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Murder Concentration and Distribution Patterns in London: An Exploratory Analysis of Ten Years of Data

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Abstract

The phenomenon of how the volume of crime varies from place to place has received significant focus over the last four decades. Previous research has identified that crime is not randomly distributed across places but clusters in areas sometimes called hot spots. This research analyses 10 years of homicide patterns across London from Local Authority Borough level down to small local neighbourhood level. Through the use of geo-coding technology to map homicide locations and victims' and offenders' home addresses, frequency analysis is conducted down to a Lower Super Output Area (LSOA) level. This provides a structure to segment London into 4761 neighbourhoods. The findings of this research are that 74% of London's LSOAs do not have a single homicide over the 10 year period. Additionally it identifies that homicide in London is concentrated in a small number of local neighbourhood locations rather than randomly spread across the whole city. These concentrations account for only 6% of neighbourhoods but contribute 42% of the homicide locations, over the 10 year period. This methodology is also applied to specific methods of homicide, e.g. domestic violence, where similar patterns of concentrations of homicides are identified. Geographical analysis of victims and perpetrators of homicide identifies that 50% of perpetrators reside within one mile of the homicide offence location. Additionally 52% of perpetrators' home addresses are clustered within 9% of LSOAs. This research will contribute to the criminological evidence-base, having both operational implications, such as the focus of policing patrol strategy, and policy implications for a significant number of agencies in how they assess the prioritisation of resources, particularly within the current difficult fiscal climate.

Introduction

An analysis of any weekly television entertainment guide shows a vast range of homicide-related programmes. Equally, an assessment of the daily newspapers highlights the huge amount of media coverage given to this crime. However, homicide is a statistically rare event which occurs less often than other violent offences, which are themselves uncommon (Riedel 1999). One cannot overstate the importance of the practical and theoretical criminological learning that can be obtained from research of *the* most serious criminal offence, the taking of a person's life, in particular the potential for the reduction or prevention of such violence. This research focuses on developing a greater knowledge about homicide in the 21st century and the places where the crime occurs in one of the world's major cities. Such an approach will contribute to the growing body of evidence of place-based criminology complementing the many studies which have identified the potential theoretical and practical benefits of research into micro-places (Eck & Weisburd 1995). Operational benefits will be achieved such as a focus upon police patrol strategies, with crime problems being more effectively managed if police officers can focus their attention in crime hot spots (Sherman & Weisburd 1995). By applying the same theory to other social agencies, policy implications are raised questioning how the prioritisation of resources are managed to achieve the most efficient impact, particularly within the current difficult fiscal climate.

Research has explored the link between crime and place however, as Janet Foster commented during her assessment of the impact of the inquiry into the murder of Stephen Lawrence (Macpherson 1999) on police practice, 'patterns of victimization were not part of the operational detectives recipe of knowledge' (2008, 106). The analysis of crime and

place nonetheless is not a new theory and has been researched by many over numerous years, e.g. Park, McKenzie, & Burgess 1925. Much of this research has been at a macro level however a growing interest in micro places began to develop during the late 1970s and 1980s, around the time of computerised development and with it crime mapping and statistical tools (Weisburd, Bernasco, & Bruinsma 2009). In learning from previous research this work will analyse the concentration and distribution patterns of homicide offences in London by means of an exploratory analysis of ten years of homicide data. This will provide an excellent opportunity to examine homicide in the 21st century. The exploration of homicide in London has never been the subject of extensive research leaving a gap in knowledge of how this crime is distributed across the capital and with it the missing opportunity to identify generalizable findings beyond the streets of London. Such gaps are recognised by others; 'homicide is an under-researched topic in this country (England and Wales), and although a fair amount of evidence is available from North America and elsewhere, its value is limited by cultural differences' (Brookman & Maguire 2004, p325).

Homicide Trends

By having access to detailed homicide data a significant opportunity exists to examine homicide offences in greater depth to build upon the analysis of data already conducted. London is shown to have one of the lowest homicide rates of any major city in the world (Home Office 2005**)**. This is clearly illustrated by comparing data from 2007 when London had a homicide rate of 2.2 homicides per 100,000 population compared with New York, a city with a similar population, with a rate of 6 homicides per 100,000 population (Stanko et al 2008), almost three times the level of London. Within the London context, and combined with a crime as rare as murder, it is clear that there will be discrete

places free of any such crime within areas which might be considered criminally problematical and vice versa (Weisburd & Green 1994). Learning from previous research suggests that a focus upon small areas, described as hot spots of crime, may provide enlightening information. Many studies of spatial distribution of crime have consistently identified that crime is persistently concentrated at a small number of 'micro' places (Groff, Wiesburd & Yang 2010) and therefore a critical factor in maximising the quality of analysis and any subsequent findings is the geographical unit size of place analysis. In keeping with such learning, this research will analyse homicide distribution and concentration at three levels: local authority borough, ward and Lower Layer Super Output Area. This approach initially analyses homicide concentrations at a more 'macro' level before progressively focusing down into ever smaller units, therefore attempting to follow the approaches of other acclaimed work, e.g. Weisburd et al (2004), in ensuring a focus upon areas large enough to be able to draw out concentrations of homicides without using too large an area where concentrations in micro places may be missed or lost.

During previous research into homicide offences, Dorling (2008) analysed murder in Britain between 1981 and 2000 when there were approximately 13,140 victims. His analysis showed that the homicide rate as a whole in England and Wales almost doubled between 1967 and 2001/2 from around 350 per annum to around 800. The increase in these offences was not geographically equally spread across all places. The people living in the *least* poor places saw their murder rate actually fall during this period of significant increase in overall numbers. The increase in murder was concentrated almost exclusively in the poorest parts of Britain and most strongly in the poorest 10% of wards. Dorling concluded this research with the comment: 'it is obvious to the public at large and to criminologists who consider murder in detail that *place matters'* (2008, p31).

Whilst Dorling's research described increases in homicide offences over a number of years, the latest crime statistics released by the Home Office show a reduction of 6% in homicide offences for 2009/10 (Flatley et al 2010). However, despite such a statistic, over the last 3 years homicide within London has received considerable media coverage with specific focus on young people's involvement, both as victims and offenders. Headlines such as 'A murder that gripped the nation', describing the murder of Ben Kinsella a 16-year-old boy stabbed to death in a North London street, have been common place. The public interest in this crime led to a 'media frenzy far beyond his London birthplace' (Davey 2009). National newspapers led on the story for days and thousands of people marched against knife crime fearing a wave of such violence. As a result significantly more media interest is generated and doubt is voiced over the accuracy of any crime figues that are produced (Boxell 2010). It is relevant that whilst the Home Office provide analysis of elements of homicide offences, e.g. type of weapons used in the offence, they do not examine at any level place-based factors.

Criminological Theory

The examination of criminological theories, such as routine activities theory (Cohen & Felson 1979), is highly relevant when considering the complexity of criminal offending and previous findings that have identified that crime is not geographically uniformly distributed at places (Eck & Weisburd 1995), however repeat events at the same location have been established (Sherman et al 1989), and specific crime types may cluster at places, i.e. drug dealing (Weisburd & Green 1994). In essence these theories suggest that the distribution of crime is not random but varies in time and space (Sherman, Gartin & Buerger 1989). By adopting this approach to the analysis of homicide in London this

research will fill a clear gap in knowledge. Such theories were critical in shaping this research and the interpretation of the findings and recommendations.

Research Methodology

Following a review of existing literature this research will be conducted through analysis at three levels. The first will explore questions of whether there are spatial concentrations of homicide in London and, if so whether geographic pockets of homicide exist within these concentrations? Conversely, if having completed the analysis homicide concentrations are not identified, it will be of equal importance to explore whether homicide in London is a random event in terms of location. The research thrust underpinning this work is that homicide and place are connected or alternatively that homicide in London occurs at random in relation to place. The second level of research will explore whether homicide concentrations are dependent upon the victim or offender characteristics and finally the third level will analyse whether there is a relationship between the homicide location and the victim and offender.

This thesis addresses these questions by the analysis of secondary data. This was achieved with the aid of geo-coding technology which was utilised to map all the homicide locations from 1.4.2000 to 31.3.2010 within the London Metropolitan Police Service area. Additionally the same technology was utilised to map the home addresses, where known, of all victims and offenders. A frequency analysis process was then applied to the data at each of the 3 levels of geographic measurement. In line with previous research, e.g. Sherman, Gartin, & Buerger 1989, the critical geographical measurement was to identify a method of examining the 'micro places' across London. This was achieved by the use of Lower Super Output Areas, an area of measurement used by the Office for National Statistics (2010) and provided the structure to segment London into 4761 sections. The

findings of this research were that 74% of London's LSOAs did not have a homicide over the 10 year period. Additionally it identified that homicide in London was concentrated in a small number of LSOAs rather than randomly spread across the whole city. These concentrations contributed 42% of homicide offences within only 6% of neighbourhoods, over the 10 year period.

Overview

The first section of this research summarises the existing literature on crime and place, place-based criminological theories and the nature of homicide trends and analysis. The next four sections describe the research questions and methodology, detail the statistical models used to analyse the data and present the results of the analysis. The final two sections discuss the findings of the analysis and present the conclusions drawn from the research.

Literature Review

The research of Sherman, Gartin & Buerger (1989) was a seminal moment in the analysis of crime and place, identifying the clustering of crime in a small number of hot spots. That distribution of crime varies within and between neighbourhoods has been known for a significant period of time (e.g. Park, McKenzie, & Burgess 1925). In considering the concentration and distribution patterns of homicide in London this literature review will examine homicide trends and, in particular, spatial and temporal analysis. Additionally it will explore the concept of crime and place, its origins as criminological research and some of the key studies. The final theme will be place-based criminological theory, e.g. crime pattern theory (Brantingham & Brantingham 1993a). This review will also explore other place-related issues and their potential links to crime which will add demographic richness to the analysis.

Homicide Trends

"Homicide is not randomly distributed over persons, places, or time. Some groups of people are more likely than others to be involved in lethal violence as its offenders and victims. There are also fundamental differences within and across geographical areas in their rates of homicide".

(Miethe & Regoeczi, 2004, p61)

It is important to place homicide crime in London within the context of its frequency against other similar locations around the world. In 2207 following extensive media coverage subsequent to a number of high profile murders involving young people, both as victims and offenders, an analysis of all reported homicides was conducted. Of note was that the overall frequency of homicide had reduced by 7% since 2000. When

compared with an international perspective, London was shown to have one of the lowest homicide rates of any major city in the world, including other major European Union cities such as Berlin and Paris (Home Office 2005**)**. By way of illustration, in 2007 London had a homicide rate of 2.2 homicides per 100,000 population compared to New York, a city with a similar population, which experienced 6 homicides per 100,000 population (Stanko et al 2008), almost three times the level of London.

To inform this research the work of Wolfgang (1958) will be used as the basis for a conceptual replication. In his examination of homicide offences Wolfgang analysed spatial, temporal and victim and offender detail within the Philadelphia police district between 1948 and 1952. The basis of his work was the examination of differences between two key racial groups, African-Americans and White Americans. Other racial groups were not part of the research and therefore Wolfgang's work does not examine all of the homicides during the period concerned. Wolfgang's work analysed homicide down to the level of which room within a house the offence occurred. This research does not have Wolfgang's level of detail of offences however many of the principles are equally applicable today, with particular focus upon the features of victims and offenders and when offences were committed.

