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Citation for published version:

McVie, S, Norris, P & Pillinger, R 2020, 'Increasing inequality in experience of victimisation during the crime drop: Analysing patterns of victimisation in Scotland from 1993 to 2014-15', *British Journal of Criminology*, vol. 60, no. 3, pp. 782-802. <https://doi.org/10.1093/bjc/azy044>

Digital Object Identifier (DOI):

[10.1093/bjc/azy044](https://doi.org/10.1093/bjc/azy044)

Link:

[Link to publication record in Edinburgh Research Explorer](#)

Document Version:

Publisher's PDF, also known as Version of record

Published In:

British Journal of Criminology

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INCREASING INEQUALITY IN EXPERIENCE OF VICTIMIZATION DURING THE CRIME DROP: ANALYSING PATTERNS OF VICTIMIZATION IN SCOTLAND FROM 1993 TO 2014–15

SUSAN McVIE*, PAUL NORRIS and REBECCA PILLINGER

Research on the international crime drop has predominantly focused on the nature and extent of overall crime or changes in specific crime types, but less attention has been paid to how equally the crime drop has been distributed across society. Applying a novel quasi-longitudinal approach to Scottish victimization data, this article examines changes in the prevalence, frequency and type of victimization experienced. We argue that the crime drop has resulted in an increase in inequality between those at most and least risk of being a victim of crime, especially violence. The article contributes to theoretical debates on the crime drop, crime inequality and distributive justice, and provides policy recommendations on the importance of crime reduction strategies that target repeat victimization.

Key Words: crime drop, crime inequality, latent class analysis, distributive justice, Scotland, victimization

Introduction

Since the early to mid-1990s, there has been a dramatic and sustained fall in the volume of crime in North America, Canada, Australia and many European countries according to both police-recorded crime data and victim surveys (see [Zimring 2007](#); [van Dijk and Tseloni 2012](#); [Farrell 2013](#)). Within the body of literature that has emerged around these country-level changes in crime, there is broad agreement that the largest and most sustained reductions have occurred for property crimes such as vehicle thefts and burglary ([Rosenfield and Messner 2009](#); [Farrell et al. 2011b](#)), while there have also been significant (albeit less consistent) reductions in violent crime, including homicide and assault ([Blumstein and Wallman 2006](#); [Tseloni et al. 2010](#)). The extent and timing of the crime drop across different countries has shown sufficient similarity for some scholars to describe it as a ‘near universal drop’ ([van Dijk et al. 2007](#): 16) and most theoretical enquiry to date has focused on identifying some kind of global explanation (see [Tseloni et al. 2010](#); [Farrell 2013](#)). However, some scholars have questioned this assumption on the basis of important differences between countries, especially around the timing of the crime drop and the nature and consistency of change between property and violent crime (see [Aebi and Linde 2012](#)). This macro-level variation between crime types is important as it raises questions about whether the crime drop has been experienced

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evenly within the population, given that it is well known that different types of crime tend to be experienced by different groups of people (Gottfredson 1984).

The proposition that the burden of crime is unequally distributed within society is not new (see Thacher 2004; Tseloni and Pease 2005). It is well known that a small proportion of any given society tends to experience a greater than average share of all crime, an issue that has given rise to the notion of distributive justice. Rawls (1999) in his 'theory of justice' proposed that citizens of modern democracies should expect a fair and just social order underpinned by social cooperation and equal opportunity. His liberal principles of justice specified that social, political and economic capital should be structured so as to provide the greatest benefit to the least advantaged members of society. Nevertheless, the unequal distribution of crime within society has been an enduring finding of criminological enquiry and, therefore, raises the question of whether crime inequalities have reduced, remained stable or increased further as a result of the crime drop.

In an effort to explore whether the dividend of the crime drop has been shared equally, a small number of studies have conducted a micro-level analysis of crime victims. Using British Crime Survey¹ data from 1982 to 2012, Ignatans and Pease (2015) found that, although crime in England and Wales had reduced in absolute terms, the relative share of all crime had increased over time among the most victimized households. They found this to be true for vehicle, property and personal crime (Ignatans and Pease 2016) and concluded that crime had become more concentrated among those households that were already victimized. Analysis of the International Crime Victimization Survey indicated that the same pattern could be observed across 13 countries (Pease and Ignatans 2016). Furthermore, the characteristics of those groups that experienced the most crime were remarkably stable across countries (i.e. they were the most disadvantaged socially, economically and demographically). Using a different methodology, Hunter and Tseloni (2016) explored the changing distribution of burglary across different social groups and areas between 1993 and 2008–09 in England and Wales. They also found a widening inequality gap in terms of those households that experienced burglary and those that did not, with risk remaining highest within households and areas that were characterized by socio-economic disadvantage.

These studies are significant in two main respects. First, they suggest that the crime drop is associated with a social and economic concentration effect that has increased crime inequality. This has profound implications for theories of the crime drop and whether these can be claimed to be universal in nature, as well as the changing nature of distributive justice within contemporary society. Second, they indicate that crime prevention policies should be increasingly targeted at vulnerable households that are subject to repeat victimization to have the most beneficial effect, especially during an era of severe financial constraint. However, these studies have a number of methodological limitations and are flawed in their approach to understanding victimization. Victim surveys are intended to provide a 'victim centred' measure of crime, which means that they should take into account not only the frequency of victimization but also the different types of victimization experienced by each individual (i.e. the crime mix). This is crucial to gaining a holistic understanding of a person's experience of victimization within a specified period of time (typically the last 12 months). Hunter and Tseloni's

¹From 2012 onwards, the British Crime Survey was renamed the Crime Survey for England and Wales.

work focused only on burglary, while Ignatans and Pease's work examined different crime types but did so separately. In addition, both sets of analyses focused on the household rather than the individual. Since victim policies are typically targeted at the needs and experiences of individuals, household-level analysis is unlikely to provide the granularity of evidence required to support policy development. Finally, although these prior studies used repeated cross-sectional survey data, [Hunter and Tseloni \(2016\)](#) simply compared two time points (therefore ignoring all change in between) and [Ignatans and Pease \(2015; 2016\)](#) conducted separate analysis for each year rather than applying a quasi-longitudinal methodology that takes full advantage of the repeated sweeps of data. Neither of these approaches, therefore, can fully understand change in the individual distribution of victimization during the period of time covered by the crime drop.

