for an abortion effect in Canada. Charles and Stephens (2006) did not specifically test for a crime effect of abortion legalization, they did find that it decreased substance abuse in the US. Two studies by Pop-Eleches (2006; 2009) used data from Romania, which followed the opposite pattern to the US in that abortion was *banned* in 1966 and then legalized again in 1989. He found that banning abortion led to a doubling of the birth rate but that average education and employment outcomes *improved* overall. This was because – unlike in the US – women who had abortions in Romania prior to the ban tended to be more educated. Pop-Eleches showed that when this was controlled for, the banning of abortion decreased average educational and employment outcomes and probably also led to upward pressure on crime although he acknowledged that his crime analysis was somewhat limited due to data restrictions. When the abortion ban was lifted in Romania, Pop-Eleches (2009) showed that educational outcomes improved and there were also fewer child abandonments (Mitrut and Wolff, 2011).

Several studies suggest that the most important effect of abortion legalization on crime might come via its effect in reducing teenage motherhood. Sen (2002) argued this in relation to Canada's homicide fall and Molland (2016) used a natural experiment in Norway to demonstrate persuasively that abortion legalization caused a delay in child-bearing in Norwegian mothers which in turn resulted in better child outcomes. In addition, Shoesmith (2017) used the same data and methods as DL but disaggregated the results by state to demonstrate that the significant findings for violence and property crime (they did not test homicide) were driven by a small group of states with high teenage pregnancy rates and a high percentage of pregnancies aborted. They concluded that shifts in teenage motherhood were a major driver of both the rise and fall of crime in the US, including homicide.

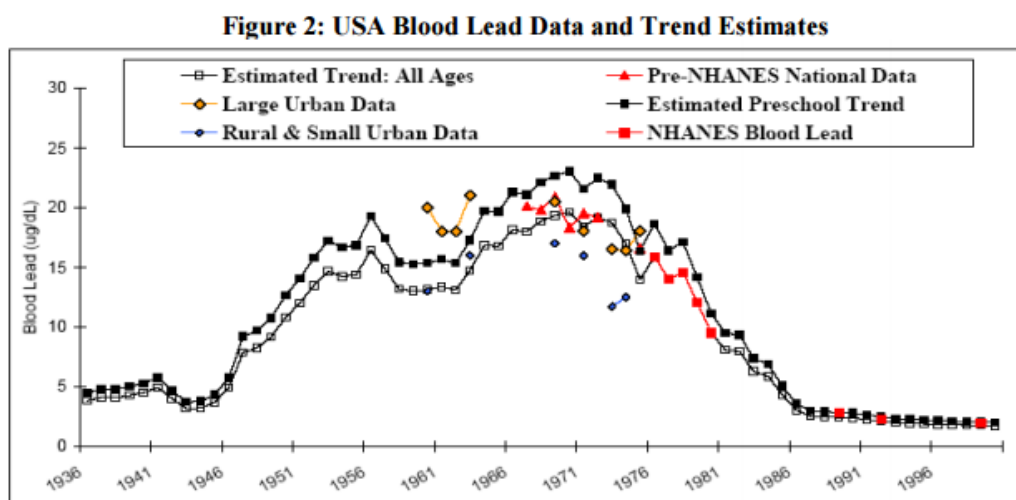
Summarising the vast and conflicting literature on DL's abortion hypothesis is challenging, but if the methodological jousting is set aside, the following points seem reasonably clear:

- Abortion legalization did cause the number of births in the US to decrease by about 5%.

- On balance, the evidence suggests that abortion legalization also slightly improved some child outcomes in the remaining-born (on average). However, whether this included crime propensity remains unclear.
- As such, our reading of the evidence suggests that abortion legalization may have had some impact on the crime drop, especially in relation to overall crime (rather than homicide specifically). If there were fewer people with a lower average propensity for crime post-legalization, then crime should fall, all else equal.
- But the case that abortion legalization was a *major* driver of US homicide trends between 1980 and 2012 looks weak due to the absence of evidence for a cohort effect in the age-distribution of homicide arrests (see Appendix A). Certainly, the effect of abortion on crime does not appear to be as big as DL original's estimates suggested.

6) Specific cohort effect 3: the lead hypothesis

A final cohort effect that has been linked with homicide by some authors concerns the so-called 'lead hypothesis'. Numerous studies have shown that elevated blood lead levels in pregnant mothers and pre-school children can impair brain growth leading to lower educational performance and a greater propensity for aggression (Needleman et al., 1996; Needleman, 2004; Reyes, 2015). This has been linked to aggregate crime trends, including homicide, because lead levels in many nations rose and fell around a generation before crime did the same, see chart below for the US¹⁸:



Legend: Preschool blood lead estimates reflect 1980-1988 air lead, 1946-1976 refinery lead use (see Figure 1), and 1936-1946 (leaded) road gasoline use, anchored by NHANES data showing 1976-1980 preschool blood lead was higher than blood lead for all ages. Blood lead estimates for all ages are also shown for comparison with other available 1956-1976 survey data on national, large urban area, and small city and rural blood lead levels.

Four of the short-listed papers tested the relationship between trends in lead and trends in homicide. These are shown in Table A7.6. These studies have been included in this annex because the lead hypothesis suggests that exposure to high levels of lead at a young age drove biological changes which affected brain development in children, and that these changes influenced individual-level characteristics associated with violence. In that sense, the inclusion of these studies is recognition that character is likely to be both biologically and environmentally driven.¹⁹

¹⁸ The two main sources of high blood lead levels are lead in paint and petrol. The latter means that the rise in blood lead levels tracked the popularity of motor vehicles until the 1980s when leaded petrol began to be phased out (Nevin, 2007).

¹⁹ Twin studies, though controversial, typically show an almost 50/50 split between genetic and environmental drivers of personality traits, though it varies by the trait – see for example Beaver et al.,

Table A7.6: Studies examining the relationship between lead and homicide

Study	Area and time period	Character-related variable	Method and finding
McCall and Land, 2004	US from 1960 to 1995	Early years lead exposure	Age, period, cohort characteristic model with early years lead exposure as the cohort variable and age-specific homicide arrest rates as the dependent variable. Find no support for a lead exposure cohort effect on US homicide rates.
Nevin, 2000	US 1876 to 1987 and separately from 1960 to 1998	Lagged blood lead levels	Regression with lagged lead variable and other controls. Found a significant relationship between blood lead levels and homicide with an 18-year lag for the period 1960 to 1998 and with a 21-year lag for the period 1876 to 1987.
Nevin, 2007	8 nations from 1960 to 2004; 124 US cities from 1985 to 1994	Lagged blood lead levels	Multi-nation fixed effects regression with 18-year lag on lead variable and cross-sectional regression of US cities with lagged blood-lead variable. The international regression the lead variable significantly predicted homicide with an 18-year lag. In the cross-section US-city regression, the lagged lead variable is significant but becomes non-significant if percent Black is also included.
Reyes, 2007	51 US states from 1985 to 2002	Early child lead exposure of potential offenders.	Fixed effects regression with controls. Found a significant relationship between lagged lead levels and violence, but with homicide.

In two papers, Nevin (2000; 2007) performed several tests of the lead hypothesis. Using data from eight nations (including England and Wales) and a fixed effects regression model, he found that pre-school blood lead levels significantly predicted homicide with an 18-year lag. In separate regressions for the US only he found that lead levels predicted murder rates with an 18-year lag between 1960 and 1998 and with a 21-year lag going back to 1876. He also did a cross-sectional regression of 124 US cities and, like other studies (see Stretesky and Lynch, 2001), found a significant relationship between lagged blood lead levels and homicide, though this was reduced to non-significance when percent-Black was also included in the model.

Nevin concluded that changing lead levels provided a compelling explanation for why youth homicide levels rose and fell so sharply in the US through the 1980s and 1990s and why this was so pronounced among Black offenders. He pointed out that

2009. It's also worth noting however, that the lead hypothesis deals with a biological mechanism that is also environmental. Hence biological explanations do not instantly imply ones that aren't amenable to policy.

the prevalence of dangerous blood lead levels fell from 2% to 0.5% in White children between the late 1970s and late 1980s, but in Black children the prevalence decline was from 12% to below 1%.

However, others argued that the correct method for testing a cohort effect is via the age-period-cohort characteristic model, rather than via a panel regression with a lagged variable. While it is beyond the scope of this review to adjudicate, it is notable that McCall and Land (2004) find no relationship between early years lead exposure and homicide using this method. They tested age specific homicide arrests in the US between 1960 and 1995. Furthermore, Reyes (2007) also found no relationship between early years lead exposure and later homicide rates in her fixed effects model of US states from 1985 to 2002. There was also no relationship for property crime, though – like other studies - she did find that lead exposure predicted later violence trends (see also Mielke and Zahran, 2012).

Overall then, the evidence for a link between childhood exposure to lead and later homicide levels is mixed with arguably the strongest studies finding no relationship. The evidence for a link with trends in general violence appears somewhat stronger.

Secondary Evidence

Only a small number of the short-listed ‘character’ studies used data or evidence pertaining to England and Wales. Therefore, this section brings together available secondary evidence to try and determine whether the factors examined above might be relevant to homicide trends in England and Wales.

In relation to cultures of honour, several UK-based studies support Anderson’s notion of a ‘code of the street’ operating within gangs and drug-markets. For example, Alleyne et al., (2014) did interviews with 189 young people from gang-associated areas of London. They found that as well as being more likely to be involved with violence, gang members were also more likely than non-gang members to have “specific rituals and codes”. The authors drew links between these and the violence through reference to “moral justification” and “displacement of responsibility”. In other words, the group-level code of honour was like a psychological mechanism to make violence more acceptable. Other authors have made similar conclusions about gangs in the UK context. For example, Wood (2014) writes that joining a gang means adopting a gang’s “group norms and behaviour” which “may prompt the setting aside of existing moral standards so that the individual’s social cognitions fit with what they perceive as gang membership requirements”. Beckett et al., (2013) links these group norms to honour, or their modern equivalents: “respect” and “status” and that they can drive sexual violence as well. They found that 50% of their interviewees²⁰ were aware of examples in which sex had been traded for status or protection.

In relation to societal trends in self-control, Eisner (2014) cited Collishaw et al. (2012) as evidence that England and Wales has seen an improvement in line with the fall in crime. Collishaw et al. used the British Cohort Study and the Health Surveys for England to measure trends in parent-child relationships. They showed that while there were more single and step-parent households in 2006 than in 1986, this had not led to a decline in parent-child relationships. Indeed, many measures improved between 1986 and 2006, including the amount of quality time parents spent with their children, levels of parental monitoring, youth disclosure about out-of-home activities, and parental expectations about good behaviour. Coontz (2016) summarises similar research for the US concluding that: *“today’s single and working moms spend more time with their children than married homemaker mothers did back in 1965.”*

These results are broadly consistent with a greater parental emphasis on self-control, as Eisner claimed. They are also consistent with the possibility that the fall in

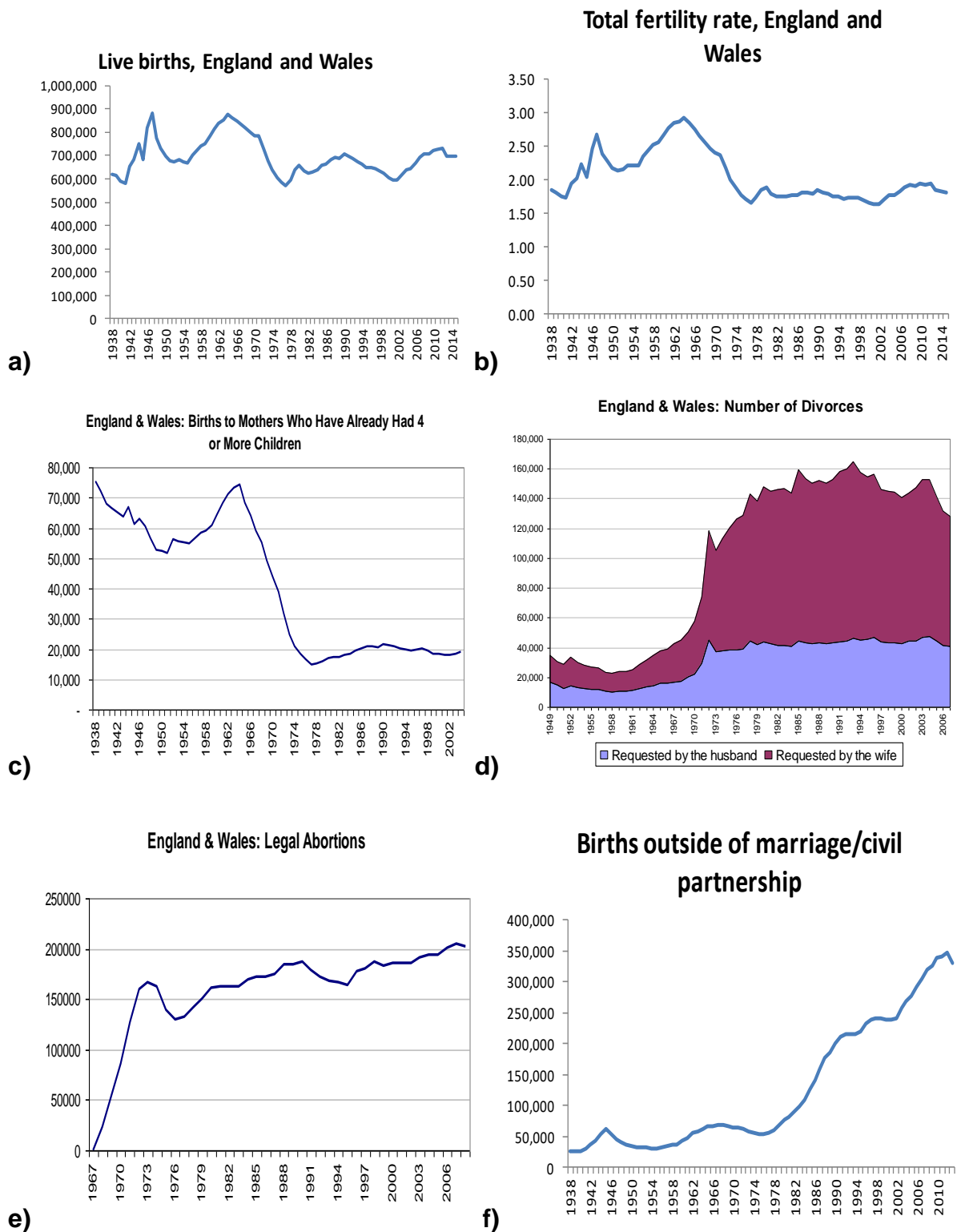
²⁰ The study interviewed 188 young people from deprived neighbourhoods and carried out focus groups with 76 professionals in the area.

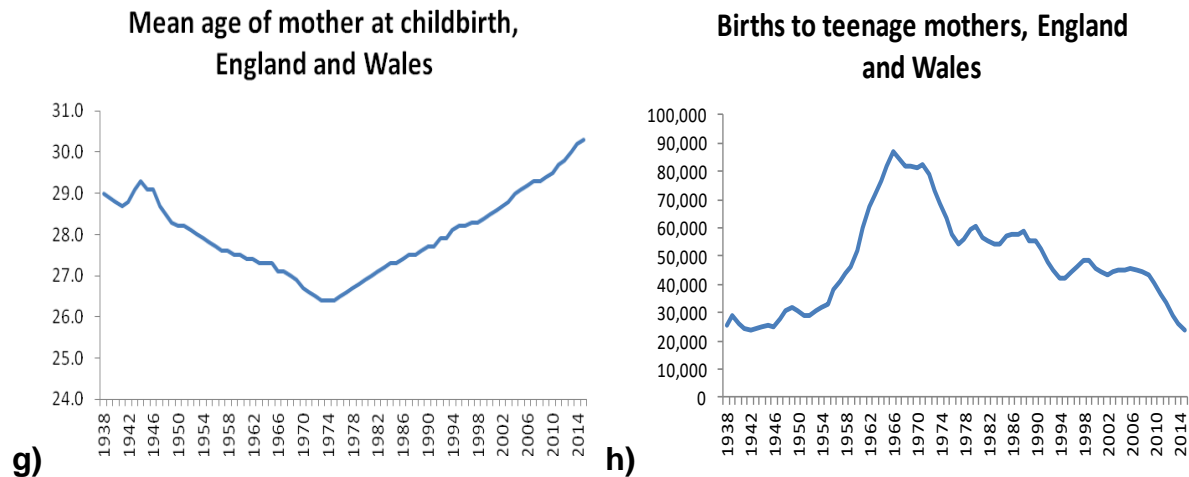
homicide has been at least partly driven by generational differences in propensity for violence caused by shifts in parenting. If there is a link with homicide – and we should emphasise that Colishaw et al. did not test for one – it would imply that parental investment is more important than family structure. The latter continued to become more fractured even as the quality of the parent-child relationship improved in England and Wales. Collishaw et al. only looked at data from 1986 onwards, so the results cannot be used to corroborate the suggestion by Eisner, Pinker and others that the surge in homicide from the 1960s was in part due to a rejection of self-control. But the results are consistent with the hypothesis that improvements in self-control resulting from greater parental investment may have contributed to the recent fall in violence and homicide.

Indeed, there is actually quite large body of evidence to suggest a shift in parenting practice internationally. For example, Trifan et al., (2014) use three surveys of young adults in Sweden carried out in 1958, 1981 and 2012 to show a clear decline in authoritarian parenting practices and corporal punishment. They found that the shift occurred mainly between the last two cohorts. Indeed, on some measures the 1981 cohort reported harsher parenting than the 1958 cohort (implying that those born in the 1950s and 1960s may have had slightly more authoritarian parents than those born before and after). Authoritarian parenting has been linked with greater risk of offending, including homicide, in several studies (Farrington et al., 2012). Trifan et al., 2014 also found that the change in parenting coincided with a shift from father-dominated household decision-making to a more egalitarian set-up. Alwin (1990) documented similar parenting trends in the US. Using repeated national surveys, he showed that there was a decline in valuing obedience and conformity and an emphasis instead on autonomy, honesty and responsibility. He found some evidence that this shift was cohort-based. More authoritarian parents tended to remain more authoritarian as they aged. Overall then, there is some evidence to suggest that parenting styles shifted markedly through the twentieth century and that these could have contributed to generational differences in homicide propensity. Certainly, it seems to be the case that the cohort born from about 1945 to 1970 (corresponding roughly to the long-wave pattern seen within homicide data – see the conclusion main report) seem to have had slightly more authoritarian parents, on average, than those born before or after.

Other short-listed studies in this annex emphasised the potential importance of trends in fertility, abortion and teenage motherhood. Figure A7.6 shows England and Wales trends for these variables, as well as other trends relevant to family environment and structure, like those related to marriage and divorce (see also the opportunity annex for more on divorce and homicide).

Figure A7.6: Panel of charts showing trends in age of first marriage, numbers of divorces, fertility, family size, and teenage pregnancies.





The charts reveal some very large shifts in these variables that generally occurred around a generation before the turning point in crime and in line with the long-wave pattern set out in this report. Fertility rates, which had reached historic lows in 1940 increased markedly to the mid 1960s before abruptly dropping back again (charts a and b). Teenage pregnancies show a similar but even more marked trend (chart h). At the same time as fertility was soaring in the 1950s and 1960s, the average age of first marriage was decreasing (chart g) and the number of large families was increasing (chart c). Then, when fertility turned around in the late 1960s (chart b), so did these other variables. The average age at first marriage began rising again (chart g) and the number of large families decreased very sharply (chart c).²¹ Figure A7.6 also shows that at around the turning point in these trends, numbers of divorces, non-marital births and abortions increased very sharply (charts d, e and f).

Importantly, similarly large shifts in these family-related occurred in other countries. For example, in the US, Stephanie Coontz (2016) notes that:

“The “traditional family of the 1950s was a qualitatively new phenomenon. At the end of the 1940s, all the trends characterizing the rest of the twentieth century suddenly reversed themselves: For the first time in one hundred years, the age of marriage and motherhood fell, fertility increased, divorce rates declined, and women’s degree of educational parity with men dropped sharply.”

Source: Coontz, (2016), p25.

Note also that, according to Coontz, this was the first reversal in these trends for 100 years. This correlates with the long-term fall in homicide from 1860 to 1960

²¹ Note that chart c shows the decline in births to *married* mothers who already have four children.

documented by Eisner (2008).²² A fall which, Eisner noted, continued unabated in spite of economic booms and busts, increases in urbanization, increases in leisure time and changes in criminal justice system policies, all factors that would be offered up as possible explanations for the rise in homicide from 1960. Arguably then, family-related indicators show a much greater long-term correlation with homicide than those other measures.

The causes of the reversal in family-related trends are much debated, but certain factors seem likely to be involved. For the rise in fertility during the 1950s and 1960s many believe that cultural change and the 'sexual revolution' was the main cause (Hofferth et al., 1987). However, others have suggested that increased prosperity and better nutrition reduced average age of menarche meaning women were able to conceive at younger ages (Cutright, 1972). The fall in fertility, family size and teenage motherhood through the 1970s is almost certainly due in large part to the greater availability of birth control. The pill was made available in England and Wales from 1961. Abortion was legalised in 1968. These changes almost certainly had a large direct effect, but they may have had an indirect too by enhancing women's rights. Many studies find that more advances in the status of women leads to lower rates of fertility and an older average age of motherhood and marriage (Wickrama and Lorenz, 2002; Upadhyay et al., 2014). The very sharp rise in divorces coincided with the introduction of unilateral divorce laws in 1971.

Taken together these trends certainly suggest that – on average – those born after 1970 might have had different family environment from those born in the 1960s. Might this have affected homicide trends? The literature review revealed modest support for the possibility that factors like relative cohort size, abortion rates, non-marital births and teenage motherhood can affect homicide a generation later. Furthermore, factors like being born to a teenage mother and into a large family have proved to be robust predictors of individual-level crime in both US and England and Wales samples (Kolvin et al, 1998; Farrington et al, 2006; Conser et al, 1997; Nagin et al 1997). Homicide is harder to test in this kind of research because it is such a rare event, but in studies that have attempted it, young motherhood is again a predictor, particularly for infanticide (Overpeck et al., 1998; Farrington et al., 2012). So, it seems possible that the large shifts up and then down in fertility, large families and teenage motherhood contributed to the rise and fall in crime (and homicide) a generation later. Children reaching adolescence in the 1980s and early 1990s in England and Wales would have had a much higher chance of being born to a younger mother and into a large family compared with children reaching adolescence in the 2000s.

²² Eisner's research did not include the US. The US did not have a continuous decline in homicide from 1860 to 1960 as in most of Europe. It had an increase during the 1920s and early 1930s. However, this coincided with the era of alcohol prohibition, which may have acted as a short-wave effect.

As is the case with the US, the trend in non-marital births does not look like a good cohort predictor for homicide in England and Wales. It has continued to rise through the 2000s when homicide trends in England and Wales turned and began falling. This again suggests that family structure may be less important than the quality of the parent-child relationship. Linked to this, it is worth also considering what these trends might mean for another crucial aspect of the family environment in relation to homicide: witnessing and experiencing abuse as a child. Many studies have concluded that this is strong predictor of crime, particularly homicide (see for example Lewis et al, 1988; Currie and Spatz Widom, 2010; Currie and Tekin 2012; Farrington et al., 2012).

The explosion in divorce coincided with the Divorce Act which came into effect in 1971 and which abolished the concept of 'matrimonial offences' and hence the idea that to get a divorce a person had to prove that an 'offence' had been committed by their spouse. As chart (d) showed this right was disproportionately exercised by women. Many of the women that requested divorces at that time cited abuse as a reason (Chester and Streather, 1972; Morley and Mullender, 1994). In both the UK and the US, the first shelters and help-lines for abused women appeared at this time. This all helped to change the cultural attitude towards domestic violence. Although it was technically a crime during the 1950s and 1960s, evidence suggests that police were granted discretion in domestic abuse cases and generally showed a reluctance to intervene and to record spousal assault as a crime (Edwards, 1989). Public attitudes also shifted both in the US and England and Wales. In 1968, 25% of men and 16% of women thought it was legitimate for a husband to slap his wife, by 1992, the figures were 11% and 6% respectively (Straus et al, 1997).

In other words, the sharp increase in divorce was also a reflection of the increase in women's status and a signal that a blind eye would no longer be turned to domestic violence. It is possible this meant that after about 1970 fewer children grew up in homes where they witnessed or experienced domestic abuse. There is evidence that the rise in divorces may have benefitted children in the most abusive households. In a meta-analysis of the effect of divorce on child outcomes, Amato (2001) concluded:

"When discord is high, divorce appears to benefit children, but when discord is low, divorce appears to harm children" (Amato, 2001).

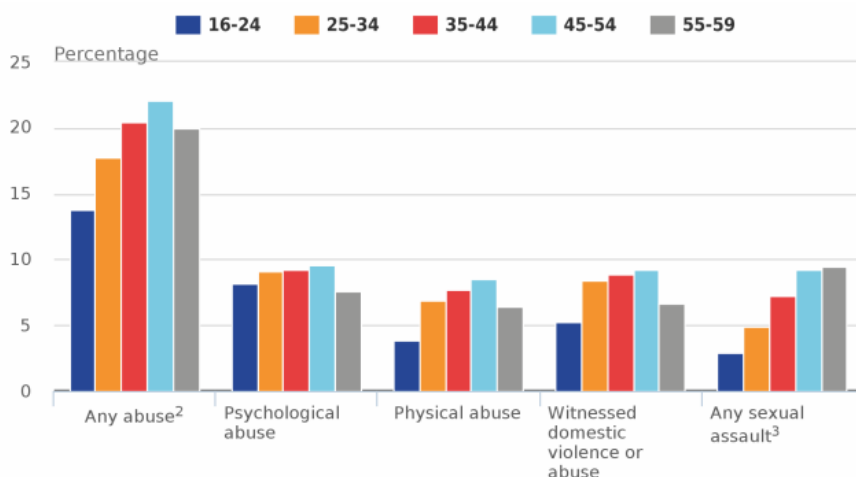
Stevenson and Wolfers (2003) showed that when US states adopted no-fault divorce laws during the 1970s and 1980s (as England and Wales did in 1971), domestic violence within marriage dropped by 30% (Stevenson and Wolfers, 2003). The other family-related trends would also support the conclusion that witnessing/experiencing domestic abuse as a child may have risen in the post-war period and then fallen with the expansion of women and children's rights in the 1970s and 1980s. There is robust (international) evidence that teenage motherhood, faster fertility rates, and younger age at marriage are individual-level predictors for both suffering domestic

abuse (Jacoby et al., 1999; Jensen and Thornton, 2003) and inflicting child abuse or neglect (de Paul and Domenech, 2000). And families with partner abuse also tend to report high rates of child abuse (Appel & Holden, 1998).

Available evidence suggests that domestic violence trended downwards in the US since it was first measured in 1974 via the National Criminal Victimization Survey, which mirrors the decline in spousal homicide. For England and Wales, Annex One one showed that homicides against women stopped rising in about 1980 and Spierenburg and Spierenberg (2008) showed that while homicides by strangers increased eight-fold between 1969 and 2008, homicides by intimate partners fell over that period.²³

Combining this evidence with the charts in Figure A7.6 would tentatively suggest the possibility that children’s trends in both witnessing and experiencing abuse would have risen through the late 1950s and early 1960s and then fallen from around 1970 onwards. Until very recently there was no data available to verify this trend. However, in 2016 the Crime Survey for England and Wales asked current adults about experience of abuse as a child. The report found that 7% of adults currently aged 16 to 59 said they had experienced physical abuse as a child and 8% had witnessed domestic abuse. The results, by age, are shown in Figure A7.7.

Figure A7.7: Proportion of adults aged 16-59 who experienced child abuse by type and age, for the year ending March 2016



Source: Crime Survey for England and Wales, Office for National Statistics

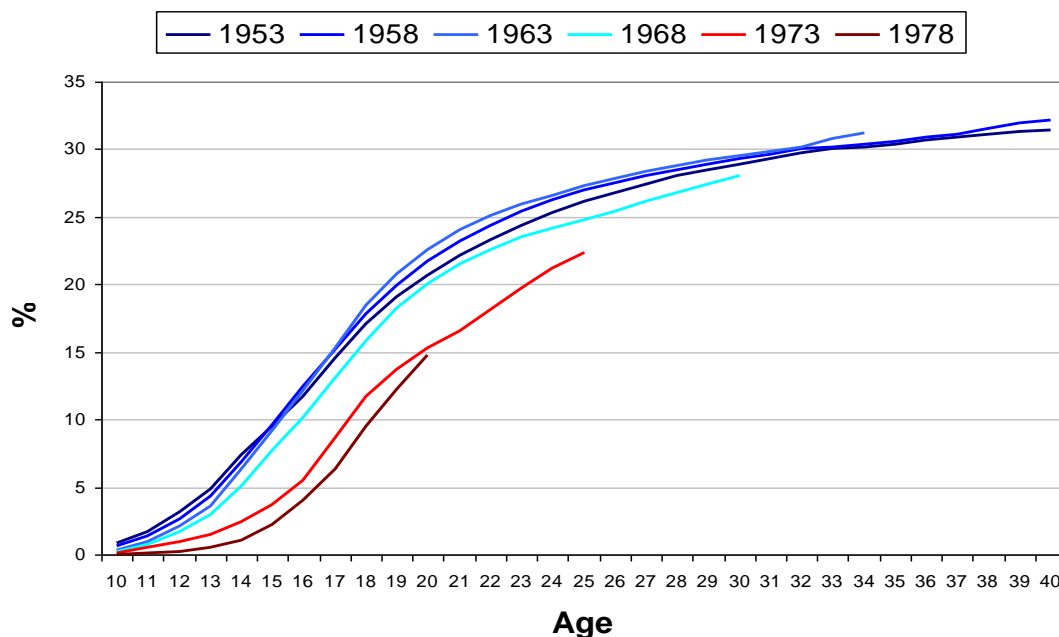
²³ It’s important to note that one trend that does not fit this hypothesis is the domestic violence trend on the CSEW, which increased from 1981 to 1995.

It is clear that younger adults have increasingly lower rates of childhood abuse. The peak is for the 45-54 year-olds (so those born between 1961 and 1972), but then rates shift downwards slightly for those born before 1961.²⁴

Overall then, there is some evidence for a potential cohort effect driven by changes in family, fertility, and typical child-rearing patterns. In terms of socialization and the development of character traits linked to crime propensity, available trends in these variables mostly worsened through the late 1950s and early 1960s and then improved after 1970.

An obvious test of this hypothesis would involve examining available crime data for evidence of a cohort effect. A Home Office study published in 2001 looked at the crime rates of cohorts born in 1953, 1958, 1963, 1968, 1973 and 1978 (Prime et al, 2001). As the graph below shows, those born before 1970 (the blue lines) had consistently higher rates of criminality than those born after 1970 (the red lines).

Figure A7.8: Cumulative percentage of the male population with a conviction by age, for six different birth cohorts



It is possible that shifts in criminal justice policies affected these different rates. If the criminal justice system became less punitive towards younger offenders after 1970 that could cause the pattern in Figure A7.8 and there is some evidence this was the case (Prime et al., 2001). But the trends are also consistent with a shift downwards in criminal propensity from 1973 onwards.

²⁴ This is tentative evidence but not conclusive. It is possible that reporting levels are influenced by length of time since the abuse occurred.

It is also worth briefly considering this hypothesis in light of the fast/slow life history strategies discussed above. Recall that teenage motherhood, lower age at marriage, higher fertility levels, and a greater appetite for risk and violence are all indications of a faster life history strategy. Lower fertility, increased status for women and greater parental investment are linked to a slower life history strategy (ibid.). Faster life history strategies are adopted during times of unpredictability and stress, particularly in utero or early childhood. Studies of a Dutch cohort affected by famine during the final years of World War Two have found that women who were pregnant during the famine gave birth to offspring with higher levels of fast life history traits. Daughters of famine-affected mothers had more children and had them at a younger age, and sons were more impulsive and at greater risk of anti-social personality disorder (Neugebauer et al., 1999)

Very broadly, a fast life history explanation of crime trends in England and Wales might run as follows. The Great Depression and World War Two generated the kind of unpredictability, stress and reductions in life expectancy and parental investment which would encourage a faster life history strategy generally, as well as the reductions in self-control that have been suggested to accompany it (Roth, 2011; Dunkel et al., 2013). A generation later, in the late 1950s and early 1960s, this manifests in rapidly rising crime and teenage pregnancy rates. However, as discussed previously, the cohort with the highest homicide rates were born in the period from about 1945 to 1970. So, the effect of the Depression and War would have to continue and even worsen in the subsequent period to fit with the facts. This is possible. Certainly, post-war rationing likely prolonged war-generated stress beyond 1945 and Vronsky's hypothesis about the crisis in post-war fatherhood feels worthy of further investigation. Another hypothesis might be that the shadow of war and its effect on life-course strategy lingered well into the 1950s and 1960s when economic conditions vastly improved, meaning that a faster-life-course strategy combined with *increased* fertility rates to create the long-wave cohort pattern that is arguably visible within crime data in multiple nations.