Research has been conducted within the USA examining patterns of homicide at city levels, making comparisons between cities and looking at specific types of murder, e.g. Lattimore et al 1997. Much of the research examined a period through the 1980s when the USA experienced a dramatic rise in homicide offences, through to the 1990s when there was a subsequent decline in such offences. Research by Blumstein et al (2000) concluded that homicide trends could only really be understood by examining rates in specific age, gender and racial groups. It was identified within the research that significant

increases in homicide occurred within the 12-24 age group. When this was further examined, the ethnic breakdown showed that African-Americans were over 6 times more likely to be a victim of murder than their white counterparts. The instigator of this increase was the sudden appearance of crack cocaine within drugs markets of the big US cities around 1985, and the increased use of guns. Lattimore et al's research (1997) examined homicide across 8 US cities analysing a number of variables including poverty, employment and race. Their findings showed that the variables had a moderate and inconsistent relationship with homicide.

Gartner (1990) conducted a cross-national and temporal comparison of homicide in 18 'developed' nations, including the UK. A number of risk factors were identified, some of which were extremely relevant to this research. In line with research already examined, Gartner identified that 'income inequality is associated with high homicide rates of adults but not children' (1990, p101) but also highlighted the impact of divorce rates within communities, with adults and older children facing significantly higher risk of homicide where divorce rates were high. The overall conclusion was that economic inequality and cultural heterogeneity are associated with higher homicide rates of adults. Such research helped guide and inform the methodology of this work.

A limitation regularly highlighted within this type of research is the issue of macro rather than micro analysis. Lattimore et al (1997) commented that the data examined was only available on a city-wide basis and therefore not detailed enough to identify variations within the city, i.e. neighbourhoods. This was echoed by Pearson-Nelson (2008) who, having analysed homicide in the USA between 1997 and 2001 across a number of major cities, noted that understanding was limited by data being based at a city-level thereby

restricting what could be learnt. Such comments will be tested within the levels of geographical analysis used in this work.

In examining homicide from the perspective of crime and place Braga, Papachristos, & Hureau (2010) researched gun crime within Boston over the period of 1980 to 2008. Like many other US cities, Boston experienced a massive increase in such crime in the 1980s followed by a large reduction. In 1993 gun homicides across the whole of the USA peaked at 17,075 but by 2000 had dropped to 10,203 which equates to a 40% reduction, however by 2005 a small increase of 6% (11,346) had again been experienced. In line with similar crime and place research, i.e. Sherman, Gartin, & Buerger 1989, Braga and his colleagues identified that within Boston the majority of gun crime was being perpetrated at a very small number of micro places. In drawing together their research it was identified that 5% of street and intersections were responsible for 74% of serious gun crime assault. Of equal importance were their conclusions regarding the 'at risk' populations from gun crime. They identified clear characteristics of individuals involved in such violence. These included young, minority males living in disadvantaged neighbourhoods; in 2006 1% of Boston's youth population (15-24) accounted for 50% of the city's homicides. The research identified that a small number of locations and small number of individuals accounted for the majority of the homicide crime.

Demographics and Place

In attempting to understand spatial patterns of homicide it is clear from previous research that social issues within the place where murders were committed are likely to be an influence upon the commission of the crime. In drawing together international comparisons Miethe and Regoeczi (2004) described homicide offenders in the USA to be disproportionately male, young and African-American whilst Australia and Canada have

similar patterns of disproportionality with the majority of their homicide offenders being male, young and from particular ethnic or racial minorities. In these cases the spatial analysis of crime locations suggests that such offenders are highly likely to be poor and economically disadvantaged.

Rosenfeld, Bray and Egley (1999) conducted research into gang motivated, gang affiliated and non gang homicide in St Louis, Missouri between 1985 and 1995. During this period the volume of murders increased significantly. The conclusions of the research was that both gang and non-gang homicides were not randomly distributed across neighbourhoods but tended to be clustered in areas with high levels of disadvantage and large concentrations of African-American residents. All of these studies, whilst dealing with different elements of homicide and in a variety of geographical contexts, suggest that homicide does not occur randomly in relation to its place; will London be any different?

When considering geographical issues of race and gangs an inter-related factor is poverty. Do such factors contribute to the commission of homicides in London? The theory that crime might be correlated with poverty is fascinating when examined from a US perspective. The US is one of the most affluent countries in the world however it has one of the highest crime rates. The homicide rate in the US is ten times that of Western Europe (U.S. Bureau of the Census 1979: 182) and this clearly raises many questions. Blau and Blau (1982) identified that income inequality within certain racial groups had a direct effect on murder and assault rates. An understanding of social conditions within 'places' may help explain why criminal violence rates differ across London.

Demographic and spatial distribution based research of homicide in the UK concluded that the occupants of the poorest 10% of areas were 5.7 times more likely to experience murders than the occupants of the least poor 10% of areas. The authors

commented: ‘despite concern about violence in Britain little attention has been paid to the significance of the demographic and geographical patterns that underlie the composite rates of homicide’ (Shaw, Tunstall, & Dorling 2005, p51). Their study identified some of the genuine complexities that exist when attempting to understand homicide trends. The murder rate for women over the period 1981 to 2000 has either fallen or hardly changed, with the exception of infant girls. However, the homicide rate for men has seen significant increases with the rates for males aged 20-24 years doubling in the same period. Spatially murder has risen in the poorest areas of Britain increasing the risk of murder among young men in these deprived areas. Such an evolving picture is highly consistent with other evidence such as trends from health and social indicators (Shaw, Tunstall, & Dorling 2005). But women are also living in the same places where the homicide rate is increasing yet their homicide rate at worst is consistent and at best reducing. This reinforces the complexity of the assertion that homicide trends are being driven by social and spatial inequality. London too is a city of significant variations in wealth across areas and therefore the previous research would suggest that this study will have similar findings.

Dorling (2008) analysed murder in Britain between 1981 and 2000 when approximately 13,140 people were murdered. In an interesting reversal of the data he noted that 99.88% of people in Britain were not murdered and that there were around 1.8 murders a day. The homicide rate in England and Wales almost doubled between 1967 and 2001/2 from around 350 per annum to around 800 homicides. Interestingly the increase in murders was not geographically equally spread across all places. The people living in the *least* poor places saw their murder rates actually fall during this period of significant increase in overall numbers. The increase in murder was concentrated almost exclusively in the poorest parts of Britain and most strongly in the poorest 10% of wards.

Dorling stated that: 'the poorer the place you live in the more likely you are to be murdered' and concluded with the highly relevant comment that 'it is obvious to the public at large and to criminologists who consider murder in detail that ***place matters'*** (2008, p31). In examining homicides within London and their location it will be critical to analyse concentrations and spread in line with Dorling's findings. Do the poorest parts of London experience the highest levels of homicide?

Deprivation and its links to crime is a theory not necessarily wholly accepted by all. Cohen, Kluegel and Land (1981) examined three crime types, assault, burglary and personal larceny, against income, race and age to ascertain how they relate to the risk of predatory criminal victimization. Their findings did suggest that income had a direct effect upon the probability of victimization within all three crime types but not in the way that previous research quoted would have suggested. With caveats of similar exposure to risk and lifestyle patterns, the most affluent in our society would make the most attractive target for criminal victimization. Bailey (1984) examined whether there was any relationship between poverty and city homicide rates. He concluded that at best there was only a weak theoretical linkage between homicide and relative economic deprivation.

Further research within the UK analysed the difference in homicide rates between Scotland and England & Wales. The research was conducted on a macro level examining a 10 year period between 1985 and 1994. On a trans-national basis the homicide rate differences were stark; the male homicide rate in Scotland was twice that of England and Wales, however female homicide rates were very similar. Analysis within Scotland showed significant differences in homicide rates with the area of Strathclyde having a homicide rate higher than the Greater London area (Soothill et al 1999). Their analysis highlights the importance of examining homicide and its relationship with place.

Having discussed homicide trends this review will now examine the theories that attempt to explain the trends. This section will examine place-based research in more detail within the context of crime distribution and concentration.

Crime and Place

"Such an area is vulnerable to criminal invasion. Though it is not inevitable, it is more likely that here, rather than in places where people are confident they can regulate public behaviour by informal controls, drugs will change hands, prostitutes will solicit, and cars will be stripped. That drunks will be robbed by boys who do it as a lark, and the prostitutes purposefully and perhaps violently. That muggings will occur."

(Wilson & Kelling 2005, p403)

This extract is from the work 'Broken Windows' which for many agencies was an instigator of new approaches to combating crime on a location or problem-solving basis. However over many decades criminology has long been interested in spatial analysis of crime and place. As far back as 1829 Balbi and Guerry discovered that levels of crime varied between different places (Kenwitz 1987).

London has many neighbourhoods. Do these neighbourhoods vary in their frequency of homicides? In the early part of the 20th century the Chicago School of American Sociology rose to prominence with its exploration of ecological issues and their contribution to crime. Chicago experienced a rapid expansion of growth from 4,470 inhabitants in 1840 to 1 million inhabitants by 1890, (Weisburd, Bernasco, & Bruinsma 2009). During the period of continual growth, crime was perceived as one of the key urban problems. Burgess and colleagues illustrated the city using a series of concentric rings looping around the city centre. Each of the five rings contained a different neighbourhood

and, depending on the distance from the centre and other specific features, the level of crime would vary. The theory proposed was that as the city expanded residential zones developed (concentric rings) and with increasing affluence residents moved further from the centre to the periphery. In Burgess' model the zone of transition was the ring closest to the centre typified by successive waves of migrants, older housing and low-cost housing. In this zone life was hard with a greater potential for crime without the spatial and cultural stability of the outer rings (Graham & Clarke 2001). Within contemporary London, will similar findings be identified?

Bottoms and Wiles (2001) explored this issue further examining variations in crime rates and physical space. They discovered that offender residence in Chicago was not randomly distributed across the city but that the highest concentration lived in the inner city zone. Burgess concluded that characteristics of the urban environment were critical in explaining the emergence of crime in specific communities ((Park, McKenzie, & Burgess 1925).

Shaw (1929) conducted empirical research on the geographical distribution of crime on the basis of Burgess' zonal model. Using the concentric ring concept Shaw examined the distribution of school truants. In line with many such approaches of today, he plotted offenders' home addresses onto a map of Chicago. This approach will be utilised to analyse both victims' and offenders' home addresses within London.

A growing interest in micro places began to develop during the late 1970s and 1980s following the development of computers, crime mapping and statistical tools (Weisburd, Bernasco, & Bruinsma 2009). A watershed in the analysis and understanding of crime and place occurred during research in Minneapolis in 1986. Through the examination of 323,000 calls to police it was identified that a small number of hot spots

produced most of the crime, in fact 3% of places produced 50% of the calls. For predatory crimes, such as robbery, 5% of addresses or intersections produced 100% of the calls (Sherman, Gartin, & Buerger 1989). This was further explored by the use of a randomised controlled trial in Minneapolis whereby 55 out of 110 hot spots received increased patrol with the other 55 continuing to receive the usual level of police patrol. The result of this experiment was a reduction in crime of between 6% and 13% in the hot spots receiving increased police patrol presence (Sherman and Weisburd 1995). The principles of Sherman's work will be applied within this study and test those findings within the specific crime category of homicide.

The result of place-based research was to increase the questioning of the criminological emphasis placed on individual motivation in the commission of crime and to recognise the importance of other elements (Cohen & Felson 1979). As Sherman (1995) stated: 'Why aren't we thinking more about whereduni rather than whodunit?' But is crime more concentrated amongst a small number of offenders or a small number of places? As far back as 1972 Wolfgang, Figlio and Sellin identified that crime is concentrated in offenders. Weisburd (2008) explored this issue comparing offenders and locations using crime incidents from Seattle over a period of 1989 to 2002. They identified that 1,500 street segments accounted for 50% of crime each year. To achieve the commission of 50% of the crime each year required 6,108 offenders. As a result police would have to focus upon four times as many offenders to combat the same level of crime as they would the number of places.