Many studies have shown that the distribution of crime within a general population tends to exhibit an excess of zeros and a long 'right tail' or diminishing number of high values (see [McDowell 2010](#) for a detailed discussion). Such a distribution suggests that the majority of the population are likely to be non-victims, while a small proportion of the population appear to be repeat victims of crime. In other words, frequency of victimization is not distributed equally across the population ([Hope and Trickett 2008](#)). In addition, the prevalence of victimization within the population is greater for property crimes, especially vehicle theft and criminal damage, and far lower for violence and crimes against the person (see [ONS 2015](#); [Scottish Government 2016](#)). The unequal distribution of crime across the population, both in terms of frequency and crime type, combined with the knowledge that the extent of the crime drop has varied across crime types, gives rise to the possibility that there has been a profound change in the nature of crime inequalities within jurisdictions. However, surprisingly little attention has been paid to this issue within the crime drop literature.

Understanding the distribution of crime

Research on the distribution of crime has tended to focus separately on the extreme ends of the distribution; that is to say, either the probability of becoming a victim ([Nelson 1980](#); [Sparks 1981](#); [Tseloni 2006](#)) or the nature and level of repeat victimization ([Hope et al. 2001](#); [Tseloni et al. 2002](#); [Farrell and Pease 2007](#)). Both approaches to understanding the 'prevalence' and 'frequency' of victimization have merits. Concentrating on the prevalence of victimization addresses the fact that the majority of the general population in any one year are not victimized and helps sidestep the statistical difficulties associated with modelling skewed count data. Meanwhile, work that focuses on the small proportion of the population who experience a disproportionate share of crime is of particular relevance to policy debates around how limited criminal justice resources can best be targeted to respond to those who are at most risk of experiencing crime. However, since a fall in the aggregate level of victimization could occur as a result of either a fall in the overall number of victims or a reduction in the total number of incidents of crime experienced by victims, or indeed both, then considering the two ends of the overall distribution in isolation cannot provide a complete explanation of the changes underpinning the crime drop.

Taking advantage of the detailed information collated by victim surveys, [Hope \(2001\)](#) outlined how an individual's experience of crime could be represented by a three dimensional matrix, consisting of *time* (the reference period covered by the survey

question), *type of victimization* (identified by asking questions about different types of victimization) and *frequency* (the number of times each type of crime occurred within the reference period). In essence, the aggregate distribution of crime within a population is a combination of *all* incidents of *all* types of crime experienced by *all* victims and, as such, it conceals substantial variation between individuals in terms of prevalence, frequency and type of victimization. The implication of this matrix is that the aggregate level of crime must represent several sub-populations, each with different experiences of victimization. Thus, to truly understand the mechanisms of the crime drop, and the extent to which its dividend has been shared across the population, requires an understanding of how both the relative sizes of these sub-populations and the type and frequency of crimes they experience has varied over time.

A potential analytical solution to this problem lies in the work of [Hope and Norris \(2013\)](#), who applied latent class analysis (LCA) to victim survey data from England, Wales and Scotland. They tested the hypothesis that the frequency distribution typically observed in cross-sectional victim survey data was a heterogeneously distributed product of mixing together two separate processes that were associated with each of the opposing tails of the crime distribution. Their LCA models identified a large class of non-victims and several smaller victim classes who varied in terms of the frequency and type of victimization they experienced. In particular, they found a small cluster of people who were frequent victims of all types of crime. Therefore, the aggregate level of victimization within the population was a product of the prevalence within each class of victims multiplied by the frequency of victimization experienced by each member of the class. However, Hope and Norris's work also has limitations in that it modelled property crime and personal crime separately and did not use repeated sweeps of data to account for change over time.

This article makes three main contributions to this field of study. First, it extends Hope and Norris's methodology to model change in the distribution of victimization over time and, specifically, over the period of the crime drop. Second, it examines the extent to which reductions in the aggregate level of victimization are the result of a change in the prevalence of particular classes of victims, or a change in the frequency of crime experienced by particular classes of people, or both. Finally, it improves on previous work by examining change over time in the mix of crime types experienced by different classes of victim.

The Scottish context

Like many other countries in Western Europe, Scotland witnessed a large decline in crime over recent decades ([McVie 2017](#)). Police statistics show a 58 per cent fall in recorded crime from its peak in 1991 to 2016–17, resulting in a crime rate at its lowest level since 1974 ([Scottish Government 2017](#)). This includes unprecedented falls in housebreaking,² motor vehicle theft, non-sexual violence and criminal damage. Of course, police statistics have many limitations and, therefore, are not always a dependable source of trend information ([Coleman and Moynihan 1996](#)). It is widely accepted

²Under Scots criminal law, the term housebreaking refers to entering a dwelling (including any attached building, such as a garage) in an unusual way with the intention of committing a theft. The term is broadly similar to the definition of burglary used in England and Wales.

that victim surveys provide a more reliable estimate of the total amount of crime experienced within the population and a more stable indicator of changing trends over time (for a critique of victim surveys, see [Mayhew 2000](#)).

In Scotland, 11 repeated cross-sectional victim surveys were conducted between 1992 and 2014–15.³ These showed a more modest 35 per cent reduction in crime, mainly driven by falls in motor vehicle theft and housebreaking ([Scottish Government 2016](#)), although this figure is not directly comparable to the recorded crime estimate as different crime categories are included (see [Pillinger 2017](#)). This article uses data from these Scottish victim surveys as they are relatively unaffected by arbitrary or technical issues (such as changes in reporting or recording that typically affect the reliability of police-recorded statistics) and, therefore, represent a robust source by which to explore change in the prevalence, frequency and type of victimization over time. Given the broad similarity in trends to many other countries, and the availability of victim survey data over the full period of the crime drop, Scotland represents a good case study jurisdiction in which to examine any change in inequality among those who experience crime.

Data and methods

The Scottish victim surveys involved face-to-face interviews with one adult (aged 16 or over) from randomly selected households across the Scottish mainland and its largest Islands. Respondents were asked a series of screening questions designed to identify the types of crime they had experienced during the previous 12 months. Anyone reporting victimization completed up to five victim forms, which collected specific details about what happened to them. Each victim form could cover a single incident or a series of very similar incidents where ‘the same thing was done under the same circumstances and probably by the same people’. An offence code was applied to each incident or series of incidents, and prevalence and frequency measures were calculated for each type of victimization. Only those incidents occurring in Scotland during the 12-month reference period were considered valid. There were some differences in procedure and coding over the 11 sweeps of the survey, so efforts were made to minimize these differences (see [Pillinger 2017](#)). For example, the method used to calculate official incidence rates had changed between earlier and later sweeps; therefore, to retain consistency, the method of incidence calculation used in the most recent sweeps was adopted. The changes were minor, but there is a small possibility that these could partially explain observed changes in patterns of victimization over time.