More definite is the evidence for the *downwards* turning point. The shift within birth cohorts from around 1970 does coincide with well-documented advances in women's rights and the increasing availability of birth control, which would both serve to encourage a return to a slower life history strategy. So, this could manifest in greater parental investment in fewer children and, a generation later, in the falls in crime and other types of risky behaviour seen among youths generally.

While there are many questions still to be answered, this kind of approach may also offer at least a partial explanation for two of the puzzles associated with homicide trends. Firstly, the fact that Japan did not experience a rise in homicide in the 1960s.

Japan was far less affected by the Great Depression (Cha, 2003)²⁵ and as Figure A7.3 showed, did not have a fertility 'bounce' in the same way that most other developed nations did.²⁶

Secondly, it may help to explain why homicide is so strongly correlated with deprivation on a cross-sectional basis but not on a temporal basis. Studies using England and Wales data have shown that deprivation is strongly correlated geographically with fast-life history variables like life expectancy, father absence, lower parental investment, teenage pregnancy, risk-taking and violence (Nettle 2010; Nettle, 2011; Copping et al., 2013). The authors of these studies concluded that adopting a fast life history strategy is an understandable evolutionary approach to the conditions of deprivation and lower life expectancy but that it entails specific costs to children. So economic conditions could be implicated in generating crime propensity via their effect on parental investment (and, as a result, in the development of character traits like self-control). But because this operates on a generational basis it is less clear that crime propensity would follow the booms and busts of the economic cycle.

However, it is also important to point out that only a handful of studies have linked fast life history strategy to homicide trends in the US and none have done so for England and Wales. This therefore seems an important avenue to explore in the second stage of this project.

Finally, we briefly review available data relating to the lead hypothesis. Data on lead emissions in the UK has been published by DEFRA, see Figure A7.9.²⁷

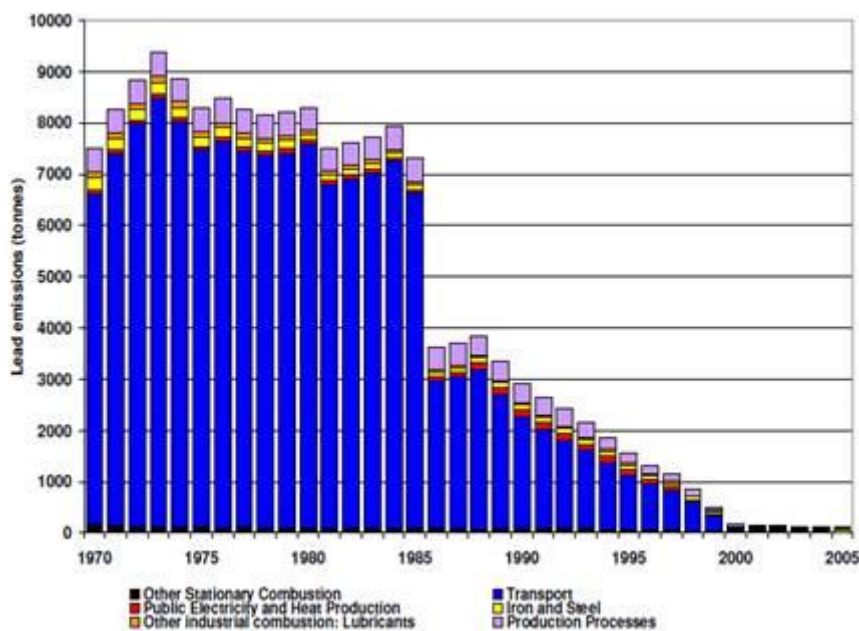
²⁵ In a classic study (Elder, 1999), examined the effect of the Great Depression on cohorts of children born in California. Elder showed that the effects were far more severe for those born immediately before it than those who were already 8-9 years old when it started. He showed that the stress and family stability affected the very young children hugely whereas the older cohort, who had spent their early years in better times, were more resilient.

²⁶ Interestingly, evidence suggests this may be connected to factors that also brought fertility rates down in other developed nations much later. In particular there was a sharp advance in women's status immediately after World War Two in Japan, which included equal access to higher education, dissemination of contraceptive information and – importantly – legalization of abortion (Hashimoto, 1974).

²⁷ See https://uk-air.defra.gov.uk/assets/documents/reports/cat07/0801140937_2005_Report_FINAL.pdf

Figure A7.9: Lead emissions in the UK

Figure 3.5 Time Series of Lead Emissions (tonnes)



It shows a marked drop in lead levels from 1985 onwards. Given the individual-level evidence on lead and aggression discussed in section nine, this would suggest a downward effect on homicide and violence from around 2003 to 2005. This is totally consistent with the actual fall in homicide, though less consistent with the fall in other types of crime, which began in the mid 1990s. So, although the research evidence supporting a link between lead levels and homicide trends in the US is not strong, the hypothesis may warrant further investigation in England and Wales.

Conclusion

The studies reviewed in this annex covered a lot of overlapping and complex topics, which rather defy neat summary. Added to this, the overall methodological quality was poor, primarily due to data limitations. Finding accurate measures of character-related variables over time is challenging. Where there were stronger quantitative studies, there was also much debate as to their methodological accuracy, which makes prioritising studies on the basis of rigour very difficult. There was also very little primary evidence relating to England and Wales. The most studied nation by far was the US.

Even so, the review has thrown up many interesting hypotheses for further investigation. Per-Olof Wikstrom and colleagues have shown that a composite measure of self-control and morality (which incorporates an individual's belief about the rightness/wrongness of crime) is a strong predictor of individual offending (Wikstrom, 2016). In many ways, the first two sections of this annex highlighted the same characteristics in relation to the long-term trend in homicide.

The first section reviewed studies that examined the 'civilising process' proposed by Norbert Elias as a reason for the long-term decline in violence. In particular these studies drew out the inter-related links between social/cultural change and shifts in personality traits like self-control. The second section also contained studies that used Elias's framework, but which instead placed a greater emphasis on the link with 'honour'. Authors like Pieter Spierenburg pointed out that many homicides throughout history contained a ritualistic element, meaning vengeance was often delayed. In these cases, self-control was perhaps less important than a belief in the 'rightness' of violence in situations when the code of honour had been breached. Trends may therefore have been driven by the extent to which cultures of honour were maintained in certain areas (like the fringes of Europe or the US south) due to weaker state control. Some argued that the same dynamic drove up homicide more recently via street-gangs who developed their own code of honour. Overall though, while these studies make quite a compelling case that changes in personality traits have been an important driver of homicide trends throughout history, they provided limited quantitative evidence of effects on more recent trends.

If character is formed mainly by socialization or other early-years environmental factors, then the effect on homicide might be cohort-based. This was tested by studies in the final four sections, with mixed results. Generally, studies that tested for the presence of a cohort effect on homicide found some evidence for one and there was stronger evidence for a cohort effect on crime overall. However, there were also areas and time periods identified in which cohort effects seem to be largely irrelevant. For example, the available US homicide data show no sign of a cohort effect from 1985 to 2000.

If there is a cohort effect – what could have caused it? One possibility is the so-called ‘lead hypothesis’. Our review found that there is robust evidence that high childhood lead levels can affect brain development causing changes in homicide-relevant characteristics like a raised propensity for aggression. But quantitative studies that directly tested the proposition that increases, and then decreases, in lead exposure have driven aggregate-level homicide trends found only mixed support. However, they were significant predictors of violence trends more generally, and the timing of lead declines in England and Wales would fit with a cohort effect on homicide, so further investigation is recommended.

Another possible, non-character-related, cohort effect is Easterlin’s relative cohort size hypothesis (section four), which proposed that larger cohorts suffer greater competition for resources and that the less successful may turn to crime as a result. Certainly, the rise in homicide coincided with the baby boom generation reaching their crime prone years. But the relationship looks less certain through the period of homicide’s decline.

Similarly, Donohue and Levitt’s abortion hypothesis, which was the subject of section five, was also supported by some studies, while others dismissed it. Taken together the evidence perhaps suggests that abortion legalization probably did have an effect on the average propensity for crime and violence, but that this effect was much smaller than Donohue and Levitt originally suggested.

Another set of studies, explored in section four, broadened the link between fertility patterns and homicide, using an evolutionary framework. They suggested that character traits linked with violence and other risky behaviours are not pathological or irrational but are actually evolutionarily sensible adaptations to highly unpredictable or stressful environments. That is, individuals brought up to believe life may be short, will generally adopt a faster, riskier approach to it. This involves having more children, having them earlier, offering less parental investment per child and having a higher tolerance for risk and violence. These variables show a strong relationship with homicide rates cross-sectionally.

It is possible then that major shifts in the environment into which children were brought up, from the harsh and unpredictable period through the Great Depression and World War Two to the more prosperous but patriarchal 1950s and early 1960s to the more gender equal 1970s, might have affected homicide rates in this way. Several studies found relationships with fertility and teenage pregnancy measures in particular (Baumer, 2008; Wilson and Daly, 1997). There is also some overlap between this approach and the studies that examined the civilising process. The unstable and stressful early-life conditions that generate fast life history strategies have been linked to the development of ‘honour’ (McCullough et al., 2013), and attitudes towards reproduction are correlated with attitudes to morality and a belief in the rightness/wrongness of illicit activity (Quintelier et al., 2013).

At the moment though, robust evidence for this being a major driver of aggregate homicide trends is sparse, and this review has thrown up a timing issue. If the fertility patterns linked to violence are driven by harsh and unpredictable environments, why were the cohorts with the highest homicide rates those born immediately *after* WW2 rather than during it. Even so, it remains a hypothesis worth investigating further because it would help to explain some otherwise puzzling factors about homicide trends. For example, the fact that the falls in homicide have continued in the US long after the crack epidemic waned, and that in England and Wales the crime decline has been accompanied by falls in risky behaviour of all kinds. It is also striking that Japan was the only nation studied to avoid both a fertility bounce and a rise in homicide.

The final section of this annex examined the review evidence in relation to trends in England and Wales. These offered some support for the cohort hypotheses. Cumulative conviction rates were lower for those born after 1970, shortly after abortion was legalized. But rising numbers of abortions were just one of many large changes that occurred to family-related factors around that time. There were large increases and then decreases in fertility, family size and teenage pregnancy and possibly domestic violence and abuse. Given that all of these have been suggested as crime risk factors, it is possible that those growing up after 1970 had – on average – a lower crime propensity than previous birth cohorts, particularly as studies showed that trends in parental investment also improved for the generation responsible for the crime drop.

Ultimately though, in relation to homicide, all cohort hypotheses run up against the critique of Lafree (1999), who noted that:

“...the simple rapidity of the changes (in homicide) calls into question explanations based on fixed biological characteristics, deep-seated psychological characteristics, or slow-moving social characteristics”.

Certainly, the ‘epidemics’ of homicide that occurred in many US cities during the 1980s and early 1990s do not lend themselves easily to character-based explanations. And the age-specific homicide trends outlined in the appendix also suggest that other factors were more dominant through that period. Annex One showed that recent homicide trends in England and Wales, though less dramatic overall, still involved some sharp rises and falls, especially when viewed at the regional level. As such, the character explanations outlined in this annex are possibly best viewed as underlying or contributory drivers to the ‘long wave’ but probably cannot explain the ‘short waves’.

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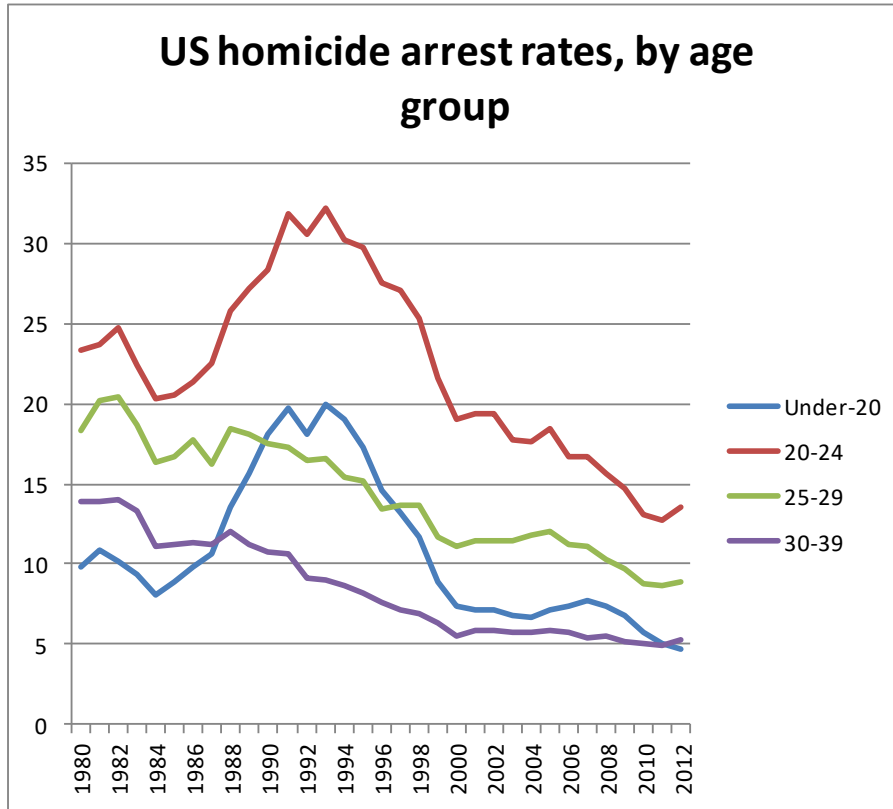
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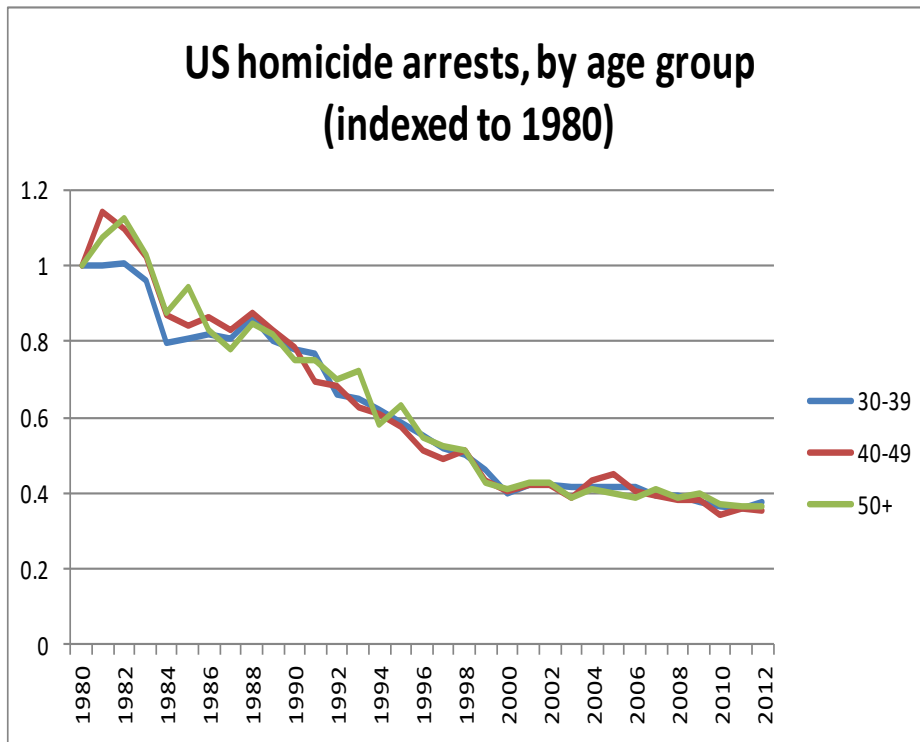
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Appendix 1: Possible cohort effects - US arrests rates by age

Age-specific homicide arrest rates in the US paint a clear picture of the age groups responsible for the 1991 homicide peak.

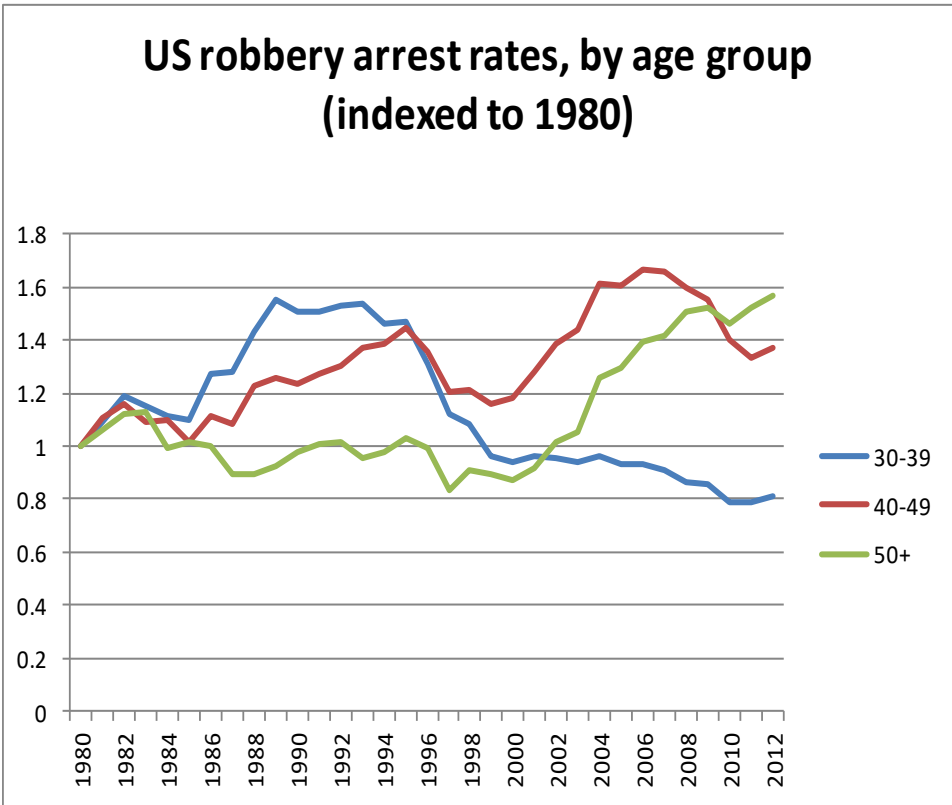
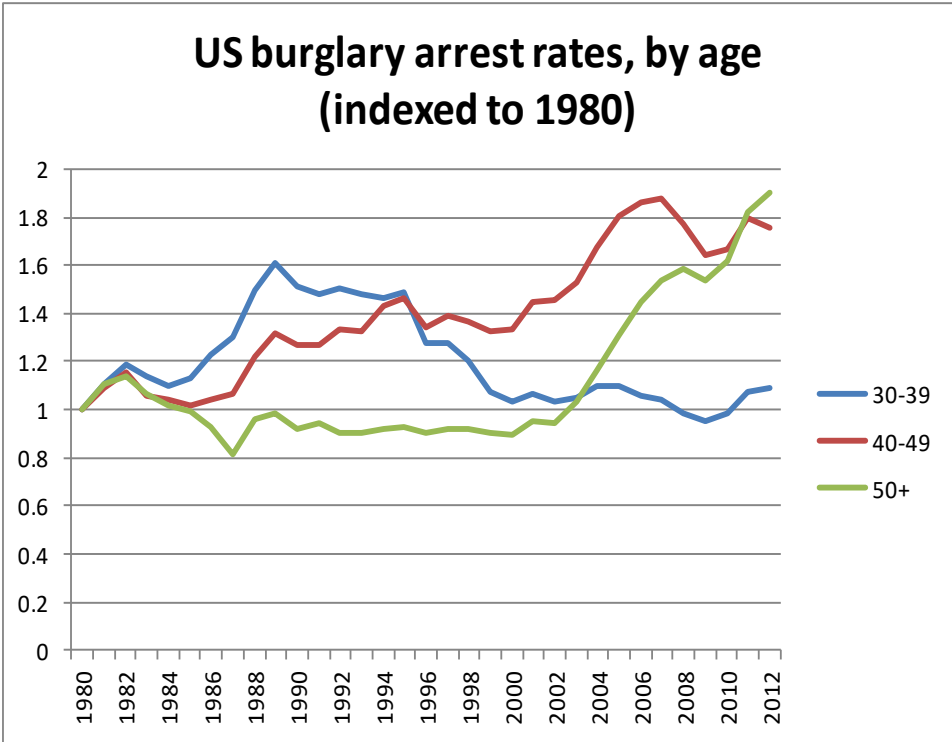


The chart clearly suggests a 'period effect' (possibly the crack-cocaine epidemic) that increased homicide propensity for under-25s between the mid 1980s and the late 1990s but had almost no effect on those aged over 25. Indeed, if we limit the trends to older age groups, see chart below, the trends show no real sign of being affected by the crack epidemic and instead are totally uniform, with a decline from 1980 to 2000 and then a much more gradual fall thereafter.



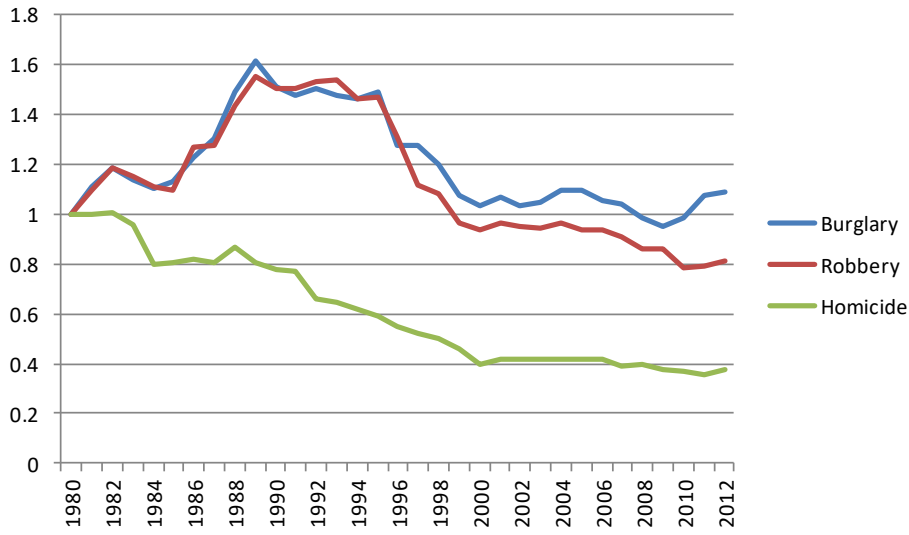
Neither of these charts show any real signs of a cohort effect within the arrest data for homicide. The older age groups above, were less affected by obvious period effects, like the crack epidemic, yet still follow exactly the same trend. The `kink' from 2000 occurs at exactly the same time for all three age groups. This implies that whatever drove that change in trend was also a period effect – i.e. something happened in 2000 to change the trend for all these age groups.

By contrast, arrest rate trends for other crime types do show some signs of a cohort effect. The charts below show arrest rate trends for the older age groups (so those less likely to be affected by period effects like the crack epidemic) for burglary and robbery.

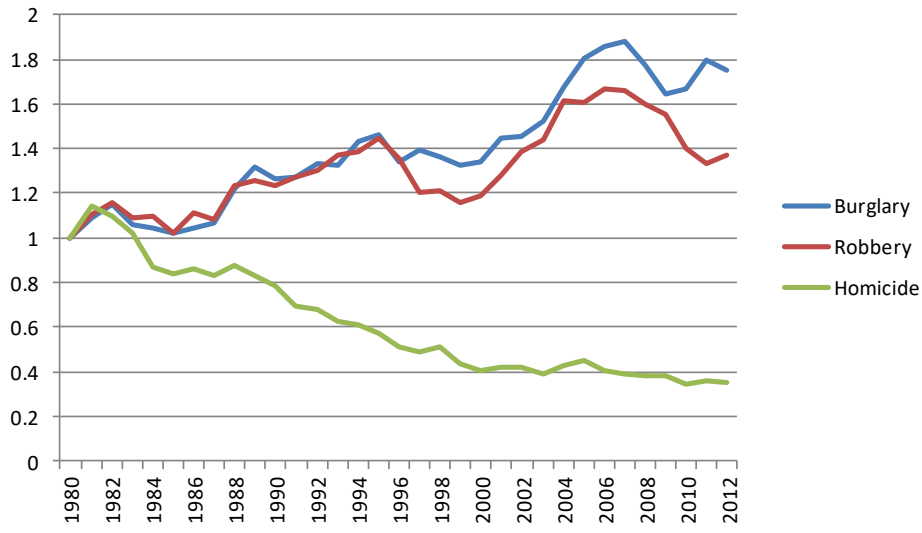


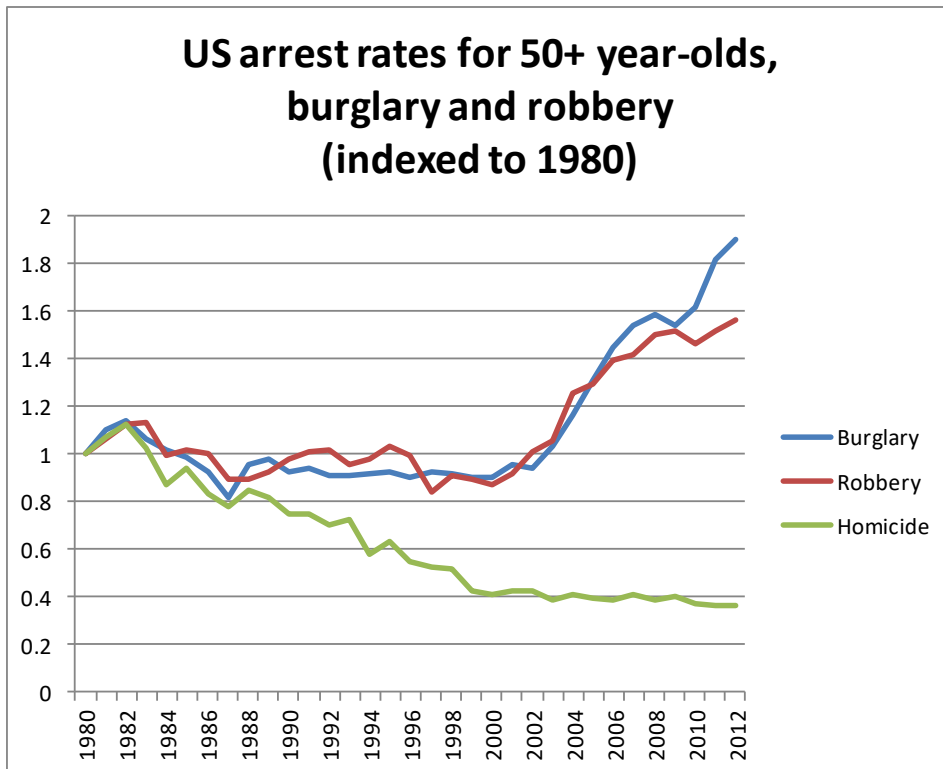
There are two important conclusions to be taken from this. Firstly, the two charts are incredibly similar. The age-rate trends for burglary and robbery are clearly very well correlated. This is shown even more clearly in the three charts below, which also shows that homicide follows an entirely different path.

US arrest rate trends for 30-39s, burglary and robbery (indexed to 1980)

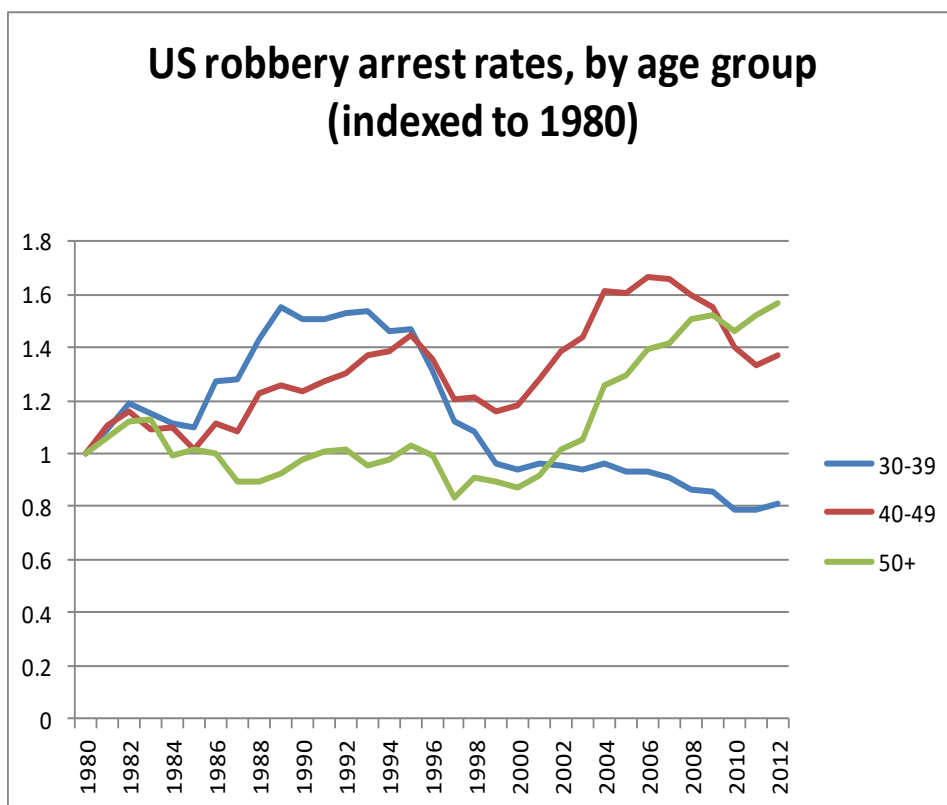


US arrest rates trends for 40-49s, burglary and robbery (indexed to 1980)



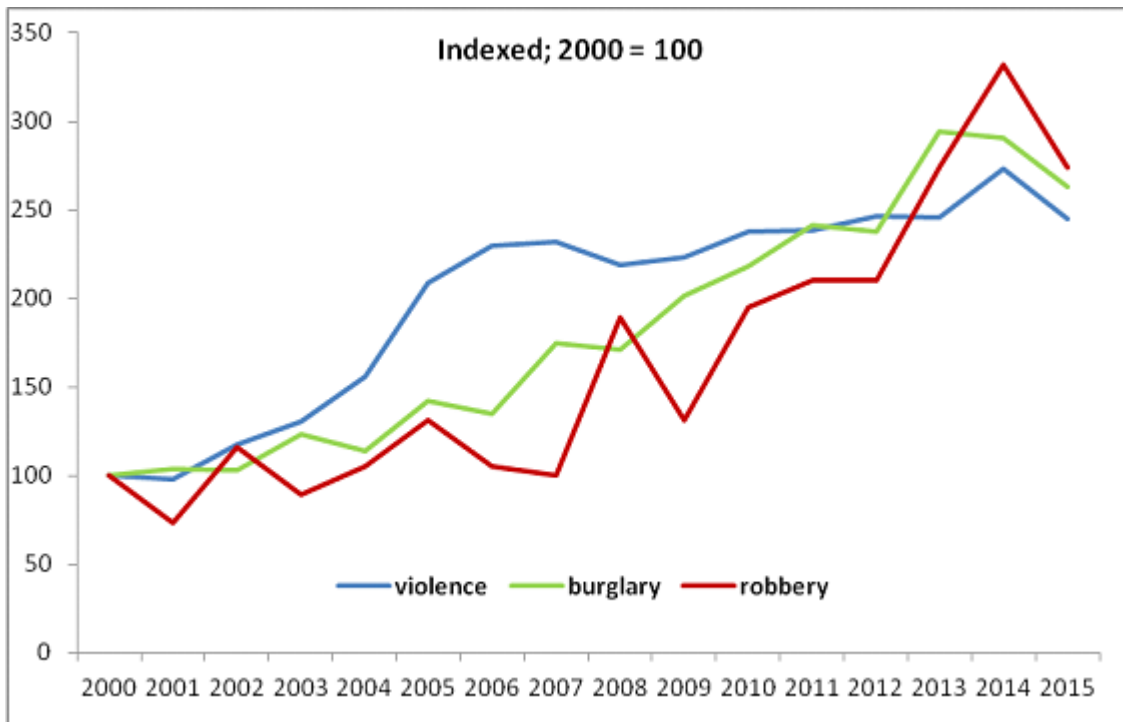


The second point to note about these trends is that they hint at the possibility of a cohort effect in the crimes *other than homicide*. Taking the over-50s chart above as an example, it is clear that arrest rates for over-50s start increasing sharply – for both burglary and robbery – after 2000. That is, as soon as the individuals in the 50+ group started to contain people who were born after 1950, the arrest rates start to rise. If we then look at the chart below again, for robbery:



It is clear that the 40-49 age group has a mostly continuous rise in arrest rates from 1987 to about 2006. In other words, once that group starts to contain individuals born after 1947, its level starts to rise and continues to do so until 2006 when the majority of the cohort was born in 1965 or after. Similarly, the 30-39 age group has a rise in arrest rates to 1989 (when the majority of the cohort would have been born in 1964 or later) and mostly falls thereafter.