In 2001 an assessment of hot spot policing strategies was conducted by Anthony Braga. A systematic review was performed on nine initiatives all of which had been developed through the mapping of police data to identify hot spot locations where

incidents could be identified as clusters. The initiatives varied from general crime repeat venues (Sherman, Buerger & Gartin 1989) to crime specific issues, i.e. drug markets (Sherman & Weisburd 1995). The results of the review supported the assertion that focusing resources at hot spot locations can be an effective approach to preventing crime, with seven of the nine initiatives reporting crime and disorder reductions. The review supported previous research which stated that targeted hot spot policing did not necessarily lead to crime displacement and in fact provided additional diffusion of crime reduction benefits (Clarke & Weisburd 1994).

In pursuing place-based theory many police agencies have adopted computerised crime mapping systems indeed 125 US police departments with 100+ sworn officers claimed to have adopted such systems (Weisburd & Lum 2005). Visibly representing the data in map format is seen as an extremely powerful tool and supports the visualisation of crime (Cope 2003). In line with this methodology many studies of spatial distribution of crime have consistently identified that crime is persistently concentrated at a small number of micro places (Groff, Wiesburd & Yang 2010). The critical element of the process is the size of the geographical unit of analysis. Within a London context, and combined with a crime as rare as murder, dependant upon your unit of analysis, e.g. local authority borough, there will be discrete places free of such crime within the areas which might be considered criminally problematical and vice versa (Weisburd & Green, 1994). The learning from the previous research suggests that it is critical to focus upon small areas that could be described as hot spots of crime. Therefore this study will adopt three levels of geographical analysis from larger local authority boroughs down to much smaller neighbourhood areas.

Having examined both homicide trend analysis and place-based research this review will examine some of the key criminological theories which attempt to explain why such crime occurs.

Criminological Theory

"Individual behaviour is a product of an interaction between the person and the setting. Most criminological theory pays attention only to the first, asking why certain people might be more criminally inclined or less so. This neglects the second, the important features of each setting that help to translate criminal inclinations into action."

(Felson & Clarke 1998, p1)

Traditionally ecological criminological theories searched for explanations and understanding of offenders' actions based within the social structure in which an individual is embedded (Anselin et al 2000). But why are certain places more attractive or vulnerable to the commission of crime or, within the context of this research, the commission of homicide? A number of place-based theories have developed and evolved from within the theoretical tradition of social ecology which may assist in explaining this.

Rational choice theory proposes that a person continually looks about them for opportunities and makes amoral choices and asocial choices to maximise their personal utility. The creation of this 'economic person' is not necessarily empirically based but, it is argued, strips away what rational choice theory proposes is unessential theoretical and descriptive clutter. This person makes decisions based on risk, effort and reward in the settings in which they may take place (Rock 2002). The most basic premise of this theory is that offenders seek to achieve an advantage for themselves through their offending with decisions which are rational within the constraints of their time and ability (Cornish &

Clarke 1986). Whether such offenders are always so rational in their thinking is questionable however, this theory was utilised by Ronald Clarke in the application of situational crime prevention (SCP). SCP has its origins in the British Home Office of the 1970s when interventions for a range of crime problems were being pursued (Lab 1997). Ronald Clarke (1980), a leading exponent of this strategy, defined this preventative approach as focusing on the criminal event by reducing the physical opportunities to offend and increasing the chance of being caught. SCP focuses on those conditions that are susceptible to crime and attempts to reduce or pre-empt such vulnerability by changing those conditions (Sutton, Cherney, & White 2008). Clarke described the three main interventions of SCP as target hardening, e.g. the use of plastic glasses within alcohol violence locations to reduce the impact of injuries, surveillance, e.g. city centre CCTV to reduce victims of violence (Cardiff University 2007), and environmental management, e.g. paying employees with cheques not cash (Clarke 1983).

Routine activity theory (RAT) initially emanated from work by the same Ronald Clarke and Marcus Felson, a theorist of crime and routine activities. Both agreed that criminals were unremarkable people and not too dissimilar to the rest of society (Rock 2002). Felson, working with Lawrence Cohen, took this further. Their theory was that through the routine activity of people, patterns in crime rates would be influenced by the convergence in the same location and time of motivated offenders, suitable targets and a lack of capable guardians. They further proposed that the lack of any of these ingredients would be sufficient to prevent the completion of a 'direct-contact' predatory crime (Cohen & Felson 1979). They asserted that trends in crime rates are influenced by changes in the routine activity of an individual's everyday life. The logic of this theory is that routine patterns of work and leisure time affect the convergence in time and place of the above

elements (Adler, Mueller, & Laufer 1995). Cohen and Felson (1979) utilised many of the social changes since the end of World War 2 in the development of the theory; within the UK recently we have experienced changes such as the introduction of 24 hour drinking. Alcohol related homicide is not a new phenomenon however have the significant social changes altered the routine activities of victims and offenders resulting in an increased convergence of the three key elements and thus a growth in this crime?

Roncek and Maier (1991) explored the issues of routine activities and hot spots. In their examination of street blocks within Cleveland they found that those which had facilities such as schools and bars had, on average, higher levels of crime due to these facilities impacting upon the routine activities of people. In its relevance to this study, RAT is essentially a micro level theory and therefore informs patterns observed at the micro level place (Groff, Wiesburd & Yang 2010). Do the routine activities of people in London contribute to or result in the commission of homicide?

Crime pattern theory (CPT) is an alternative explanation of the relationship between crime and place, the key issue being how targets come to the attention of offenders and how this then influences the distribution of crime. CPT explores the interactions between offenders and their social and physical choices of target (Brantingham & Brantingham 1993a). Place is essential to CPT as it is proposed that its characteristics influence the likelihood of crime (Eck & Weisburd 1995). It is the combination of desirable targets, the context within which they are found and how they come to the offender's attention which influences the commission of a crime at a place. CPT proposes that crimes are committed in nodes which are areas known to offenders because of their routine activities, i.e. work or leisure. Although it might sound obvious, as a result, large volumes of crime can be expected at places frequented by lots of offenders who will find

suitable targets. Nodes are then connected by paths which are the routes used during the criminals' routine activities and as a result CPT focuses on the way nodes and paths shape local amounts of crime (Brantingham & Brantingham 1993b). How relevant is this to the commission of a murder as opposed to the acquisitive type of crime such as burglary? This research will examine the characteristics of both the victims and offenders within concentrations of homicide offences. This will assist in exploring the elements of nodes and paths, particularly with regard to the locality of both in relation to the homicide venue.

In summarising, criminological theories are highly relevant when considering that the complexity of criminal offending is not geographically uniformly distributed at places (Eck & Weisburd 1995), however repeat events at the same location have been established, (Sherman, Gartin, & Buerger 1989), and specific crimes may cluster at places, i.e. drug dealing (Weisburd & Green 1994). These theories suggest that the distribution of crime is not random but varies in time and space (Sherman, Gartin & Buerger 1989). Such theories will be critical in attempting to interpret the findings of this research.

The research quoted above highlights a number of opportunities for this work. Critically there is a lack of UK-based homicide research to test many of the findings from around the world, within a UK context and at a more focused level, to examine London's homicide patterns in line with other world cities. This research will explore whether homicide and place are connected and, if not, whether homicide in London occurs at random in terms of place. Seminal elements of the above research will be the basis upon which this work will be structured, with a conceptual replication of Wolfgang's work coupled with Sherman's place-based criminological research applied to spatial concentration of homicide.

Research Questions

Introduction

The purpose of this research is to explore whether homicide and place are connected or alternatively if homicide in London occurs at random in terms of place.

Research Questions

A number of research questions have been developed, based upon the previous literature quoted above, to assist this research. These questions have been developed in three stages in order to create an incremental approach to analysing the data. The first-level question asks if there is a spatial concentration of homicides in London. If the results tend to indicate this, the data will be further analyzed to ascertain if there are geographic pockets of homicide. If the analysis does not tend to support either question, a further question will be explored: Is murder a random event in terms of place? This approach is based upon previous literature in relation to micro places (Groff, Wiesburd & Yang 2010) and crime-based research, e.g. Sherman, Gartin, & Buerger 1989. Finally in line with Dorling's conclusions (2008) if geographic pockets of homicide are identified, are they more likely to be in the poorer areas of London?

The second-level research questions analyse the characteristics of both the victim and offender utilising similar socio-demographic factors to Wolfgang (1958). The questions ask whether homicide pockets are dependent upon the characteristics of the offender, whether they are dependent upon the characteristics of the victim and if there are correlations between the offender-victim characteristics within the homicide pockets.

The third-level research question brings together all three elements of the offence (victim, offender and location) and asks if there is a relationship between the location of the homicide offence and the home addresses of the victims and offenders. This will be addressed by analysing the distance between the homicide location and victim/offender addresses.

All the research questions have been developed using the evidence and research quoted within the literature review section. These questions will underpin the research strategy and will provide a significant opportunity to explore homicide offences in one of the world's major cities.

Methods

Introduction

This research is based upon an exploratory descriptive secondary analysis of homicide offences over a 10-year period from 1.4.00 to 31.3.10 within the London Metropolitan Police Service (MPS) area. This equates to 1664 homicide locations, 1714 victims of homicide and 2382 persons against whom proceedings for a homicide offence was commenced. This section will define the data sources used and the limitations identified during the research. Following this the methodology and process of analysis will be explained in detail before concluding with broader considerations.

Definitions

Definitions of key terms throughout this paper are fully described within Appendix 1. Of particular relevance to this section are the descriptions of what constitutes a homicide offence, homicide location, offender and victim. This appendix also explains police crime reporting periods relevant to the methodology of this paper. Additionally the appendix defines the geographical area that the MPS polices.

Data Sources

The homicide data was obtained from a range of sources, the first being the MPS's crime recording information system (CRIS), a computerised system upon which all recordable crimes (Home Office 2009) are inputted to a set format. This system was the initial source of factual data from which all confirmed homicide crimes and their details

were extracted. The second source used was the Home Office Large Major Enquiry System (HOLMES) which holds detailed information from each investigation, inputted onto the individual account for the homicide. The HOLMES system has been adopted nationally (Byford 1981) but is managed locally by the investigating team and is totally isolated from all other investigations unless specifically linked, e.g. a linked series of murders. This system did not however allow cross-account investigation of data, only allowing each investigation's account to be individually interrogated by the researcher.

Also used was the Home Office homicide index a database of all homicides across England and Wales. Data is stored to a set format whereby key variables are recorded, i.e. gender of victim. From this database national statistical reports are produced each year describing the homicide picture of England and Wales (Home Office 2010). Finally access was made available to the original homicide files and their related documents. Such access provided exceptional opportunities to cross-reference data and clarify accuracy in significant detail for example ensuring the use of as accurate a location of the homicide offence as possible when geo-coding.

To allow a suitable database to be developed to support the aims of this research, a separate database of all the relevant homicides was created using information exported from the crime reporting system. The relevant details of the variables were also exported into this database mainly from the CRIS system. All the homicide locations, victim and offender home addresses (where known) were geo-coded to exact addresses or street locations to allow the best possible analysis of the data.

Some limitations were identified which may impact upon this research. A number of murders in London have not been included in the homicide analysis. These include the small number of homicides investigated by the City of London and British Transport

police; on average these forces investigate one murder between them per year in London. Also excluded are the 52 people murdered in the London bombings in 2005. This is because it is believed that as these were terrorist related murders, the motivation is very different to the general murder issues which this research intends to analyse and therefore including them may create significant bias in any findings. Finally, only murders that have been identified and classified as such will form part of the data collection (Home Office 2009). It is accepted that cases such as missing persons where no body has been discovered, which have never been classified as a murder and remain a missing person's investigation, cannot be analysed despite the fact a murder may have been committed.