Eleven survey sweeps, involving 96,793 respondents, were conducted between 1992 and 2014–15. Relevant variables from these sweeps were merged into a single data spine, and appropriate survey weights were included to adjust for unequal selection probabilities and non-response, thus ensuring that any victim class identified was not over- or under-represented relative to its size in the population. Unlike previously published work, this analysis combined crimes against individuals (including

³The term ‘Scottish victim survey’ is used in this article to collectively describe all surveys over time, but there have been some changes over time in the name, design, frequency and management of the victimization surveys in Scotland (see [McVie et al. 2011](#)).

violence and robbery) and crimes against households (including housebreaking and vehicle theft). An estimate of prevalence for a personal crime, such as robbery, could be interpreted as the probability that an adult in Scotland had been a victim of robbery during a specific year, while an estimate for a household crime, such as housebreaking, could be interpreted as the probability that an adult in Scotland lived in a household who had been a victim of housebreaking during a specific year. Similarly, an estimate of the frequency of robbery could be interpreted as the number of incidents of robbery that an adult living in Scotland could expect to experience during a specific year, while the frequency estimate for housebreaking could be interpreted as the number of incidents of housebreaking that a Scottish adult could expect to happen to their household. To adjust for differences in sample size, the weights for each sweep were multiplied by a factor that ensured that weights were the same within sweeps, and the sum of the weights within each sweep was also the same. This prevented survey sweeps with larger samples (i.e. those from 2008 to 2009 onwards which had the lowest victimization rates) from unduly influencing the overall latent class model.

Extending Hope and Norris's (2013) methodology, LCA was applied to the data spine to identify classes of victims based on type and number of incidents of victimization experienced. Each respondent was able to complete up to five victim forms, describing either a single incident of victimization or a series of similar incidents. There were 38 separate offence types recorded in the data; however, to enable model estimation, these were combined into four broad groups: motor vehicle crime; household crime; personal theft and robbery; and assaults and threats (see Appendix 1). In addition, the number of incidents in any series was capped at 4 (which affected a very small percentage of victims and made no difference to the LCA). As a consequence, it was not possible to identify highly disaggregated groups of victims based on crime type and incidence; however, since LCA is a heuristic technique, it could be argued that it is more useful to identify broad classes of individuals within the population.

Descriptive analysis

Extent of change in prevalence and incidence for each of the four broad crime groups between 1993 and 2014–15 is illustrated in Figure 1a and 1b, respectively. Overall, the prevalence of victimization halved from 32.1 per cent in 1993 to 15.1 per cent in 2014–15. Figure 1a shows that the largest decline in prevalence over this period was for motor vehicle crime (which fell by 73 per cent) and household crime (which fell by 53 per cent), the largest drop occurring between 1993 and 2000. The percentage of people experiencing personal theft and robbery was much smaller overall, but this also fell by 46 per cent. There was also a 16 per cent drop in the percentage of people experiencing assaults and threats between 1993 and 2014–15, although prevalence fluctuated up and down between 4 per cent and 6 per cent over this period. The much smaller decline in prevalence of assaults and threats means that it increased in terms of percentage share from 17 per cent of all victimization in 1993 to 31 per cent in 2014–15.

The changing patterns of incidence of victimization largely reflected the changes in prevalence, as shown in Figure 1b. Overall, the incidence of victimization more than halved, from an average of 0.56 incidents per year in 1993 to 0.25 in 2014–15 (note that values are much lower than one because most survey respondents were not victims). Looking at each of the four crime groups, the overall fall in incidence largely reflected

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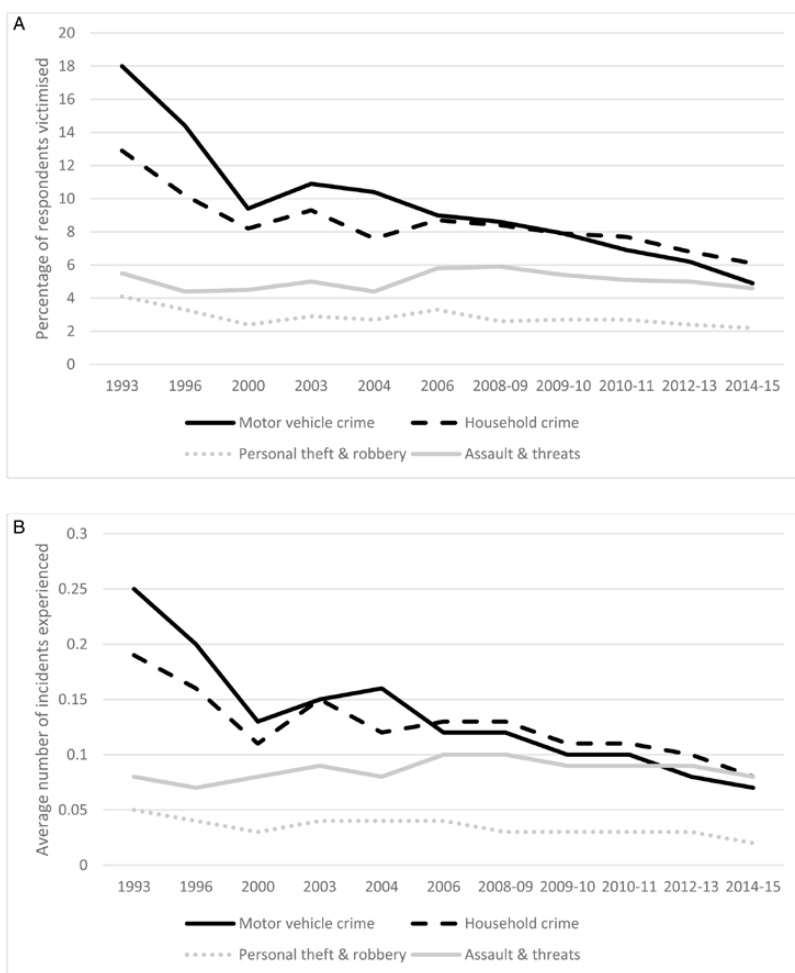


FIG. 1 (a) Percentage of Scottish victim survey respondents victimized, by crime group and survey year (prevalence). (b) Average number of incidents experienced by Scottish victim survey respondents, by crime group and survey year (incidence).

a reduction in numbers of motor vehicle crimes (which fell by 72 per cent) and household crime (which fell by 58 per cent). Notably, the pattern and extent of the reductions in property crime were broadly similar to the falls in prevalence. However, there was a 60 per cent reduction in incidence of personal threats and robbery over the period, which was larger than expected given the drop in prevalence was only 46 per cent, but did not contribute much to the overall drop due to small absolute numbers. The incidence of assault and threats (which was also small in terms of absolute numbers) fluctuated from year to year but showed no overall decline over time.