Putting all this together, there is certainly some evidence that individuals born between about 1947 and 1965 may have had a higher propensity to commit robbery and burglary and that this higher propensity has persisted for some right through into their 50s. These effects are not absolute and are undoubtedly clouded by period effects. For example, there still looks to be a potential crack effect in the 30-39 and 40-49 trends above, but arguably there is enough within the data to suggest the possibility of a potentially important underlying cohort effect. Furthermore, such an effect would also fit with the initial rise in crime that occurs in the US from the mid 60s, because this would be when the first individuals born after 1947 would have reached their most crime-prone teenage years. Interestingly, although the data is less comprehensive in England and Wales, there are some striking similarities. Below is a chart showing cautions and convictions (volumes, not rates) for burglary, robbery and violence for the over 50s:



Though we do not know whether the pre-2000 trends would be flat or falling, as in the US, it is clear that after 2000, there is a marked rise in the arrest-rate trends for over 50s, just as in the US. In other words, it is possible that the 1947-1965 'high-crime cohort' is also a factor in England and Wales trends.

Overall then, this analysis, though far from conclusive, does suggest the potential for a cohort effect within crimes like burglary and robbery, which may have been an important underlying driver of crime, notwithstanding other period effects that also clearly affected trends. But, very importantly for this review, there is no sign of such a cohort effect within the US homicide data. For US homicide, period effects seem to have been completely dominant between 1980 and 2012.

Annex 8: Profit as a driver of homicide and other studies from the systematic literature review

This annex summarises the short-listed evidence on profit as a driver of homicide. This includes studies that have examined potential relationships between gangs and/or organized crime and homicide. The annex also includes summaries of other studies which met the inclusion criteria for the systematic review, but which did not fit easily into any of the other categories. These potential drivers are brigaded under the following headings: economics, immigration, media/television, mental health, improvements in medical care and 'other'.

i) Profit as a driver of homicide, including studies on gangs and organized crime)

In the Modern Crime Prevention Strategy, the driver 'profit' is intended to capture crimes that occur due to the behaviour of organised criminals who aim to accumulate profits over and above those required for immediate need (Home Office, 2016). Unfortunately though, no study was identified that directly tested for a relationship between criminal profits and trends in homicide. The single most important reason is that, to our knowledge, there is no reliable long-term time series data for criminal profits, either in England and Wales or elsewhere.

There is, however, a large overlap between profit and drugs as drivers of homicide. The drugs annex explores in detail theory and evidence to support the hypothesis that changes in drug markets and the profits they offer drive changes in homicide trends. As that section discusses, measures for drug market demand, and hence profits, are highly imperfect, so proxies have been used. Even so, the evidence does suggest the possibility that drug profit may be an important driver of homicide trends.

In this annex, we concentrate instead on studies that have examined homicide in relation to changes in the level of organised crime more generally, and for the purposes of this review we include street gangs within that definition. As in the drugs annex, the level or density of gangs and organized crime groups is taken as a proxy for the profits being made. An important caveat is the evidence which suggests that people may become part of a street gang or organized crime group for other reasons, such as camaraderie, stimulation, or a sense of belonging. Furthermore, these groups could be linked to homicides through channels unrelated to profit, like conflicts linked to inter- or intra-group arguments that have nothing to do with financial gain. In other words, this section the limited evidence on whether more gangs and/or

more organized crime leads to more homicide. It says nothing about whether any relationship is due to competition over profits or some other mechanism.

Beginning with evidence on street-gangs, the systematic search identified two studies that met the selection criteria, see Table A8.1. Both used data from the United States, an important caveat given that the nature of US-based street gangs may be different to the UK.

Table A8.1: Short-listed studies on gangs and homicides

Study	Area and time period	Independent variable(s)	Method and finding
Robinson, Boscardin, George, Teklehaimanot, Heslin & Bluthenthal, 2009	Los Angeles, US, 1994-2002	Street gang density (predictor variable)	Descriptive analysis and bivariate and multivariate regression analysis. Descriptive analysis showed that a higher number of homicides were found in areas with high street gang density. Street gang density was a significant predictor of homicide variation.
Rosenfeld, Bray & Egley, 1999	St. Louis, US, 1985-1995	Gang motivation/affiliation and non-gang youth	Descriptive bivariate analysis and spatial distribution analysis (maximum-likelihood regression analysis). Descriptive analysis showed that a large amount of homicide trends could be explained by patterns in gang homicide.

Robinson et al. (2009) studied the relationship between street gang density and eight-year homicide trends in Los Angeles County (USA). The authors measured street gang density by examining the number of African American and Latino gangs that were active within a two-mile radius of the population-weighted centre of each zip code. Their descriptive analysis showed that areas with a greater number of gangs within a two-mile radius witnessed more homicides per square mile compared to areas with less street gang density. Population density and race were also significant bivariate predictors of homicide variation at the local level. Their overall multivariate regression analysis found that street gang density was one of the significant predictors of homicide variation, and 90% of the zip code variation in eight-year homicide incidence was explained by street gang density, race, ethnicity, high school dropout rates, unemployment rates and population density. Of all explanatory variables analysed, only street gang density and population density were consistently significant when breaking the variables up by Black, Latino and White/other ethnic groups. The authors do point to the possible endogenous

nature of the relationship between homicides and street gangs, as the areas in which the gangs operated were defined before the start of the study in 1994. More importantly, as the authors pooled all homicides together, this study does not specifically examine whether changes in street gang activity drive changes in homicides over time.

Rosenfeld et al. (1999) examined the empirical distinction between gang-motivated, gang-affiliated and non-gang youth homicides in St. Louis (USA) between 1985 and 1995. Gang-affiliated homicides were those that involved gang members, but that did not result from gang activity, whereas gang-motivated homicides did result from gang activity. Non-gang related youth homicides included cases with suspects aged between 10 and 24, but where a link to gangs was absent. When documenting the ten-year trend in homicides in St. Louis Rosenfeld et al. (1999) found that a large amount of these trends could be explained by patterns in gang homicides. While there were limited gang-related homicides in the 1980s, this trend changed from 1989 onwards, with gang-motivated and gang-affiliated homicides continuing to rise until 1993 and 1995 respectively, taking up around one quarter to a third of all homicides in St. Louis in the early 1990s. The study did conclude that whilst overall homicides in St Louis started to decline from 1993, gang-affiliated homicides still showed increases up to 1996. When comparing gang-motivated, gang-affiliated and non-gang youth homicides based on victim, offender and event characteristics in 1990-1995 the authors found that for both gang and non-gang related homicides around 90 per cent of both victims and suspects were black males, and no significant differences were observed at the neighbourhood level with just over two-thirds of the homicides across all groups committed in disadvantaged neighbourhoods. When looking at event characteristics, however, Rosenfeld et al. (1999) identified several differences between the groups. The proportion of homicides involving multiple suspects significantly differed between gang-motivated homicides (52 per cent) and non-gang youth homicides (30 per cent). Gang-affiliated and gang-motivated homicides are more likely to involve a firearm (94 and 99 per cent respectively), although the proportion of non-gang youth homicides is also high (82 per cent). Notably, the role of drugs in homicides is more prominent in gang-affiliated and non-gang youth cases (46 per cent and 38 per cent respectively) compared to gang-motivated cases (19 per cent).

Rosenfeld et al. (1999) also examined the spatial distribution of homicides and found that neighbourhood disadvantage and racial composition played a key role in the distribution of homicides in St Louis. These two factors were themselves very highly correlated, making strong conclusions difficult to determine, however, the authors noted that neighbourhood disadvantage was not a significant predictor of gang homicides when racial composition was controlled (Rosenfeld et al. 1999, p. 512). The authors also found that the gang homicides tended to cluster in such a way that could not be entirely explained by structural factors suggesting the possibility of a contagious, tit-for-tat effect within gang homicides.

Given the limited evidence available - just two studies - wider secondary evidence was sought. Six other secondary studies were located. These were

either papers completed after the systematic search was completed or studies that shed light on a potential relationship between gangs and homicide in other ways. E.g. cross-sectional studies. Five of these were conducted in the United States with one using England and Wales data. They are listed in Table A8.2.

Table A8.2: Secondary evidence on gangs and homicides

Study	Area and time period	Independent variable(s)	Method and finding
Braga, 2003	Boston, US, 1984-1995	Offender and offence characteristics (note that study examined youth gun crime, not homicides)	Descriptive analysis and negative binomial regression analysis. Youths with prior involvement in crime were driving the youth gun trends, and no diffusion effect to young people not involved in criminal activity was found.
Cohen & Tita, 1999	Pittsburgh, US, 1991-1995	Youth gangs; crack cocaine markets	Descriptive analysis and Exploratory Spatial Data Analysis (Moran scatterplot). The volume of gang-related homicides increased following the arrival of youth gangs in 1991.
Constanza & Helms, 2012	154 US central cities, 1993	Active street gangs. Also examines other structural indicators: population, concentrated disadvantage index, unemployment, divorce rates and black to white income ratio.	OLS and errors-in-variables regression analysis. Regression analysis showed a modest significant correlation between active street gangs and homicides.
Griffiths & Chavez, 2004	831 Chicago census tracts (geographical region), US, 1980-1995	N/A (note that study did not examine gangs specifically)	Exploratory Spatial Data Analysis and a semi-parametric group-based trajectory procedure (TRAJ). Areas with higher homicide rates also matched the main gang territories of Chicago.
Hagedorn (2015)	Chicago from the 1930s through to the present	N/A	Qualitative, narrative approach describing gang competition and co-operation.

Study	Area and time period	Independent variable(s)	Method and finding
Kirchmaier & Villa Llera, 2018	London, UK, 2011- May 2018	Gang activity; knife crime	OLS and probit regression analysis. Results show a correlation between the presence of gangs and a higher level of homicides.

Kirchmaier and Villa Llera (2018) examined the spatial distribution of homicides in London and the possible links with street gangs. Using information on gang territories as published by The Independent - which was based on an interview with one former Met police officer - they found that areas with one or more gangs witnessed a higher number of homicides between 2011 and May 2018, and that this correlation was particularly strong when homicides sharply increased in 2016. The number of homicides was also higher in areas with more children aged 0 to 15. Their regression analysis further showed that higher unemployment, high population density and higher median house prices were all common characteristics of the areas in which gangs operated. Kirchmaier and Villa Llera (2018) also used survey data to explore the possible correlation between homicides and perceptions of knife crime issues in London boroughs and found that homicides were “positively correlated with the percentage of last years’ black respondents in the age group 25 to 34 who believed knife crime is a major concern” (p. 6).

In a US-based study on spatial distribution, Cohen and Tita (1999) looked at the distribution of 287 youth gang homicides in Pittsburgh from 1991 to 1995. Based on case file analysis they found that while the volume of drug-related homicides did not change between 1987 and 1995 following the arrival of crack, the volume of gang-related homicides did change following the arrival of youth gangs in 1991 (an increase of 21 gang-related homicides, or 60 per cent of the total increase in 1991). The authors applied an inclusive definition of both drug and gang-related homicides, with drug-related cases including any drugs link, and gang-related homicides both including gang motivations and gang participation. They found that one fifth of cases were classified as both gang and drug-related. The study’s main objective was to test if cross-sectional spatial data analysis techniques could be used to measure spatial changes in youth gang homicides over time. The authors found some evidence for a contagious spread of homicides from gang youth to non-gang youth in neighbouring areas, but only when homicides peaked from 1992 to 1993. For non-neighbouring areas, however, Cohen and Tita (1999) concluded that “the increases in both youth-gang and youth-nongang homicides generally occur simultaneously” (p. 491).

Although not looking at gangs as an independent variable, Griffiths and Chavez (2004) also pointed to the possible diffusion of homicides to neighbouring areas. In their study of street gun and other weapon homicides in Chicago between 1980 and 1995 they found that areas that initially had lower ‘other weapon’ homicides later experienced more street gun homicides

when bordering neighbourhoods with high street gun homicides and other weapon homicides. They speculated that “while this does not prove a defensive diffusion of street gun homicide to tracts surrounding the most violent areas, it at least suggests a process wherein residents may arm themselves for protection against members of nearby notoriously violent communities” (Griffiths and Chavez, 2004, p. 968). The authors also pointed to possible links with gang activity as they found that the areas with higher homicide rates also matched the main gang territories of Chicago.

Costanza and Helms (2012) analysed homicide variation within 154 US central cities in 1993. When structural conditions were controlled for, the presence of active gangs significantly correlated with increases in homicides. However, the effect was only modest compared to other, structural conditions. It was found that the concentrated disadvantage index, divorce and population size were all stronger predictors of homicide variation than the rate of active gangs.

Although not looking at homicides and street gangs specifically, Braga (2003) tested a similar hypothesis in Boston using criminal history data to explain patterns in youth gun assaults and gun possession over time. The results of his analysis suggested that the youth violence epidemic in Boston was linked to serious youth gun offenders but found no support for a diffusion effect to youth not involved in criminal activity. It could not be ruled out, however, that during the studied period there was increased police focus on those areas where street drug markets and gangs were present.

In his book about Chicago gangs, Hagedorn (2015) argues that the surge in violence and homicide in Chicago in the 1990s was mainly due to, “*organizational contests for power (between gangs)*” and “*formal gang warfare*” (p9) rather than due to a decline in structural neighbourhood factors or collective efficacy. He also highlights the importance of distinguishing between organized crime and street-gangs and how the degree to which they exert control over the retail end of the illicit drugs market can affect levels of violence. In his view, “*more organized crime meant less violence*” (p9). In other words, if the market is fully controlled by organized crime it tends to be less violent. The more that street gangs become involved, the more violent it becomes. Following this logic, his analysis also suggests a hypothesis for the homicide rise from the 1960s. Hagedorn notes that from the end of the ‘beer wars’ of the 1920s/30s until around 1960, the mafia controlled Chicago’s illegal drug activity in a monopolistic way and that during this period, they used ‘surgical’ homicides to prevent insurgents, but otherwise eschewed violence in favour of business. Hagedorn says this situation changed from the 1960s as the mafia effectively handed over the retail end of the drugs market to urban street gangs (pp. 35-37). If this is correct, then what had been a monopoly changed to a highly competitive market at the street level and the participants changed from more business-oriented organized criminals to street-gang members who, in Hagedorn’s view, are more likely to have spells of warfare with rival outfits. Hagedorn offers no quantitative analysis to test his hypothesis.

Moving now to studies that examined links between organized crime and homicide trends, the systematic search identified no studies that met the selection criteria. However, two secondary studies were located. These are shown in Table A8.3.

Table A8.3: Secondary evidence on organised crime and homicides

Study	Area and time period	Independent variable(s)	Method and finding
Preti & Miotto, 2000	Italy, 1980 – 1994	Age, gender and geographical distribution (method and motive of homicides, including the mafia, were also briefly described)	Simple correlations and descriptive statistics. Firearms were used in 75% of homicides and 33.8% of cases were related to the mafia.
Hopkins, Tiley & Gibson, 2013	England and Wales, 2005-06	Organised crime	Qualitative case studies. Seventeen cases were related to organised crime. Most groups were involved in drugs and firearms trade, and sources of conflicts included securing drug market territory and threats to profitability.

In the only UK study identified, Hopkins, Tiley and Gibson (2013) analysed homicides related to organised crime in England and Wales in 2005-06. They applied a broad definition of organised crime in their review of the 696 non-terrorist cases, which included links to profit: “any enterprise, or group of persons, engaged in continuing illegal activities in which one of its primary purposes is the generation of profit, irrespective of national boundaries” (Hopkins et al., 2013, p. 6). Through use of information included in the Homicide Index and through interviews with senior investigating officers the authors identified seventeen cases (around 2%) with direct links to organised crime. Whilst this could be an indication of the relative rarity of such cases in England and Wales, it could also partially reflect a lack of police knowledge about certain homicides. In-depth qualitative analysis of the identified cases showed that most groups were highly organised criminal networks involved in the trade of drugs and firearms (n=12), which aimed to generate profit from these activities. The three main types of conflict involved inter group rivalry (n=7), internal group conflict (n=6) and resistance of police or citizens during armed robbery (n=4). More specifically, in cases of inter group rivalry and internal group conflict the main sources of conflict were related to drug market competition (n=4) and to members leaving the group (n=3) respectively. Both conflicts primarily derived from an instrumental motive to achieve a goal, either to obtain turf (inter group rivalry) or, in the case of an internal group conflict, to “stop a member leaving the group to set up a rival enterprise and

threaten the profitability of the group” (Hopkins et al., 2013, p. 25). Whilst the study provides an in-depth account of organised crime related homicides in England and Wales, because the authors only looked at a single year it tells us little about the degree to which these can explain changes over time.

Preti and Miotto (2000) mainly looked at the age, gender and geographical distribution of homicides in Italy between 1980 and 1994, but also briefly covered motive and method of homicide. They found that between 1989 and 1992, 33.8% of homicides were related to the mafia, and 75% of those cases involved the use of firearms.

Conclusion

No studies were located that specifically looked at the relationship between criminal profits and homicide. This section therefore explored studies that analysed the relationship between organized crime and homicide, and between urban street-gangs and homicide, accepting the caveat that any relationship could be caused by competition for profits within drugs or other illicit markets, but might also be driven by factors unrelated to profit.

In relation to street-gangs, the literature largely confirms that areas with higher street gang density experience higher levels of homicide, even when structural conditions like population density and deprivation are controlled for. In other words, while gangs are certainly more prevalent in the poorest areas, the presence of gangs seems to exert an effect on homicide over and above the effect of poverty and other structural factors alone.

This suggests the possibility that *changes* in the level of street-gang density and changes in the level of conflict between street-gangs may be an important driver of homicide trends. Hagedorn in particular has argued, using the example of Chicago in the 1990s, that the punctuated nature of gang warfare offers a persuasive explanation of the sudden increases in homicide that have occurred in certain localities.

However, our systematic review located almost no studies that have used methods which robustly test how *changes in gang activity* have driven *changes in homicides* over time. Hence, whilst the link between street gangs and homicides remains a strong hypothesis, this has not been tested robustly. Furthermore, almost all the studies examined in this section were done in the US.

Evidence was even more sparse for organized crime and homicide. One England and Wales study found that the proportion of homicides directly driven by organized crime was small (2% of the annual total), but evidence on whether this has changed over time is lacking.

In sum, this literature review shows that more robust research is required to further explore the possible links between profit and homicides.

ii) Economic factors as drivers of homicide

A very high proportion of the studies in the overall literature review included an economic measure amongst the explanatory variables, either as the variable of primary interest or as a control. This section briefly reviews this evidence. It is divided into four subsections: unemployment, inequality, gross domestic product (GDP), and welfare payments.

Unemployment

A number of different theoretical mechanisms have been suggested by which changes in unemployment might be a driver of homicide trends. The two most commonly cited were set out in detail by Cantor and Land in a seminal 1985 paper. They distinguished between the *motivational* effect of unemployment and a separate *opportunity* effect. The motivational effect refers to the possibility that individuals who become unemployed suffer emotional and financial stress and that this makes them more likely to be involved in homicide. The opportunity effect operates in the opposite direction. It suggests that as more people become unemployed a greater amount of aggregate societal time is spent in and around the home. This might be expected to increase domestic homicides but reduce public space homicides. As most homicides are non-domestic the overall opportunity effect of unemployment could be expected to be negative.

Many studies have tested these propositions by including unemployment as a variable in models attempting to explain homicide trends. This section summarises the results from those studies with a focus on the papers which examined unemployment as the main variable, or one of the main variables, of interest. The short-listed papers falling into this category are shown in Table A8.4 below.

Table A8.4: Short-listed studies examining the relationship between homicide and welfare spending

Study	Area and time period	Economic variable	Method and finding
Baller et al., 2001	US counties, 1960 to 1990	Unemployment, resource deprivation (index including percent black, median family income, a Gini index of family income inequality, percent of families below the poverty line, and percent female-headed families.)	Repeated cross-sectional analysis. Found that deprivation was a consistent and robust predictor of homicide whereas results for unemployment were inconsistent.

Brenner and Swank, 1986	US, 1951 to 1982	Unemployment, business failure rate.	Multivariate regression. Found a positive significant relationship between recessions and homicide.
Cantor and Land, 1985	US, 1946 to 1982	Unemployment levels and changes	First and second difference models. Found a negative relationship between unemployment levels and homicide and no relationship between unemployment changes and homicide. Concluded that the opportunity effect of unemployment dominates the motivational effect. That is, that lower rates of unemployment puts more people outside the home, raising the aggregate risk of homicide.
Cheatwood, 1994	11 German Lander from 1971 to 1990	Unemployment rate	Repeated linear regression. Found that four of the 11 lander had a significant positive relationship between homicide and unemployment, while one had a significant negative relationship. Also found that the lander with positive relationships also had a high correlation between homicide and robbery, whereas other states did not. Concluded that the association between unemployment and homicide is driven by a stronger association between robbery and unemployment.
Jacobs and Richardson, 2008	14 developed nations (including the UK) from 1975 to 1995	Unemployment, GDP and inequality	Fixed effects panel models using moving averages to capture long-term cumulative relationships. They found positive significant relationships between homicide rates and unemployment, inequality and GDP.

Lafree et al., 2010	80 US cities from 1960 to 1999	Unemployment levels and changes	Mixed model approach using ratio of black to white homicide arrest rates as the dependent variable. Found that Black and White homicide rates converged over time and that reversed somewhat between 1980 and 1990. Black-to-White unemployment ratios predicted Black-to-White homicide ratios but there was no effect for changes in the unemployment ratio over time. Demographics, family structure (proportion of single-parent families), and particular drug arrests were found to be better predictors of change over time.
Lee and Shihadeh, 1998	26 nations from 1965 to 1984	Availability of low-skilled jobs, unemployment	Pooled cross-sectional OLS regression. Found a positive significant relationship between homicide and unemployment.
Loftin et al., 1989	Detroit from 1926 to 1969	Poverty (infant mortality), unemployment rate.	OLS regression. Found strong positive relationship between poverty and both domestic and criminal transaction homicides and also a weaker positive relationship between unemployment and the two groups of homicides (once the Great Depression was controlled for, using a dummy variable). Also found that effects were lagged, and only emerged over time.
Matthews et al., 2001	105 US cities (85 'rustbelt cities' and the 20 largest cities) between 1980 and 1995	Unemployment and deprivation index.	Least squares dummy variable regression. Found that whereas homicide rates fell in the largest US cities between 1990 and 1995 they did not, on the whole, in rustbelt cities, which also experienced above average unemployment and population decline. These deprivation factors were the strongest predictors of homicide rates in the regression model.

McCall et al., 2010	932 US cities in 1970, 1980, 1990, 2000	Resource deprivation index, unemployment rate.	Repeated cross-sectional analysis. Found significant positive relationship with deprivation that was consistent over time. Found that the unemployment rate had no effect on homicide rates (net of other factors) in 1970 or 1980 but had a significant positive relationship in 1990 and 2000.
Nunley et al., 2011	The US from 1934 to 2006	The Misery Index (the sum of inflation and unemployment rates).	Cointegration models using Engle-Granger and separately OLS regressions. Found a significant positive long-run relationship between homicide and the misery index, as well as the proportion of the population aged 15-29.
Parker, 2003	196 US cities in 1980 and 1990	Urban disadvantage/segregation, economic deprivation, joblessness, industrial change (shift from manufacturing to services)	Random effects, pooled, cross sectional, negative binomial poisson regression. Found a positive significant relationship between homicide trends and changes in joblessness and the degree to which jobs shifted from manufacturing to the service industry. But these effects were focused on homicides involving Black victims.
Rosenfeld, 2009	4 US regions from 1970 to 2006.	Unemployment, Index of Consumer Sentiment, GDP.	Fixed effects panel data models. Found a significant negative relationship for the Index of Consumer Sentiment and unemployment and no relationship for GDP. Also found that the effect was stronger on felony homicides and that adding acquisitive crime to the model rendered these results insignificant. Concluded that beliefs about worsening economic health raise acquisitive crime which in turn increases homicide via robbery/burglary homicides. Also concluded that higher unemployment reduces homicide - when the perception effect is controlled - via an opportunity effect (spending more time at home reduces potentially homicidal interactions).
Rosenfeld (2014)	14 nations from 1981 to 2010	Inflation, GDP per capita and unemployment	Found marginally significant relationship between homicide and inflation and no relationship for GDP or unemployment.

Rosenfeld and Oliver, 2008	4 US regions from 1970 to 2006.	Unemployment, Index of Consumer Sentiment, GDP.	First difference OLS models with region fixed effects and time trends. Finds negative significant relationship between homicide and both contemporary and lagged consumer sentiment. They also found a negative relationship with unemployment but no relationship with GDP.
Smith et al., 1992	US, 1959 to 1987	Unemployment, inflation.	First differences OLS model with age- and race-specific homicide arrests as the dependent variable. Found a significant negative effect on homicide for the level of unemployment and a positive effect for changes in unemployment. Found no significant results for inflation. Concluded that unemployment affects homicide via an opportunity and motivation effect, and that it affected whites more than African Americans.
South and Cohen (1985)	US, 1947 to 1979	Unemployment level and change	OLS regression with first difference model used as a robustness check. Found a significant negative relationship between the level of unemployment and homicide and a significant positive relationship between changes in unemployment and homicide. Concludes that this supports both opportunity and strain theories - i.e. that while becoming unemployed increases the motivation for homicide, a high level of unemployment decreases homicide because it reduces aggregate time spent outside home.
Tcherni, 2011	3075 US counties from 1950 to 2005	Poverty, unemployment, residential mobility	Repeated cross-sectional analysis. OLS and negative binomial regression with factor analysis to decide on control variables. Found that poverty, percent-divorced and percent-Black were strong and stable predictors of cross-sectional homicide distribution in both time periods and despite the marked changes in levels for these variables. Results were less consistent for unemployment and residential mobility.

A glance down the far right column in Table A8.4 reveals that, in general, the results of the studies are mixed. Although our review focuses on analyses of homicide trends, it is worth pointing out that cross-sectional results are also equivocal. In a series of famous papers examining the cross-sectional correlates of homicides in the US, Land et al. (1990) and McCall et al. (2010) found that unemployment rates were significant in some periods but not others. Similarly, mixed results were obtained by Baller et al. (2001) and Tcherni (2011).

It is possible that the different theories of unemployment and homicide mentioned above – the motivational and the opportunity effect – may explain these results. That is, because these theories operate in opposite directions, it is possible that different overall results could be gained at different times. Cantor and Land (1985) suggested that a method for testing this would be to look separately at the effect of unemployment levels and unemployment change. They proposed that levels would be a better measure of the opportunity effect, while changes would better capture the motivational effect. Their own empirical model, using national time series data from the US from 1946 to 1982, found support for the opportunity effect but not the motivational effect.

However, South and Cohen (1985) using the same data but for very slightly different years (1947 and 1979) gained results in line with Cantor and Land's theoretical hypothesis. They found a significant *negative* relationship between the level of unemployment and homicide and a significant *positive* relationship between changes in unemployment and homicide. In line with Cantor and Land's original hypothesis, they concluded that becoming unemployed increases the motivation for homicide, but that a high level of unemployment decreases homicide because it reduces aggregate time spent outside home. The same results were obtained by Smith et al., (1992) using US data from 1959 to 1987 and Loftin et al., 1989 also obtained compatible findings using Detroit data from 1926 to 1969.¹

It's important to note though, that the period of study for these analyses incorporated the period from 1965 to 1970 when unemployment levels were low and reasonably stable but homicide rose sharply. The studies also missed the 1990s in which unemployment and homicide generally fell together, reaching around the same level as that of the 1965-1970 period. It is hard to square this latter trend with Cantor and Land's hypothesis, unless we are to assume that the motivational effect came to totally dominate the opportunity one.

Certainly, many of the studies that examined the 1990s period tended to find that higher levels of unemployment predicted higher rates of homicide. For example, McCall et al. (2010) found that cities with higher unemployment rates had higher homicide rates in 1990 and 2000, but not in 1970 or 1980. Similarly, Jacobs and Richardson (2008) and Matthews et al., (2001) both

¹ One study that doesn't fit this pattern is Lee and Shihadeh (1998). They found a significant positive relationship between homicide and unemployment using a cross-national sample for the years 1965 to 1984, but they didn't include change in unemployment as a separate variable.

found significant *positive* relationships between unemployment rates and homicide trends using data up to 1995. Richardson (2008) used cross-national data while Matthews et al. (2001) used data from the US. They concluded that continued high levels of unemployment were one of the main reasons why 'rust-belt' cities in the US had more delayed falls in homicide in the 1990s, relative to the biggest and most prosperous cities. Similarly, Parker (2003) examined how race-specific homicide rates changed between 1980 and 1990 in the US. She found a positive significant relationship between homicide trends and changes in unemployment levels particularly in relation to homicides involving black victims. Lafree et al., (2010) also disaggregated homicide trends by race. They found that black and white homicide rates converged over time but that this reversed somewhat between 1980 and 1990. Black-to-white unemployment ratios had a positive significant relationship with black-to-white homicide ratios cross-sectionally, but there was no similar temporal effect.

Overall then, the authors of these studies tended to emphasise the motivation effect and discarded the possibility of an opportunity effect. However, two studies by Richard Rosenfeld (Rosenfeld and Oliver 2008; Rosenfeld, 2009) provided slightly different results. In both studies, Rosenfeld looked at US homicide trends in the four US regions (West, South, Midwest and Northeast) between 1970 and 2006. Using a first-differences model he showed that changes in unemployment and changes in consumer sentiment had a significant negative effect on changes in homicide. He argued that as people's perceptions of the economy worsened (as measured by consumer sentiment) homicide generally increased. This is akin to the motivational effects. However, he also found that once this was controlled for, the relationship between unemployment and homicide was also negative (less unemployment equals more homicide). He concluded that this indicated the persistence of an opportunity effect.

Rosenfeld (2014) has since modified this position in light of the 2008 recession, which drove a marked increase in unemployment rates in the US (and to a lesser extent in England and Wales) yet appeared to have very little effect on homicide rates in either nation. He argued that the interaction between unemployment and *inflation* is crucial and that because inflation rates stayed low through the 2008 recession – in contrast to previous recessions – this cushioned the impact on crime. Indeed, using linear and quadratic multivariate models, Rosenfeld found that of unemployment, GDP per capita and inflation, only inflation had a relationship with homicide in a dataset of 14 nations from 1981 through to 2010.

This model, which suggests that unemployment might only impact on homicide when combined with high inflation, is given some credence by Nunley et al., (2011). They did not cover post-2008 trends but they did look at the viability of the Misery Index as a predictor for the US homicide rate from 1934 to 2006. The Misery Index is a combination of unemployment and inflation. They found a significant positive long-run relationship between homicide and the misery index and concluded that it was a particularly

important factor in explaining why homicide rates did not fall in the late 1980s as the baby boom generation aged.

In summary, this brief review of the evidence on unemployment and homicide has produced mixed results, both theoretically and practically. Higher unemployment has been suggested to increase homicide via a motivational effect but also decrease it via an opportunity effect. Studies aiming to test the relationship have found some support for both positions, which is also a reflection of a general inconsistency in results. Importantly, the inconsistency does not seem to be due to methodological rigour. More recent, quasi-experimental studies have still produced different findings. As a result, many authors have concluded that unemployment is at best a weak driver of homicide trends (Rosenfeld, 2014; Tcherni, 2011), particularly given the 2008 recession and its apparent lack of effect on homicide trends.

Welfare/benefit payments

Many studies have investigated the relationship between welfare spending and homicide. The theoretical basis for these studies comes from several perspectives. One emphasises poverty reduction. If poverty is a driver of homicide then to the extent that welfare payments reduce poverty, they might also be expected to reduce homicide. Another related possibility, derived from strain theory, is that welfare payments might reduce crime by serving to placate “those who might react antagonistically to their adverse economic status” (Devine, Sheley and Smith (1988). Chamlin et al., (2002) hypothesised that the relationship was more likely to be based on the fact that welfare payments are “part of a larger enterprise to enmesh citizens in mutual bonds on concern.” Common to all these approaches is the expectation that there will be a negative relationship between welfare payments and homicide - increases in welfare spending should decrease homicide, all else equal.