Data Analysis

Before any analysis was conducted a full manual review of the data was completed. Clear data standards were adopted to ensure a consistent coding scheme for each of the variables which allowed consistency in the subsequent descriptive analysis. Such an approach required all the data used to be reviewed to ensure, to as high a level of certainty as possible, that the data was accurate, e.g. all homicide locations were reviewed by cross referencing with original source documents and rechecking detail such as postcodes. Many gaps and inaccuracies were identified through this process. (One of the unintended positive consequences of this analysis was the improvement of the data quality available to the MPS). Once this process was completed, to identify and then analyse spatial and temporal distribution of homicide, a geo-coded crime mapping tool was utilised. Additionally to assist in the analysis of victim and offender linkages to the homicide location another crime mapping tool, spider-graph, was utilised. Each location was assigned geographic coordinates to ensure an accurate geographic location and thereby plotting to an exact location within London.

Unit of Analysis

In this study three discrete levels of geographic unit were applied ranging from macro areas through to smaller neighbourhood-type places. Initially the largest unit of measurement used was the local authority borough area. Within London there are 32 of these local authority boroughs and whilst they range in size, all have populations around the 200,000 level.

The boroughs are each sub-divided into wards which are significantly smaller areas. This was the second level of analysis used and with, on average, 23 wards per borough it provided a far more focused geographical location. In total London is divided up into 624 ward areas.

The third and final level of analysis was the Lower Super Output Area (LSOA). A LSOA is a unit of geography used within the neighbourhood statistics strand of the Office for National Statistics (ONS) for statistical analysis. LSOAs were created with the intention that they would not be subject to frequent boundary changes which therefore make them a very useful geographic unit of analysis as there is an element of consistency. There are 3 layers of Super Output Area; lower, middle and upper. Each of the classifications covers a different size of geographical area. This research used the smallest geographical unit also known as the Lower Layer Super Output Area. The LSOA covers an area consisting on average of 633 households with a minimum population of 1000 residents, with a mean average across the country of 1500 residents (Office for National Statistics , 2010). There are currently 4,761 LSOAs within the Greater London area.

To provide some context to the three levels of measurement, the following sets out the impact of an approach which uses a geographic area of London. Lambeth is a local authority borough and was part of the 32 boroughs forming the first level measurement. Within this borough there are 21 wards (second level of measurement) and 157 LSOAs (third level of measurement).

The crucial aim of this research is to explore small geographical areas to allow the identification of any concentrated homicide pockets in line with theoretical workings highlighted within the literature review, i.e. Sherman, Gartin, & Buerger 1989. By pursuing a three-level methodology it is proposed that opportunity will be maximised to achieve this aim. Many studies of spatial distribution of crime have consistently identified that crime is persistently concentrated at a small number of micro places (Groff, Wiesburd & Yang 2010). The key to identifying such concentrations is the size of the unit of analysis. Within a London context, and combined with a crime as rare as murder, dependant upon your unit of analysis, e.g. local authority borough, ward or LSOA, there will be discrete places free of such crime within the areas which might be considered criminally problematical and vice versa (Weisburd & Green 1994). This methodology builds upon the learning from the previous research suggesting a focus upon small areas that could be described as hot spots of crime.

Analysis

The key critical research element of this work is to explore whether there are spatial concentrations of homicides within London. To achieve this the following processes were adopted. All homicide locations, victims' and offenders' home addresses were geo-coded and mapped with the aid of a computer based tool. For analytical purposes the mapped data for each level was analysed and placed into frequency distribution tables for each of the

three geographical areas of measurement. Analysis was then conducted by means of frequency at which homicides occurred per places of measurement, from zero to over 100, dependant on the place size. Data was further analysed by means of the percentage that the number of homicides and their places accounted for within the overall dataset and additionally presented by further means of a cumulative percentage measurement. These tables form the basis from which additional analysis was conducted (see Appendix 1 for an example of this methodology). The approach was adopted for each of the three geographical areas moving from the largest down into the smallest places and attempted to utilise the acclaimed work of Sherman, Gartin, & Buerger 1989 in focusing upon areas large enough to be able to draw out concentrations of homicides without using an area so large that concentrations in micro places may be missed or lost.

Sub-group Analyses

Having worked through the initial analysis of the homicide locations and identified places where there are concentrations or pockets of homicides, a secondary analysis was then conducted. The purpose of this was to examine the characteristics of those homicides which occur across London against those that occur in a small number of concentrated areas. The examination compared the homicides in terms of socio-demographic indicators of murderer and victim. Like Wolfgang's work this included ethnicity, age and gender but was limited due to the quality of data available. The examination of ethnicity was based upon the MPS's broad ethnicity recording 6 point protocol (Appendix 4). Such data was captured during the homicide investigations and provided a basic tool for analysis. The aim of the second-level analysis was to explore whether there were reasons or differences for these pockets based upon the characteristics of either the victim or offender and whether there were any connections.

Spatial Analyses

A further level of spatial analysis was then conducted to explore the relationship between the homicide location and that of the victims' and offenders' home address. This used the same technology as the initial part of the research, i.e. plotting geo-coded data. Through spider-graph technology the distances between the geo-coded points were then calculated (Appendix 5).

Temporal Analyses

Finally, temporal analyses were conducted to compare the general homicide picture across the 10-year period against that within the concentration areas. This analysis examined factors such as years, months, days and times when offences were committed, the purpose being to explore any similarities and differences between the groups. As previously highlighted this analysis looked to replicate, within the context of London in the 21st Century, the work performed by Wolfgang (1958) in relation to temporal and victim and offender factors.

Many of the key pieces of research highlighted within the literature review explored the underlying causes of why a particular crime was clustering in particular places. In terms of the places where homicide clusters in London, an analysis was performed utilising data from the Index of Multiple Deprivation which focuses down to the LSOA level of geographical measurement. This data, produced by the Office for National Statistics, enabled comparison of the whole of the London homicide picture against those pockets of homicide. Using the Index of Multiple Deprivation also enabled the

identification of any links between homicide clusters in London and Dorling's assessment (2008, p31) that 'the poorer the place you live in the more likely you are to be murdered'.

Other Considerations

Ethical issues have been considered throughout the development of this research. Authority for access to and use of homicide data has been obtained in writing from the MPS's Head of Homicide Investigation who fully supports this work. The homicide data has been anonymised so that no individual can be identified within the final product and thus respects the sensitivity of such an impactive crime and the privacy of all concerned, managing the implications of the Data Protection Act.

The issue of generalisability has been considered in this research. In developing the methodology employed, consideration was given to purely examining a sample of murders per year selected on a random basis. Due to the relatively low number of murders as a crime in comparison with a volume crime such as burglary, it was decided to analyse the whole of the homicide population data between the time parameters except the exclusions previously highlighted. As a result no sample extraction process or selection bias will be introduced into the research and therefore the potential for any findings to have validity based within the whole population group will be increased. It is however accepted that the source of the homicide data is based solely within one city, as such a single society research, and therefore may encounter generalisability challenges beyond London's population groups.

The reliability of all data secured is anticipated to be at a high level due to the original reasons for its capture. The data is factual objective information obtained to support the investigation and on many occasions subsequent court trials. It is accepted

however that any inaccuracy and any gaps in the data that was gathered through the initial homicide investigations could have the potential to limit the effectiveness of any findings. It is an accepted fact that police incident data can have shortcomings (Black 1970) however, despite any potential flaws, with careful analysis police incident data can be a vehicle by which useful research findings are gathered (Schneider & Wiersema 1990). In accepting this limitation it is anticipated that by analysing every MPS homicide investigation across the time parameters as described, any impact will be reduced. Additionally as part of the methodology for this research, data has been reviewed and cross-referenced with original source documents to increase its quality and accuracy.

Official police incident data is widely used within research to aid the assessment of crime trends and patterns and to evaluate crime reduction programmes (Sherman & Rogan 1995). The independent variables which have been extracted from this data set, e.g. gender, are very clear and objective. This is believed to provide a measurement process that will be both reliable and valid. Such measurement processes have been utilised in similar research in other countries (Rosenfeld, Bray, & Egley 1999) and have been found to be valid.

Results

Introduction

The research focus of this work was to explore whether homicide and place in London are connected or if homicide occurs at random in relation to place. The research was underpinned by incremental research questions, the first of which being whether there are geographic concentrations of homicide. Following identification of these homicide clusters the research explored if homicide concentrations were dependant upon the characteristics of either the victim or offender and whether there was any relationship between the location of the offence and the home addresses of the victims and offenders. Finally temporal analysis compared the whole dataset with that of geographic concentrations.

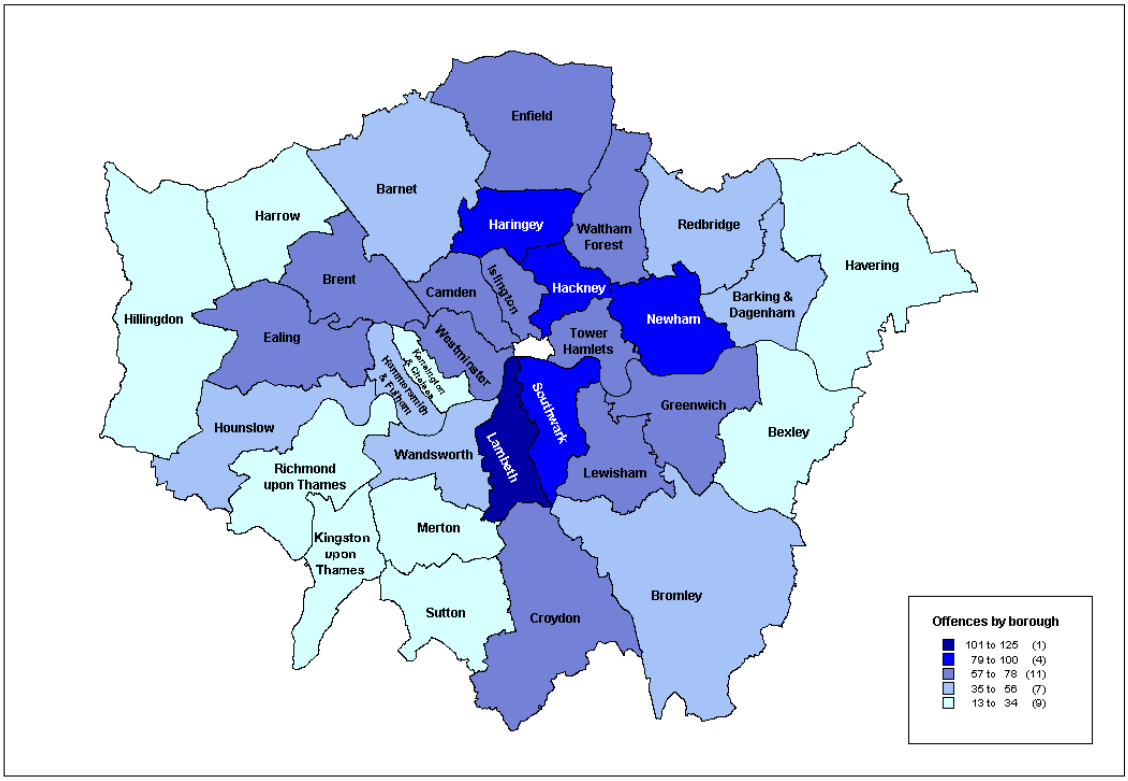
The results are based upon an exploratory descriptive data analysis of homicide offences over a 10 year period from 1.4.00 to 31.3.10 within the Metropolitan Police Service (MPS) area of London. This equates to 1664 homicide locations, 1714 victims of homicide and 2382 persons against whom proceedings for a homicide offence was commenced.