As noted earlier, previous work analysed different crime types separately; however, this approach ignores the fact that some crime types can demonstrate ‘clustering’. Table 1 shows that Scottish victims who experienced household crime were slightly more likely to also experience motor vehicle crime compared with those who experienced personal

TABLE 1 *Percentage of people who experienced a crime in one group (row) who also experienced a crime in another group (column)*

	Motor vehicle crime	Household crime	Personal theft and robbery	Assault and threats
Motor vehicle crime	—	18	5	9
Household crime	20	—	6	13
Personal theft and robbery	18	18	—	18
Assault and threats	17	22	10	—

theft and robbery, or assaults and threats, while people who experienced assaults and threats were slightly more likely to also experience household crime than those who experienced motor vehicle crime or personal theft and robbery. The greatest degree of concurrence occurred between crimes involving violence. For example, victims who experienced assaults and threats were around twice as likely to also experience personal theft and robbery compared with those who experienced motor vehicle or household crime, while those who experienced personal theft and robbery were more likely to also experience assaults and threats than those who experienced household and, especially, motor vehicle crime. This pattern of victim concurrence is in line with [Hope and Norris's \(2013\)](#) typology of victims, which indicated that LCA was likely to identify clustering of victims by crime type. Taking this analysis further, a clustering analysis approach was used to determine the extent to which change in victimization over the period of the crime drop was variously accounted for by changes over time in the prevalence and incidence of different types of crime.

Latent class Modelling of Victimization Patterns

LCA is analogous to traditional cluster analysis, endeavouring to group together cases which are similar across a range of different measures ([Muthén 2001](#)). As a technique, it is designed to work with data that are not normally distributed (such as the ordinal measures of victimization employed in this article). LCA models estimate the class membership of each individual using two types of parameter: the probability that an individual appears in each of the classes identified, and the average value for each variable for respondents within each class. Both of these estimates are relevant to understanding the changing nature of victimization. When aggregated, the probability of individuals appearing in each class identified by the model provides a measure of the prevalence for different 'types' of victim, while changes in the average value for each of the victimization types within a class will illustrate change in the nature of victimization experienced by a particular group over time.

Identifying the appropriate number of latent classes needed to represent a distribution is an iterative process. Models containing different numbers of classes are estimated and these are compared in terms of both model fit and theoretical interpretation. A range of statistical indicators have been developed to help identify the optimal number of classes to include in an LCA model, and there are ongoing debates about which model fit measure is most appropriate (see [Yang 2006](#), [Nylund et al. 2007](#)). The adjusted Bayesian information criterion (ABIC; [Sclove 1987](#)) is one of the most

common statistical indicators used within the social science literature for assessing model fit. It is a function of a model's log-likelihood value, but includes a penalty for models that estimate additional parameters (in the case of LCA models, those which include additional classes), and a parameterization of sample size intended to reduce variability of results due to changes in sample size. When comparing a range of models, the one with the smallest ABIC value would be favoured in terms of model fit. On examining the ABIC values for the analysis conducted here, a four-class solution appeared to be the optimum model for these data as it had the lowest ABIC value.⁴ Class membership probabilities over time were calculated after fitting the model using a bootstrapping approach. This took account of uncertainty in the model parameter estimates used to predict class membership probabilities and, therefore, enabled the calculation of confidence intervals for the probabilities. The means of these provided point estimates, and the 2.5th and 97.5th percentiles represent the lower and upper limits of the confidence intervals.

Results

The LCA model estimated four classes of victim within the Scottish adult population living in households between 1993 and 2014–15. The characteristics of these classes are illustrated in [Figure 2](#) that shows, on the right, the total number of crimes experienced per victim on average for each of the four crime types and, on the left, the average number of crimes of each type experienced per victim within that class. Examining the classes pooled across all years, the largest class, which consisted of 82.3 per cent of the population overall, was labelled 'Non-victims' as they had a very low (almost zero) probability of experiencing any type of crime. The next largest class, making up 12.0 per cent of the population overall, was labelled 'One-off Property Victims' as they had experienced on average just over one incident of crime in the previous year, most commonly a motor vehicle or household crime. The third class, representing 5.4 per cent of the population, was labelled 'Multiple Mixed Victims' as they tended to experience an average of around two incidents of crime per year, consisting of a mixture of motor vehicle crime, household crime, and assault and threats. Finally, just 0.3 per cent of the population overall were in a class labelled 'Frequent Personal Victims'. They experienced an average of 3.5 incidents of crime per year and were most likely overall to experience assaults and threats, and personal theft and robbery.

Because LCA class membership is based on probability, probabilities of belonging to all four classes were estimated for each individual. The estimates of the average number of incidents for each class are, therefore, based on all individuals weighted according to their probability of belonging to that class. Probability also comes into play in the sense that the incidents experienced by members of each class are estimated to have a certain distribution: the probability of experiencing each number of incidents is constant for members in the same class, but the actual number of incidents experienced will vary from person to person. Therefore, the error bars in [Figure 2](#) show the confidence intervals around the average incidence of each crime type experienced by victims. Consequently, those who actually experienced one or more incidents of crime

⁴ABIC values were as follows: one class model 224,112; two class model 221,077; three class model 221,011; four class model 220,997; five class model 221,097; six class model 221,199.