There have been many studies that have sought to test this proposition. However, many were based purely on US data and used a cross-sectional design (see for example DeFronzo and Hannon, 1998), hence were not picked up in this review. Summarising this evidence, Worrall (2005) concluded that the vast majority of cross-sectional studies did indeed find a negative relationship between welfare spending on homicide. However, our focus is on explaining trends. The short-listed studies that examined the temporal relationship between welfare spending and homicide are shown in Table A8.5 below:

Table A8.5: Short-listed studies examining the relationship between homicide and welfare spending

Study	Area and time period	Economic variable	Method and finding
Batton and Jensen, 2002	US, 1900 to 1997.	Decommodification (measured via an index of social welfare expenditure measures).	OLS regression with both levels and differences. Found no direct relationship between decommodification and homicide but they did find a positive relationship with unemployment up to 1945 but not afterwards. They concluded that this provided indirect support for welfare support because the welfare programmes removed the relationship between unemployment and homicide.
Chamlin et al., 2002	Oklahoma city from 1976 to 1994	Welfare transfers (number of Aid to Families with Dependent Children recipients)	ARIMA modelling without controls. Found a negative relationship between welfare payments and family-related homicides but no effects on all other types of homicides. Concluded that this supports a social altruism hypothesis - i.e. That welfare payments reduce homicide by promoting altruistic values rather than by alleviating poverty directly or by keeping a potentially murderous underclass in check.
McCall and Brauer, 2014	29 European countries (including the UK) from 1994 to 2010.	Social welfare support, GDP, inequality, inflation.	Multi-level model testing both within- and between-nation effects. Found a significant negative relationship between social welfare support and homicide with a 1-3 year lag. Found no relationship with GDP, inflation or inequality.
Neumayer, 2003	117 nations (including the UK) from 1980 to 1997	Economic growth, income level, inequality.	Fixed effects models with random effects models used as sensitivity analysis. Found a negative significant relationship between homicide and economic growth and income level but no effect for inequality or welfare policies.
Nivette (2011)		Decommodification Index (i.e. an index of social welfare expenditure measures).	Meta-analysis of temporal and (mainly) cross-sectional studies. Found that income inequality and the decommodification index had significant and strong effects on homicide whereas economic development (and democracy) had weaker effects.

Thames and McCall, 2014	247 European regions in 2000, 2005 and 2009	Lagged and contemporary level of social support measured via total annual social benefit expenditure per capita	Hybrid panel data model combining both within and between region effects. Found a negative statistically significant three-year lagged relationship both within and between regions and that social support moderated the effect of deprivation on homicide.
Worrall, 2005	58 counties in California from 1990 to 1998	Welfare spending (five different types of variable tested)	Two-way fixed effects regression. Found no relationship between welfare spending and homicide, regardless of the variable used for welfare spend.

Generally, the studies in Table A8.5 were of high methodological quality, with most employing a quasi-experimental design. The findings are somewhat mixed, although there are certainly several studies which have findings in line with the cross-sectional evidence showing a negative relationship between welfare payments and homicide.

For example, Thames and McCall (2014) used data from 247 European regions between 2000 and 2009. They found a negative, statistically significant lagged relationship both within and between regions using a hybrid panel data model. They also found that that social support moderated the effect of deprivation on homicide, but for Western European nations only. Similarly, McCall and Brauer (2014) used multi-level models to test the relationship between homicide and social welfare in 29 European countries (including the UK) from 1994 to 2010. They found a significant negative relationship between social welfare support and homicide with a 1 to 3 year lag. Welfare spending was also a strong predictor of homicide in Nivette's (2011) meta-analysis of results from mostly cross-national studies.

However, some results were more equivocal. Chamlin et al., (2002) found a negative relationship between welfare and homicide in a study using data from Oklahoma City from 1976 to 1994, but only for family-related homicides, not for any other homicide type. And Batton and Jensen (2002) found no relationship between welfare spending and homicide in their study of US homicide rates from 1900 to 1997, although they did conclude that increased welfare spending seemed to have removed the relationship between unemployment and homicide, which they found existed up to 1945 but not afterwards. Two studies, Worrall's (2005) examination of homicide rates in Californian counties from 1990 to 1998 and Neumayer's study of 117 nations (including the UK) from 1980 to 1997, found no evidence of a relationship with welfare spending.

Some researchers have suggested the possibility that welfare spending could actually *raise* homicide rates. For example, in two separate papers, Kivivuori and Lehti (2006; 2011) examined long-term homicide trends in Sweden and Finland. They argued that Finland's higher homicide rate was driven mostly by

higher homicide rates among older men, who previously worked on farms, but as a result of a collapse of agriculture became long-term recipients of welfare. They spent most of their time in the private sphere where alcohol and the lack of social controls raised homicide risks. Adam Perkins has made a similar argument for the rise in homicide in England and Wales in the 1960s (Perkins, 2016). He argued that the creation of the welfare state in the 1940s encouraged high fertility rates a generation later by offering increased state benefits per child. He also argued that these individuals are more likely to display personality traits like low-self-control that have been linked both to welfare dependence and crime. He therefore concluded that the creation of the welfare state may have been a driving factor behind the rise in homicide a generation later. However, neither Perkins, nor Kivivuori and Lehti, attempted to test their hypotheses quantitatively. And in relation to Perkins' theory, one apparent issue would be that whilst state welfare has continued to become more generous over time in England and Wales, the rise in fertility and family size (and indeed other family-related risk factors) ended abruptly in the 1970s, see Character annex.

Overall then, the strongest studies methodologically have shown some evidence of a negative relationship between welfare spending and homicide, although arguably the evidence is stronger for a cross-sectional relationship rather than a temporal one.

Gross Domestic Product (GDP)/Economic Growth

Many studies include either Gross Domestic Product (GDP) or the year-on-year change in GDP (economic growth) in models attempting to explain homicide. Similar to unemployment, theories have been proposed for both a positive and negative relationship between crime and GDP. For example, Durkheim's modernization perspective proposes that, during the transition to a modern society, economic growth leads to the disruption of traditional relations and social bonds via urbanization and that this creates 'anomie' or a lack of social integration which in turn increases the likelihood of crime. Another theory that links higher GDP to higher homicide is the opportunity approach. In this formulation, more wealth might be expected to drive more out-of-home activity, including socialising in the night-time economy, which puts more individuals at risk of homicide (Cohen and Felson, 1979). However, other theorists have suggested the opposite relationship. For example, Becker's economic model of crime (Becker, 1968) suggests that crime is a rational alternative when economic prospects are poor. Following this approach we might expect more economically-motivated homicides at lower levels of GDP.

Untangling these competing theoretical positions is difficult for at least two reasons. Firstly, some of the above theories (e.g. modernization) are as much about *changes* in levels of economic activity as the levels themselves. Secondly, GDP is likely to be correlated with other economic variables explored in this section like unemployment and inequality. This makes interpretation of results more challenging when two or more economic variables are included in the same model. The following section focuses on

temporal studies of GDP as a possible driver of homicide, but it should be kept in mind that this economic measure is in itself driven by other socio-economic factors.

The short-listed studies that examined the relationship between GDP and homicide trends in some detail are shown in Table A8.6 below:

Table A8.6: Short-listed studies examining the relationship between homicide and GDP/economic growth

Study	Area and time period	Economic variable	Method and finding
Bennett, 1991	52 nations from 1960 to 1984	GDP and change in GDP	Fixed effects models. Found no significant relationships between homicide and GDP or changes in GDP
Fajnzylber et al., 2002	45 nations (including the UK) from 1970 to 1994	Income inequality, GDP growth rate, economic development (per capita GDP, educational attainment)	Panel-based general method of moments models including several controls including for illicit drug activity. Found a significant positive relationship between inequality and homicide and a significant negative relationship between GDP growth and homicide but no effect for the economic development measures.
Jacobs and Richardson, 2008	14 developed nations (including the UK) from 1975 to 1995	Unemployment, GDP and inequality	Fixed effects panel models using moving averages to capture long-term cumulative relationships. They found positive significant relationships between homicide rates and unemployment, inequality and GDP.
McCall and Brauer, 2014	29 European countries (including the UK) from 1994 to 2010.	Social welfare support, GDP, inequality, inflation.	Multi-level model testing both within- and between-nation effects. Found a significant negative relationship between social welfare support and homicide with a one to three-year lag. Found no relationship with GDP, inflation or inequality.
Neumayer, 2003	117 nations (including the UK) from 1980 to 1997	Economic growth, income level, inequality.	Fixed effects models with random effects models used as sensitivity analysis. Found a negative significant relationship between homicide and economic growth and income level but no effect for inequality or welfare policies.

Rosenfeld, 2009	4 US regions from 1970 to 2006.	Unemployment, Index of Consumer Sentiment, GDP.	Fixed effects panel data models. Found a significant negative relationship for the Index of Consumer Sentiment and unemployment and no relationship for GDP. Also found that the effect was stronger on felony homicides and that adding acquisitive crime to the model rendered these results insignificant. Concluded that beliefs about worsening economic health raise acquisitive crime which in turn increases homicide via robbery/burglary homicides. Also concluded that higher unemployment reduces homicide - when the perception effect is controlled - via an opportunity effect (spending more time at home reduces potentially homicidal interactions).
Rosenfeld, 2014	14 nations from 1981 to 2010	Inflation, GDP per capita and unemployment	Linear and quadratic multivariate models. Found marginally significant relationship between homicide and inflation and no relationship for GDP or unemployment.
Rosenfeld and Oliver, 2008	4 US regions from 1970 to 2006.	Unemployment, Index of Consumer Sentiment, GDP.	First difference OLS models with region fixed effects and time trends. Finds negative significant relationship between homicide and both contemporary and lagged consumer sentiment. They also found a negative relationship with unemployment but no relationship with GDP.
Stamatel, 2009	9 East European nations from 1990 to 2003	GDP, inequality, democratization and post-communist economic reform.	Used pooled time series OLS regression with nation fixed effects. Found statistically significant relationships between homicide and GDP (negative), ethnic diversity and population density (both positive). There was no relationship with inequality or divorce rates. The analysis also showed that countries that adopted market-based economic reforms faster post-communism had lower levels of homicide through that period.
Stamatel, 2014	33 nations from 1990 to 2005	GDP, infant mortality rate (which they used as a proxy for	Feasible generalized least squares regression. Found structural economic variables to be robust predictors of female homicide victimisation.

Similar to the results for unemployment, the findings in relation to GDP are somewhat mixed, even though many of the studies listed in Table A8.6 employed sophisticated quasi-experimental designs. Four of the studies found a negative relationship between homicide trends and GDP, four found no relationship and one found a positive relationship.

Of the four studies that found a negative relationship, two were by Janet Stamatel. In the first of these (Stamatel, 2009) she notes that the transition from Communism caused increases in homicide throughout much of Eastern Europe, but that nations which adopted market-based economic reforms faster (and hence had higher GDP) had lower levels of homicide generally, through that period.² She also found that countries in the midst of regime change had higher homicide rates than full autocracies or democracies. In a later paper (Stamatel, 2014), she found that structural economic development variables (GDP and infant mortality rate) were robust predictors of *female* homicide in panel off 33 European nations. However, this latter study used a pooled time series design rather than the fixed effects approach employed in the earlier study. So, although it used data with a temporal component, it did not test within-national trends, which is our primary interest.

Neumayer (2003) did use fixed effects models to study within-nation trends in 117 nations (including the UK) from 1980 to 1997. He found a negative significant relationship between homicide and GDP for both levels and changes in GDP. Using a similar methodology but a smaller sample of nations (45), Fajnzylber et al., (2002) found a significant negative relationship between GDP *growth* and homicide but no relationship for the *level* of GDP per capita.

Importantly, the three studies described above that found negative relationships between GDP and homicide within nations, used either a wide pool of nations or a select group of Eastern European nations. Studies that have used Western European nations or the US have found differing results. For example, McCall and Brauer (2014) found no relationship in their study of 29 European countries (including the UK) from 1994 to 2010, and two studies by Rosenfeld (Rosenfeld and Oliver, 2008; Rosenfeld, 2009) also found no relationship when using purely US data. However, Rosenfeld's models also included a variable capturing economic perceptions, which none of the other studies did and which may have confounded the GDP result.

As well as geographic variation, the relationship between GDP and homicide may also be temporally dependent. Bennett (1991) pointed out that earlier (albeit cross-sectional) studies had consistently found a negative relationship between development and homicide. Yet his study, looking at a slightly later period, found no relationship.

Finally, Jacobs and Richardson (2008) found a *positive* relationship between levels of GDP per capita and homicide in a sample of 14 nations. Given that they used a similar time period to the other studies (1975-95) it is hard to

² It is also possible that this shift reflects poor recording of homicides in the Communist period.

explain this differing result. It may have been caused by a slightly different methodological approach. They used moving averages to capture long-term cumulative relationships.

Overall then, the collected evidence offers more support for a negative or no relationship between GDP and homicide than a positive relationship. But to the extent that there is a relationship, it seems to vary geographically and temporally. Arguably there is some support for the notion that GDP growth in the initial phase of development is likely to lower homicide rates, but that once a certain level of development has been reached the effect lessens or disappears. In the case of Eastern Europe this must be qualified by the finding that political transition to a market-based economy coincided with a marked *rise* in homicide initially, but that economic growth tempered this rise and/or sped up the subsequent decline in homicide rates.

Poverty/Deprivation

Poverty and deprivation are also commonly used variables in models or analysis attempting to explain homicide trends. Again, different theoretical perspectives suggest different potential relationships with homicide. While several related theories (e.g. strain) propose a positive relationship between homicide poverty (higher levels of poverty drive higher levels of homicide), aspects of the modernization and opportunity frameworks (see above) would suggest the opposite relationship.

The short-listed studies that have examined the relationship are shown in Table A8.7.

Table A8.7: Short-listed studies examining the relationship between homicide and poverty/deprivation

Study	Area and time period	Economic variable	Method and finding
Baller et al., 2001	US counties, 1960 to 1990	Unemployment, resource deprivation (index including percent Black, median family income, a Gini index of family income inequality, percent of families below the poverty line, and percent female-headed families.)	Repeated cross-sectional analysis. Found that deprivation was a consistent and robust predictor of homicide whereas results for unemployment were inconsistent.
Baumer and Wolff, 2014	86 countries 1989 to 2008	Inequality (gini coefficient), poverty (infant mortality plus GDP per capita)	Two-level hierarchical linear models using overall and age-specific homicide rates. Found strong positive relationship between poverty and homicide.

Chamlin, 1989	109 US cities in 1970 and 1980	Inequality, poverty, residential mobility	Linear regression using residual-change scores. Found that poverty was negatively related to homicide cross-sectionally but that changes in poverty had no significant effect. Inequality was non-significant cross-sectionally but had a significant positive relationship temporally. Residential mobility was non-significant for both.
Frye and Wilt, 2001	New York, 1990 to 1990	Socio-economic index	OLS regression models. They found that socio-economic conditions and social disorganization (measured by percent divorced and percent female-headed households) were predictors of female homicide victimisation by non-partners but not for intimate partner homicides of women.
Kubrin and Herting, 2003	111 census tracts in St. Louis from 1979 to 1995	Neighbourhood disadvantage (poverty, proportion of children not living with both parents, median income, unemployment, percent black); neighbourhood instability (residential mobility, percent divorced).	Growth curve modelling. They found that trends and predictive factors differed depending on homicide type. Neighbourhoods with greater initial disadvantage had higher initial levels of all homicide types and had sharper swings both down and up. Initial instability was related only to felony and domestic killings. But changes over time were less predictive, only the change in disadvantage and felony homicides was significant.
Loftin et al., 1989	Detroit from 1926 to 1969	Poverty (infant mortality), unemployment rate.	OLS regression. Found strong positive relationship between poverty and both domestic and criminal transaction homicides and also a weaker positive relationship between unemployment and the two groups of homicides (once the Great Depression was controlled for, using a dummy variable). Also found that effects were lagged, and only emerged over time.
Lane, 1999	England and the US long-term trends	n/a	Historical analysis. Concluded that poverty and the criminal justice system have been less important drivers of homicide than alcohol, drugs, gun availability, inequality, family instability and a cultural character of 'honour'.

MacDonald and Gover, 2005	159 US cities in 1980 and 1990	Concentrated disadvantage (index including percentage of the Black population, percentage of female-headed households, percentage of persons living in poverty, and percentage unemployed).	Negative binomial regression model. Tested effects on youth-on-youth homicide only. Found a positive significant relationship between the change in concentrated disadvantage and change in homicide. The only other significant predictor was percentage divorced (also positive relationship).
McCall et al., 2010	932 US cities in 1970, 1980, 1990, 2000	Resource deprivation index, unemployment rate.	Repeated cross-sectional analysis. Found significant positive relationship with deprivation that was consistent over time. Found that the unemployment rate had no effect on homicide rates (net of other factors) in 1970 or 1980 but had a significant positive relationship in 1990 and 2000.
McCall et al., 2011	157 US cities from 1976 to 2005	Resource deprivation, concentrated poverty and income inequality	Latent trajectory analysis. Divided cities into four groups based on homicide trajectory and found that cities with the highest homicide rates also experienced the biggest shifts up and down in homicide levels over the study period. Economic factors, notably higher levels of resource deprivation, concentrated poverty and higher income inequality predicted membership of this group.
Ousey, 2000	121 US cities in 1970 and 1990	Deindustrialization (manufacturing employment) and economic deprivation (the sum of poverty and male joblessness rates).	Two-stage OLS regressions using residual change scores and lagged variable (i.e. level in 1970). Found that deindustrialization increased economic deprivation which raised the number of Black, female-headed households which in turn raised youth homicide rates (measured via arrest data). For whites the economic transition had a direct significant relationship.

Strom and MacDonald, 2007	155 US cities from 1982 to 1994	Disadvantage (an index including percentage of female headed households, percentage of female headed households with children under 18, adult male unemployment, percentage of persons living in poverty).	Random effects, pooled, cross sectional, negative binomial regression. Found a positive significant relationship between homicide trends and disadvantage for both Black and White youth homicide.
Stults, 2010	831 census tracts in Chicago from 1965 to 1995	Concentrated disadvantage index (comprised of median household income, the percentage of persons with a high school diploma, the percentage of persons with a bachelor's degree, percentage of persons who are African American, and the percentage of persons unemployed).	Used semi-parametric group-based trajectory modelling to divide Chicago neighbourhoods by homicide trajectory and multinomial logistic regression to examine features predicting those trajectories. Found that, regardless of whether a trajectory started at low, moderate, or high homicide, initially high levels of disadvantage, and increases over time, were predictive of increasing or high homicide trajectories.
Stults, 2012	Chicago neighborhoods from 1980-2000.	Concentrated disadvantage index (comprised of median household income, the percentage of persons with a high school diploma, the percentage of persons with a bachelor's degree, percentage of persons who are African American, and the percentage of persons unemployed).	Mixed methods approach. Group-based trajectory modelling showed that concentrated disadvantage was predictive of being in a group with a higher homicide starting level with increases over time. Hierarchical growth-curve modelling also showed that concentrated disadvantage was predictive of initial homicide levels, yet unlike social disorganization and immigrant concentration, it did not predict change over time. Also, the effect of concentrated disadvantage was significantly and substantially reduced after controlling for social ties and disorder.

Tcherni, 2011	3075 US counties from 1950 to 2005	Poverty, unemployment, residential mobility	Repeated cross-sectional analysis. OLS and negative binomial regression with factor analysis to decide on control variables. Found that poverty, percent-divorced and percent Black were strong and stable predictors of cross-sectional homicide distribution in both time periods and despite the marked changes in levels for these variables. Results were less consistent for unemployment and residential mobility.
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At first glance, the findings from the studies in Table A8.7 seem more consistent than for other economic variables. All identified studies conclude that there is a positive relationship between poverty and/or deprivation and homicide. However, on closer inspection, these results needed to be treated cautiously for the understanding of homicide *trends*.

One issue is that several of the studies use an index of different measures for their poverty or deprivation variable. For example, MacDonald and Gover (2005) find a significant relationship between changes in concentrated disadvantage and changes on youth-on youth homicide in 159 US cities between 1980 and 1990. However, their measure is an index including the percentage of the black population, the percentage of female-headed households, and the percentage of unemployed as well as the percentage of persons living in poverty, and percentage unemployed. By including ethnic and family-structure variables it is hard to know whether the relationship is being driven by poverty alone or by some other mechanism related to, say, family factors (see Character section.) The Frye and Wilt (2001), Strom and MacDonald (2007) and McCall et al., (2010) studies have similar issues of interpretation.³ Similarly, Loftin et al., (1989) use infant mortality as a proxy for poverty and Baumer and Wolff's (2014) measure of poverty is a combination of GDP per capita and the infant mortality rate. As Daly (2017) pointed out, it is not clear that poverty would be the only factor driving high infant mortality rates and there is also a potential circularity given that infanticide may be one cause of high infant mortality rates.

The other major point about the studies in Table A8.7 is that although they all use temporal data, many are really capturing cross-sectional effects. For example, Baller et al. (2001), Tcherni (2011) and McCall et al (2010) use data spanning several decades but their analyses are essentially based on repeated cross-sectional analysis seeing whether the cross-sectional relationship changes over time. Both find that the relationship between poverty/deprivation and homicide is very robust. The most poverty-affected areas consistently have the highest rates of homicide, regardless of time

³ Although using an index of measures makes it difficult to discern the exact mechanism at work, there are still good methodological reasons for using one. When the variables within an index are all highly correlated, including them separately can result in variable results. See the discussion on the 'partialling out fallacy' in Land et al., 1990.

period. However, these analyses do not test whether sharp *changes* in homicide are driven by changes in poverty.

Several of the studies employ a growth-curve modelling approach (Kubrin and Herting, 2003; Stults 2010; Stults 2012). The typical method is to see whether structural conditions (including poverty/deprivation) predict both initial levels and subsequent changes in homicide. In all these studies, a positive relationship was detected for the initial level, which is essentially a cross-sectional analysis. The results for temporal changes are far more equivocal. Kubrin and Herting found that initial levels of deprivation predicted initial levels of homicide and that these areas tended to have bigger swings up and down, but deprivation did not predict the timing of these swings except in relation to felony (mostly robbery/burglary) homicides. Similarly, Stults' (2010; 2012) studies grouped Chicago neighbourhoods into those that showed high, medium or low homicide trajectories. Findings revealed that an initially high level of concentrated disadvantage and increases in disadvantage were strong predictors of 'high-homicide trajectory' areas. But this is not a test of whether increases in disadvantage and increases in homicide were contemporaneous. And when Stults employed an alternative approach using hierarchical growth-curve modelling concentrated disadvantage predicted initial homicide levels but not changes over time.

Overall then, the evidence supports a strong cross-sectional relationship between poverty/deprivation and homicide levels. The most deprived areas generally have the highest homicide rates, and when homicide rates shift up or down these areas will generally experience the biggest swings. But poverty/deprivation does not seem that helpful in predicting exactly when those big shifts in homicide may occur.

Inequality

Like many of the other economic variables in this section, inequality has been the subject of many studies examining its relationship with homicide. Originally, the theoretical underpinning for this proposal came mainly from Merton's concept of 'strain' and other related theories (Merton, 1938). The strain approach proposes that criminal behaviour arises primarily from the "disjuncture between goals and the legitimate means of attaining those goals" (Savage, 2009). Arguably, inequality is a reasonably direct measure of the gap between a goal and its attainability. That is, the greater the distance between the richest and the poorest in society, the more likely it is that goals will be thwarted.

More recently, scholars have added an evolutionary element to the possible link between homicide and inequality. Daly (2017), for example, argues that violence should not be considered 'pathological' behaviour as it is a perfectly rational response to individuals faced with a markedly inequitable distribution of resources. He produces data showing that when resources are unequal so are numbers of offspring. Those with the most resources bear the most children, meaning that competing violently for those limited resources is a perfectly rational evolutionary strategy.

The studies that met our criteria and examined the relationship between inequality and homicide trends are shown in Table A8.8.

Table A8.8: Short-listed studies examining the relationship between homicide and inequality

Study	Area and time period	Economic variable	Method and finding
Baumer and Wolff, 2014	86 countries 1989 to 2008	Inequality (gini coefficient), poverty	Two-level hierarchical linear models using overall and age-specific homicide rates. Found no significant relationship with inequality.
Chamlin, 1989	109 US cities in 1970 and 1980	Inequality, poverty, residential mobility	Linear regression using residual-change scores. Found that poverty was negatively related to homicide cross-sectionally but that changes in poverty had no significant effect. Inequality was non-significant cross-sectionally but had a significant positive relationship temporally. Residential mobility was non-significant for both.
Daly et al., 2001	10 Canadian provinces and 50 US states between 1981 and 1996	Inequality	Correlation analysis and fixed effects models. Found that the relationship between inequality and homicide held even when inequality was positively related to median income (as in Canada) rather than negatively related (as in America) and that inequality provided a potential explanation for the difference in homicide rates between the US and Canada as Canada as a whole was far less unequal. Results over time were more equivocal. There was no significant relationship between temporal trends in inequality and homicide at the national level in Canada although inequality was a significant predictor at the provincial level.

Enamorado et al., 2016	Mexican municipalities (2,372) from 1990 to 2010	Inequality (gini coefficient)	Instrumental variable approach. Found a significant relationship between inequality and drug-related homicides between 2005 and 2010, and a much smaller effect of inequality on general homicides prior to 2005. Concluded that drug wars amplify the effect of inequality by both providing displays of ample wealth (achieved via violent criminality) and by lowering the costs of entry into that criminal world.
Fajnzyber et al., 2002	45 nations (including the UK) from 1970 to 1994	Income inequality, GDP growth rate, economic development (per capita GDP, educational attainment)	Panel-based general method of moments models including several controls including for illicit drug activity. Found a significant positive relationship between inequality and homicide and a significant negative relationship between GDP growth and homicide but no effect for the economic development measures.
Jacobs and Richardson, 2008	14 developed nations (including the UK) from 1975 to 1995	Unemployment, GDP and inequality	Fixed effects panel models using moving averages to capture long-term cumulative relationships. They found positive significant relationships between homicide rates and unemployment, inequality and GDP.
Lafree et al., 2015	55 nations from 1950 to 2010	Modernisation, income inequality	Fixed effects regression. Concludes that while there has been some convergence in downward trends since 1990, support for the modernization (or civilising process) hypothesis was marginal given the variety of trends across nations. But there was even less support for conflict theories based on income inequality.
Leyland and Dundas, 2010	Scotland, 1980 to 2005	Inequality	Assessment of inequality within homicide rates across social groups using rate ratios and the slope index of inequality. Found that as homicide increased in Scotland the homicides became more concentrated in those from deprived areas and lower socio-economic backgrounds.

McCall et al., 2011	157 US cities from 1976 to 2005	Resource deprivation, concentrated poverty and income inequality	Latent trajectory analysis. Divided cities into four groups based on homicide trajectory and found that cities with the highest homicide rates also experienced the biggest shifts up and down in homicide levels over the study period. Economic factors, notably higher levels of resource deprivation, concentrated poverty and higher income inequality predicted membership of this group.
McCall and Brauer, 2014	29 European countries (including the UK) from 1994 to 2010.	Social welfare support, GDP, inequality, inflation.	Multi-level model testing both within- and between-nation effects. Found a significant negative relationship between social welfare support and homicide with a 1-3 year lag. Found no relationship with GDP, inflation or inequality.
Neumayer, 2003	117 nations (including the UK) from 1980 to 1997	Economic growth, income level, inequality.	Fixed effects models with random effects models used as sensitivity analysis. Found a negative significant relationship between homicide and economic growth and income level but no effect for inequality or welfare policies.
Savage, 2009	Washington DC from 1960 to 1996	Inequality	Multivariate time series analysis using first-differenced variables. Found inequality and homicide were not temporally related in the standard model. However, further analysis suggested this may be due to the fact that the secular trend in inequality (increasing over time) was being controlled out. Leaving out the linear time trend (and hence not controlling for the secular trend in inequality) suggests a positive significant relationship between homicide and inequality that they concluded cannot be explained by possible missing variables.

As the focus of this review is trends, Table A8.8 includes only studies that have examined the relationship longitudinally.

There is a large body of literature examining the cross-sectional relationship between inequality and homicides. Summarising the cross-national studies testing the static relationship, Savage (2009) says that it is “dominated by

studies reporting a strong, positive link". Nations with higher levels inequality had consistently higher rates of homicide. A meta-analysis by Hsieh and Pugh (1993) reached a similar conclusion using both national-level studies and those employing data at a lower level of geography. Certain studies from our short-list also perform essentially cross-sectional analysis. For example, Fowles and Merva (1996) used a pooled time series design, which looks at change across areas more than change *within* areas. They also found positive significant relationships between homicide and inequality. Even so, there is not a complete consensus about the existence of a positive, cross-sectional relationship between inequality and homicide. Pridemore (2011) challenges the notion, claiming that the important variable is absolute poverty and that inequality often becomes insignificant when poverty is included as a control. These claims have since been countered by Daly (2017).

Either way, we have seen with other economic variables that the presence of a strong cross-sectional relationship does not always imply a similarly strong temporal relationship. A somewhat similar pattern is revealed here. While a number of studies in Table A8.8 do find a positive temporal relationship, a number of others do not. For example, Fajnzylber et al., (2002) found a temporal effect for inequality using a quasi-experimental design and data for 45 nations including the UK. Jacobs and Richardson (2008) obtained a similar result using a smaller panel of nations. However, Neumayer (2003) found no relationship in his study of 117 nations (also including the UK), and neither did Lafree et al (2015) or Baumer and Wolff (2014) in their cross-national examinations of homicide predictors.

Purely US-based studies have only slightly more homogeneous conclusions. Chamlin (1989) found a positive temporal relationship at the US city level (though not a cross-sectional relationship) and McCall et al. (2011) found that high levels of inequality predicted a high homicide trajectory in their city-level analysis. But Savage (2009) initially find no relationship in her study of Washington DC from 1960 to 1996, although follow-up analysis suggested this may be due to the fact that the secular trend in inequality (increasing over time) was being controlled out. Adjusting for that suggested a possible positive relationship. Daly et al., (2001) also obtained equivocal results for Canada, finding no temporal relationship at the national level but one at the provincial level.

Overall, we are left with the conclusion that inequality is a strong predictor cross-sectionally but has a somewhat variable relationship temporally. As Daly (2017) pointed out, if inequality was the primary driver of homicide trends, how could it be possible that the sustained declines in homicide from 1991 in the US and from 2002/03 in England and Wales could occur during a period of increasing inequality? This is certainly hard to explain, but two of the short-listed studies offered a potential path out of the dilemma.

First, Daly (2017) suggested that the reason for the diverging results may be due to the fact that the expected temporal relationship would occur with a lag. He cited a study (Zheng, 2012) showing that inequality affected mortality rates with a lag of about seven years, and suggested that the effect on homicide

may work in a similar manner given longitudinal evidence showing that the environment experienced during upbringing can affect later offending (Daly, 2017)

Second, a study by Enamorado et al. (2016) suggests another possibility. They found a strong relationship between inequality and homicide during the period of the drug war in Mexico from 2005 to 2010. They concluded that drug wars amplify the effect of inequality by both providing displays of ample wealth that might be achieved via violent criminality, and by lowering the costs of entry into that criminal world. But the relationship between homicide and inequality in Mexico was not simple during that period. Inequality actually fell at the national level as homicide rose from 2006. It also fell in the drug-trafficking areas in which homicide was most prominent. The authors argued that this was due to reverse causality – richer people fled the areas afflicted with the worst violence. It was only once they'd controlled for reverse causality that the relationship emerged.

In other words, it seems possible that local inequality is important in that it defines the areas most likely to be affected by the sudden scrambles for resources that drug markets provide. And it is therefore this interaction that drives very sharp swings in homicide rather than the more gradual movement of macro-level inequality over time.

Other economic effects

Petras and Davenport (1991) used simple graphical analysis to examine the relationship between homicide and declining manufacturing employment in five US cities. They found correlation between rising homicide and declining manufacturing employment and that the magnitude of the correlation depended on whether the fall in manufacturing employment was steady or volatile.

Ousey (2000) expanded the analysis to 121 US cities between 1970 and 1990 and found slightly different results depending on ethnicity. A decline in manufacturing employment was significantly related with decreases in economic growth and increased numbers of female-headed households for Black people, and these factors in turn raised juvenile homicide rates. For White people, the economic transition had a direct relationship on homicide.