Spatial Analyses

To investigate whether homicide and place are connected each of the homicide locations were geo-coded and plotted onto a map. This amounted to 1664 homicide locations however, only 1635 were mapped within the London area. This was due to the omission of homicides that either did not have an identified location such as a missing person inquiry which became a homicide investigation, albeit the victim's body was never found, or the actual location was outside of London.

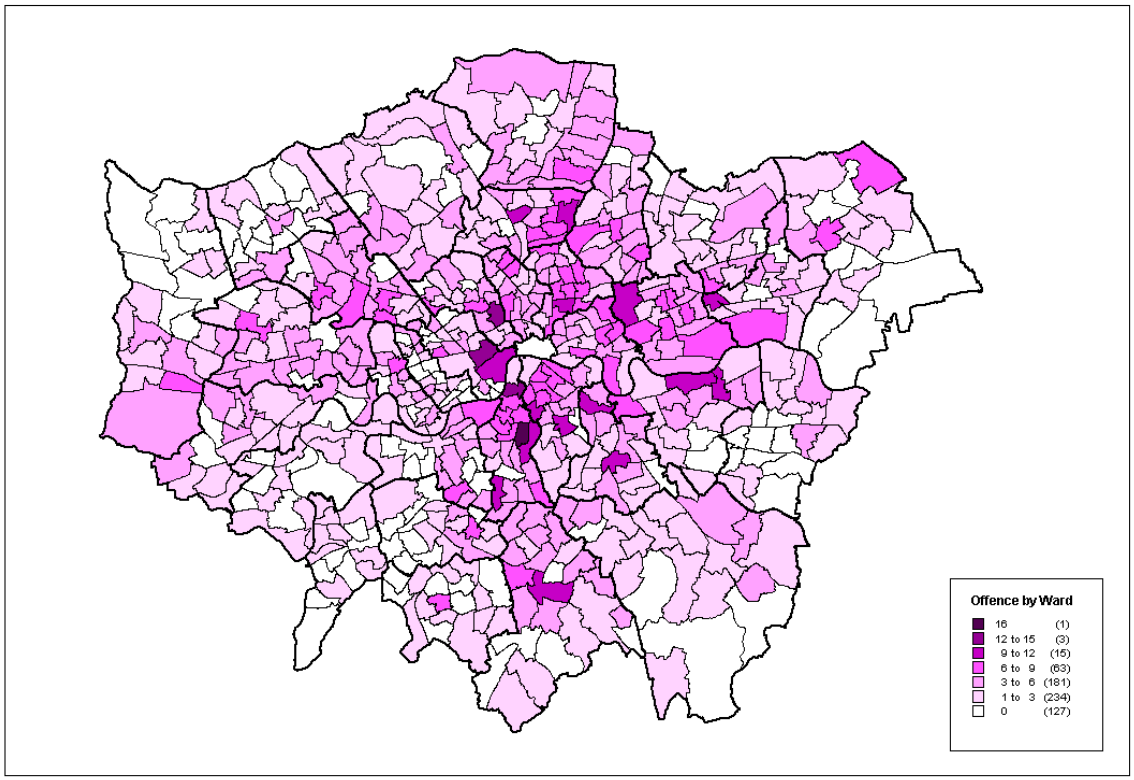
The first level of analysis conducted was at a local authority borough level. Each of these 32 areas are large 'chunks' of London and have a population in excess of 200,000. The number of homicide locations within each borough varied from 125 within the borough of Lambeth to 13 within Richmond upon Thames. The top 16% of boroughs (n=5) with regard to homicide volume accounted for 30% of the homicide locations (n=493), with a mean average of 51 homicide locations per borough over the 10 year period. Figure 1 displays the spread of homicides across London's boroughs. This analysis did not assist in identifying whether London had spatial concentrations of homicide.

Figure 1 – Homicide location density by local authority borough within MPS boundaries – 1.4.2000 to 31.3.2010



The second level of analysis was at ward level. Since there are 624 wards within London the analysis was taken down to smaller geographical areas. Appendix 2 shows the breakdown of homicide location frequency within wards. This approach began to identify slightly more focused 'clustering' of homicide locations due to the smaller geographical measurement. It was discovered that 20% of London's wards (n=127) did not experience a homicide over the 10 year period of analysis. Conversely 13% of the wards (n=19) accounted for 39% (n=201) of the homicide locations with a mean average per ward of 2.6 homicide locations over the 10 year period. Figure 2 shows the spread of the homicide locations on a ward basis.

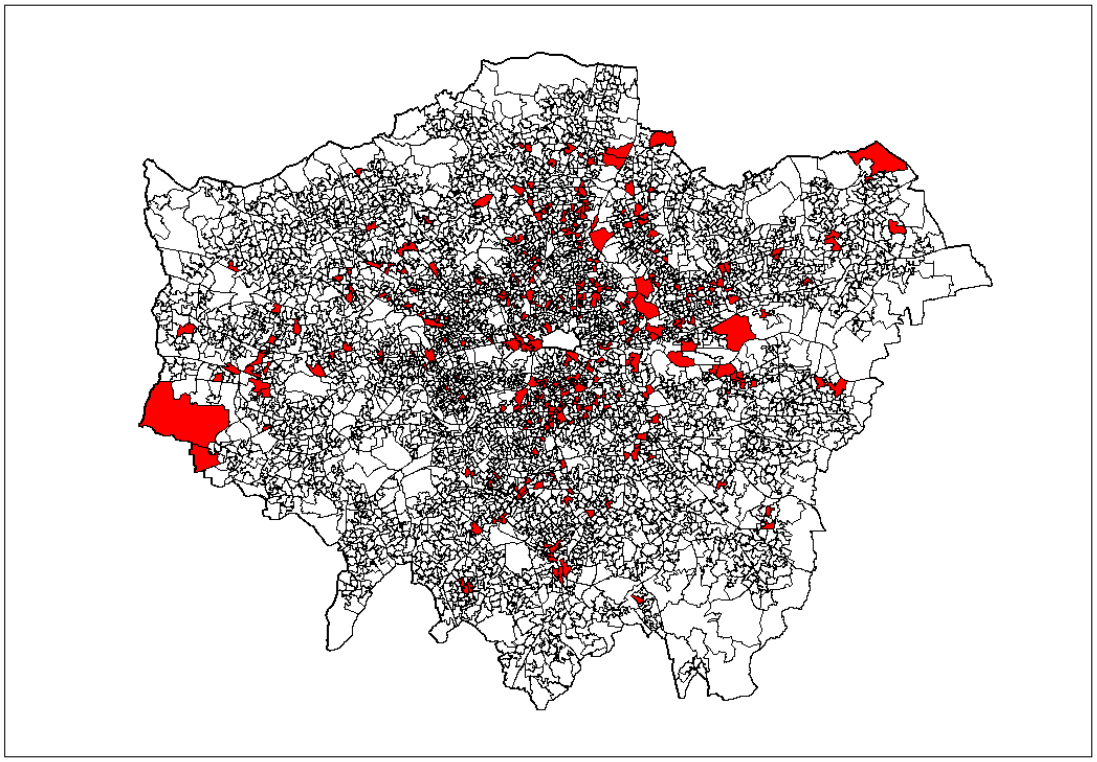
Figure 2 – Homicide location density by ward within MPS boundaries – 1.4.2000 to 31.3.2010



The final level of analysis examined the smallest geographical area, the LSOA.

Appendix 3 sets out the frequency of homicide locations within each LSOA. Emerging from this approach were clear areas of homicide and non-homicide location concentrations. Across the 4761 LSOAs, 74% (n=3520) did not have a homicide occurrence over the 10 year period of this study. The remaining 26% LSOAs (n=1241) accounted for 100% of homicide locations in London (n=1635). Further analysis identified significant clustering of homicide locations with 6% (n=287) of the LSOAs accounting for 42% (n=681) of all London's homicide locations. Figure 3 below shows London divided up into LSOAs with the 6% of LSOAs contributing the 42% of homicides highlighted in red.

Figure 3: The 6% of LSOAs that contributed 42% of all homicides within MPS boundaries (highlighted in red) – 1.4.2000 to 31.3.2010



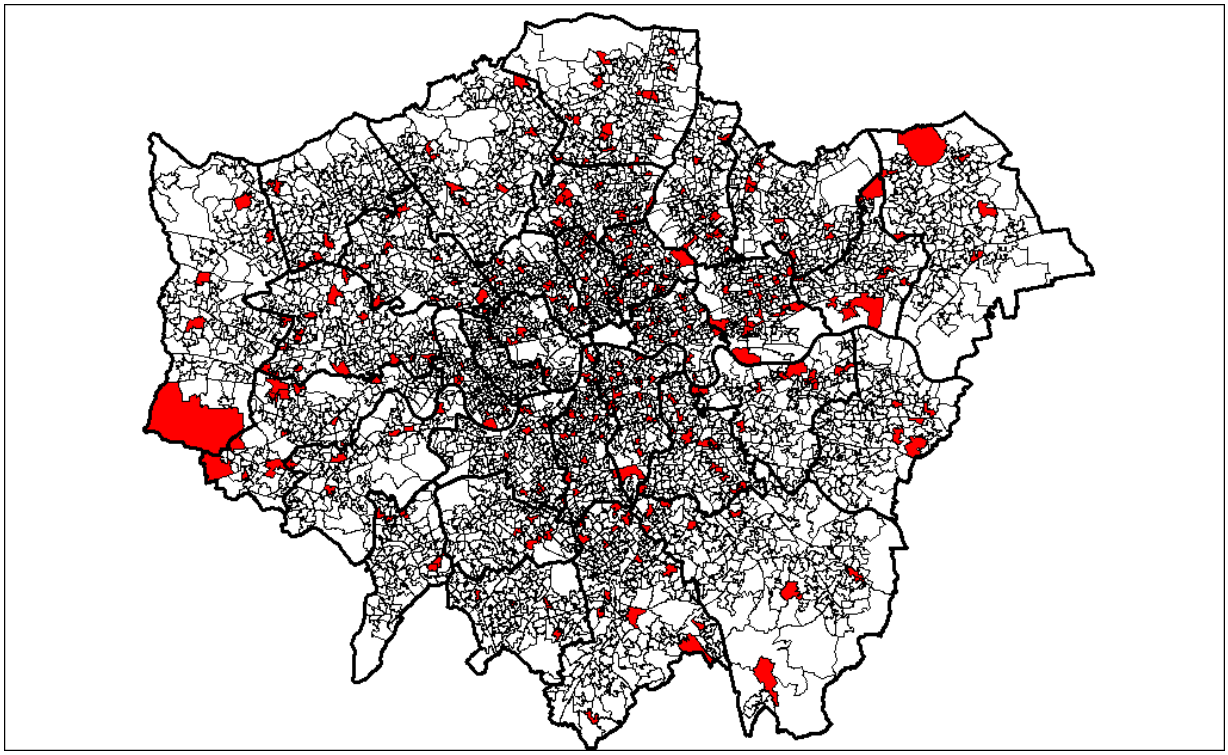
At a micro-level the top three LSOAs, in terms of homicide location volume, were all connected to each other, crossing ward boundaries within the borough of Westminster

(Appendix 4). They would not have been identified by the larger geographical method of analysis discussed above. Such findings support the importance of focusing down to the smallest of geographical areas, i.e. Weisburd & Green, 1994.

Having conducted this examination further analysis was completed applying the same methodology to domestic violence, gun and knife-related types of homicide to see whether particular types of homicide were also concentrated across London.