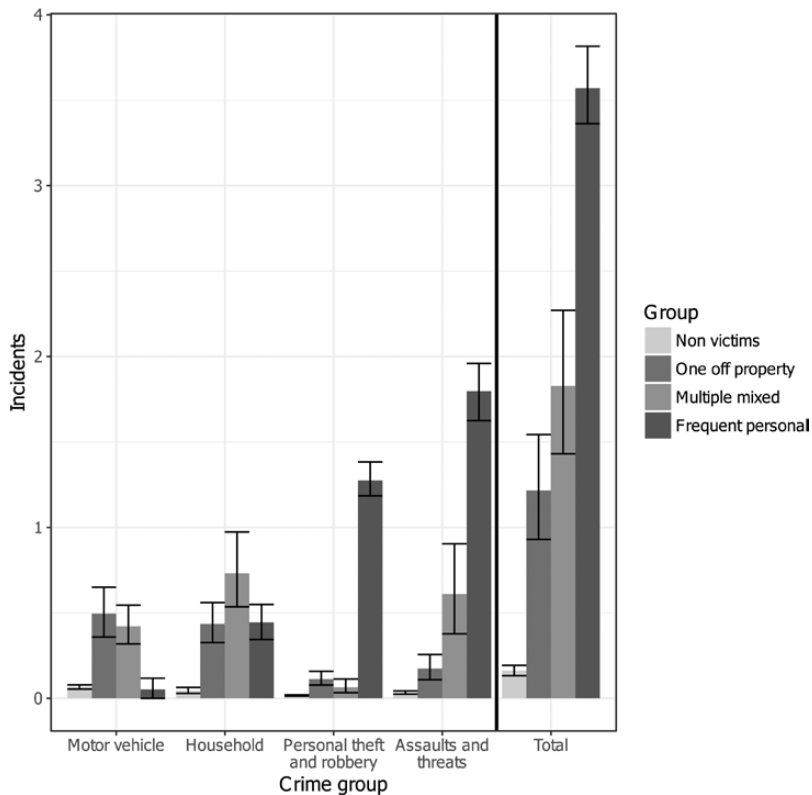


FIG. 2 Average number of incidents for each crime group experienced by people in each victim class.

may have a (small) probability of belonging to the Non-victim class. Correspondingly, people who did not experience any crime may have a (small) probability of being in one or more of the three victim classes.

As for any statistical model, it is unlikely that the true value of the parameters was identified exactly, which means there is some uncertainty around the estimates. For the LCA model, there is uncertainty both in terms of the group membership probabilities and the distribution of the number of incidents of each crime type for members of each class. Accordingly, the 95 per cent confidence intervals shown in Figure 2 are based on both sources of uncertainty. The confidence interval for the total number of incidents experienced per victim ranged from 0.9 to 1.5 for One-off Property Victims and from 1.0 to 2.5 for Multiple Mixed Victims. The interval for the smallest class, the Frequent Personal Victims, had a wider range from 2.0 to 5.0 incidents per victim.

Figure 2 reveals considerable variation in the amount of each crime type experienced by the four victim classes. Looking at the point estimates of the expected number of incidents of each crime type, the Non-victim class experienced only 0.16 incidents overall and less than 0.1 incidents for any one crime type. The One-off Property Victims experienced about an equal number of incidents of motor vehicle (0.50) and household crimes (0.44), but very few incidents of personal theft and robbery (0.11) or assaults and threats (0.17). The Multiple Mixed Victims experienced fewer incidents of motor vehicle

crimes (0.42) than the One-off Property Victims, but a far greater number of household crimes (0.73). This class also experienced a considerable number of assaults and threats (0.61). Indeed, they were almost as likely to be a victim of violence as they were to experience household crime, but they experienced almost no incidents of personal theft or threats (0.07). The Frequent Personal Victims experienced almost no incidents of motor vehicle crime (0.05), which could be due to a very low level of vehicle ownership among these individuals. They experienced a similar number of incidents of household crime to the One-off Property Victims (0.45); however, they experienced far more incidents of personal theft and robbery (1.28) and assaults and threats (1.80) than the other classes.

Change in victim classes over time

The primary focus of this article was to examine change in class membership over time to determine whether the crime drop reflected any inequality in the reduction of victimization across different victim classes. Figure 3 shows the percentage change in probability of class membership within the four victim classes as an indexed trend, from 1993 to 2014–15. As expected, there was a significant increase over time in the probability of being in the Non-victim class, from 0.78 in 1993 to 0.86 in 2014–15. The largest reduction in victimization was experienced by the One-off Property victims, which declined in terms of probability from 0.16 in 1993 to 0.10 in 2014–15. The probability of being a Multiple Mixed Victim also declined significantly, although to a lesser extent, from 0.06 in 1993 to 0.05 in 2014–15. However, there was no clear upward or

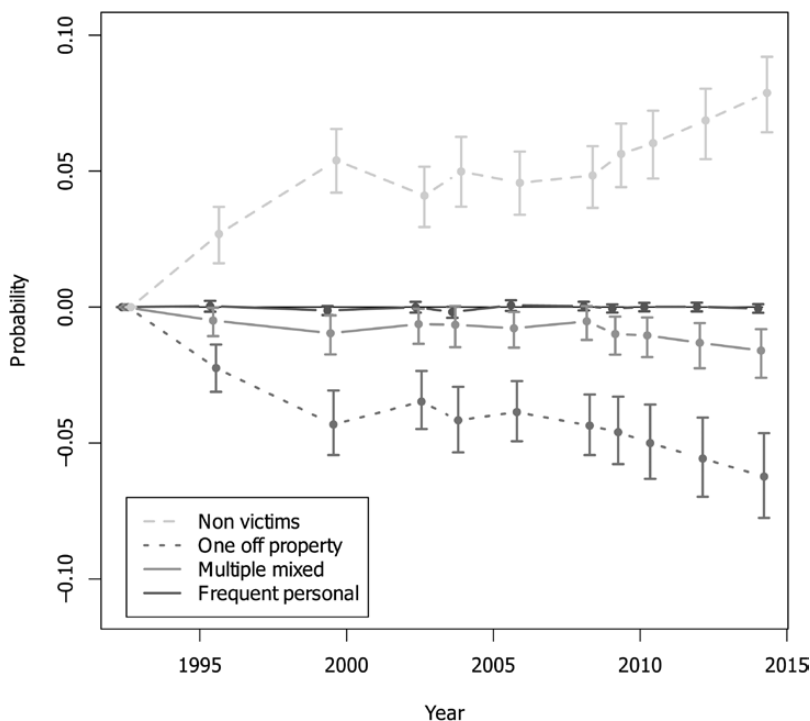


FIG. 3 Percentage change in the probability of victim class membership from 1993 to 2014–15.

downward trend apparent among the Frequent Personal Victims. In other words, the crime drop was mostly explained by a large reduction in victimization among those who experienced an average of one incident of property crime per year and, to a lesser extent, those who experienced around two incidents of mixed crime types per year; however, there was no change for those who experienced the most frequent victimization and who were most likely overall to experience violent crime.

Another point that is clearly evident from [Figure 3](#) is that falling victimization in Scotland occurred in two distinct phases. The trend for One-off Property Victims shows a clear drop from 1993 to 2000; then, it plateaus until around 2008–09, before there is a second distinct fall. The pattern for Multiple Mixed Victims is similar, although it is harder to detect because the percentage change is much smaller. Caution is needed in determining the precise timeframe for the change in victimization since survey data were not available for all years (especially in the early period). Nevertheless, the suggestion that the crime drop occurred as a series of distinct phases rather than as one continuous period of change is consistent with other research in Scotland. For example, [Matthews and Minton \(2018\)](#) found two distinct phases of decline in criminal convictions, especially among young people aged under 25, between 1989 and 2000 and then again between 2007 and 2011. Moreover, patterns of referral to the juvenile justice system and changes in the age profile of the prison population in Scotland are indicative of two distinct eras of crime reduction with a period of stasis in between ([McAra and McVie 2018](#)).