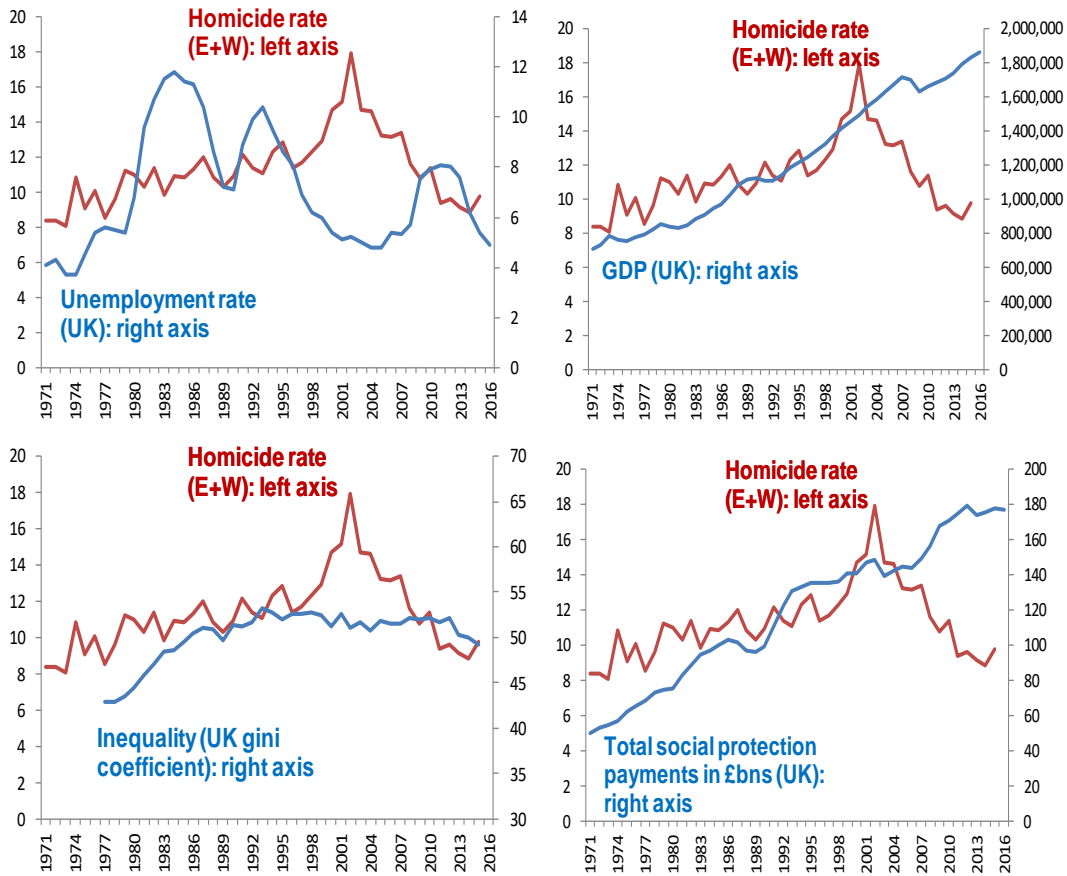
Dolliver (2015) tested Messner and Rosenfeld's Institutional Anomie Theory (IAT), which posits that a culture prizing individual success coupled with an institutional framework dominated by economic rather than social institutions results in higher crime rates. Using panel data model with fixed effects, Dolliver found little support for the notion that stronger economic institutions drive up homicide, instead homicide rates were lower when economic institutions were stronger. However, the study noted variation by type of nation: results for developed nations were more in line with IAT theory than for transitioning nations.

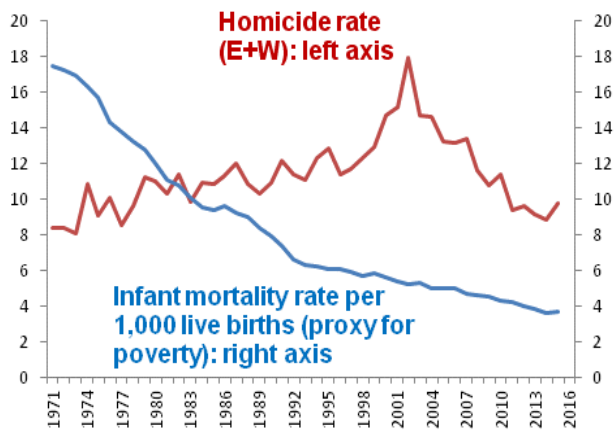
England and Wales economic evidence

This brief section summarises evidence from papers that did not meet our selection criteria, but which contained useful information on economic trends and homicide in England and Wales. It also displays available data on these trends, see Figure A8.1.

Figure A8.1 shows a panel of charts, plotting homicide against England and Wales data for each of the potential economic drivers explored above: unemployment, welfare payments, GDP, poverty (proxied, as in many of the above studies by infant mortality) and inequality.

Figure A8.1: Panel of charts showing economic conditions and homicide trends in England and Wales



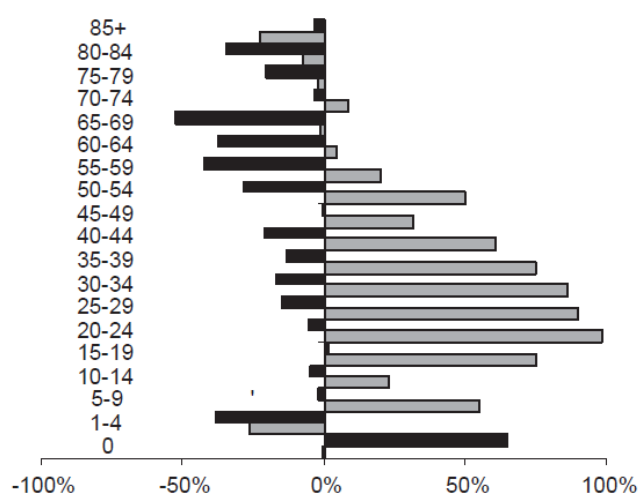


At first glance, none of the economic indicators shown in Figure A8.1 appears to have a particularly strong direct relationship with homicide. Homicide did not noticeably increase in line with any of the three large rises in unemployment seen over the last 40 years. There is also no obvious pattern of higher homicide in recessions (see GDP chart). Homicide did rise with inequality through the 1980s and 1990s but it is hard to reconcile the substantial fall in homicide from 2002 with an inequality trend that remained at a very high level historically through that period. Similarly, the trends in welfare provision and infant mortality (a commonly used proxy for poverty) offer no immediate support for the suggestion that intervention in these areas would significantly affect homicide trends.

However, it's important to point out that the aim of this section is not to provide a full evaluation of the extent to which economic factors may have driven homicide trends in England and Wales. Figure A8.1 merely gives an idea of an association, not a causation. But the evidence and data are hopefully useful in helping to establish which hypotheses are worthy of further investigation.

Several papers have drawn links between economic and homicide trends in England and Wales. For example, Shaw et al (2005) and Dorling (2006) found that while homicide rates increased from 1981 to 2000, the increase was not uniform across groups. They showed that the increase was focused along both age/gender and socio-economic lines. As Figure A8.2 shows, most female age groups actually saw their homicide rates decline over that period. The rise was driven, as it was in the US, by homicide victimisation of young men.

Figure A8.2: Change in homicide rate in Britain from 1981-85 to 1996-2000. (Light grey bars are for men and dark grey for women).



Similarly, the researchers found that some socio-economic groups saw a fall in homicide rates through the 1980s and 90s. The homicide increase was driven by victimisation rates in the poorest areas. To show this, Shaw et al (2005) produced the table below of standardized mortality ratios (SMRs) using an index to divide areas into deciles by their level of poverty. The ratio shows actual homicide rates compared with expected homicide rates given the age-gender of the population. Thus, a value of 100 would mean that the area had the homicide rate that would be expected based on age and gender.

Table: A8.9: Standardized mortality ratios by area in Britain

Breadline Britain poverty decile	1981-1985	1986-1990	1991-1995	1996-2000	Change in SMR 1981-1985 to 1996-2000	% Change in SMR 1981-1985 to 1996-2000
1-least poor	54	59	55	50	-4	-7.4
2	67	65	67	60	-7	-10.4
3	62	69	68	66	+4	+6.5
4	74	85	72	81	+7	+9.5
5	79	77	83	88	+9	+11.4
6	95	95	95	103	+8	+8.4
7	112	122	125	130	+18	+16.1
8	119	130	148	147	+28	+23.5
9	151	166	191	185	+34	+22.5
10-poorest	243	261	271	282	+39	+16.0
Ratio 10:1	4.50	4.42	4.89	5.68		

Note: Expected values are based on 1981-1985 national rates.

Table A8.9 shows that in the least poor decile of areas, for every 100 homicide victims expected under SMRs, 54 were actually killed and that this number fell to 50 in 1996-2000. In the poorest decile, for every 100 expected victims in 1981-1985, 243 were actually killed, rising to 282 by 1996-2000. The results are also striking in that they show an almost perfectly positive monotonic relationship between poverty and homicide in every time period. Shaw and colleagues (2005) noted that these results were in line with other evidence (including that reviewed above) showing a strong spatial, cross-sectional relationship between homicide and economic factors. However,

noting that overall poverty and inequality increased markedly between 1980 and 2000, they also suggested that there was likely to be a temporal relationship too, concluding that: “*the results of this analysis are suggestive of a link between poverty and inequality in society and the rate at which people kill their fellow citizens.*” (Shaw et al., 2005). Leyland and Dundas’ (2010) study obtained very similar results using Scottish data from 1980 through to the early 2000s and showed that as rates of homicides increased in Scotland, this rise was underpinned by increases concentrated among those from deprived areas and lower socio-economic backgrounds.

Kingston and Webster (2015) also made a similar argument, suggesting that increases in poverty and inequality, coupled with long-term unemployment in the most important demographic - young men – drove homicide increases through the 1980s and 1990. However, they acknowledge that a simple inspection of time series data throws up a number of problems with this approach. Firstly, homicide began to rise in the early 1960s, long before the era of high unemployment in the late 1970s and 1980s. Secondly, the abrupt homicide turning point does not seem to correlate in any obvious way with any of our economic measures (see Figure A8.1). Finally, the 2008 recession and the resulting sudden rises in unemployment seemed to have no immediate effect on homicide trends. Kingston and Webster (2015) attempted to explain this last point by contrasting the early part of the 2008 recession with conditions from around 2013/14 on. They argued that economic conditions for the groups affected by homicide were reasonably benign through the early part of the recession. Unemployment rose but not as much as in previous recessions, and increased welfare payments meant bottom decile incomes held up and inequality actually decreased as middle/high income groups saw a greater relative impact. However, from around 2013/14 they argued that the situation changed, the overall welfare package levelled off (see Figure A8.1) and certain benefits, like unemployment benefit, became more means-tested with overall pay-outs dropping sharply.

Given the reasonable evidence of a link between welfare payments and homicide rates revealed by the results of the full literature review, above, it therefore seems possible that some of the increase in homicide seen since 2014 could be connected to changes in welfare.⁴ However, given the trends in Figure A8.1, it is hard to make the case for welfare payments as a long-term driver. In particular, the sharp homicide turning point in the early 2000s does not seem obviously linked to any noticeable change in the welfare regime, or indeed to any other economic factor.

Overall then, the evidence from this section suggests similar results for England and Wales. There is a strong, robust link between economic factors like poverty and deprivation at the spatial level. The poorest areas consistently have the highest homicide rates and also see the biggest swings in homicide rates over time. However, the evidence on the impact of macro-

⁴ There have been a number of changes to the welfare system in England and Wales since 2010, which make consistent measurement of trends difficult. See Institute of Fiscal Studies briefing papers for more details on this – for example: <https://www.ifs.org.uk/uploads/BN270-The-distributional-impact-of-personal-tax-and-benefit-reforms-v2.pdf>

level economic factors is weaker and it does not help us to predict when the next swing will take place.

Conclusion on links between economic factors and homicide

This section has produced two clear conclusions. Internationally and for England and Wales, there is a strong and consistent spatial correlation between economic factors and crime. Put simply – the most economically distressed areas have the highest homicide rates, and the biggest swings in homicide rates. They suffer the sharpest increases and benefit from the sharpest decreases. But, the temporal relationship between economic factors and crime is far weaker, with inconsistent evidence to the effect that one exists at all. In other words, macro-level economic factors do not seem to be a particularly good guide in determining *when* homicide rates will turn upwards or downwards, they are only a good guide of determining *where* it will happen. What should we conclude from this regarding economic factors as a driver of homicide? Firstly, it should be noted that there is a lively academic debate about the methodological implications of these findings. It is beyond the scope of this review to outline this in full but Phillips (2006) provides a useful summary. Phillips argues that temporal-change models better capture flow or temporary effects, while cross-sectional studies better capture stock or permanent effects. Others, however dispute this and argue that the inconsistent results simply indicate that an important variable is missing from the models. As discussed throughout this review, the lack of good data series on drug markets and organised crime may therefore be a factor. Given this debate, and wider evidence on possible relationships between economic factors and crime, we tentatively suggest that there are at least four (not mutually exclusive) ways of explaining the results, alongside the explanation proposed by Phillips:

- 1) There is no strong relationship between economic factors and crime, the strong cross-sectional results would disappear if a full set of control variables (including drug markets, organised crime and perhaps some societal 'character' measures like self-control etc) were included.
- 2) There is a relationship between economic factors and crime, but it is lagged in such a way that makes temporal results hard to detect. One possibility here is that suffering economic deprivation during childhood is what matters. Some studies find that it predicts later offending and an important study by Bellis *et al.* (2011) showed that hospital admissions for violence are not only focused in individuals from the most deprived areas but that this is strongest at ages 0-10, suggesting that individuals from poorer neighbourhoods suffer far greater exposure to violence at young ages, which may at least partially condition them to greater violence victimisation and perpetration during adolescence and adulthood.
- 3) The most deprived areas consistently attract the individuals most likely to be involved with homicide. Or conversely, those less likely to be involved with homicide consistently move away from the most deprived areas.

- 4) Economic factors *interact* in some way with other factors to drive homicide trends. For example, if burgeoning drug markets are an important driver of changes in homicide trend, it may be that poorer areas suffer the brunt because that is where those most susceptible to the drugs trade reside.

There may well be other possible explanations and given the current evidence we can offer no strong conclusions about which might be correct. But this does seem a particularly important question for future research to attempt to resolve.

iii) Television/Media as drivers of homicide

Many have suggested that television, and the exposure to on-screen violence it brought, could have changed people's propensity for violence and hence affected homicide rates. This hypothesis is rooted in the Social Learning Theory proposed by Bandura in 1973. Bandura tested levels of aggression in children and found that television violence distorts expected outcomes of the 'real world' violence. This process is underpinned by a mechanism of sanitisation of the aggressive act itself (e.g. perceived to be heroic) and injuries sustained by the victim (e.g. non-life threatening). This distortion coupled with desensitisation resulting from repeated exposure to on-screen violence can lead to elevated levels of aggression and violence. However, our knowledge of social learning processes has never been tested for extreme violence such as homicide, due to methodological and ethical issues. Nonetheless, Bandura's theory provides a useful theoretical framework for the understanding of potential mechanisms linking exposure to media violence and the real-world violence.

However, this systematic review looks only at studies that attempted to assess a link with homicide trends. Studies that looked at links between media/television and violence more generally were excluded if the effect on homicide specifically was not tested. As such, only five studies were located (see Table A8.10) and the discussion that follows is limited to them, rather than being a full assessment of the evidence base on links between media/television and violence more generally.

Table A8.10: Studies examining the relationship between television and homicide

Study	Area and time period	Independent variable	Method and finding
Phillips (1983)	US, 1973 to 1978	Television violence (proxied by prize fights)	Regression of daily homicides with day and month controls. Finds a significant increase in homicides three days after prize fights.
Baron and Reiss (1985)	US, 1973 to 1978	Television violence (proxied by prize fights)	Re-examined data and results of Phillips (1983). Concluded that the spike in homicides three days after prize fights could be explained by the relationship between the typical timing of important boxing matches relative to peak mortality times.
Centerwall (1993)	US, Canada and South Africa, 1950 to 1980s	Televisions per capita (as a proxy for the impact of TV violence on general propensity for violence).	Before and after comparison of homicide rates with variation across nations. Concluded that the introduction of television was a major driver of the increase in homicide, though it was delayed. It took effect as the children brought up on violent programmes grew up.
Jensen (2001)	US, Canada and South Africa, 1945-92	Televisions per capita (as a proxy for the impact of TV violence on general propensity for violence).	Time series regression with control. Correlation between homicide and the spread of televisions was non-significant when controlled for other factors. Concluded that alcohol and family breakdown were more important in explaining post-war homicide increases.
Perry (2007)	US, 1960 to 2000	Proportion of households with a television.	Age-period-cohort characteristic model with controls. Found a significant effect for television penetration that weakened with age. Concluded that either the spread of televisions coincided with the true cause(s) of rising homicide rates or exposure to television genuinely made people more homicidal.

The studies vary both in the strength of their methodology and in the effect tested. Phillips (1983) and Baron and Reiss (1985) tested immediate effects of televisual violence, while the other studies tested long-term effects. The results were mixed and equivocal due to methodological issues such as no controls for other homicide-related factors (e.g. economy, youth population size, prison population, etc.). It also should be noted that the identified articles studied the time periods between 1945 and 2000. This relatively large time lag

combined with rapid socio-cultural changes of the 20th and 21st century mean that those findings cannot be easily extrapolated to the current socio-cultural context.

In his study of the US homicide rates between 1973 and 1978, Phillips (1983) found that homicides tended to peak three days after heavily publicised boxing matches, even when the effects of different days of the week and months were controlled for. However, Baron and Reiss (1985) re-analysed the same dataset and concluded that the results obtained by Phillips (1983) could be explained by the relationship between the typical timing of boxing matches (late evenings and nights) relative to peak mortality times.

Centerwall (1993) argued that exposure to television violence has long-term effects on human psychology and as such the correlation between media violence and crime rates should be studied on a generation-to-generation level. He compared trends in television adoption and homicide rates in three countries: the US, Canada and South Africa between 1950 to 1980s. He found that homicides tended to rise a generation after the spread of television. He argued that children brought up with television were more prone to violence and that this was a major factor in the homicide rise. He found this was particularly true for the US, explaining around half violent crime. However, when Jensen (2001) re-analysed the same data, but controlled for divorce rates and alcohol use, the correlation between homicide and the spread of televisions was reduced to non-significance. Jensen also noted that after 1992 homicide fell markedly in the US and Canada, yet television violence remained unchanged.

Perry (2007) agreed with Jensen (2001) that television could not explain the homicide fall given that television violence continued as homicides fell particularly in the 90s. However, he found that increased television exposure 15 years earlier correlated with greater arrests rates when controlling for age and birth rates. Perry suggested that this could occur if television caused a gradual desensitisation to violence across all age groups. He also acknowledged that another possibility was that the spread of televisions had coincided with the true causes of rising homicide rates that were not explored in his study.

While no UK studies matched our selection criteria, the spread of television in Britain occurred mainly between 1949 and 1961 when the percentage of households with black-and-white sets increased from 1% to 75% (Bowden and Offer, 1994). The US achieved 75% penetration 6 years earlier, which would partially fit with its earlier peak in homicide. But as in the US, there has not been any reduction in television violence in England and Wales that might explain the recent decline in homicide up to 2016.

Overall then, while there is good evidence from the social learning theory that viewing violence (including media violence) can increase aggression and lead to violence, the link between media exposure and homicide is weak. Phillips (1983) and Centerwall (1993) both concluded that media had a significant impact on homicide rates. However, when their analyses was re-examined with a use of controls such as alcohol consumption (Baron and Reiss, 1985;

Jensen, 2001), this correlation was reduced to non-significance. The remaining study (Perry, 2007) found that while television exposure to television seemed to have an effect on homicide rates, the spread of televisions may have coincided with the true cause(s) of rising homicide rates.

iv) Immigration as a driver of homicide

There are many criminological theories that conceptualise a link between immigration and homicide. Merton's (1938) strain theory suggests that opportunity structures are poor for immigrants (e.g. lack of social networks), leading to unemployment and inability to obtain desired outcomes in legitimate way. From the perspective of the subculture theory (Cohen, 1955), immigrants may develop a different, conflicting set of values to those dominant in wider society. Those values may stand against the rule of law meaning that immigrants commit more crime, including homicides. Social bonds to family, friends, work and more generally conventional society prevent individuals from developing a motivation for committing crimes, but also limits the amount of unstructured time and opportunities to engage in illegal activities (social control theory; Hirschi, 1969). New immigrants may be unemployed and away from their family and friends, which (according to the theory) makes them more likely to commit crime. However, the most frequently cited theory in this context is social disorganisation theory (Shaw & McKay, 1942), which suggests that new immigrants are more likely to live in socially disorganised areas (areas with high levels of poverty, unemployment, high ethnic heterogeneity and population turnover) that are conducive to crime. It should be noted that this theory does not attribute criminogenicity to immigrant groups per se, but to disorganised neighbourhoods.

While most theories predict that increased immigration can increase homicide, Lee, Martinez and Rosenfeld (2001) argue that immigrants have strong ties to family and local labour markets that offset the effects proposed by the other theorists. Several of the short-listed studies below also suggest ways in which immigration might have a negative relationship to homicide, acting to reduce it rather than increase it

Latzer (2016) takes a different perspective from the other theorists. Rather than viewing immigration as a good or bad thing per se, he argues that what matters are the people involved. He argues that "*...the crime impact of immigrants is contingent on an entering group's crime rates relative to crime rates at the destination point.*" In this formulation, immigration, or indeed migration, from a high-homicide area to a low-homicide area will likely raise homicide rates and vice versa.

The short-listed studies examining these different theories are listed below:

Table A8.11: Studies examining the relationship between immigration and homicide

Study	Area and time period	Variable	Method and findings
Andresen (2013)	Canadian provinces 1986 – 2005	Migration variables used include young male immigrants, interprovincial and international migration.	Fixed effects panel specification. No direct evidence of immigrant populations causing increases in homicide. Both international and inter-provincial immigration led to decreases. But found that the net increases in young males generally leads to increases in homicides.
Baumer & Wolff, 2014	86 nations, 1989 – 2008	Used change in the percentage of foreign-born during the previous 5 years to measure immigration.	Mixed-model regression. They found no significant effect for immigration generally though there was a significant interaction between immigration and the informal economy.
Chavez and Griffiths (2009)	Chicago 1970 - 1995	Foreign born residents and recent immigrants.	To establish homicide development trajectories over time the authors used a customised SAS procedure called TRAJ followed by one-way ANOVAs to test a link with immigration. They found that growth in foreign-born populations across all neighbourhoods was unrelated to violence.
Latzer, 2016	US, 1945 to present	N/A	Historical analysis of trends in violence, including homicide, using descriptive statistics. Finds strong cultural persistence in homicide rates, meaning that immigration from higher-rate homicide cultures like Jamaica and Mexico increased US homicide rates while immigration from lower-rate homicide nations like China and Japan decreased rates. Makes the same case for migration patterns from the higher-rate US South to the US north.
Martinez, Iwama and Stowell (2015)	1980 – 2000 Miami and San Diego	Levels of immigration	Descriptive statistics - homicide rate trends by ethnic background of victims compared with trends in immigration. Suggest that immigration can decrease homicide rates in the long-term through revitalising inner-city areas.
Martinez, Stowell and Lee (2010)	San Diego 1980 - 2000	Immigration, economic disadvantage index, neighbourhood stability index.	Multivariate regression with fixed effects. Found that increases in immigration over time led to fewer homicides.
Nielsen and Martinez (2009)	Miami 1985 - 1995	Immigrant concentration at community level and ethnicity-specific disadvantage.	Negative binomial regression with spatial lags for racial/ethnic specific measures of homicide. More immigration means less black and Latino homicide but has no impact on suicide levels. Also found that greater group-specific disadvantage is related to more Latino and black homicides.

Ousey and Kubrin (2014)	1980 – 2010 156 large US cities	Immigration Index (percent foreign born and percent Latino).	Fixed effects negative binomial and two-stage least squares instrumental variable regression models. Findings suggest that temporal increase in immigration is associated with a decrease in overall homicide and drug homicides.
Stowell and Martinez (2009)	Miami 1997 – 2003	Indicators on immigration based on nativity and national origin (Cuba, Honduras, Nicaragua and Haiti).	Two regression models to compare their predictive power based on inclusion of social disadvantage proxies. Findings suggest that Latino immigrant groups in Miami have a stronger negative association with homicide levels than non-Latinos. This is despite relatively high levels of structural disadvantage in the neighbourhoods in which they settle.
Velez (2009)	Chicago 1993 – 1995	Recent immigrant concentration (foreign-born residents arrived within the last 5 years).	Negative binomial regression. Findings suggest recent immigrants help to reduce homicide levels but only in disadvantaged neighbourhoods. Recent immigration raised homicide rates in more affluent neighbourhoods.
Wadsworth (2010)	1990 – 2000 USA (city level)	Foreign-born proportion of the population and immigrants arrived in the last 5 years.	Ordinary Least Squares Regression to establish cross-sectional; relationship between homicide and immigration. Pooled cross-sectional time series models to assess temporal changes. Results suggest cities with largest increases in immigration between 1990 and 2000 experienced the largest decreases in homicide and robbery during that time. OLS model – results indicate immigration is associated with higher levels of homicide and robbery.

Almost all studies that met the inclusion criteria for this section utilised quasi-experimental analytical procedures that allow for an assessment of the impact of *changes* in immigration on homicide rates, thus testing temporal rather than simply cross-sectional effects. The only exceptions were Latzer’s (2016) historical analysis and the study by Martinez et al. (2015), in which they used purely descriptive statistics to examine trends in the proportion of immigration and homicide in Miami and San Diego.

The independent variables used were very similar, if not the same, in the studies. This is perhaps not surprising as immigration is relatively straightforward to measure. This was done using latest available census data of foreign-born residents and ‘new immigrants’, who migrated within the last 5 years.

The short-listed research was very US-centric and mainly largely focused on just a few US cities. Miami, Chicago and San Diego were most frequently chosen and for a good reason – all those cities have high levels of immigrants. Other studies looked at urban areas in the US more broadly

(Wadsworth, 2015; Ousey and Kubrin, 2014) and only two identified studies looked outside of the US. Baumer and Wolff (2014) used a panel of multiple nations and Andresen (2013) examined Canada. Therefore, findings from these studies cannot be simply extrapolated to the UK or Europe without a good degree of caution.

Contrary to most of the criminological theories described above, most empirical studies found either no association between an increase in immigration and homicide rates (Baumer and Wolff, 2014; Chavez & Griffiths, 2009) or a negative relationship between those two variables meaning that high immigration can in fact decrease local homicide rates (Andresen, 2013; Martinez, et al. 2015; Martinez, et al., 2010, Nielsen & Martinez 2009; Ousey & Kubrin, 2014; Stowell & Martinez, 2009; Wadsworth, 2009).

Importantly, these findings were limited to models within the studies that looked at changes over time and used a quasi-experimental design. As Stowell and Martinez (2009) suggest, immigrants often settle in relatively disadvantaged and more crime-affected areas, which may create a false impression that immigration is responsible for high crime rates if this endogeneity is not controlled for. This analytical issue is demonstrated well by Wadsworth's (2010) study of urban areas in the US. His initial ordinary least square analysis of 459 US cities found that immigration was positively and significantly associated with both homicide and robbery. However, when he employed a time-series analytical approach, he found that cities with the largest increases in immigration between 1990 and 2000 experienced the largest decreases in both homicide and robbery. He concluded that increased immigration was responsible for part of the crime drop in the 1990s, though he made no attempt to quantify exactly how much.

Similar results were obtained in other studies. For example, Martinez et al. (2015) point out that immigration into the US is near an all-time high, as is the case with European countries (e.g. Belgium, Italy, Sweden), yet homicide is decreasing. This point was made in 2015 before we saw an increase in serious violence in many developed countries (see International Trends annex), but the logic remains sound.

In a study of Canadian provinces, Andresen (2013) found that the net change in the most criminogenic subpopulation of young males and the population more generally can be a real driver of homicide rates, rather than immigration per se. Social and economic deprivation is another factor that needs to be accounted for. Martinez et al. (2010) measured local economic disadvantage with an index consisting of percent of the population living in poverty, percent of families receiving public assistance, and percent of families with children younger than age 18 that are headed by female. The index was used as an independent variable alongside immigration. They concluded that disorganization was associated with increased homicide, but that immigration and residential instability did not seem to be central to the disorganization process. When the economic disadvantage index was included as a control immigration had a significant negative effect on homicide.

While Martinez et al. (2015) did not analyse temporal effects of immigration on homicide, which is the main focus of this literature review, their article provides an interesting explanation of how immigration can drive homicide rates down. They suggest that immigration into poor, disadvantaged neighbourhoods can lead to revitalisation by stimulating local economies. Following the breakdown of inner-city communities caused by deindustrialisation in the US in the 1970s and 80s, many immigrants chose to settle in these areas due to their affordability, which, he suggests, ultimately led to the reinvigoration seen in the 1990s and the drop in homicide rates.

This finding was partially echoed by Baumer and Wolff (2014) in their study on homicide trends between the late 1980s and late 2000s, which examined the effect of a range of factors, including immigration on homicides in 86 nations. They found that immigration had no significant effect. However, they did find a small but significant interaction between trends in immigration and levels of the hidden, informal economy (measured using the “difference in annual changes of electric consumption and annual changes in GDP”) with a more thriving informal economy having a crime-reducing effect. They suggested that a thriving informal economy can reduce negative outcomes from immigration by providing economic opportunity.

The only study which partially found that immigration is correlated with increased homicide rates was conducted by Velez (2009) on Chicago data between 1993 and 1995. She found that while immigration was negatively associated with homicide in disadvantaged neighbourhoods, it had a positive effect (i.e. increased) homicide rates in advantaged neighbourhoods. The author suggested that affluent communities are more heterogenous and less open to new-comers, making it more difficult for migrants to form social bonds that can act as social form of control (see social control theory above). However, this study covered a relatively small period of time compared to all other studies, which may limit its robustness.