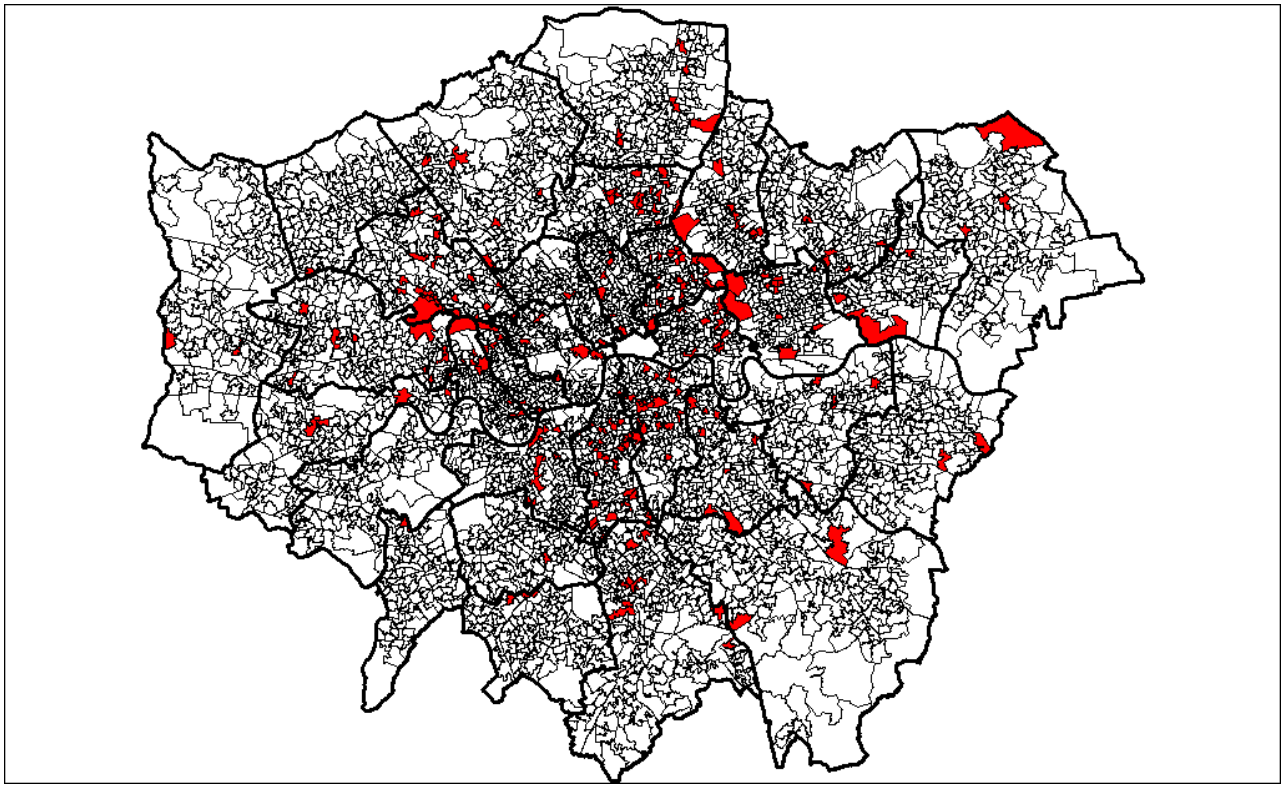
Figure 4 below shows all domestic violence homicides across the 10 year period. This equates to 351 however due to data accuracy issues only 345 could be mapped; the remaining were therefore excluded from the geo-coding. These homicides occurred within only 7.2% of LSOAs (n=328) thus leaving 92% of London's LSOAs without any domestic violence homicide.

Figure 4: Location of Domestic Violence related homicides within MPS boundaries (highlighted in red) - 1.4.2000 – 31.3.2010



The MPS only began to record usage of guns and knives in homicide offences during the crime recording year 2002/2003 therefore only 8 years of data are available for the parameters of this research. Examination of gun-related homicide over this period shows there were 257 identified offences of which 256 could be mapped. These homicides were located in just 5% of London's LSOAs (n=237). Figure 5 below provides a pictorial image of the concentration.

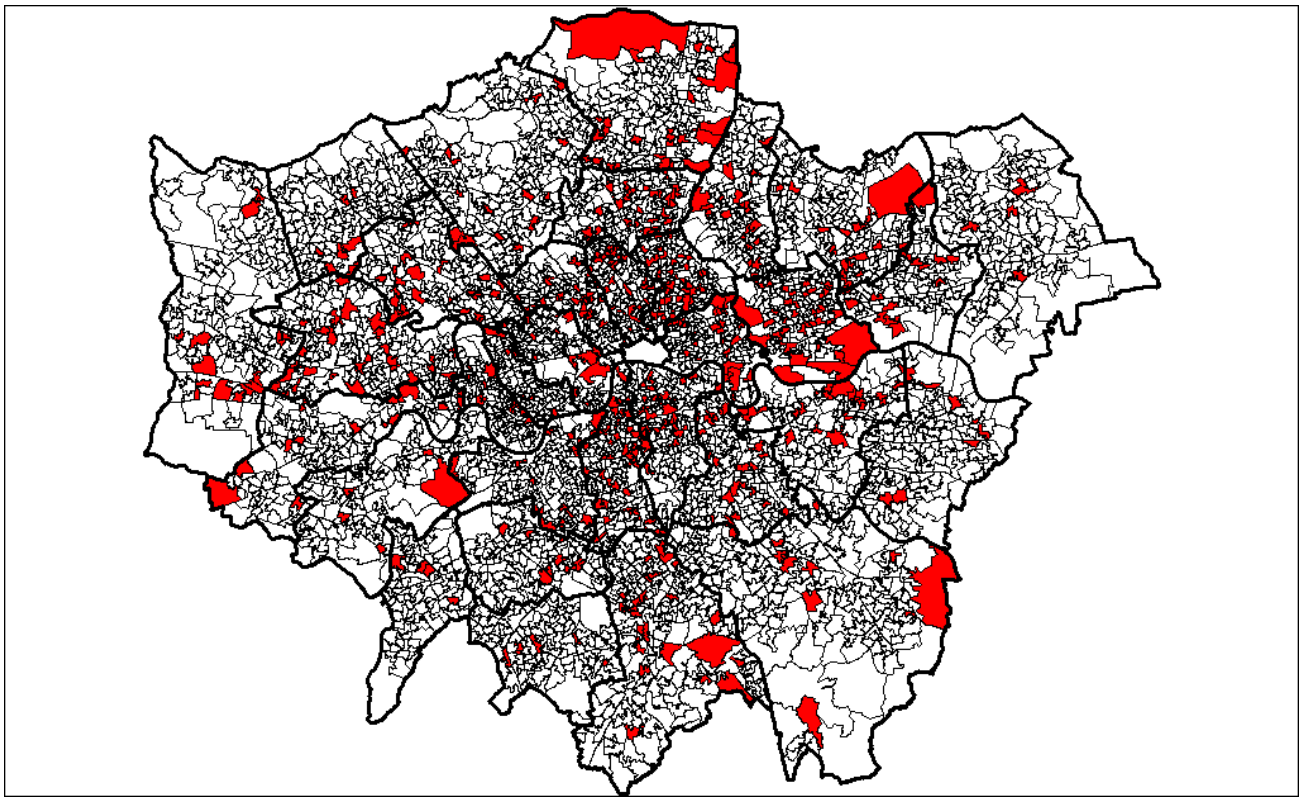
Figure 5: Location of gun-related homicides within MPS boundaries (highlighted in red) – 1.4.2002 to 31.3.2010



Finally all knife-related homicides were examined which equated to 656 offences of which 655 could be mapped. Knife-related homicides were dealt with separately as a homicide type due to the significant media coverage this particular crime had received. As a result of concerns over increasing levels of knife crime, a range of new criminal offences were introduced, i.e. Violent Crime Reduction Act 2006, in response to what had been

described in the media as a knife culture which was sweeping the streets of the country (Knife Crimes 2010). Despite this knife-related homicides occurred in only 12% of London's LSOAs (n=579) displayed in figure 6.

Figure 6: Location of knife-related homicides within MPS boundaries (highlighted in red) – 1.4.2002 to 31.3.2010



Summary

Having applied the methodology as described the analysis showed different results at each level of examination. At both local authority and ward level concentrations of homicide offences could not be identified due to the geographical size of the areas. However, the findings in relation to the LSOA geographic areas identified that 42% of homicide offences were committed in only 6% of the LSOAs tending to support the research proposal that homicide and place are connected.

Having identified geographical concentrations of homicide, a similar analysis was conducted for the locations of domestic violence, gun-related and knife-related homicide. This examination also identified concentrations of types of homicide in small geographical areas of London. Comparison was made between homicide clusters in the 6% of LSOAs identified above and the additional homicide clusters of domestic violence, gun-related and knife-related homicides. This showed that 28% of domestic violence homicides (n=91), 38% of gun-related homicides (n=90) and 35% of knife-related homicides occurred within the 6% of LSOAs contributing to the 42% of London's overall homicide total over the 10 year period.

Second Level Analyses

To investigate whether homicide pockets are dependent upon the characteristics of the accused or victim, a series of comparisons were conducted. Examination of gender, ethnicity and age was conducted on a single issue basis and was then combined to allow a cumulative analysis.

Gender

The analysis of victims across the 10 year period identified 1714 persons, made up of 1299 males (75.8%) and 415 females (24.2%). Within the 42% sub-set of the top 6% of LSOAs there were 698 victims with 79.5% (n=557) male victims and 20.5% (n=143) female victims.

Between 1.4.2000 and 31.3.2010, 2382 people were accused of homicide offences with 92.7% being males (n=2207) and 7.3% being females (n=175). The 42% sub-set showed similar divisions, males accounting for 94.3% (n=925) and females 5.7% (n=56).

Ethnicity

Ethnicity analysis was based upon the Metropolitan Police Service's 6 point ethnicity recording matrix (Appendix 5) categorising victims and offenders within the 6 ethnic groups that the system utilises. Table 1 breaks down the victims of homicide into groups as described.

Table 1: Analysis of ethnicity of victims of homicide – 1.4.2000 to 31.3.2010

White European	746
Dark European	110
Afro- Caribbean	566
Asian	222
Oriental	38
Arabian/ Egyptian	19
Unknown	13
Total	1714

The largest victimised group, in terms of absolute numbers, were White Europeans who accounted for 43.5% of all victims analysed (n=746) with the second largest group being Afro-Caribbean victims who accounted for 33.0% (n=566). A similar exercise with the 42% sub-set again identified White Europeans as contributing the highest number of victims but with a smaller percentage of the count, 39% (n=275). Afro-Caribbean were again the second largest victim group accounting for 33.2% of victims (n=566).

Those accused of homicide offences were subject to the same examination however ethnicity data was only available for 2378 of those persons. Table 2 shows the breakdown of this data.

Table 2: Analysis of ethnicity of persons accused of homicide – 1.4.2000 to 31.3.2010

White European	829
Dark European	142
Afro - Caribbean	1041
Asian	304
Oriental	41
Arabian/ Egyptian	26
Unknown	4
Total	2382

The largest accused group were Afro-Caribbean persons who accounted for 43.7% (n=1041) of all persons accused of homicide with the second largest group being White Europeans accounting for 34.8% (n=829). Within the 42% sub-set the breakdown had a similar profile with the largest group being Afro-Caribbean persons, equating to 44.8% (n=440), and White European persons the second largest group at 34.2% (n=336).

Age

Age was broken down into the same age categories as Wolfgang (1958) to assist in subsequent comparison. Table 3 below shows the volume of homicide victims within each age group. The peak age for victims of homicide was between 20 and 29 years accounting for 30.3% (n=520) of all victims. Of note however was the volume of victims aged 65 and over accounting for 7% of all victims (n=120). Within the 42% sub-set the peak age was again between 20 and 29 accounting for 29.6% of the victims (n=208).