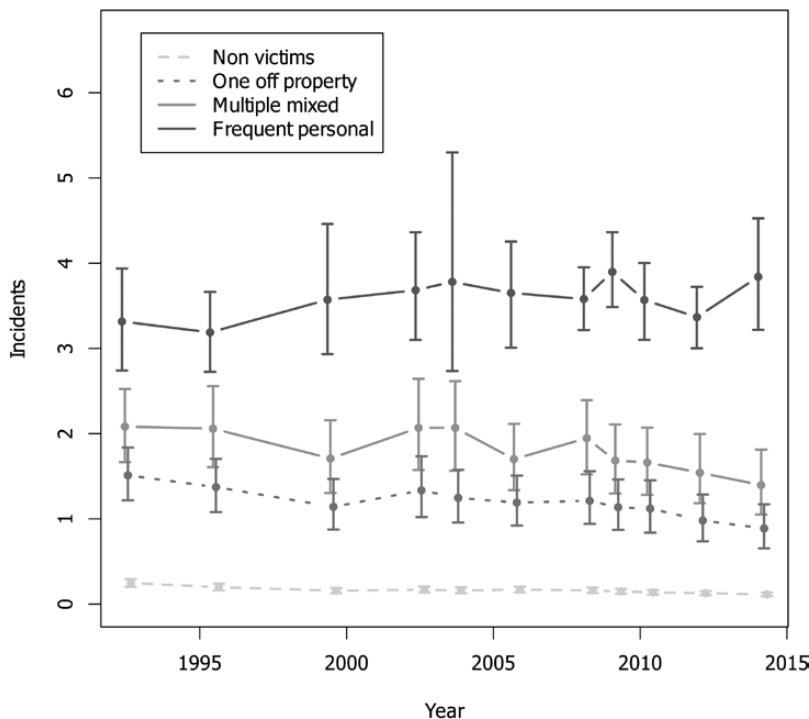


FIG. 4 Change in average number of incidents of any kind of crime for each class from 1993 to 2014–15.

Different patterns of change were also found in the average number of incidents of crime experienced by members within each class over time. Figure 4 shows that the average number of incidents experienced by Frequent Personal Victims increased, from 3.32 in 1993 to 3.84 in 2014–15, although this change was not statistically significant. Conversely, the average number of incidents experienced by individuals in the other three classes declined significantly over time. Among the Non-victims, who already experienced a very small number of incidents of crime on average, there was a small but significant reduction from 0.25 to 0.11 incidents over this period. Whereas the average number of incidents experienced declined from 1.51 to 0.89 for the One-off Property Victims and from 2.08 to 1.40 for the Multiple Mixed Victims. These findings strongly suggest that the crime drop in Scotland was underpinned by a reduction in the average number of incidents experienced by all classes *except* the Frequent Personal Victims.

Changing class membership or a reduction in incidence?

Analysis was conducted to determine whether the overall fall in victimization was primarily a result of change in the size of class membership (prevalence) or change in the number of incidents experienced by each class (incidence). This is important as it

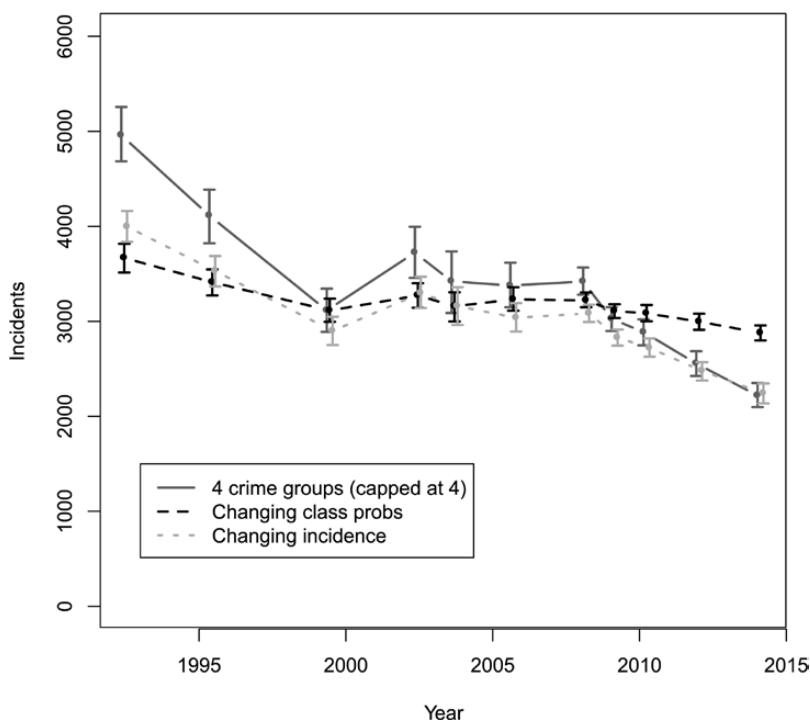


FIG. 5 Change in the total estimated number of crime incidents using different estimation techniques.⁵

⁵The data have been re-scaled so that, for each sweep, the number of incidents per 8,796.6 people is shown, rather than the number of respondents in that sweep. The solid line labelled '4 crime groups (capped at 4)' represents the change over time in the actual number of incidents reported to the survey which was capped at a maximum of 4 for each crime type.

helps to explain whether the crime drop was due to fewer victims, or a lower frequency of victimization among victims, or indeed both. Figure 5 shows different estimations of the total number of crime incidents (combining all four crime types together) that were experienced by all individuals across the four victim classes. The solid line shows overall change in the number of incidents of crime (across all four crime groups, with the data capped at four incidents of victimization per person) that were experienced between 1993 and 2014–15. The trend shows a dramatic decline between 1993 and 2000, followed by a significant increase in 2003, a modest decline to 2008–09 and then by a sharp and continuous drop to 2014–15.

The dark dashed line labelled ‘Changing class probs’ in Figure 5 represents the estimated number of incidents that would have been experienced if the class membership probabilities had changed over time in the way shown in Figure 3, but the number of incidents experienced on average by members of each class had stayed fixed at its average (i.e. at the values shown to the right of the vertical line in Figure 2). In other words, holding the incidence for each class constant, how much would the change in class membership have contributed towards the overall drop in victimization? Figure 5 shows that this would have resulted in a slight (but non-significant) decrease in the total number of incidents experienced over time; however, this would have been far shallower than the actual change in victimization. Therefore, changing class membership alone did not account for the sharp drop in victimization between the 1993 and 2000 sweeps and then again between the 2008–09 and 2014–15 sweeps.