Latzer (2016) also surveyed studies of immigration and violence (his review was not limited to homicide). He found mixed results. He argued this was because the effect of immigration is likely to vary depending on the type of people moving from place to place. He noted the persistence of cross-cultural differences in rates of homicide and concluded that when people move around they do not simply assume the homicide rate of their surroundings. For example, tracing homicide trends by ethnicity in the US from 1945 onwards, Latzer showed that White victimisation follows a similar trend to Black victimisation – they rose and fell together. But despite the fluctuations, Black rates stayed persistently higher, with rates for Latinos somewhere in the middle. Thus, Latzer argues, as Blacks migrated from the high-homicide South to the lower homicide Northern cities in the US, they changed the homicide situation in those cities. In New York, for example, during the 1940s, the Black population and Black homicide rates both increased by more than 50%. By 1950 Blacks made up 6% of the population but nearly 60% of the homicide victims. Latzer cites similar examples for immigration, like the Marielito immigration from Cuba to Miami around 1980. The Marielitos were escaping poor economic conditions in Cuba but 45% of them were offenders

and 10% serious violence offenders. Within five years of their move to Miami, 128 were arrested for murder and 171 were murder victims.⁵

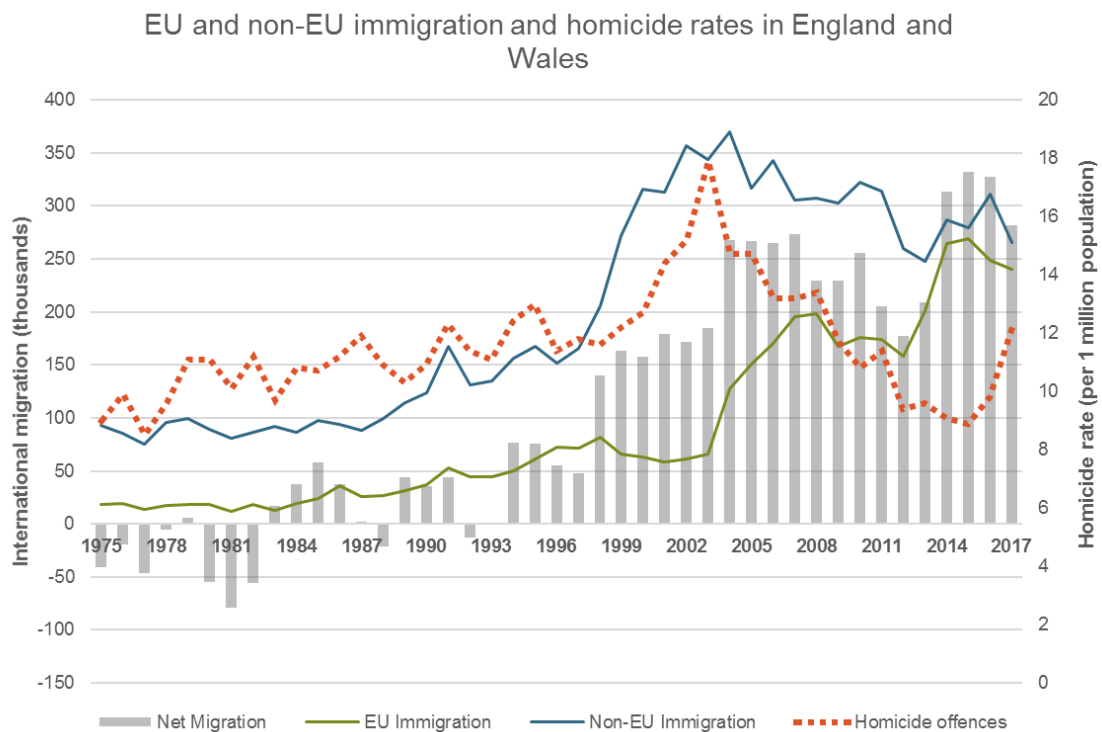
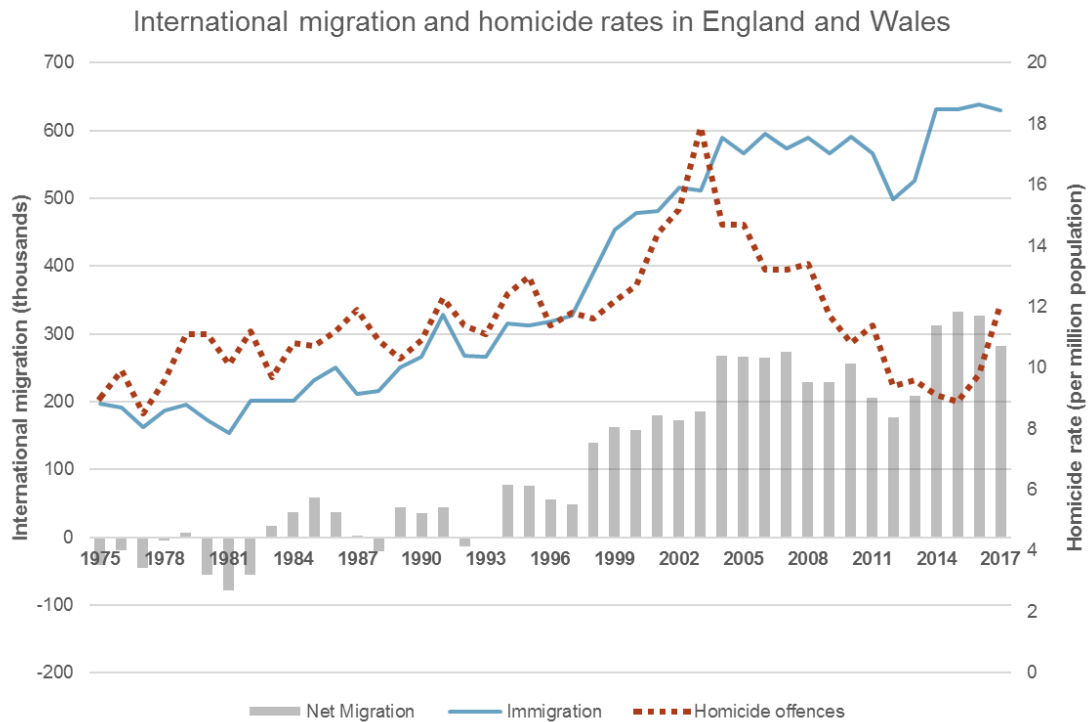
Latzer shows that immigration can work in the opposite way too. He cites the example of Haitians, who also arrived in their thousands in Miami in the early 1980s and, crucially, suffered just as much prejudice and deprivation as the Marielitos, yet did not appear in the city's homicide statistics to anything like the same level. Similarly, he cites immigration of more than 101,000 Chinese and 66,000 Russians, with their relatively low homicide rate, into New York in 1990s as one reason why crime fell so fast in that city in the 1990s (p193). Importantly, Latzer argues that despite the persistence of cross-cultural homicide rates, differences do not have to be permanent. He cites the example of the Irish and Italians in the US who had high homicide rates in the nineteenth century but comparable rates to native whites in the twentieth century. He also argues that something similar is gradually happening with the Black homicide rate in the US.

Latzer's conclusions are supported to some extent by the ethnicity and country of birth analysis in this study. As in the US, there are clearly cross-cultural and cross-ethnic patterns in homicide that persist within cultural groups. Just as in the US, Black and White homicide victimisation has followed similar trends in England and Wales, but their levels have remained sharply different. Patterns of Asian homicide in England and Wales show a much older profile, with relatively fewer homicides occurring between young men. This is similar to the homicide patterns in Asian nations and is in sharp contrast to other ethnic groups.

Given this data, it is hard to dispute Latzer's contention that people, and their propensity for homicide, matter. But note that this does not rule out a positive or negative effect for immigration per se. It could still be the case that the act of moving from one place to another has an effect over and above individual propensity. For England and Wales however, this review did not identify any studies that matched our selection criteria. Therefore, as in other annexes, best-available data and studies were gathered and are summarised below.

⁵ Although mentioned only tangentially by Latzer, the Jamaican posses were likely another example of this phenomenon: a group of individuals with a very high homicide rate transporting that rate with them, see drug annex.

Figure A8.3. Trends of international migration and homicide rates in England and Wales (1975-2017).



The graphs above show trends of international migration and homicide rates and separate volumes for EU and non-EU immigration. The homicide rates seem to be increasing in line with overall immigration until 2003. After then,

homicide rates started decreasing sharply, but started increasing again in 2015. At the same time, total immigration continued to increase reaching record levels in 2016, which suggests that if there was a positive relationship between the two variables, it disappeared after 2003. The homicide rates seem to follow net migration figures more closely than immigration, which may suggest that the homicide rates are associated more with population size rather than immigration per se. When EU and non-EU immigration are separated, the line for non-EU immigration seems to follow similar trend to homicides throughout the time period, while EU immigration resembles the overall immigration trend. This may be a Latzer-like example of different cultural in-flows having different effects on homicide, but further work would be needed to test this more fully.

While we found no UK studies on immigration and homicide, several authors examined the relationship between immigration and crime more generally and these reflected findings from US and Canadian studies described above. For example, Jaitman and Machin (2013) studied the impact of increasing migration in England and Wales from 2001 to 2011. They found no evidence of a causal impact of immigration on crime in their spatial econometric analysis both on national level and when London was analysed separately. These findings are consistent with Bell and Machin (2011) research that examined the effect A8 and Tier 2⁶ visa immigration and found significant negative effects on property crime and no effect on violent crime. All else equal, areas with higher shares of these types of immigrants in the population experienced faster falls in property crime rates than other areas. Ignatans and Roebuck (2018) obtained similar results, with areas containing the highest concentration of first-generation immigrants saw a reduction in crime relative to areas with the second highest concentration. Finally, Papadopoulos' (2011) using econometric analysis of the Offending, Crime & Justice Survey found that after controlling for under-reporting and basic demographics, immigrants reported less criminal activity than non-immigrants, but the estimated difference was statistically insignificant.

SUMMARY

In summary, while many criminological theories suggest that immigration should lead to increases in crime and more specifically homicide, the empirical evidence largely suggests that the opposite is true. Seven out of nine studies which met our inclusion criteria found that immigration was associated with a reduction in local homicide rates. These studies suggested that new immigrants can revitalise struggling inner-city neighbourhoods by providing an economic and population boost. One study found no relationship between the two variables and the last remaining study found that the

⁶ A8 (also known as EU8) are a group of 8 out of 10 countries that joined the European Union in 2004 including Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Slovakia and Slovenia.

Individuals can apply for Tier 2 (general) visa if they have been offered a skilled job the UK and they are outside of the European Economic Area (EEA) and Switzerland.

relationship depends on the affluence of the neighbourhoods and can be either positive or negative.

While no UK studies testing the relationship between immigration and homicide were found, four investigated links between immigration and crime more generally. Again, these papers found either no, or a negative relationship between the variables. The consistency of the research findings from the UK with the studies from the US and Canada suggest that immigration has either no effect on homicide rates or has a potential to decrease them. However, one caveat to this finding is highlighted by the historical work of Latzer (2016). Most of the studies in this review draw their conclusions based on area-level changes in immigration and area-level changes in homicide. Latzer (2016) notes that this may be insufficient to pick up individual-level effects that could operate in either direction. He argues that – all else equal - (im)migration of individuals from high homicide rate areas will likely raise rates, while (im)migration from low homicide areas will likely have the opposite effect.

As such, the relationship between homicide and immigration needs further testing before any firm conclusions are drawn.

v) Mental health as a driver of homicide

According to a mental health charity Mind, in any one year 1 in 4 people will experience a mental health problem⁷. This figure covers a wide range of conditions, including more common diagnoses such as depression and anxiety and less common diagnoses such as bipolar disorder and schizophrenia or psychosis. While schizophrenia, psychosis and some personality disorders have been linked to heightened levels of violence in those affected, there is no evidence that other mental health illnesses have a similar impact (Ponde, et al., 2014). However, those who are suffering from any mental health problems were found to be far more likely than the general population to be the victims of crime, especially violent crime⁸. Therefore, it is important to remember that while this section focuses on the link between mental health and homicides, the vast majority of people affected do not go on to commit violent crimes, let alone homicides.

⁷ <https://www.mind.org.uk/media/998781/Violence-and-mental-health-Mind-factsheet-2014.pdf>

⁸ <http://shawmindfoundation.org/wp-content/uploads/2016/12/Shaw-Mind-Guide-to-Crime-and-Mental-Health.pdf>

Table A8.12. Shortlisted studies on mental health and homicide.

Study	Area and time period	Main explanatory variables tested	Method and finding
Taylor & Gunn, 1999	England and Wales, 1957-1995	Homicides perpetrated by people with a mental illness (Home Office statistics)	Time trends and simple correlation. Found little fluctuation in numbers of people with mental illness committing criminal homicide over the time period.
Large et al., 2008	England and Wales, 1946-2004	Homicide rate and numbers of mental health related homicides (Home Office statistics)	Rank correlation of trends in homicides over time. The rate of total homicide and the rate of homicide committed by those with a mental disorder rose steadily until the mid-1970s. From then there was a reversal in the rate of homicides attributed to mental disorder, which declined to historically low levels, while other homicides continued to rise.
Swinson et al., 2011	England and Wales, 1997-2006	Homicides related to schizophrenia and psychosis (NCI data)	Poisson regression. A significant increase in homicides by those with mental illness from 1997 to 2006, as defined by those with schizophrenia or with symptoms of psychosis at the time of the homicide.

All studies used regression models to examine homicide trends over time however the findings are mixed. Swinson, et al. (2011) found a statistically significant increase in homicides perpetrated by those with schizophrenia and psychosis between 1997 and 2006. Using earlier data (1957-1995) and including all mental health illnesses, Taylor & Gunn (1999) found overall little fluctuations in numbers of homicides committed by those with mental illnesses and suggested that these cases had little impact on overall homicide trends. Large, et al. (2008) found that the numbers of homicides related to mental illness were increasing until mid-1970s, followed by steady declines. None of the studies controlled for socio-economic factors known to correlate with homicides other than the population size, probably due to ethical and practical difficulties in linking individuals to other datasets.

All identified studies used UK Home Office data relating to cases of diminished responsibility in homicide trial, this is perhaps a result of greater data availability than in other countries and probably a greater interest in mental health and crime in the UK compared to other countries. Diminished responsibility was introduced under Section 2 of the Homicide Act 1957 and covers permanent unfitness to stand trial, not guilty by reason of insanity and

infanticide for women who kill an infant as a result of postnatal depression. As the data is recorded by the police and courts, its accuracy in identifying those with mental health issues is dependent on appropriate, timely diagnosis. Further, it is hard to disentangle the effects of substance abuse and other confounding variables without access to more detailed case-level data. It is also important to remember that while those perpetrators were diagnosed with a mental illness, it does not necessarily mean that their illness *caused* them to commit the homicides.

Taylor & Gunn (1999) looked at trends in homicide levels and the proportion found to have a mental health issue. They found the proportion of homicide offenders in England and Wales with mental health issues increased from 1957 to the 1970s but fell thereafter. The authors stress that the proportion of those diagnosed with a mental health illness who commit homicide is notably low compared to the wider homicide offender population. They conclude that there is a need to improve the resources and quality of care for people with substance misuse and personality disorders. This conclusion however, does not link directly to their analysis.

A subsequent paper by Large et al (2008) agreed with Taylor & Gunn (1999) in finding that the annual number of homicides due to mental disorder rose from under 50 in 1957 to well above 100 by the 1970s. They note that during this period (1957–1980), homicides due to mental disorder and total homicides were strongly positively correlated. However, in the subsequent 24 years (1981–2004) homicides due to mental disorder declined and were negatively correlated with the rate of homicide by people without mental disorder.

Large, et al. (2008) propose several explanations for those variations. The first possible explanation may have been changes in the threshold for the finding of a verdict of diminished responsibility. However, as authors note, there had been no changes to the official definitions of the defences to murder since the reforms of the mid-1950s. Another possibility is that methods of the detection of mental illness among courts and prison staff declined after mid-70s, however the authors believe that the reverse is true. Thirdly, it is conceivable that there was a peak in the 1970s of incidence of severe and enduring mental illness. However, this hypothesis is not supported by substantial empirical evidence.

One more plausible explanation is that rates of abnormal homicide increased because of the same sociological factors (e.g. the availability of weapons, patterns of substance misuse, and patterns of internal and external migration) that caused the increase in total homicide. An alternative explanation may be that the fall can be attributed to improvements in diagnosis, treatment and anti-psychotic medication.

Swinson, et al. (2011) used case-level data on all 5,884 perpetrators of homicide notified to the National Confidential Inquiry into Suicide and Homicide by People with Mental Illness between 1997 and 2006.

They found that over that period, the number of homicide perpetrators with schizophrenia increased at a rate of 4% per year and those with psychotic symptoms at the time of the offence increased by 6% per year. Importantly, and in agreement with the other studies, they found that the number of verdicts of diminished responsibility decreased during the same period.

They concluded that the likeliest explanation for the rise in homicide by people with psychosis was the misuse of drugs and/or alcohol. Data for these variables increased at a similar magnitude to homicides by those with psychotic symptoms. However, they were unable to demonstrate a causal association.

Although not short-listed because it did not look at trends, a study by Rodway et al., (2011) is also worth mentioning. It examined 363 juvenile homicide perpetrators in England and Wales from 1996 to 2004. For 45% of this group (165 cases), the researchers located a psychiatric report relating to that individual prior to the homicide. Most of these were for alcohol and/or drug abuse. Severe mental illness was rare (only five cases), while 33 perpetrators (20% of those with a psychiatric report and 9% of total) had been diagnosed with a mental disorder. Conduct disorder was the most common of these. Only 16 individuals had been in contact with mental health services in the year prior to the homicide.

In summary, homicides perpetrated by offenders with severe mental illness make up only a small proportion of all homicides. Other mental health issues, including conduct disorder and alcohol/drug misuse are associated with a much higher percentage of homicides. Trends in alcohol and drug-related homicides are explored in other annexes. No study was located that looked at trends in conduct disorder and homicide over time. Available evidence suggests homicides involving severe mental illness increased from the 1950s to the late 1970s in England and Wales. After that, there seems to have been a steady decline. All studies attribute this decline to improvements in mental health care provision, however no specific analysis was conducted to prove this claim and there is tentative evidence that homicide perpetrators with mental health issues do not always access services prior to the offence.

vi) Medical and emergency care and trends in homicide

Some academics argue that the downward trend in the last century can be explained by improvements in quality and access to medical services. The literature identified several possible mechanisms for this effect, including improvements and access to pharmaceuticals; improved medical equipment and faster transportation (ambulances). At the core of this argument lies an assertion that injuries inflicted on a victim nowadays are less likely to lead to death due to improvements in health care.

The studies identified for this section are listed in Table A8.13 below.

Table A8.13. A list of identified medicalisation studies.

Study	Area and time period	Main explanatory variables tested	Method and finding
Giacopassi et al., 1992	City level - Memphis, US, three years separated by 25-years intervals (1935, 1960, 1985)	Lethality index	Descriptive analysis: change in homicide, lethality and duration of survival over time. Improvements in medical care served to suppress the homicide rate.
Harris et al., 2002	County level - US, 1976-1980 and 1994-1997	Lethality index (% of violent assaults that result in homicide) regressed against medical variables (e.g. hospital beds, physicians, patient intake).	Negative binomial regression. Found a negative correlation between the lethality index and having a hospital in the county, number of physicians, having open-heart surgery facilities and regional systematisation of trauma centres. Estimates that advances in emergency medical care have reduced the lethality index annually by 2.5% to 4.5%.
Andresen, 2007	Canada and US, 1983-2001	Augmented lethality indices – two lethality indices for attempted homicide and Canadian aggravated assault	Trends and simple linear regression. Found that lethality index is not a reliable measure. The Canadian augmented lethality indices were not found to illustrate time trends similar to those for the original lethality index, but the author agrees that improvements in emergency healthcare contributed to a decrease in homicide rates.

Only three studies met the inclusion criteria for this literature review⁹ and all found some support for the hypothesis that improvements in emergency healthcare contributed to a decrease in lethality rates of potential homicides. The lethality rate is generally defined as the percentage of violent assaults that result in a homicide. However, the studies vary in terms of methodology robustness and all use different measures to capture a difference between actual homicide rates and those expected under no improvements in health

⁹ We identified one more study on the impact of medical care on homicide rates. It was conducted by Norton (2005) as a part of his degree. However, as to our knowledge, this paper was not peer-reviewed and as such was excluded from the core list of studies. Nonetheless, it seems to present methodological and analytical rigour. Norton (2005) used multiple regression analysis for US data (15 states) between 1996 and 2001 and found that increased health care resources were negatively correlated with lethality rates. Surprisingly, the study found that the number of doctors was positively correlated with lethality rates. The author suggested that the measure of physicians does not accurately measure the concentration and type of services because it includes all doctors, not just those working in trauma care.

care. Giacomassi, et al. (1992) simply used descriptive analysis to show trends in homicides, aggravated assaults and hospital survival rates for victims. Harris, et al. (2002) devised a lethality index that measured the difference between homicide rates and aggravated assaults, which were argued to be a proxy for “potential homicides”. They also used a more robust analytical approach by conducting a negative binomial regression analysis to study the relationship between various medical health care variables and the lethality index. However, Andresen’s (2007) study showed that the lethality index as calculated by Harris, et al. (2002) lacks construct validity since aggravated assaults capture a proportion of crimes, for which death was a very unlikely result.

This academic interest in the role of medical care in homicide rates was initiated by Giacomassi, Sparger and Stein in 1992, who examined trends in the lethality of serious violent attacks in Memphis, Tennessee in three years separated by 25-year intervals (1935, 1960, 1985). They found that the lethality of serious personal attacks was decreasing, which seem to confirm that improvements in medical care had contributed to a decrease in homicides. However, they also found that the survival times for non-DOA homicide victims decreased, which seems contradictory to the hypothesis. The authors explain this discrepancy by stating that “hospitals have been saving increasing proportions of persons who have been violently assaulted, and that only those victims in extremely critical condition when brought to the hospitals die subsequent to admission” (Giacomassi, et al., 1992, p. 255). They also note that it is important to realise that the increasing proportion of aggravated assaults to murders cannot be entirely or even largely attributed to advances in medical care.

However, there are several methodological issues with this study. The analysis is limited to descriptive statistics only, thus is not able to tell us whether the reported decreases in lethality are significantly correlated with the number of homicides or are a result of the sampling strategy. The sampling strategy itself is problematic as it intends to capture long-term trends but, it only represents 3 years, separated by long time intervals in one US city. Furthermore, the number of homicides is too small for statistical analysis, particularly in 1960 where there were only 38 homicides. Therefore, the findings are not generalisable to a wider population.

A major methodological improvement was made by Harris, et al. (2002) who used negative binomial regression to measure the correlation between various medical care variables and lethality index between 1976-1980 (Period 1) and 1994-1997 (Period 2) using county-level, US-wide data. The lethality index was calculated as a proportion of homicides and “potential homicides” measured with the number of aggravated assaults.

In 2000, the homicide rate for the United States was 107% of its value in 1960; however, the aggravated assault rate in 2000 was 375% of its 1960 value. Harris, et al. (2002) called this a paradox, which led them to a hypothesis that the decreases in trauma mortality in the United States from 1980 onwards correspondingly decreased the deaths resulting from violent

assaults. This hypothesis follows directly from their belief that “homicides are neither no more, nor no less, than aggravated assaults with the outcome of the victim’s death” (Harris, et al. 2002, p. 135). In other words, Harris, et al. (2002) argued that assaults and homicide are the same in nature and only differ in the outcome, which is heavily dependent on the quality of emergency healthcare provision.

In line with Giacomassi, et al. (1992) findings, Harris, et al. (2002) found a sharp decrease in the lethality rate over the time period. They further conducted analysis of various medical care variables and found a statistically significant negative correlation between having a hospital in the county, number of physicians, open-heart surgery facilities and regional systematisation of trauma centres (coordination of triage and inter-hospital transfers). However, the effect sizes differ between Period 1 and Period 2. For example, simply having a hospital in the county was estimated to lower lethality by 11.2% each year in Period 1, but this effect grew to 24% a year in Period 2. Contrary, for every 100 physicians affiliated with a county hospital there was a larger reduction in Period 1 (4.3%) compared to 1.45 in Period 2. Surprisingly, Harris, et al. (2002) found that the countywide presence of a trauma centre was associated with a 7% reduction in lethality, but this effect was not statistically significant at any conventional significance levels. They argue that while trauma centres should be associated with a reduction in lethality soon after they open, for many years after implementation, individual centres “may become magnets for trauma cases with high fatality rates, channelling and concentrating their distribution from previously broader, regional dispersions” (Harris, et al., 2002, p. 154). The authors conclude that advances in emergency medical care have reduced the lethality of violent assaults, with observed annual drops in such lethality ranging from 2.5% to 4.5%.

Andresen’s (2007) study of both Canadian and US lethality rates between 1983 and 2001 questions the findings from the above studies arguing that the lethality approach is sensitive to data definitions. The lethality measure as adopted by Giacomassi, et al. (1992) and Harris, et al. (2002) assumed that every aggravated assault is a potential homicide, but Andresen (2007) argues that aggravated assaults is too broad of a category. He points out that in the US, an aggravated assault usually is accompanied by the use of a weapon *or* by means likely to produce death *or* great bodily harm. On the other hand, the Canadian definition does not include use of a weapon and captures only bodily assault and assaults that endanger the life of the victim. He shows that adjusting the offences included within a lethality index can markedly change the conclusion. For example, he finds, using an alternative ‘augmented lethality index’, that the degree of lethality has remained flat since 1980, rather than continuing to decline, as in the Harris, et al. (2002) analysis.

Even so, Andresen (2007) still concluded that improvements in trauma care are likely to have had a beneficial impact on falling homicide rates. He suggested that the reason this does not always show in a lethality index could be because the effects of advances in medical technology have been relatively evenly distributed across violent crimes. In other words, medical

improvements may prevent violent assaults becoming homicides, but they may also prevent more minor assault becoming serious ones.

Another factor relevant to England and Wales but only infrequently touched upon by the literature reviewed is the strong evidence that all categories of police recorded violence have been inflated over time by an increased propensity of victims to report offences (particularly domestic violence) and by recording practice changes that have increased police recording of violence. These aspects would likely make interpretation of a lethality index for England and Wales highly problematic.

To summarise, all three studies agree that improvements in medical science and emergency health care have to some extent decreased the lethality of potential homicides. However, as showed by Andresen (2007) the lethality index is an imperfect measure and is unlikely to capture only the assaults that could have been homicides without the medical care. Therefore, it is currently hard to assess the precise impact that improved medical care may have had on homicide trends.

vii) Other short-listed studies

Seven other studies were identified that matched our selection criteria, but their focus did not fit into any of the categories covered in the previous annexes. The ‘other’ studies explored the link between homicide and broadly four factors: a diet rich in linoleic acid, rapid change in communities linked to oil industry, wars and political system. As there are only few or just one studies per category, it is impossible to draw firm conclusions from them. This section aims to give a brief overview of other factors that may influence homicide rates.

Table A8.14: A summary table of ‘other’ studies that explored links between homicide and variables not covered elsewhere

Study	Area and time period	Main explanatory variables tested	Method and finding
Diet (linoleic acid)			
Hibbeln, Nieminen & Lands (2004)	Argentina, Australia, Canada and the UK and US, 1961 – 2000	Linoleic acid intake	Linear regression and iterative curve fitting for linear and nonlinear regressions. Greater apparent consumption of linoleic acid was correlated with higher rates of homicide mortality over a 20-fold.

Oil industry

Seydlitz, Laska, Spain & Triche (1993)	US (Louisiana parishes), mid 1950s – mid 1980s	Level of activity of the oil industry and price of oil	Descriptive statistics and linear regression. High or rapidly changing levels of activity in the oil industry were associated with higher homicide rates
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(Sub)urbanization

Rotolo & Tittle (2006)	US cities, 1960, 1970, 1980, 1990	Changes in city population	Bivariate regression allowing for non-monotonic, curvilinear relationships. Increases in population are associated with declines in crime rates while decreases in population are associated with increases in crime rates, thus change in population is not predictive of directionally corresponding change in crime rates.
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Chilton (1987)	Chicago, US, 1960-1980	Age, gender, ethnicity	Descriptive analysis. The results indicate that a changing racial composition contributed to changes in the homicide rate. As much as 24% of the total increase in homicide arrests can be attributed to an increase in the number of non-white men in the population.
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Wars and post-war homicide

Archer & Gartner (1976)	110 nations, 1900-1970	Armed conflicts	Compared homicide rates in war afflicted countries with control countries (t-test). Most of the combatant nations in the study experienced substantial post-war increases in their rates of homicide. These increases did not occur among a control group of non-combatant nations.
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Political system and personal freedom

Stamatel (2014)	33 countries (including UK) over four time periods (1990, 1995, 2000, 2005)	Traditional gender roles, political rights and civil liberties	Feasible Generalized Least Squares (FGLS) regression. Socio-historical context still has a significant effect on female homicide victimization after controlling for other predictors. Regions with communist legacies had significantly higher female homicide rates than Western Europe
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Child protection services

Pritchard & Sharples (2008)	England and Wales compared to other major developed countries, 1974-76 and 2000-02	Age and gender of child homicide victims	Descriptive statistics and international comparisons. In the 1970s, combined 'violent' deaths of all children (0-14 years) (homicide, OECD and AAE) in England and Wales were 203 per million, they are now 61 per million, a 70% decline with only Italy having lower rates.
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Urbanization/Suburbanization

A general positive relationship between city size and crime is often perceived as one of the “facts” of criminology (e.g. Gottfredson and Hirschi, 1990). However, the only study testing this assertion for homicides that was identified for this literature review, presents a more complex argument. Rotolo and Tittle (2006) argue that if urban population size cause, or affect crime rates, then longitudinal analysis should show that *changes* in population are followed by *changes* in crime rates after an appropriate time lag. Indeed, their own analysis of 584 cities showed no significant association between city size and homicide rates when controlling for extraneous variables.

Separately, Chilton (1987) studied the effects of suburbanization on crime. He showed that, cross-sectionally, the rise in homicide in Chicago between 1960 and the mid-1970s was mostly due to an increase in homicides committed by non-white males, although murders by non-white females and white males also increased. He argued that in many big US cities suburbanization led to inner-cities having larger non-white youth populations. Yet, this cannot be the only explanation as rates rose across most demographic sub-groups regardless of race and age.

Wars

Archer and Gartner (1976) analysed time-series of homicide rates for approximately 110 nations beginning in about 1900 and ending in 1970. They concentrated on post-war periods as wartime data was likely to be affected by large social changes associated with armed conflicts including a removal of a large proportion of young males from civilian populations. The authors found that most of the post-war nations experienced substantial increases in their homicide rates. These increases occurred after large wars and smaller wars, with several types of homicide rate indicators, in victorious as well as defeated nations, in nations with both improved and worsened post-war economies, among both men and women offenders and among offenders of several age groups. Archer and Gartner (1976) tested several theoretical models to explain this increase and concluded that the only model, which appears to be fully consistent with their study is the legitimization model. This model suggests that the presence of authorised or sanctioned killing during war has a residual effect on the level of homicide in peacetime society.

Political system

Stamatel (2014) studied panel data from 33 European nations in four years: 1990, 1995, 2000 and 2005. He found that socio-historical context had a significant effect on female homicide victimisation after controlling for other factors. The regions with communist legacies had significantly higher female homicide rates than Western Europe, and the difference between the magnitude of the regional effects between Central and Eastern Europe and the European countries of the former Soviet Union was substantial. The author argues that this historical legacy was likely to have an indirect effect on female homicide victimisation through the indicators included in this analysis.

For example, different post-communist economic and political reforms had an effect on GDP per capita, infant mortality, and female labour force participation. Additionally, it is argued that the strain caused by these social changes was likely to have affected family dynamics leading to an increase in female victimisation.

Child Protection Services

Pritchard and Sharples (2008) used data from England and Wales and nine other developed nations from 1974 to 2002 to argue that increases in child protection services have driven down child homicide rates. They showed that falls in England were comparable or larger than in most other nations and that part of this may be due to child protection services, although the authors acknowledged that their data do not allow for anything more than very tentative conclusions.

Diet

Clinical intervention trials and animal studies indicate that reducing linoleic acid intake may reduce aggression and violent behaviour. Seed oils are rich in linoleic acid, and these oils have displaced other dietary calories in the food supply in developed countries during the 20th Century. Hibbeln, Nieminen & Lands (2004) calculated linoleic acid available for human consumption for 12 major seed oils in the food supply for the years 1961 to 2000 in Argentina, Australia, Canada, the UK, and the US. They then analysed the association with homicide rates. They found that greater apparent consumption of linoleic acid correlated with higher rates of homicide mortality across countries and time in an exponential growth regression model. However, this study did not control for any established factors contributing to homicide rates including, but not reserved to, economy, youth population, drug and gang activity or deterrence. Therefore, this finding should be treated with large caution as consumption of linoleic acid may be a covariate variable.

Oil industry

Seydlitz, et al. (1993) studied the impact of rapid changes in communities associated with local expansion of the oil industry. They compared several factors associated with disorganisation (including homicide) between highly and minimally involved in oil industry parishes. They were divided into these two groups based on their degree of involvement determined by the percentage of people in the parish employed in the oil industry and percentage of total income of parish residents derived from work in the oil industry. The independent variables measured the level of activity of the oil industry through two proxies - the average price per barrel of oil and the number of developmental wells in the region. However, no controlling variables were included in the model.

The results showed that when price and number of wells were at higher level, the means of homicide rates were higher in both groups of parishes. The proportion of variance in homicide rates explained by the levels of price and

wells was greater for the more involved parishes. The study also found that the mean rates of homicide were higher when oil activity was rapidly changing, especially in the more involved parishes.

Saydlitz, et al. (1993) then explored the whether the differences they saw in the regression analysis was significant. They found that the levels of homicide rates experienced by communities did not significantly differ by the community's degree of involvement in the industry.

While no solid conclusions can be drawn from the studies in this section, it shows that homicide rates may be influenced by multiple socio-economic and cultural factors, law-enforcement and many other factors such as diet or moral legacies of wars.

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Technical Annex

A: Notes for Annex A and all sections relating to homicide trends in England and Wales

1) The Mortality Statistics

Description

The Office for National Statistics publish data on the causes of death compiled from information supplied when deaths are certified and registered as part of civil registration, a legal requirement. The figures represent deaths that occurred in England and Wales. These include the deaths of individuals whose usual residence was outside England and Wales.

The number of deaths in England and Wales in each year represents the number of deaths registered in the calendar year. In the dataset, these are broken down by age group, sex and the underlying cause of death.

From 1911 onwards, the underlying cause of death is coded according to the contemporary version of the International Classification of Diseases (ICD). For the period 1901-1910, causes of death follow a classification scheme which was used in England and Wales before the ICD was adopted. Each dataset thus contains an Historic Deaths table for 1901-1910, and a table for each period in which a different revision of the ICD was in force. Down to 1992, the data relates to deaths which were registered in the year in question; from 1993 onwards, the figures represent deaths which occurred during the year. Note that this is different from the police statistics in which the homicide continues to be listed in the year in which it was recorded rather than the year it actually occurred.