Table 3: Age analysis of homicide victims - 1.4.2000 to 31.3.2010.

U15	101
15-19	177
20-24	278
25-29	242
30-34	190
35-39	173
40-44	136
45-49	102
50-54	88
55-59	45
60-64	51
65+	120
Unknown	11
Total	1714

Analysis of those accused of homicide identified a trend towards younger persons, the peak age being between 15 and 24 years, amounting to 50.4% (n=1201) of the total amount. In the 42% sub-set a very similar pattern emerged with the same peak age span of 15 to 24 years of age accounting for 50.7% (n=498) of persons accused of homicide.

Combined Analysis

In pursuing this research's aim of conducting a partial conceptual replication of Wolfgang's (1958) work the socio-demographic data was then brought together into one set of results to allow further focused analysis of the data on both the victim and accused.

Victims

The combined picture of victimisation is presented within Appendix 6 drawing together gender, ethnicity and age. This was the starting point for more in-depth of the data.

In examining this data a more detailed picture was forthcoming of particular groups that appeared to suffer greater victimisation. Grouping victims into age bands of 5 years, with the exception of those under 15 and the over 65, provided the basis for identifying patterns and themes within those victimised. The three highest groups in terms of volume victimisation are Afro-Caribbean males between the ages of 15-19 (n=99), 22-24 (n=118) and 25-29 (n=82). They together as a small segment of the overall victim groups account for 17.4% of all the victims of homicide over a 10 year period. Table 4 below provides more detailed analysis of the victimisation of Afro-Caribbean males between these ages comparing them with all other victims in the same age categories. Of considerable interest is that of all the victims of homicide between the ages of 15-19, Afro-Caribbean males make up 55.9% of the total (n=99). However, the most victimised overall group were White European males who accounted for 32.0% (n=548) of all victims. The Afro-Caribbean males as a whole accounted for 27.1% (n=465).

Table 4: Comparison of Afro-Caribbean male victims of homicide and overall victims – 1.4.2000 to 31.3.2010

Age Category	Overall number of Victims within category	Number of Afro-Caribbean males	% of Afro-Caribbean males within overall age category
15-19	177	99	55.9%
20-24	278	118	42.4%
25-29	242	82	33.9%

When these findings are compared with the victims murdered in the 6% of LSOAs that account for 42% of the total homicides, a change in victim profile is noted. Overall the most victimised group changed from the White European male, 29.7% (n=209) to the

Afro-Caribbean male who accounted for 32% of all victims (n=225). However similarly to the overall dataset, the most victimised sub-groups were Afro-Caribbean males aged 15-19 (n=56), 20-24 (n=50) and 25-29 (n=37), see Table 5. Within the 15-19 age category an increased difference was identified with Afro-Caribbean males accounting for 70.8% (n=56) of all homicide victims within this sub-set of the homicide data.

Table 5: Comparison of Afro-Caribbean male victims of homicide and overall victims within the 6% of LSOAs – 1.4.2000 to 31.3.2010

Age Category	Overall number of victims within category	Number of Afro-Caribbean males	% of Afro-Caribbean males within overall age category
15-19	79	56	70.8%
20-24	111	50	45%
25-29	97	37	38.1%

Accused Persons

In line with the examination of victims, Appendix 7 sets out the analysis of all persons accused of homicide over the 10 year period. The single largest category was the Afro-Caribbean male who accounted for 41.4% (n=986) of all persons accused of homicide. The second largest group was the White European male, who accounted for 31.4% (n=747) of all persons accused of homicide.

Grouping persons accused into age bands showed that the two most common sub-groups of persons accused of homicide were the Afro-Caribbean males aged 15-19, accounting for 14.7% (n=351), and Afro-Caribbean males aged 20-24 accounting for 10.7% (n=257) of the whole dataset. Afro-Caribbean males aged between 15 and 34

account for 34.1% (n=814) of all persons accused of homicide offences. This is placed into perspective when compared with the second largest category of accused persons, the White European male, which only accounts for 19.9% (n=475) of persons accused of homicide.

Table 6 below provides analysis by comparing the highest occurring group within an age category against the overall numbers of persons accused of homicide within that age group. This clearly displays the considerable proportion of Afro-Caribbean males that are accused of homicide offences.

Table 6: Analysis of Afro-Caribbean males accused of homicide and their peer age group – 1.4.2000 to 31.3.2010

Age Category	Overall number of accused within category	Number of Afro-Caribbean males	% of Afro-Caribbean males within overall age category
15-19	615	351	57%
20-24	586	257	43.8%
25-29	305	105	34.4%
30-34	287	101	35.2%

Within the sub-set of the 42% of homicides occurring within the 6% of LSOAs, the most common group of persons accused of homicide was again the Afro-Caribbean male, making up 43.4% (n=426) of those accused. The White European male was again the second most common group accounting for 30.8% (n=303) of those accused of homicide. Further analysis identified that Afro-Caribbean males aged between 15 and 34 accounted for 37.2% (n=365) of all persons accused of homicide within the sub-set. Below in Table 7

further contextual analysis is shown comparing the numbers of Afro-Caribbean males accused of homicide offences with all others of the same ages.

Table 7: Analysis of Afro-Caribbean males accused of homicide and their peer age group within the 6% concentration of LSOAs – 1.4.2000 to 31.3.2010

Age Category	Overall number of accused persons within category	Number of Afro-Caribbean males	% of Afro-Caribbean males within overall age category
15-19	237	150	63.3%
20-24	261	112	43.0%
25-29	136	43	31.6%
30-34	120	50	41.7%

Summary

Throughout the analytical tests for each aspect of the demographic profile the comparison between the whole dataset and those homicides within the concentrations were very similar. The proposition that the homicide concentrations are dependant upon either the characteristics of the victim or offender has not been supported, therefore the second level research has been falsified, however, particular groups were identified in both datasets whom appeared at increased risk of being a victim or offender. This will be discussed later.

Temporal Analysis

Temporal analysis was conducted using a range of variables, e.g. time of offence, in line with the analysis conducted by Wolfgang (1958). The purpose of this was to

compare the whole dataset and the concentration of 42% of homicides to ascertain if there were any similarities or differences.

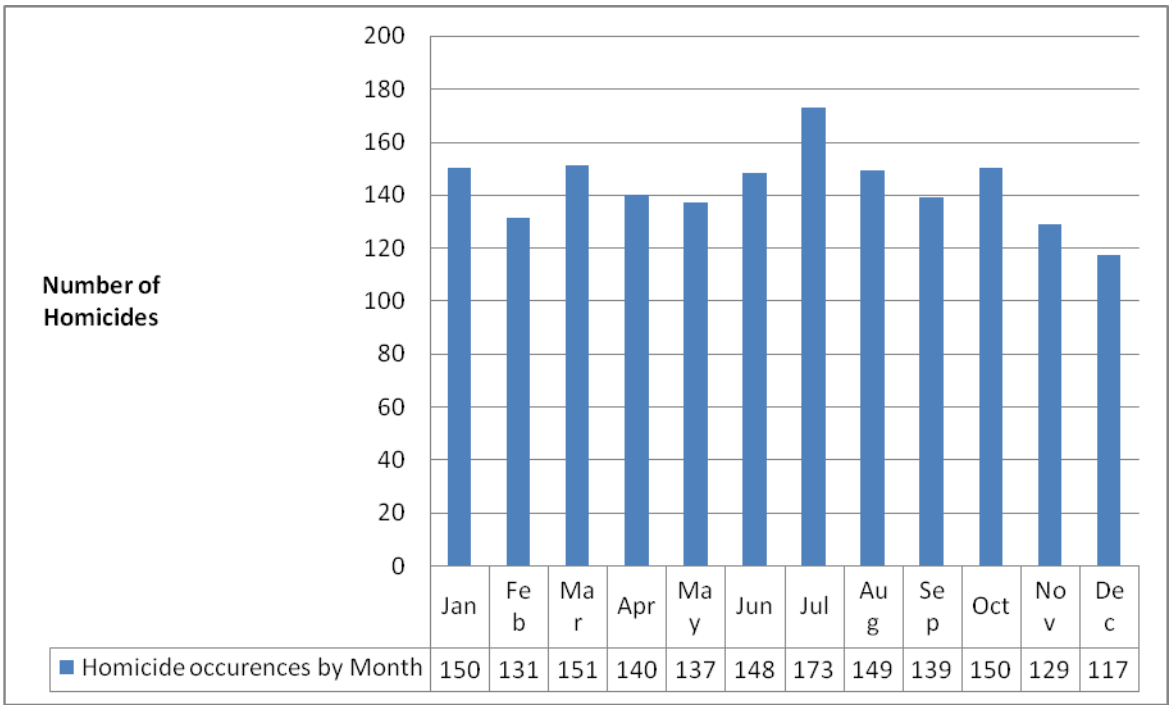
Year

The first level of analysis examined the number of homicide victims per year. Across London there were 1714 homicide victims which equated to a mean average per year of 171.4. The peak year for homicide was 2003/04 (n=200) with the lowest year being, 2009/10, which had 114 victims. This equates to a reduction in homicide victims between 2003/04 and 2009/10 of 43%. A similar pattern was identified with the 42% of homicides within the clustered 6% of areas. During the 10 year period these areas accounted for 698 homicide victims with a mean average of 69.8 homicide victims per year. Like the overall London picture this segment of homicides experienced its peak in 2003/04 (n=87) and its lowest number in 2009/10 (n=46), a decrease of 47%.

Month

Table 8 below, sets out the volume of homicide offences occurring on a month-by-month basis across the whole 10 year period. Analysis shows a range from the peak month of July (n=173) through to December (n=117). This equates to a mean average of 142.8 homicides per calendar month for the 10 year period. When analysis was conducted on the clustered LSOA data, a similar pattern was identified with July again being the peak month for homicide offences (n=79), however in these locations the lowest month for homicide was February (n=40).

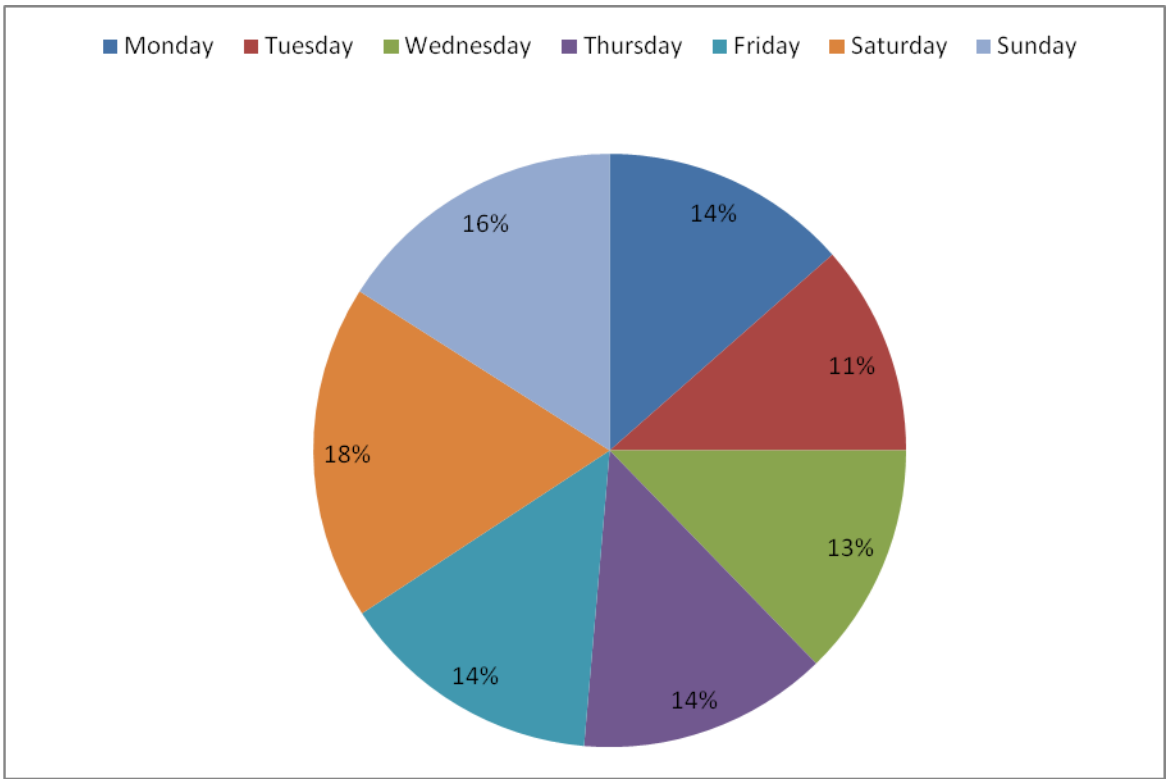
Table 8: Homicide Occurrence by Month - 1.4.2000 to 31.3.2010



Day

Table 9 below sets out the spread of homicides across days of the week. Within this dataset and that of the sub-set of homicides within the 6% of LSOAs, both experienced their highest frequency of homicide on Saturdays and Sundays. Within the whole dataset this accounted for 33.3% (n=570) of all homicides whilst within the sub-set of data there was an increased frequency of 38.2% (n=260).