The light dashed line labelled ‘Changing incidence’ represents the total number of incidents that would have been experienced if the class membership probabilities had been fixed at their averages over time, but the average number of incidents experienced by people in each class had changed in the way shown in Figure 4. In other words, holding the class membership constant, how much did the change in the number of incidents experienced by each victim class contribute towards the overall fall in victimization? Figure 5 shows a sizeable reduction in the number of incidents occurring between 1993 and 2000 and then again between 2008–09 and 2014–15. The decrease in victimization is slightly more pronounced when the class membership is fixed than when the incidence is fixed, which suggests that both periods of the crime drop were explained by fewer victims and a lower frequency of victimization, but it was the latter that made the largest contribution.

Did incidence reduce for all four crime types within the victim classes?

Having established that the crime drop was explained to a greater extent by a reduction in incidence of victimization rather than changing class membership, it is important to examine whether incidence of all four crime types had reduced for all of the victim classes. Examining just the three victim classes, we found no significant change over time in the average number of incidents of personal theft and robbery experienced by any group. The number of incidents of motor vehicle and household crime experienced by One-off Property Victims and Multiple Mixed Victims declined significantly between 1993 and 2014–15; however, there was no identifiable change in the average incidence of these two crime types among the Frequent Personal Victims. Most importantly, the average number of incidents of assaults and threats declined significantly over time for One-off Property and Multiple Mixed Victims; however, there

was a small but significant increase in the average number of incidents of assaults and threats experienced by Frequent Personal Victims over this period. So, not only was there no change in the overall likelihood (or prevalence) of being a Frequent Personal Victim over this time period, but the average number of incidents experienced remained constant in the case of motor vehicle and household crime and increased in the case of assaults and threats over the period of the crime drop. These findings provide further evidence of an increase in inequality among different 'types' of victim over the period of the crime drop.

Discussion

Using Scotland as a case study, this article set out to examine whether relative inequality in the distribution of crime had reduced, remained stable or increased in the context of the great crime decline witnessed across many countries during the last three decades. In a novel approach (which extends the work of [Hope and Norris 2013](#)), this study used LCA to identify broad classes of victims based on prevalence, frequency and type of crime experienced, and examined change in the relative distribution of these classes over time. The results revealed heterogeneity among the population summarized through four latent classes based on experience of crime. This included a majority class of Non-victims who were at little or no risk of any type of victimization; a moderate-sized class of One-off Property Victims who experienced one incident of motor vehicle or household crime on average per year; a small class of Multiple Mixed Victims who experienced two incidents of mixed crime types per year on average; and a very small class of Frequent Personal Victims who experienced more than three crimes per year on average, mainly consisting of assaults and threats, and personal theft and robbery.

Temporal analysis showed that victimization in Scotland did not fall constantly over this period of time, but fell in two distinct phases: an initial steep fall in crime during the 1990s, followed by a slight increase in the early 2000s and a period of relative stability until 2008–09, and then a further substantial decline in victimization from the late 2000s onwards. During both periods of reduction, there was a change both in the victim class membership (i.e. people were more likely to be classified into the Non-victim class as opposed to one of the three victim classes) and in the average incidence of victimization (i.e. people were likely to experience fewer incidents of crime). However, the reduction in incidence appears to explain the crime drop to a far greater extent than the change in class membership. Therefore, the crime drop in Scotland primarily reflects a reduction in the number of incidents experienced by victims, especially among those who were least likely to experience crime, namely one-off victims of property crime. There was a modest reduction in the number of incidents experienced by some repeat victims—primarily those who experienced an average of two incidents of household and/or personal crime in any one year. However, there was no discernible reduction in either the prevalence or incidence of people who experienced the most repeated victimization, on average of three to four incidents per year, of mainly personal threats, robbery and violent assault. Indeed, against the prevailing trend of a crime drop, the incidence of violence increased among those at highest risk of victimization in Scotland.

The literature on the crime drop emanating from multiple countries has signalled an implicit assumption of universality. And although there is some debate as to whether

sufficient evidence exists to verify the existence of a general crime drop (see [Aebi and Linde 2010; 2012](#); [Farrell et al. 2014](#); [Tonry 2014](#)), the term ‘general’ is typically used to describe commonality in trends in crime between countries. Far less attention has been paid to commonality within countries or within the population. The findings presented here demonstrate that whatever factors have driven the crime drop in Scotland they have not pervaded every part of society equally. While numerous crime drop theories have been proposed (see [Farrell et al. 2014](#)), these have largely ignored the experience of victims at an individual level and none have provided a clear explanation as to why crime may have fallen differentially for some social groups compared to others. The security hypothesis—which is underpinned by routine activity and opportunity theory—appears to offer the most compelling explanation for the international decline in crime ([Farrell et al. 2011a; 2014](#)). However, the underlying empirical evidence for this hypothesis has relied heavily on analysis of property crime data (with connections to trends in violent crime being largely speculative) and has not taken account of the multi-dimensional nature of victimization as a product of prevalence, frequency and crime type. Prior work on change in repeat victimization during the crime drop has either applied a crude definition of people who experience crime more than once in 12 months (e.g. [Thorpe 2007](#)) or a sophisticated analysis of repeat or multiple victimization restricted to single crime types (e.g. [Hunter and Tseloni 2016](#); [Pease and Ignatans 2016](#); [Walby et al. 2016](#)). Our approach to modelling victimization demonstrates that the heterogeneity of repeat victimization reflects degrees of difference in terms of prevalence, incidence and types of crimes experienced, and these are all key to understanding inequity in the wake of the crime drop.

This article has important theoretical implications for scholars studying the crime drop in terms of distributive justice. As noted earlier, [Rawls’ \(1999\)](#) theory of justice considered that social and economic inequalities could be justified if the net effect was one of universal benefit, especially for those living in the most disadvantaged circumstances. Unfortunately, it was not possible within this analysis to explore the social and economic circumstances of each victim class because changes to the design of the survey questionnaire over time meant there were no comparable variables across all available sweeps. As noted by [Jennings et al. \(2015\)](#), the lack of comparable measures over time is a perennial limitation of secondary data analysis and highlights the need for consistency in the planning and design of repeated cross-sectional social surveys to allow analysis of long term patterns of social change. Nevertheless, there is sufficient criminological evidence to support the hypothesis that our Frequent Personal Victim class is likely to be characterized by significant social disadvantage and economic deprivation ([Levitt 1999](#); [Thacher 2004](#); [Wilkinson and Pickett 2009](#)). From Rawls’ perspective, any inequality in the reduction of victimization would need to disproportionately benefit those individuals who experienced the greatest amount of (and the most serious) crime. To a large extent, the crime drop theories that support the notion of a global crime drop provide inherent support for the suggestion that falling crime has benefited everyone. However, the findings from this article do not support such a proposition and, instead, demonstrate a growing inequality between those at most and least risk of experiencing victimization.