The 'underlying cause of death' was defined in the 9th revision of the ICD as (1) the disease or injury that initiated the train of events leading to death, or (2) the circumstances of the accident or violence (e.g. suicide) that produced the fatal injury.

Where death was not due to natural causes, as with homicide, ICD revisions 6-9 allowed two codes to be assigned to each death: one covers the external cause of injury and the other the nature of the injury. To avoid any double counting of deaths, only counts for external causes of injury are included in the Historic Deaths tables for these revisions, in both datasets.

Further details can be found <https://discovery.nationalarchives.gov.uk/details/r/C15263>, and in the 'User Guide to mortality statistics':

<https://www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/deaths/methodologies/userguidetomortalitystatisticsjuly2017>

Further details about the data including sources

The table below shows the source and homicide codes used for each year in the mortality statistics series.

Years	Source	ICD Series	Homicide codes used
1901 to 1910	Twentieth Century Mortality Files	icd1	1890
1911 to 1920	Twentieth Century Mortality Files	icd2	182, 183, 184
1921 to 1930	Twentieth Century Mortality Files	icd3	197, 198, 199
1931 to 1940	Twentieth Century Mortality Files	icd4	173, 174, 175
1941 to 1949	Twentieth Century Mortality Files	icd5	165, 166, 167, 168
1950 to 1957	Twentieth Century Mortality Files	icd6	E964, E980-E983
1958 to 1967	Twentieth Century Mortality Files	icd7	E964, E980-E983
1968 to 1978	Twentieth Century Mortality Files	icd8	E960 to E969
1979 to 1984	Twentieth Century Mortality Files	icd9a	E960-969 + E9888
1985 to 1992	Twentieth Century Mortality Files	icd9b	E960-969 + E9888
1993 to 2000	ONS data request	icd9c	E960-969 + E9888
2001+	ONS data request	icd10	X85-Y09, Y87.1, (plus Y10-Y34 where the coroner's verdict was pending, and U50.9

For the Twentieth Century Mortality Files see:

<http://webarchive.nationalarchives.gov.uk/20151014074732/http://www.ons.gov.uk/ons/rel/subnational-health1/the-20th-century-mortality-files/20th-century-deaths/index.html>

For the more recent bespoke ONS data see:

<https://www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/deaths/adhocs/009286numberofhomicidesinenglandandwales1993to2017>

Caution is required when using these statistics. There are recording practice changes throughout the series. The most obvious are the changes to the ICD series and corresponding codes listed above. It is possible these changes have altered (and mostly expanded over time) the categories of death that would be counted as homicide.

In 1978, another change occurred that had particular importance for the homicide series. If someone is to be charged with an offence in relation to the death, the coroner must adjourn the inquest until those legal proceedings are completed. Since 1978 it has been possible to register these deaths at the time of adjournment, when the coroner issues Form 120 (Annex F). This form includes details of injuries that led to the death, but no conclusion. In the case of motor vehicle incidents, there is enough information to code the cause of death. Other deaths, such as possible homicides, are given a temporary code for underlying cause of death (E988.8, Y33.9,U50.9) until final information becomes available. In the series within this report these pending codes are counted as homicides because the majority do end up being coded as homicide. However, what this means is that homicide counts for any given year post-1978 will vary depending on when the data is extracted from the underlying database. This is because some of the pending cases may not be coded as homicide once all the information becomes available (and it is also possible for the reverse to occur if a death initially listed under another cause is discovered to be homicide.) It is therefore really important to note that in our series, the data from 1978 to 1993 just include all pending cases that were initially recorded in each year. These figures are therefore potentially slightly inflated. From 1993, the data comes from an updated cut of the dataset extracted by ONS in late 2018. Hence for the majority of the years in the series post-1993 the data should represent a 'final' count of homicides as virtually all pending cases should have been assigned. For this reason, we excluded the most recent two years of the series (2016 and 2017) as due to the large number of cases still pending for these years, these counts were artificially low by comparison with the police statistics.

In addition to the changes described above, other shifts in recording practice that we are aware of are listed below:

- For the period 1901-1910, causes of death follow a classification scheme which was used in England and Wales before the ICD was adopted. Each dataset thus contains a Historic Deaths table for 1901-1910, and a table for each period in which a different revision of the ICD was in force.
- Until 1992, the data relates to deaths which were registered in the year in question; from 1993 onwards, the figures represent deaths which occurred during the year.
- In 1993, the method of coding switched from being a manual to an automated process.

2) The Police Recorded Crime statistics

Description

There are three different police recorded crime series for homicide used in this report. One derives from the main recorded crime dataset and the other two come from the Homicide Index.

- *Police recorded crime dataset*: This series comes from the data that police return to the Home Office each month containing monthly counts of most types of crime, including homicide. It is published as part of the quarterly ONS Crime Statistics in England and Wales series. As an annual series it goes back to 1898 but it contains no information except the number of crimes, broken down by police force. It also represents a count of homicides based on the information immediately available (i.e. in the current month). So cases that are later discovered not to have been homicides will generally be included. It is therefore extremely similar to the 'initially recorded as' series outlined below.

Sources: For the police recorded crime series from 1898 to 2001/02 see: <https://data.gov.uk/dataset/f79c8194-93b0-41eb-bba5-56a83fd32f10/historical-crime-data/datafile/b5b1c3fe-338e-472e-b844-75108c57436c/preview>. For the series from 2002/03 on, see:

<https://www.ons.gov.uk/peoplepopulationandcommunity/crimeandjustice/bulletins/crimeinenglandandwales/previousReleases>

- *Homicide Index*: The Home Office Homicide Index 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, it is a richer source of data than the main recorded crime dataset. It is therefore the preferred source for homicide statistics. However, due to the level of detail of the information collected, the Homicide Index does not provide data that are as timely as the main police recorded crime return. The Homicide Index records all offences that were initially recorded as homicide and whether those offences are still classified as homicides. This gives two series: the 'initially recorded as' series (which is very similar to the police recorded crime series) and the 'currently recorded as' series. As the latter represents the

most accurate picture, it is used for the majority of tables and charts in this report. The Index has been running since 1946, however, data quality is variable up to 1977. So this report generally only uses these data from that date onwards.

Sources: The data used in the report were extracted from the Homicide Index on 07/09/2018. Further information can be found here:

<https://www.ons.gov.uk/peoplepopulationandcommunity/crimeandjustice/articles/homicideinenglandandwales/yearendingmarch2018#how-is-homicide-defined-and-measured>

Further details about the data

All the series mentioned above 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.

Partly for that reason, most of the homicide series from the Homicide Index data used in this report exclude certain types of homicide and certain events, in order to provide a data series most conducive to studying drivers of trends. Data table A4 shows how the most recently published figures for total homicides at the time of writing can be reconciled with the series used in Figures 5, 6 and 8 of the main report and Figures 8 through 29a in Annex 1 (except for Figures 25 and 25a, which do not use Homicide Index data). Note that published homicide statistics use the latest version of the Homicide Index available, and the data are subject to revision over time. This report uses the snapshot dated 07/09/2018 and will not therefore necessarily agree completely with some published data which uses earlier or later versions of the Homicide Index.

Use of Homicide Index data for suspect analysis in this report

All suspect analysis is done on a per homicide basis, so principal suspect information is used. For the purposes of the Homicide Index, a suspect in a homicide case is defined as either:

- a person who has been arrested in respect of an offence initially classified as homicide and charged with homicide, including those who were subsequently convicted
- 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 or being charged

Where there are multiple suspects in a homicide case they are categorised in the Homicide Index as either the principal suspect 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.

Source: Homicide in E & W, Year ending March 2017. Release date 8 Feb 2018. Link:

<https://www.ons.gov.uk/peoplepopulationandcommunity/crimeandjustice/articles/homicideinenglandandwales/yearendingmarch2017>

The choices to be made about analysis included answering the following research questions:

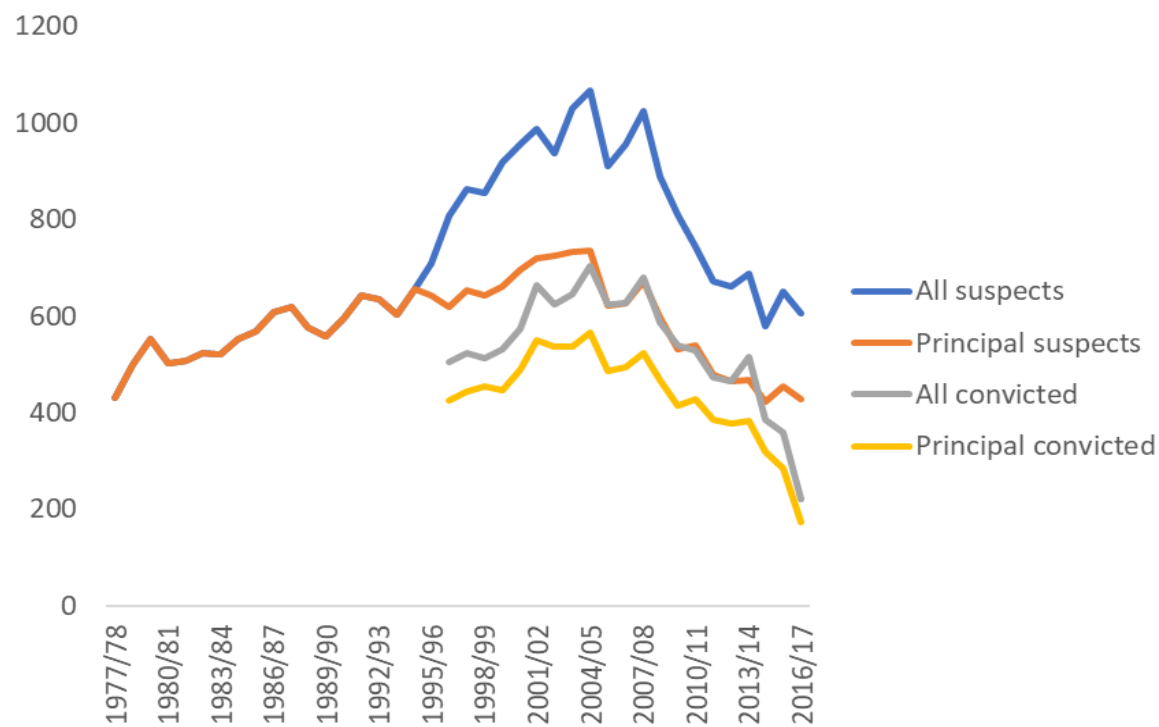
1. Do multi-victim cases skew the number of cases and so over-represent some suspects? Data table A4 shows the numbers of cases including and then excluding multi-victim cases such as those committed by Harold Shipman and Derek Bird. It is clear from this that these incidents will over-represent these individuals and so skew analysis of factors such as suspect age, gender and method of homicide. For example, the average age of a homicide suspect in 2002/03

will be markedly affected if the Shipman cases were included as his age would be counted 173 times, once for each victim.

2. Do multi-suspect cases skew the data? As outlined in Chapter 1, there are numerous ways suspects could be counted in the data. Figure TA1 below shows four different methods to check how method selection might skew the data:
 - all homicide suspects (allowing the possibility that there may be more than one suspect per victim),
 - principal suspects (one suspect per homicide victim),
 - convicted suspects (all suspects convicted so could be more than one per homicide victim) and
 - principal convicted suspects (can only be a maximum of one per homicide, but many will go un-convicted).

The chart shows a good level of correlation between these series, particularly the last three. We can be reasonably confident, therefore, that the choice of series will not bias conclusions unduly. Given the high degree of correlation, the principal suspect series was selected for the majority of tables and charts in Chapter 1 for two main reasons. Firstly, it is available back to 1977/78, whereas the two convicted suspect series are only available from 1996/97. Secondly, it counts on a per homicide basis, making it directly comparable with all the other series used in the chapter. The one weakness of using principal suspect data is that it can be skewed due to multi-victim cases. But this is dealt with via the exclusion of all cases with more than 10 victims, as outlined above.

Figure TA1: Number of suspects for all suspects, principal suspects, and convicted suspects.¹



Source: Homicide Index

¹ The lower numbers of convictions in the latest years will be mainly because there hasn't been enough time for them to go through the system. Note also that this analysis was done on an older snapshot of Homicide Index data that ran to 16/17.

The use of principal suspects requires that two important considerations are borne in mind when interpreting the data:

- a) Because only multi-victim cases above 10 victims are excluded, individuals who killed more than one person but fewer than ten people in a single incident will be counted multiple times, once for each victim.
- b) Being arrested and charged (the main criteria for being a principal suspect) does not mean being convicted. A number of individuals will be charged without being convicted, either because they die before trial or because they are acquitted. For principal suspects, the volumes of these cases are relatively low. For example, in the snapshot of the HI used for chart TA1 above, the mean number of principal suspects not convicted per year for the three years 2014/15 to 2016/17 was 62, or just under 20%.

3) Population data

The population data used in this report are re-produced in tables P1 to P4. The sources are listed below:

Historical population data, by age and gender:

<https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationestimates/datasets/populationestimatesforukenglandandwalesscotlandandnorthernireland>

Under the section entitled “Mid-2001 to Mid-2017 detailed time series”, select the link entitled UK population estimates 1838 to 2017. Population estimates for England and Wales, by sex, Mid-1838 to Mid-2017 can be found in Table 7. Population by gender and age bands from 1911 are available in Table 8, and by gender and single age year from 1961 in Table 9. These are re-produced in the accompany data tables P1-P3.

Population by region

<https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationestimates/datasets/populationestimatesforukenglandandwalesscotlandandnorthernireland>

Under the section entitled “Mid-2001 to Mid-2017 detailed time series”, select the link entitled `Regional population estimates for England and Wales, 1971 to 2017. Population estimates for government office regions in England and Wales from 1981 can be found in Table 3. These are re-produced accompanying data table P4.

Population by ethnicity

See:

<https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationestimates/adhocs/008780populationdenominatorsbyethnicgroupregionsandcountriesenglandandwales2011to2017>

Population estimates by ethnicity were sourced from the link above. These were then grouped into categories to match the ethnicity groupings within the homicide data. These data are re-produced as data table P5 in this report.

4) Additional Tables, Charts and Analysis

Homicide victimisation by individual age year.

Victimisation rates were calculated for individual age years using the Homicide Index. Corporate manslaughter cases were excluded as well as those multi-victim cases outlined in section 4 of Annex 1. The second column of Table TA 1 below shows the individual age year with the highest rate of homicide for each year from 1977/78 to 2017/18. While under-1s are the most victimised in most years, there are a number of years in which the most victimised age year was over 50, with several in the 80s. On inspection these high rates were being driven by just a small number of homicides (coupled with the lower population numbers in those age groups). The third column therefore excludes individual age-years above 50. This reveals that from 1977/89 to 1993/94, under-1s were consistently the most victimised. But more recently those in their 20s are increasing providing the most victimised age-year group.

Table TA 1: Individual age year with the highest rate of homicide, 2017/18 to 1977/78

Year	Age year with highest homicide rate	Age year with highest homicide rate (under-50)
2017/18	20	20
2016/17	Under-1	Under-1
2015/16	Under-1	Under-1
2014/15	Under-1	Under-1
2013/14	87	Under-1
2012/13	Under-1	Under-1
2011/12	29	29

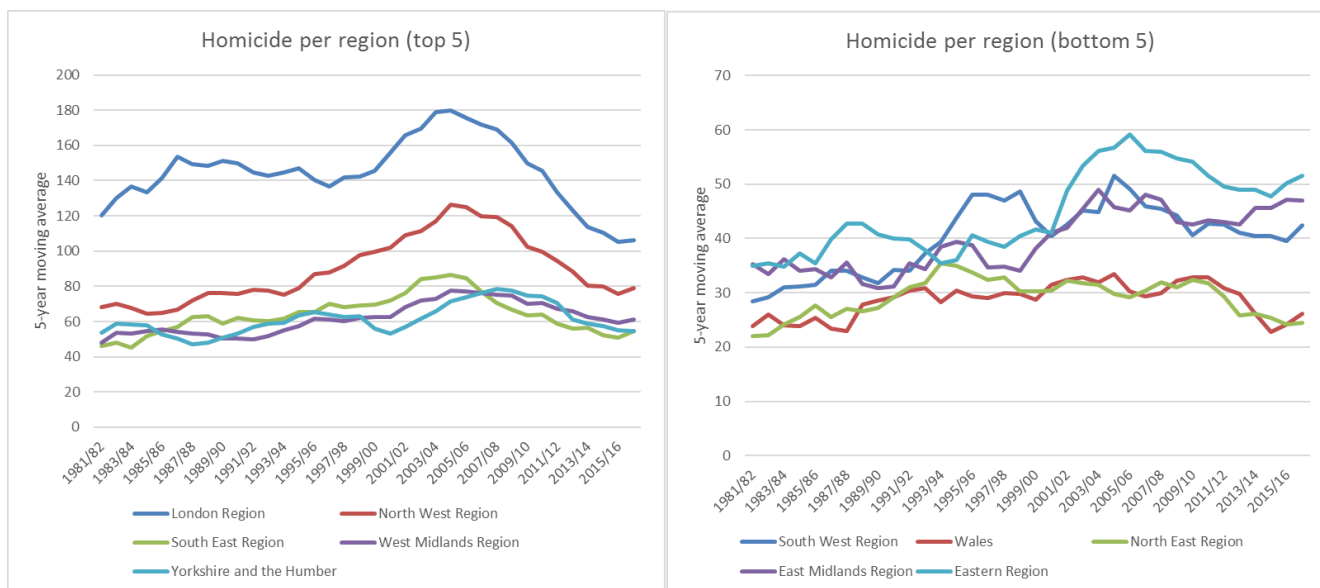
2010/11		89	40
2009/10	Under-1		Under-1
2008/09		26	26
2007/08		33	33
2006/07		29	29
2005/06	Under-1		Under-1
2004/05		24	24
2003/04		25	25
2002/03	Under-1		Under-1
2001/02		24	24
2000/01	Under-1		Under-1
1999/00	Under-1		Under-1
1998/99	Under-1		Under-1
1997/98	Under-1		Under-1
1996/97	Under-1		Under-1
1995/96		28	28
1994/95		22	22
1993/94	Under-1		Under-1
1992/93	Under-1		Under-1
1991/92	Under-1		Under-1
1990/91	Under-1		Under-1
1989/90		55	Under-1
1988/89	Under-1		Under-1
1987/88	Under-1		Under-1
1986/87		82	Under-1
1985/86	Under-1		Under-1
1984/85		87	Under-1
1983/84	Under-1		Under-1
1982/83	Under-1		Under-1
1981/82		86	Under-1

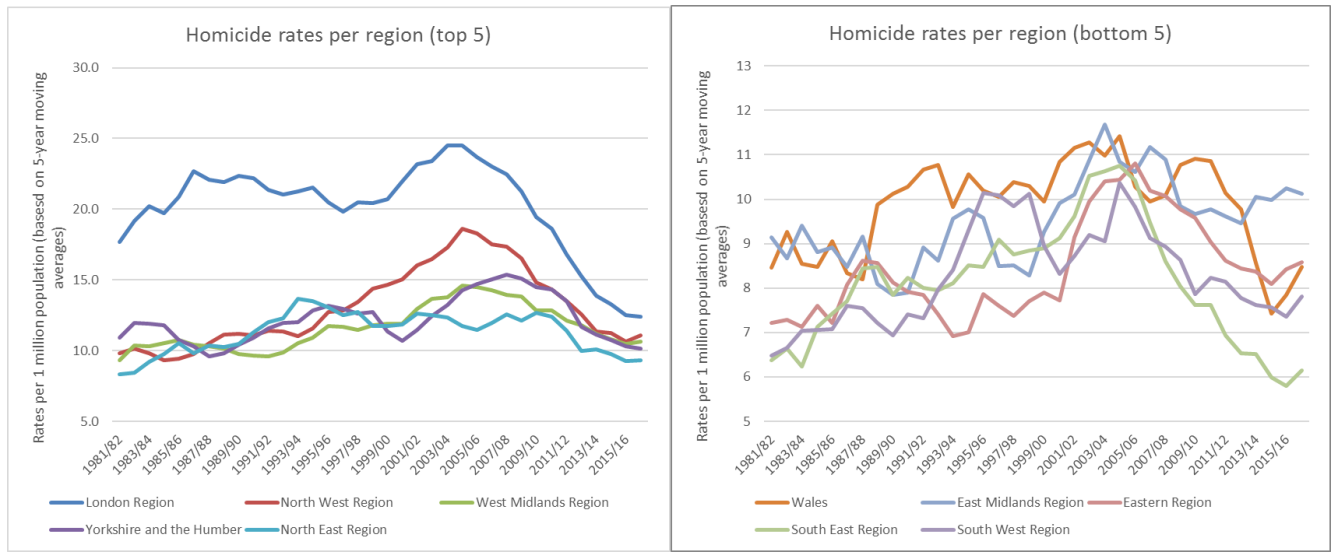
1980/81	Under-1	Under-1
1979/80	88	Under-1
1978/79	Under-1	Under-1
1977/78	89	Under-1

Further charts showing regional and force-level homicide trends.

Below are a series of charts showing homicide trends by region (see data table TA 2):

Figure TA2: Charts showing number and rates of homicides per region (5-year moving average, 1981/82 to 2016/17).

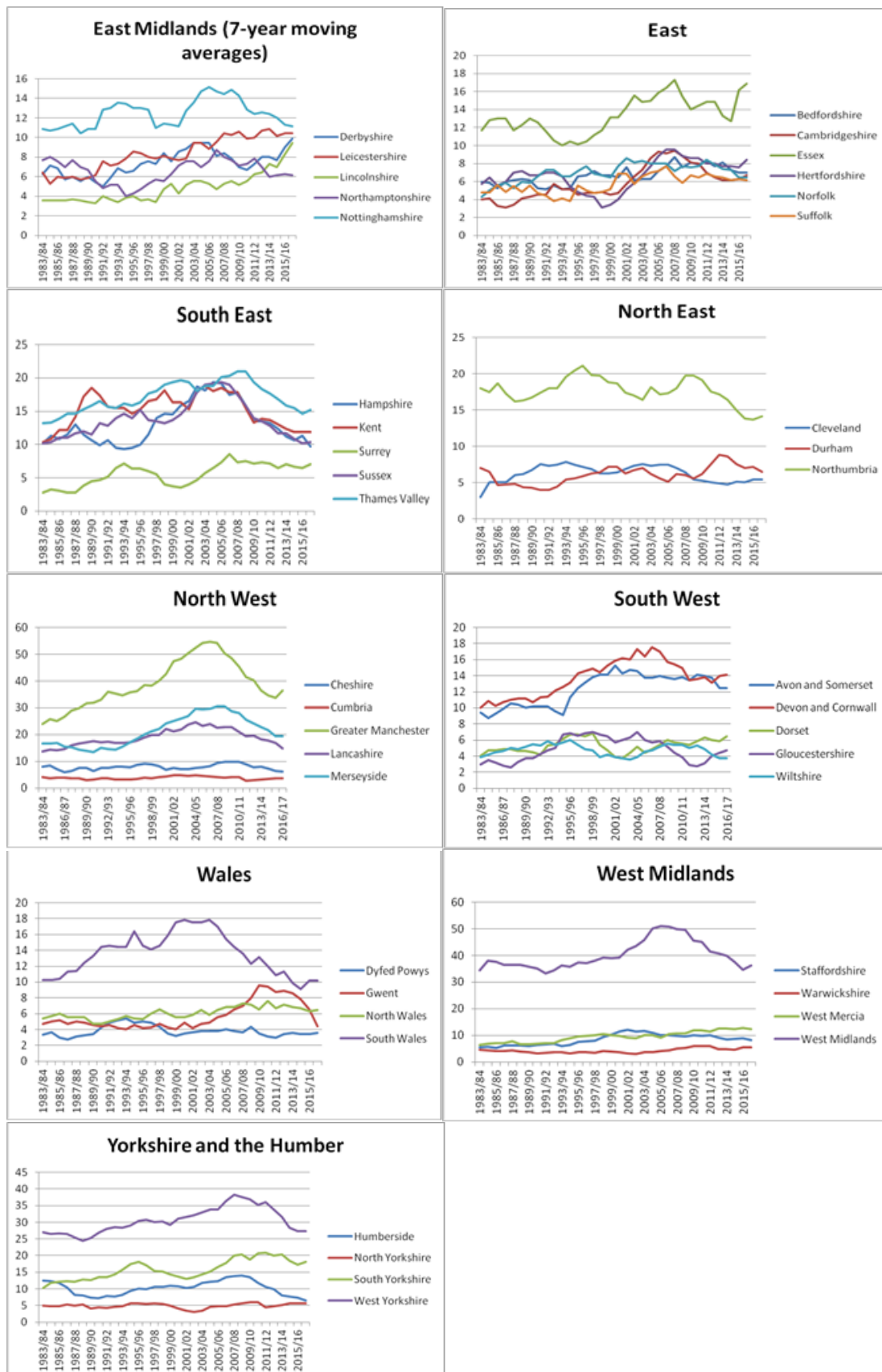




Source: Homicide Index and ONS mid-year population data

The following charts show numbers of homicides broken down by police forces area (data table TA 3):

Figure TA3: Charts showing number homicides per police force (5-year moving average, 1981/82 to 2016/17).



Correlation between homicide trends and economic performance (measured via Gross Value Added)

Analysis in this report revealed a relationship between deprivation and homicide (see Figure 7). It is possible this might help to explain London's more favourable homicide trends, relative to other regions (Figure 6). To examine this, regional economic performance was assessed using data for regional Gross Value Added (GVA). This data is available from 1997 to 2017. Results show that between those dates, London's GVA increased by an average of almost 8% per year, whereas all the other regions averaged between 4% and 5% per year. However, while this could suggest that economic performance might explain London's better homicide trend, other results call this into question. The region with the lowest average annual increase in GVA since 1997 (and hence worst economic performance) was the North East, yet like London it was one of only four regions to have lower homicide rates in 2017/18 than in the early 1980s.² In addition, the national trend does not correlate in any obvious way with economic booms and busts.

Furthermore, the review of literature on economic factors and homicide revealed that while there seems to be a very stable cross-sectional relationship between homicide and economic measures like deprivation (more homicides occur in highly deprived areas), there does not seem to be an obvious temporal relationship.³ The results presented in this section seem largely consistent with that conclusion.

Correlation between homicide trends and population change

A related measure that may affect trends in regional homicide rate is population change. There are several different theories about how this might increase or decrease homicide rates. One possibility is again linked to economic performance. To the extent that population drain is linked to de-industrialization and poor economic performance⁴, we might expect regions with lower population growth to have increased rates of homicide relative to other regions. But the opposite is also possible. All else equal, more people are likely to result in more homicides. Population increase might also result in more homicides if the new residents have a

² It is worth noting too that improved economic performance did not seem to protect London from the sharp rise in homicide that occurred there in 2017/18.

³ This does not mean that there is no relationship. But it does mean that it must be either lagged and/or moderated/masked by other factors.

⁴ See for example: <https://www.berghahnjournals.com/view/journals/nature-and-culture/4/3/nc040302.xml>

greater propensity for involvement in homicide (Latzer, 2016).⁵ Figure TA4 shows a scatter-plot of regional population change over the period 1981 to 2017 against regional changes in homicide rates over roughly the same period.

Figure TA4: Scatter plot showing regional population change against regional change in homicides, 1981 to 2017.

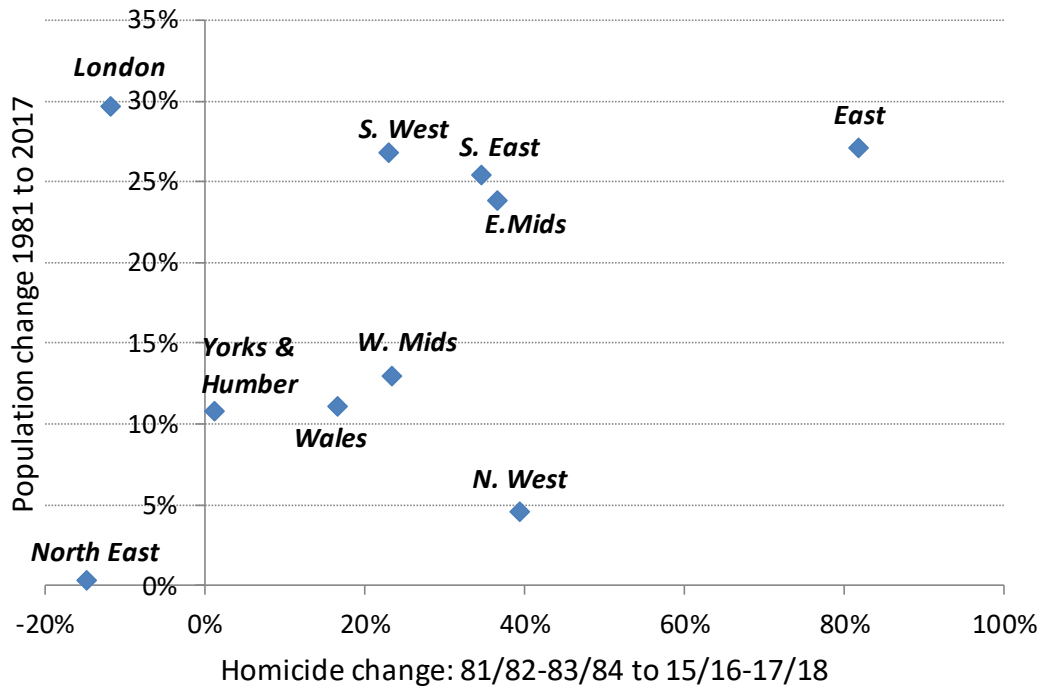


Figure TA 4 does not offer strong immediate support to either theory. There is a limited degree of positive correlation (correlation coefficient 0.35), meaning that regions with greater population growth have a slight tendency to also have more homicides over the period. But the relationship is not strong and there are notable exceptions. Perhaps linked to their economic performance, London and the North East are at opposite ends of the population spectrum. London's population has grown while the North East's has stayed almost constant from 1981 to 2017. Yet both have seen a fall in homicide over that period. Similarly, the East and the North West have seen the biggest rises in homicide but have had very different population changes. On this (albeit very limited) evidence, it would seem that other factors have been more important for driving regional homicide trends than population change.

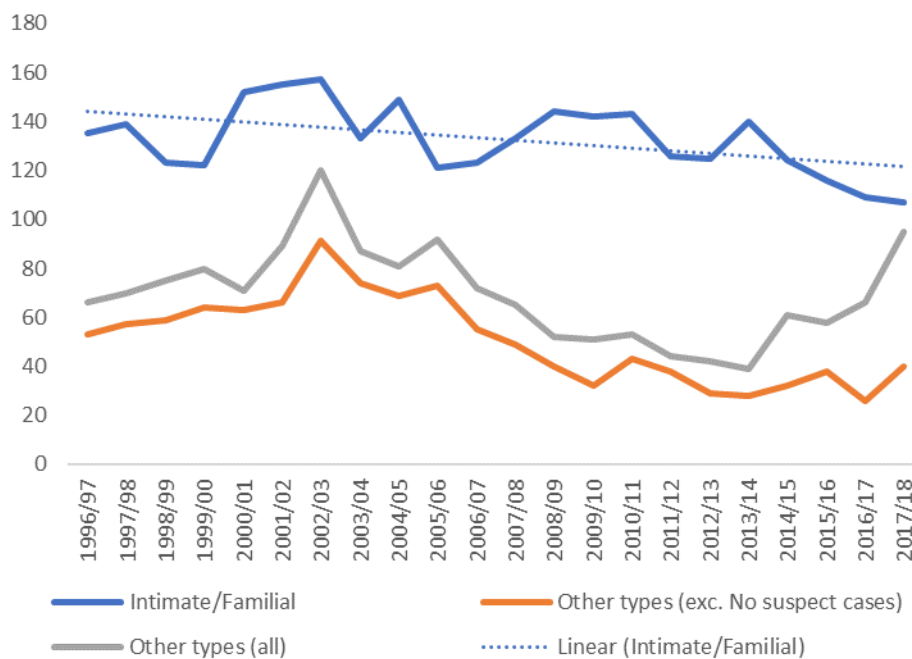
⁵ It is important to recognise that this analysis is far too crude to really test Latzer's theory. Population change can be made up of internal population growth and immigration. Latzer's theory relates only to the latter. Furthermore, Latzer's point is that immigrants will likely carry the homicide rates of their country of origin with them to some degree and for some limited time period. That makes the effect of immigration of homicide ambiguous, depending on the relative homicide rates of the old and new countries.