Despite its fundamental importance, the criminological literature is remarkably thin on the topic of distributive justice and crime. Moreover, as [Pease \(2001: 415\)](#) notes, criminological narratives on achieving a more equal distribution of crime too often

reduce ‘the problem of crime to the problem of the offender’, whereas scant attention is paid to victims. Extending the work of [Pease and Ignatans \(2016\)](#) and [Hunter and Tseloni \(2016\)](#), this article provides strong empirical evidence in support of a wider theoretical debate about equality of outcomes and reducing the gap between victims and non-victims. Specifically, this debate needs to take cognizance of changes in prevalence, incidence *and* crime type to properly understand the underlying dimensions of and contributors to crime inequality. Theoretical development would, however, benefit greatly from methodological testing and replication of these results within other jurisdictions.

The importance of this study for policymakers and practitioners cannot be understated. Against the backdrop of the ‘good news’ story of the crime drop, it may be unpalatable to address the issue that, for a small proportion of Scottish society, the risk of victimization is as great or greater than it was three decades ago. In absolute terms, an estimate of 0.3 per cent of the Scottish adult population represents only 13,500 people (based on mid-year population estimates for 2016); however, our findings suggest that this group’s share of all victimization doubled from 5 per cent in 1993 to around 10 per cent from 2006 onwards. As [Hope \(2015: 22\)](#) states: ‘If victimization is the “signal”, and non-victimization is the “noise”, then even diligent politicians will have a hard time detecting the signals of the exposed few from among the noise of the naturally protected many who, even so, amplify their demands for protection by vocalizing their excessive “fear” of crime’. Falling victimization in Scotland since the early 1990s inevitably means that the signal has reduced, while the noise has increased. And despite the reality of falling crime, it has been hard to persuade the public of this fact. Most victim survey respondents repeatedly report that crime (both nationally and locally) has remained the same, or, if they think there has been a change, they are inclined to believe it has increased ([Scottish Government 2016](#)). Furthermore, *perception* of risk by far outweighs *actual* risk. According to the 2014–15 Scottish Crime and Justice Survey ([Scottish Government 2016](#)), public perception of becoming a victim of housebreaking was eight times higher than the actual risk, while the equivalent figure for being mugged or robbed was 40 times higher. If we are to get close to achieving Rawls’ model of social justice, it is incumbent on policymakers to not only reassure the worried well, but also focus increased public resource and services on addressing the stubbornly persistent problem of repeat victimization within some sectors of the Scottish population. The results of our analysis show that efforts need to be directed at those who are known to be at most at risk of victimization if the crime drop is to be sustained.

Further research is clearly needed in light of the current study’s findings. Most obviously, more needs to be known about the demographic and social characteristics of these victim groups (e.g. their age, sex, socio-economic and household profiles) to develop better theories and target crime reduction strategies effectively. In his assessment of the most appropriate US crime drop theories, Levitt claimed that ‘the drop of crime in the 1990s affected all geographic areas and demographic groups’ (2004: 167); however, his statement was based on analysis of the demographics of offenders *not* victims. Recent work has highlighted an increase in inequality in the demographic profile of crime victims (see [Grove et al. 2012](#); [Hunter and Tseloni 2016](#); [Ignatans and Pease 2016](#)), and in a follow-up to the work presented here, analysis is underway to examine how social and economic factors have influenced the composition of victim classes. Victims who

belong to each class may share common characteristics that could allow policymakers to develop more evidence-informed interventions and victim support services. In addition, it cannot be assumed that the people in each group are randomly scattered throughout the country. Therefore, further work will examine how the probability of group membership is distributed spatially across Scotland and conduct multi-level analysis to test whether certain types of area contain higher concentrations of high-risk individuals. This will enable policymakers and service providers to determine both who and where those most at risk of victimization are and decide how to best target interventions to reduce the current inequality of victimization in Scotland.

Funding

This work was supported by the Economic and Social Research Council (ES/K006460/1).

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Appendix 1. Crime types used in the analysis

Motor vehicle crime

- 81 Vandalism to a motor vehicle (£20 or under) (in sweeps up to 2003)
- 82 Vandalism to a motor vehicle
- 61 Theft from car/van
- 63 Theft from motorbike, motorscooter or moped
- 71 Attempted theft of/from car/van
- 72 Attempted theft of/from motorbike, motorscooter or moped
- 60 Theft of car/van
- 62 Theft of motorbike, motorscooter or moped

Household crime

- 51 Housebreaking in a dwelling (nothing taken)
- 52 Housebreaking in a dwelling (something taken)
- 53 Attempted housebreaking in a dwelling
- 50 Attempted housebreaking to a non-connected domestic garage/outhouse
- 57 Housebreaking from a non-connected domestic garage/outhouse (nothing taken)
- 58 Housebreaking from a non-connected domestic garage/outhouse (something taken)
- 55 Theft in a dwelling
- 56 Theft from a meter
- 65 Theft from outside a dwelling (excluding theft of milk bottles)
- 83 Vandalism to the home (£20 or under) (up to 2003 and in 2006)
- 84 Vandalism to the home
- 85 Other criminal damage (£20 or under) (up to 2003)
- 86 Other vandalism

Personal theft and robbery

- 43 Snatch theft from the person
- 44 Other theft from the person
- 45 Attempted theft from the person
- 67 Other theft
- 73 Other attempted theft
- 41 Robbery
- 42 Attempted robbery

Assaults and threats

- 11 Serious assault
 - 12 Minor assault with injury
 - 13 Minor assault with no/negligible injury (except in 2004 to 2008–09)
 - 14 Serious assault and fire raising (from 2004 onwards)
 - 15 Serious assault and housebreaking (from 2004 onwards)
 - 21 Attempted assault
 - 91 Threat to kill/assault made against, but not necessarily to respondent
 - 92 Sexual threat made against, but not necessarily to respondent
 - 93 Other threat or intimidation made against, but not necessarily to respondent
 - 94 Threats against others, made to the respondent
-

Offences belong to the crime group in all sweeps unless otherwise noted.