Note that the evidence on immigration being driver of homicide trends is explored in more detail in Annex 8.

Analysis of trends in female-victim homicides

Figure TA 5 below shows female victim homicides split between those categorised as intimate/familial and other types of homicide. Note that the latter have risen in line with overall homicide while intimate/familial cases have continued to trend downwards.

Figure TA 5: Female-victim homicides 1996/97 to 2017/18, by type



Intimate/familial female-victim homicides have generally trended downwards over time whereas female-victim homicides of other types have more up and down trends similar to those for homicide overall. This perhaps suggests two types of trend with two types of driver: a gradual downward pressure on intimate/familial homicide and a more volatile set of upward/downward pressures on other types of female victim homicides.

5) Exploring cases initially where the victim-suspect relationship was initially recorded as 'Relationship not known'

Aim

Figure 26a in Annex 1 shows a large increase in cases where the victim-offender relationship was recorded as not known, beginning in the late 1990s and tailing off in the mid-2000s. The aim of the analysis presented here was to investigate possible reasons for this increase. Possible explanations included a recording practice change by police forces to default to Relationship not known during this time; geographical bias by one force accounting disproportionately for this increase, or a genuine increase in homicides in which initial circumstances were more unclear than for other years. Geographical bias had been excluded by an initial analysis of unknown cases by force.

Method

In 2015, hard copy paper files of cases on the Homicide Index were analysed alongside media reports to assess if subsequent years had brought to light information to indicate the victim-offender relationship. The years of focus were 2001/02 and 2002/03 because these were in the middle of the relationship not known peak.

Results

235 case files were examined across 2001/02 and 2002/03. A total of 155 cases (66%) contained information which indicated victim-suspect relationship and hence could be re-coded. Ten of the re-coded cases were subsequently excluded in line with the exclusions in the main body of this report (i.e. they were terrorist cases or they were cases involving more than 10 victims).

Table TA2 shows how the 155 cases were re-categorised.

Table TA 2: The percentage of all recoded cases by victim-suspect relationship type.

New Victim-suspect relationship sub-category	Number	% of all recoded cases
Stranger	77	50%
Friend or social acquaintance	30	19%
Emotional rival (not elsewhere specified)	8	5%
Carer, health worker/patient	7	5%
Criminal associate	7	5%
Spouse, common-law spouse or cohabiting partner	4	3%
Business associate	3	2%
Casual sexual partner	3	2%
Adulterous relationship	2	1%
Boyfriend, girlfriend	2	1%
Client/customer	2	1%
Prostitute/client	2	1%
Step-son/step-daughter	2	1%
Brother/sister	1	1%
Ex-boyfriend, girlfriend	1	1%
Ex-spouse, ex-common-law spouse or ex-cohabiting partner	1	1%
Other relative	1	1%
Son/daughter	1	1%
Step-parent	1	1%
Total	155	100%

This analysis shows that half of all the re-coded cases were committed by strangers. Such cases are likely to initially present as more difficult to solve than for example, cases committed by a spouse. For the time period 1977/78 – 2016/17, the percentage of all homicides classified as Stranger cases ranged from 8 to 25%. Only 27 of the recoded 155 cases were classified as intimate and familial as per the definition in section 10 - Type of homicide - representing 17% of the cases initially recorded as relationship not known. For 2012/13-2016/17, the dataset where the category intimate and familial was developed, the proportion of all cases classified as intimate and familial homicides was just under 30%.

Thus it seems that the cases initially classified as relationship not known in 2001/02 and 2002/03 were made up predominantly of cases where the principal suspect was ultimately found to be a stranger, and conversely that these cases contained only a small proportion of cases committed by those who were related to or had links to intimacy with the victim. Above all, this shows the need for the homicide index to be

updated by police officers with new information as it comes to light, even if several years have passed since the case was originally recorded.

Discussion and conclusion

The key conclusion is that the passage of time has revealed much useful information about the cases initially recorded as victim-offender relationship unknown in 2001/02 and 2002/03. This shows clearly the importance of updated case information being supplied to the Homicide Index records, even when considerable time has passed. A second conclusion is that cases where the relationship was initially recorded as unknown were recoded to intimate or familial cases about half as frequently as for all homicides in a year. The third conclusion is that around half of these cases were committed by strangers. The increase in recoded stranger cases increased the proportion of stranger cases in a year by an average of 4.5% across the two years of focus.

6) Intimate and Familial Homicides

To examine in detail the victim-offender relationship, in depth analysis of homicide trends in England and Wales between 2012/2013 and 2016/ 2017 was carried out. The methods were developed using two 2012/13 – 2016/2017 ‘snapshots’ of the Homicide Index. The methods developed on these 5-year snapshots were then applied to a longer 40-year snapshot of the Homicide Index for the analysis reported in the main body of this report.

Domestic homicides as published by ONS are defined according to the victim-offender relationship. The types of victim-offender relationship included in ONS published data on Domestic homicide are detailed below.

Legal definitions and ONS published stats

ONS published data on Domestic homicides from the Homicide Index include any homicide where the relationship between an adult victim (aged 16 and over) and the perpetrator falls into one of the following categories:

- spouse
- common-law spouse
- cohabiting partner
- boyfriend or girlfriend
- ex-spouse, ex-cohabiting partner or ex-boyfriend or girlfriend
- adulterous relationship
- son or daughter (including step and adopted relationships)
- parent (including step and adopted relationships) (note the cut off of 16yrs for victim age excludes infanticide cases as domestic)
- brother or sister
- other relatives”⁶

Changes to ONS reporting from 2017

In ONS statistics published in February 2017, two categories of victim-offender relationship that had previously been included in cases classed as ‘Domestic’ were

⁶ ONS (2017) ‘How are victims and suspects related’: Available at: <https://www.ons.gov.uk/peoplepopulationandcommunity/crimeandjustice/articles/homicideinenglandandwales/yearendingmarch2017#how-are-victims-and-suspects-related>

moved to the category of 'Other known' homicide. These two categories of victim-offender relationship were lover's spouse and emotional rival. The changes were made to better reflect the legal definitions of domestic abuse^{7, 8}.

For the purposes of the analysis presented in the main body of this paper, having the victim-offender categories of emotional rival, lover's spouse and casual sexual partner as separate from domestic cases raised an important question: where did they best fit within the remaining victim-offender categories? To help answer this question in depth analysis was carried out of these cases in the years 2012/13 to 2016/17 inclusive, using media searches and other relevant fields within the Homicide Index. The remainder of this Annex describes that analysis and the results.

Examining different categories of victim-offender relationship

a) Lover's spouse and emotional rival

Media analysis combined with analysis of detailed case information in the Homicide Index field 'Case details' revealed that the majority of these cases⁹ consisted of incidents where a love triangle seemed to be the main cause of the homicide. Two theoretical examples are given below:

Lover's spouse: Person A was having an affair and their spouse found out then attacked the lover. Note that if the spouse had instead attacked his spouse this would be classed as domestic.

Emotional rival: Person A's ex-partner became aware of the victim's new relationship and attacked the new partner. Note that the dynamics are similar to lover's spouse, except that for this incident the offender and victim reverse roles.

b) Casual sexual partner

The victim-offender category casual sexual partner is not currently included in published ONS statistics of domestic homicides. Due to the flexible nature of relationships, and the fact that some individuals involved may view a casual arrangement as more casual or less casual than their partner, this type of homicide

⁷ *ibid*

⁸ Domestic abuse is defined in crime counting rules as: "Any incident or pattern of incidents of controlling, coercive or threatening behaviour, violence or abuse between those aged 16 or over who are or have been intimate partners or family members regardless of gender or sexuality.

⁹ Lover's spouse accounted for only 5 cases (<1% of all cases) between 2012/13-2017. All fitted the love triangle typology. Emotional rival accounted for 24 cases (<1%) between 2012/13-2017. Case details could be found for 15 of these, and 13 (or 87% of the 15 with details) fitted the love triangle typology.

was also investigated to assess where it best fitted. Only 15 cases were categorised as casual sexual partner between 2012/13-2017 (<1% of all homicides), and all involved the homicide by or of an individual that the victim was sleeping with. A theoretical example of one case is given below:

Casual sexual partner: Person A was in two casual relationships at the same time. One partner found out about the other and attacked Person A.

Conclusion: all three victim-offender categories of emotional rival, lover's spouse, and casual sexual partner were similar in that the majority of cases involved the fall out from an ongoing or past relationship. Therefore, the decision was made to include these with the homicides carried out by family, partners and ex-partners and to essentially therefore create a new category of victim-offender relationship, 'Intimate and familial relationships.'

c) *Domestic dispute*

Within the Homicide Index, police have the option to check a box labelled 'Domestic dispute'. An analysis was carried out to ascertain the nature of these cases between 2012/13-2016/2017. Again, media sources were used to complement the data held within the Homicide Index. Each case was then scored according to whether the case fitted the 'love triangle' nature of events as described above. Results showed that over half (55%) of all cases that did not already fall into the Intimate and familial category, but that had 'domestic dispute' checked, fitted this description. Furthermore, these cases accounted for 83 cases or <1% of homicides between 2012/13-2016/2017. Therefore, the decision was made to include these cases in the definition of Intimate and familial homicides.

Table TA 3: Victim-offender relationships included in Intimate and Familial homicides, and ONS published figures of Domestic homicide.

	Familial and intimate	ONS data
Victim-offender relationship		
Family*	Yes	Yes
Partners and ex partners**	Yes	Yes
Adulterous relationship	Yes	Yes
Casual sexual partner	Yes	No
Emotional rival	Yes	No
Lover's spouse	Yes	No
Main circumstances of event		
Domestic dispute	Yes	No

* including step or adopted for parent, and son/daughter

** including common-law spouse

7) Drug and alcohol related homicides

The government's Serious Violence Strategy identified drugs as a likely driver of recent rises in Homicides in England and Wales. Twelve variables in the Homicide Index were identified that might give detailed information of whether a homicide is related to drugs, and if so what role drugs might have played. Four of these variables had been used for the analysis presented in the Serious Violence Strategy.

Table TA 4 below provides an overview of the different drugs related variables that were explored and indicates whether these were used in the Serious Violence Strategy analysis of drug-related homicides and for the analysis in this report.

Table TA 4: Homicide Index (possible) drugs variables

Homicide Index variable name	Previously used for analysis in Serious Violence Strategy	Used for updated analysis
1. Victim illegal drug user	YES	YES
2. Victim illegal drug dealer	YES	YES
3. Suspect known illegal drug user	YES	YES
4. Suspect known illegal drug dealer	YES	YES
5. Victim drink-drug level ^a	NO	YES
6. Suspect drink-drug level ^a	NO	YES
7. Suspect had motive to obtain drugs	NO	YES
8. Suspect had motive to steal drug proceeds	NO	YES
9. Drug related ^b	NO	YES
10. Method used (subcategory 'other poisoning (drugs etc.)')	NO	NO
11. Main circumstance of offence (subcategory 'unlawful administering of drugs')	NO	NO
12. General details on case (free text)	NO	NO

Notes: a. Divided into subcategories 'been drinking alcohol', 'taken an illicit drug', 'both

drinking alcohol and taking an illicit drug'. b. The Crimsec7 form also includes a tick box on whether a homicide circumstance was (thought to be) drug-related. As this category may not always be consistently used (e.g. police officers may not tick this box until they are very certain of this circumstance) we have not solely based our drugs analysis on this variable and included multiple other variables listed in this table.

Of the 12 variables listed above, two were excluded from further analysis because they included licit drugs ('methods used' and 'main circumstance of offence'); and free text data was also excluded because it was too resource intensive for regular analysis of homicide trends.

The Homicide Index variable on alcohol as used for the Serious Violence Strategy was also included in the updated analysis and no additional variables focusing on alcohol were identified. However, the updated analysis did include those instances in which a victim or suspect had taken an illicit drug *and* had consumed alcohol (compared to alcohol only).

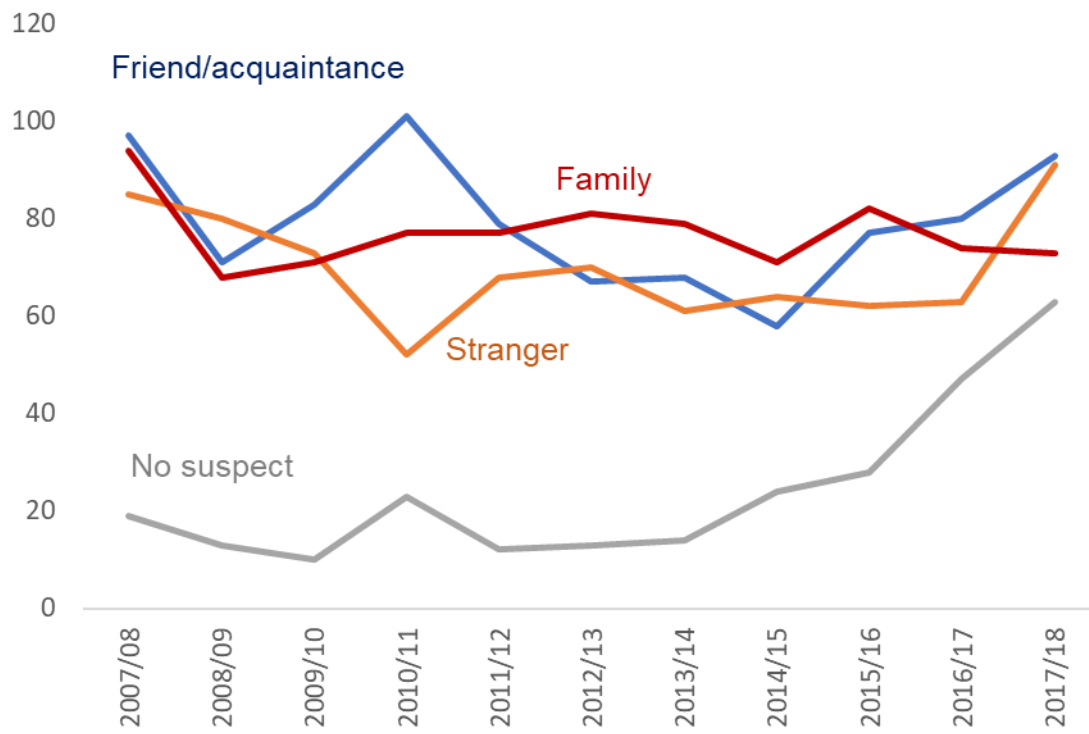
The approach taken for classifying a case as drug or alcohol-related and presented in the main body of this report is as follows:

- a. 'Drug-related'/'alcohol-related': if *any* of the relevant variables were ticked as YES
- b. 'No evidence of drug/alcohol involvement': if all variables were ticked as NO or unknown.

A key difference between the analysis presented here and that in the Serious Violence Strategy is that, in the latter, cases in which all variables were marked as NO were labelled as 'not drug-related' and any cases that had unknowns (for any variable) were labelled 'unknown'.

Further analysis showed that the increase in drug-related cases from 2014/15 was driven primarily by no-suspect and friend/acquaintance' cases with an additional sharp uptick in stranger cases from 2016/17 to 2017/18, see Figure TA 6.

Figure TA 6: Drug-related homicides by relationship of victim and suspect, 2007/08 to 2017/18



Source: Home Office Homicide Index

8) The CrimSec7 – submitting data to the Homicide Index

Police forces are required to submit a Crimsec7 form up to one month after the suspected homicide has been recorded, and then at key stages of the investigation such as when key new information comes to light, or a new suspect is identified.¹⁰

The Crimsec 7 form consists of a mix of mandatory and voluntary fields. As all fields have either blank or unknown as the default option¹¹, there is minimal risk for data entry bias towards 'No' or 'Yes'. It is possible that if any bias exists, it is towards 'unknown' or blank entries, because officers may be hesitant to flag cases as a definite 'yes' or 'no'. For example, in the initial stages of a homicide investigation police officers might be hesitant to flag cases as a definite 'yes, drug-related' when the context in which a homicide took place is still unknown.

All fields in the Crimsec7 form are validated via a macro before the form can be sent to the Home Office¹². The Home Office also conducts a sense check on the data and validates the data before manual entry onto the Homicide Index. An example would be checking that suspects have not been removed during a case update, or that dates make sense in terms of a sequence of events. Despite these checks, data quality will depend largely on what police officers submit, what they know at that time, and what they consider to be relevant for the case. For example, while some homicide entries include additional free text details about the case, in other cases this field is left blank.

As homicide cases can be complex and not all circumstances are initially apparent, the Home Office does not chase police forces for information and updates on homicides. Therefore, the timeliness and quality of updates is likely to vary. In addition, it is unknown whether police review all Crimsec7 fields when providing an update on a case, or whether they only change the relevant variable. This is a possible limitation for the analysis of homicide trends as important contextual information – such as whether a case is drug-related – may not be updated in the Homicide Index based on new information.

¹⁰ Homicide case details need to be submitted within 30 days of the crime being recorded; suspect details need to be submitted within 30 days of the suspect(s) being charged; and case outcome details need to be submitted within 30 days of the final court outcome or alternative conclusion of the investigation. Source: Crimsec 7 form (internal Home Office document).

¹¹ Technical Guide, Homicide Index Crimsec7 (April 2016), Home Office Statistics

¹² *Ibid.*

B: Notes for Annex 2 and all sections relating to international homicide trends

List of sources used in Annex 2 for international homicide trend data, by country:

England and Wales (Data Table I1): Series used in Annex 2 is the police recorded crime series sourced from Appendix Table A4 here:

<https://www.gov.uk/government/statistics/crime-in-england-and-wales-year-ending-september-2019> and historical recorded crime data available here:

<https://www.gov.uk/government/statistics/historical-crime-data>. The series contains certain exclusions (e.g. Shipman, Hillsborough).

The US (Data Table I2): For numbers of homicides, we used the Uniform Crime Report data tool, available here: <http://www.ucrdatatool.gov/>. Totals for the most recent years were taken from the UCR website). Population estimates were taken from the US Census, available at:

<http://www.census.gov/popest/data/historical/index.html>. This interpolates inter-census years. Long-term homicide rates by sex were sourced from: National Research Institute on Legal Policy Comparative Homicide Time Series (Lehti, 2013). Recent figures by sex came from: Puzzanchera, C., Chamberlin, G., and Kang, W. (2018). "Easy Access to the FBI's Supplementary Homicide Reports: 1980-2016." Online. Available at: <https://www.ojjdp.gov/ojstatbb/ezashr/>.

Canada (Data Table I3): Statistics Canada, Homicide Survey, Canadian Centre for Justice Statistics. From 2003, Statistics Canada. Table 253-0001 - Homicide survey, number and rates (per 100,000 population) of homicide victims, Canada, provinces and territories, annual. Population statistics are based on July 1 estimates from Statistics Canada, Demography Division.

Scotland (Data Table I4): Historical homicide data from: Parliamentary briefing, research paper 99/56. Available here: <http://researchbriefings.files.parliament.uk/documents/RP99-56/RP99-56.pdf>. Recent homicide numbers from: "Homicide in Scotland 2014-15" The Scottish government, available at: <http://www.gov.scot/Publications/2015/09/8172/downloads#res486357>. Population statistics: Mid-year population estimates, available here: <http://www.gro-scotland.gov.uk/statistics-and-data/statistics/statistics-by-theme/population/population-estimates/mid-year-population-estimates/population-estimates-time-series-data>.

Ireland (Data Table I4): Homicide figures up to 2003 from the National Crime Council, and from 2003 homicide figures from Central Statistics Office. Population figures from: Central Statistics Office.

Australia (Data Table I5): Historical homicide figures from: Violent Deaths and Firearms in Australia Data and Trends. Mukherjee, S. & Carcach, C. Australian

Institute of Criminology (1996). Available at: <http://www.aic.gov.au/mwg-internal/de5fs23hu73ds/progress?id=plz9mj3xYo2Ukn73s3zA8EZ5NTUFmiudekiGPCUfaWU>, Recent homicide numbers from: Victims of crime Australia (murder plus manslaughter victims). Population statistics from: Australian Bureau of Statistics, 'Australian Historical Population, 2014. Recent years: Australian Bureau of Statistics.

New Zealand (Data Table I5): Data on murders in NZ and population data from: Historic murder offences in New Zealand, 1926 – 2017. See: <https://www.police.govt.nz/sites/default/files/publications/historic-new-zealand-murder-rates.pdf>; data on homicides from: Police Statistics on Homicide Victims in New Zealand 2007 - 2016. See: <https://www.police.govt.nz/sites/default/files/publications/homicide-victims-report-2017.pdf>.

Scandinavian nations (Denmark, Norway, Sweden, Finland) (Data Table I6): For data to 2010, see: "Nordic Criminal Statistics 1950-2010" Van Hofer, H., Lappi-Seppala, T., and Westfelt, L. (2012) Homicide in Scandinavian nations. For more recent data, sources were Statistics Finland for Finnish homicide and population data, Statistics Denmark for Danish homicide and population data, Statistics Norway for Norwegian homicide and population data and the Swedish National Council for Crime Prevention for Swedish homicide data and Statistics Sweden for population data.

Austria/France/Italy (Data Table I7): Eurostat - Intentional Homicide (completed) - rates per 100,000.

Netherlands (Data Table I8): Homicide health data series from: Deaths; underlying cause of death. Available at: <https://opendata.cbs.nl/statline/#/CBS/en/dataset/7052eng/table?ts=1529931159691>. Netherlands CJS homicide series from: CBS statline. External causes of death. See: <https://www.cbs.nl/en-gb/our-services/methods/surveys/korte-onderzoeksbeschrijvingen/external-causes-of-death?RefererType=Favorite>.

Bulgaria/Hungary/Poland/Slovenia (Data Table I9): Eurostat - Intentional Homicide (completed) - rates per 100,000.

Japan (Data Table I10): Source for homicide data including attempts: Historical Statistics of Japan - Chapter 28.1. After 2004 from: Statistics Japan: Various Statistics yearbook publications. Source for completed homicides (excluding attempts): UNODC data warehouse (based on Japanese CJS data). Series for Mortality Statistics, deaths by assault, from the World Health Organisation. Population statistics from the World Bank, available at: World Bank data. http://databank.worldbank.org/data/reports.aspx?Code=SP.POP.TOTL&id=af3ce82b&report_name=Popular_indicators&populartype=series&ispopular=y#

C: Notes for Annexes C to H and all sections relating to the literature review of homicide drivers

Introduction and Objectives

The technique employed was that of a Rapid Evidence Assessment (REA). REAs provide a more structured and rigorous search and quality assessment of the evidence than an ad-hoc literature review but are not as exhaustive as a systematic review.

The main reason that the REA approach was selected, rather than a full systematic review, was that this section is intended as an accompaniment to the analysis of trends in England and Wales and other nations. The review was not seen as an end in itself and therefore, given the resource requirements, it seemed appropriate to adopt the REA approach rather than performing a full systematic review, which would have required far more time.

The main objectives of the REA were as follows:

- 1) To rigorously assemble an evidence base that can be used to assess factors that might have driven homicide trends in England and Wales. The review aimed to highlight the factors proposed and provide an assessment of the strength of evidence relating to their effect on homicide trends.
- 2) To develop specific hypotheses in relation to homicide trends in England and Wales.

The basic research question was: what factors determine changes in homicide rates? In order to answer this question, the REA sought to review all theories/hypotheses for changes in homicide rates that have been assessed by academics, government or research bodies.

Method

Criteria for inclusion and exclusion of studies: Our chosen research question was a deliberately broad one because the intention was not to pre-judge the possible factors behind the rise and fall of homicide in England and Wales. A series of selection criteria were therefore employed which aimed to ensure selected studies had maximum relevance to trends in England & Wales, and to make the project manageable. However, this also implies that the REA is highly unlikely to be entirely

exhaustive. We therefore welcome correspondence relating to missing evidence and will try and incorporate this into future updates.

The preliminary selection criteria were as follows:

- The study must involve at least one OECD country;
- The study must be concerned with changes in homicide over time. So purely cross-sectional studies were excluded, and only studies that looked at four years-worth of homicide data at least were included. However, if the study was based on a trial of some sort (e.g. RCT) over a shorter time period and referenced the impact of said trial, these were also included.
- The study must examine homicide trends for a time period including at least one year post-1945;
- The study must concern the relationship between a causal factor(s) and homicide trends, and/or unpicking contributing factors to homicide trends. Studies that merely sought to describe homicide trends were excluded.
- We excluded studies that looked exclusively at homicide trends during extreme political situations e.g. times of civil war, or prolonged violent ethnic/religious/political tensions (e.g. the 'troubles' in Northern Ireland, and the various 'Infitadas' in Israel).
- In England and Wales the term 'homicide' includes the offences of: murder, manslaughter, and infanticide. The REA includes studies looking at any subcategory of these offences but only if they relate to a substantial number of homicides, such that it could constitute a meaningful proportion of overall homicides for the area of study (e.g. partner homicides, child killings etc). Studies looking at drivers of homicide types that comprise only a very small proportion of total homicide (e.g. homicides perpetrated by serial killers) were excluded as were studies looking at mortality or violence more generally, without substantive reference to homicide.

Search strategy for identification of relevant studies: Five large research databases were used to search for relevant literature. These were chosen for their:

- Accessibility - other than ProQuest all other databases did not require subscriptions
- The ability to automatically download at least whole pages of citations, and preferably all search results, in one go – e.g. Google scholar required web-scraping code so was omitted on this basis.

- Coverage of all potentially relevant disciplines - e.g. criminology, social/public policy, social/behavioural sciences, economics, medical/health sciences

The databases searched are listed below:

- ProQuest (which includes Applied Social Sciences Index and Abstracts, EconLit, ERIC, National Criminal Justice Reference Service, PAIS international, Sociology Collection, Social Services Abstracts, Sociological Abstracts.)
- JSTOR
- IngentaConnect
- SpringerLink
- PubMed

In addition to these databases, the following journals were independently searched due to their topical similarity to the subject of inquiry.

- Homicide studies
- Journal of Quantitative Criminology
- Journal of Experimental Criminology

Some background literature on homicide trends was reviewed prior to the commencement of the REA. Several key studies that had been found in the preliminary stages of the project were used to define the key terms – e.g. Blumstein, Rivara, and Rosenfeld 2000; Bowling 1999; Ousey and Lee 2007.

The following search terms were used:

(homicide* OR murder* OR lethal violence) AND (trend* OR change* OR fall* OR decrease* OR drop* OR decline* OR rise* OR increase*) AND (explain* OR explanation* OR cause* OR determinant* OR theory* OR hypothesis*)

Though the above terms were used as a basis for all searches, search methods and terms did vary slightly depending on the database. This was partly because some databases only allowed searching of abstracts, while others allowed searches of full text. Similarly, some databases had different procedures for allowing wildcards (*), plurals (&), and the use of boolean operators (AND, OR, NOT). The adjustments were also to make the searches results as comprehensive as possible while also being manageable. For instance, the search terms used for ProQuest when used with JSTOR gave 170,000 results – a figure beyond the resources of this project. So, the search terms were adjusted slightly depending on the database to get a manageable number of hits. Ultimately, the search terms used for the databases went through multiple iterations to maximise the relevance of results.

In addition, the research team searched the libraries of both Cochrane and Campbell collaboration for anything related to homicide, with only one result that did not meet the inclusion criteria.

Processing the results: The original search produced 5,122 results, which were collated in Excel. Some databases allowed the automatic compilation of search results including abstracts, others just the titles and authors. After collation, obvious duplicate records were removed leaving 4,678 results. These titles were then sifted by two team members into three categories: a) subject matter clearly not relevant (3,162 titles); b) at least one inclusion criterion clearly not met but otherwise potentially relevant (407 titles); c) no clear reason that inclusion criteria not met (1,102 titles).

The abstracts were then reviewed for the 1,102 titles where inclusion criteria were potentially met. Some of the abstracts had to be found online as they were not included in some of the database results. Again, the manuscripts were grouped into three categories: a) not relevant (208 abstracts); b) all inclusion criteria not met but potentially useful secondary evidence (455); c) all inclusion criteria met (368). Additionally, the team deemed 72 items to be in a form deemed inappropriate for the review e.g. conference recordings, working group meeting transcripts, undergraduate theses. These had all been extracted from ProQuest. The full text of these studies was then skim-read. This process revealed 136 studies which, on reflection, did not meet the selection criteria. These were excluded. This produced a final list of 304 studies to code. See Table TA 7 for a full list of these studies.

Assessing quality of studies: Where relevant, the REA references the Scientific Maryland Scale as a measure of the methodological robustness of empirical work. However, the review did not exclude any studies based on methodological robustness.

This decision was made for two reasons. Firstly, the overall methodological robustness of the studies was poor, so a typical restriction based on methodological quality would have resulted in few studies meeting the criteria. The research question is a causal one: does factor X affect homicide rates? So, the most robust type of evidence to use would be experimental in nature, such as a randomised controlled trial (RCT). However, very few RCTs were identified. Most of the short-listed studies would be rated at 2 or below on the Maryland Scale, which is generally the bar for exclusion by organisations that specialise in systematic reviews such as the Campbell Collaboration.

The second reason that studies were not excluded based on methodological quality was that the aims and research question for this REA are arguably more conducive to less quantitatively robust approaches than those for other reviews. Often REAs or systematic reviews are used with the sole aim of trying to determine the effectiveness of a particular intervention. In these cases, it often makes good sense to restrict the studies based on methodological quality. Our aim though is to provide an evidence base with a view to testing hypotheses in England and Wales. So studies that offer plausible hypotheses, even if these are not tested to a high level of robustness, are more relevant. In this light, it should also be noted that many of the most influential studies in relation to drivers of homicide trends do not employ techniques that would score highly on the Maryland scale, yet clearly they contain evidence and information that has proved persuasive enough to influence subsequent researchers. See for example (Cohen and Felson 1979; Blumstein and Rosenfeld, 1998)

Linked to this, we are also persuaded by the methods suggested by Eck and Madensen (2009) and employed by Farrell et. al (2016) when examining long-term trends in crime. These authors suggest that analysis of 'data signatures' can 'improve the internal validity of evaluation findings' (ibid.). The essence of this approach is to ask: if X causes Y, what else would we expect to happen or not to happen. i.e. which data signatures would be consistent with a causal effect and which data signatures would be inconsistent and hence could be used to help falsify the hypothesis. In practice this means that we have tended to include individual examples of trends with no control group, if they can add anything to our causal conclusions. i.e. if we hypothesise that X is a driver of homicide trends, then a study showing a large change in X that is unaccompanied by a corresponding change in homicide seems relevant, even if the study is not well controlled. This is especially true if there is a lack of well controlled studies examining X.

However, although no studies were excluded on methodological grounds, the REA did aim to be very clear about our assessment of methodological quality for each study. It also prioritised the higher quality studies when drawing conclusions. Our overall approach to methodological robustness then was to be inclusive, but also transparent about the quality of evidence in all cases.

Secondary evidence: During the sifting process we divided studies into those that directly met the research criteria, those that had no relevance to the research question and those which did not meet the criteria but which could still have some relevance. This third group is labelled as 'secondary evidence' throughout the REA and was supplemented by: i) apparently relevant studies that were referenced or suggested by the primary studies, ii) studies that did not meet the criteria but which were especially relevant to England and Wales; iii) studies that became available after the date of the original search and which were clearly relevant.

The secondary evidence was reviewed more briefly than the selected studies, with the aim being to extract any relevant bits of information rather than exhaustively reading the full study. This information was then collected and reported on separately with methodological quality made clear.

Structure of the review: The findings of the REA have been divided into six sections. These correspond to the 'six drivers of crime' as set out in the Home Office's Modern Crime Prevention Strategy (HO, 2016). These are: alcohol, drugs, the effectiveness of the criminal justice system, opportunity/security, profit and character. The profit section also included a catch-all 'other' category, which included evidence relating to causal factors that didn't fit into one of the other categories.

This was done by coding the 304 abstracts by which of the six drivers of crime they most closely aligned. Where studies looked at more than one driver, this was noted. Reading of full texts was then allocated. A standardised coding schedule was used for each of the primary texts to note details about the methodology and findings. Secondary texts relevant to each of the drivers were identified through searching through all of the results using key words. E.g. for alcohol, the terms "alcohol*", "drink*", "beer*", "wine*", "spirit*", "drunk*", "intoxicat*" were searched for in all abstracts of secondary texts.

Though the findings were grouped in this way, it is acknowledged that there is considerable overlap between these categories and our choice of presentation in no way implies an either/or approach. The discussion section in the main report considers the degree to which different drivers of homicide may have operated in combination or even interacted to drive homicide trends.

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