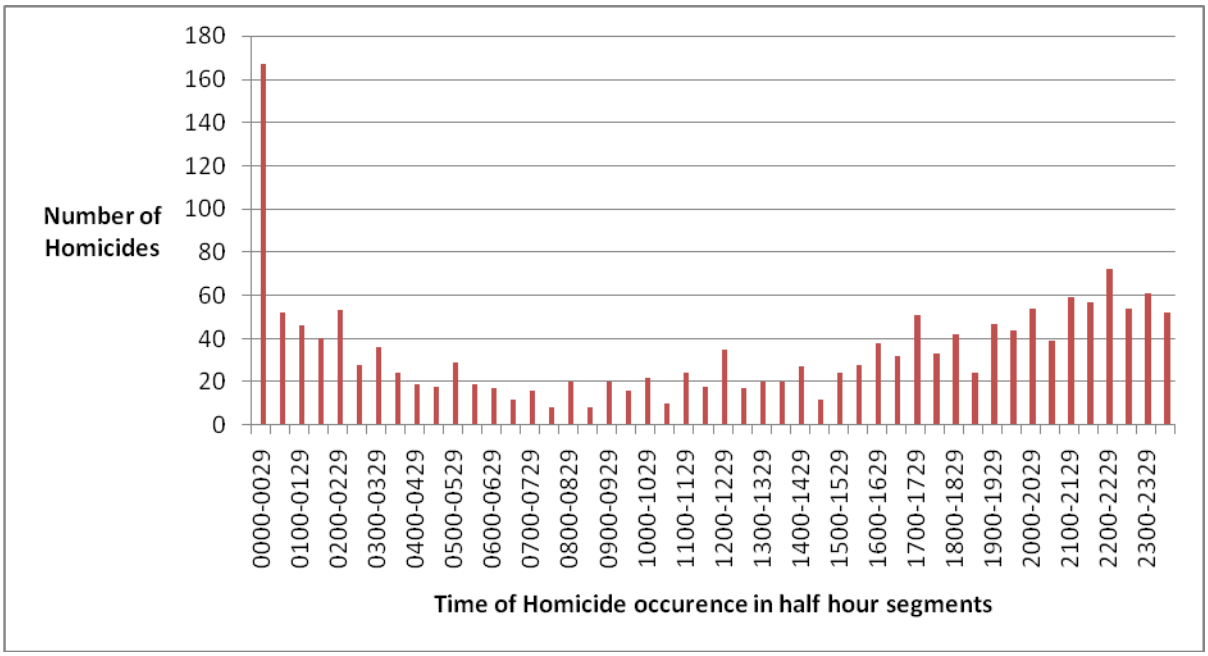
Table 9: Homicide occurrence by day - 1.4.2000 to 31.3.2010



Time

Time analysis over the 24 hour period was achieved by breaking 24 hour periods into 30 minute sections. Results identified a similar pattern for both the whole dataset across the 10 year period and the sub-set of the 42% of homicides within the clustering. Of importance appears to be a data recording issue whereby a considerable number of homicides were recorded as occurring at either '0000' or '0001'. It was not possible to identify from the police records whether this was of great importance as a finding or, more likely, due to data recording practices. Table 10 has been included to display the impact that this finding has had upon the data and potential analysis.

Table 10: Time analysis of homicide offences - 1.4.2000 to 31.3.2010



Summary

The analysis showed that there were considerable similarities between the temporal aspects of the whole homicide dataset and the sub-set of the concentration of the 42% of homicides.

Third Level Analyses

To investigate whether there was a relationship between the homicide location and the victim and offender further spatial analysis was conducted. This was done by analysing the distance from the offenders' or victims' home address to the homicide location. Further analysis was conducted replicating the homicide location methodology producing a frequency analysis of where victims and offenders lived at LSOA level. The initial location analysis had identified a clustering of 42% of homicide locations within 6% of areas therefore analysis was conducted with the whole of the dataset and then separately

with the sub-set of the 42% of homicide locations to identify any differences within profiles. This exercise identified difficulties with the quality of data extracted from police records.

In this study 1714 victims have been identified, however, only 1471 were able to be plotted by reference to their home addresses. There were a variety of reasons for this ranging from the victim being recorded as being of 'no fixed abode' through to a lack of information being recorded. The total number of victims' home addresses not plotted equated to 14% of the dataset (n=243). Similar issues were identified within the records of those persons accused of homicide. The full dataset identified 2382 persons but only 2069 could be plotted. A far greater number were shown as being of 'no fixed abode' but there were still data quality issues around incomplete data, those not plotted equating to 13.1% (n=313).

With regard to the home addresses of those persons accused of homicide offences, a significant span of distance from the homicide location was discovered ranging from 0 miles to 447 miles. When examined in detail 49.1% (n=1016) of accused persons within the total plotted dataset (n=2069) resided within 1 mile of the offence. When compared with the clustered 42% of homicide locations, similar findings were identified in which 851 accused persons 47.4% (n=403) resided within 1 mile of the offence. It is interesting to note that across all of the homicides in London over the 10 year period, just under 50% of the accused persons lived within a mile of the homicide scene. In contrast the three LSOAs which had the highest homicide frequency, all within the borough of Westminster, had a different profile. Whilst using smaller numbers (n=19), by means of the same analysis 68.4% (n=13) actually resided 5 miles or more from the location of the homicide.

The relationship of victim home address to murder scene shows a varied pattern. Across the whole plotted dataset of 1471 victims 29.6% (n=435) resided within 1 mile of their murder location and 48.7% (n=716) resided within 2 miles. In examining the 42% dataset which accounted for 580 plotted victims, 26.9% (n=156) resided within 1 mile and 51% (n=295) resided within 2 miles of their murder location. The Westminster LSOAs again displayed a different profile with 50% of their 14 plotted victims (n=7) living over 4 miles away from the homicide scene.

In line with the methodology of plotting homicide locations within LSOAs, analysis was replicated for both the home addresses of victims and accused persons where sufficient detail was available. This exercise also began to replicate a number of the clustering effects of the first exercise, particularly in relation to those accused of homicide. Table 11 below sets this out by means of frequency distribution analysis of the accused persons.

Table 11: Frequency distribution of home addresses of persons accused of homicide by LSOAs - 1.4.2000 to 31.3.2010

Number of home addresses of persons accused of homicide	Frequency of 'LSOA' with equivalent number of accused persons
7	2
6	7
5	3
4	22
3	105
2	276
1	932
0	3414
Total	4761

Significantly 72% of the LSOAs (n=3414) did not have a person residing within their area accused of homicide over the whole of the 10 year period. The remaining

LSOAs (n=1347) contributed all of the persons accused, with 8.7% of the LSOAs (n=415) accounting for 52.4% (n=1026) of home addresses of those accused of homicide. When analysing victim's home addresses the clustering effect was not so profound however it was still identified that 75.5% of the LSOAs (n=3597) did not have a homicide victim residing within their boundaries and that 4.6% of LSOAs (n=220) accounted for 35% (n=498) of the home addresses of the victims.

Summary

This analysis identified two specific findings the first being that a wide span of distance exists between the offenders' and victims' home address and the murder scene. However, across the whole plotted dataset, 49.1% (n=1016) of accused persons and 29.6% (n=435) of victims lived within 1mile of the offence location. Secondly, in terms of concentrations 52.4% (n=1026) of offenders resided within 8.7% of the LSOAs and 35% (n=498) of victims resided within 4.6% (n=220) of LSOAs. This tends to support the proposition that there appears to be a relationship between the location of the homicide offence and the home addresses of victims and offenders.

Discussion

Over the last 3 years homicide offences in London have been the subject of considerable media coverage raising fears of a wave of violence (Davey 2009). Yet despite such attention homicide within the UK remains an under-researched area (Brookman & Maguire 2004). The purpose of this research was to investigate whether there are spatial concentrations of homicide locations within London consistent with other international research, i.e. Braga, Papachristos, & Hureau 2010. This was accomplished by performing an exploratory descriptive secondary data analysis of homicide offences over a 10 year period from 1.4.2000 to 31.3.2010 within the Metropolitan Police Service area of London. This equated to 1664 homicide locations, 1714 victims of homicide and 2382 persons against whom proceedings for a homicide offence was commenced. These aspects were then geo-coded and mapped across London at three different levels - local authority boroughs, wards and Lower Super Output Areas - which allowed frequency analysis to be conducted. Further analysis was conducted to explore the characteristics of both victims and accused persons to ascertain any patterns.

Spatial Analyses

It was proposed that homicide and place are connected. The research showed that dependant upon the geographic level of analysis very different results are identified. At a local authority borough level there was a variation in homicide offences across areas and due to the size of the areas used it was not possible to draw any conclusions. The analysis of wards tended to show the same result, albeit concentrations were slowly beginning to develop. Crucially, it was the examination of the smallest geographical areas that provided the greatest insight. In the 10 year period studied, there were no murders in 3519 (74%) of

the 4761 London LSOAs. Within the remaining 26% a considerable amount of clustering was found. Critically 6% of the LSOAs accounted for 42% of the homicides in London over the 10 year period. Such clustering tended to support the research proposal.

In relation to such an impactive crime, the discovery of a considerable level of clustering is an important finding. This confirms the significance of geographical analysis as, dependant upon the size of the area analysed quite different results are uncovered, results which are then utilised to inform strategic and operational decision makers. Larger geographical methods of analysis did not identify concentrations and even more focused examination, i.e. ward level, failed to identify the extent of homicide concentrations. It was noteworthy that the top 3 LSOAs in terms of homicide location frequency were not identified until the analysis focused on the smallest unit of geographical analysis. This concurs with Weisburd & Green (1994) who identified the importance of examining small geographic areas to draw out and identify concentrations or hot spots of crime. This methodology was further applied in relation to specific methods of homicide where it was discovered that domestic violence, gun-related and knife-related homicides were also geographically concentrated.

These findings strongly support previous research findings that crime is not geographically uniformly distributed at places (Eck & Weisburd 1995), and that specific crime types may cluster at places (Weisburd & Green 1994). In essence these results suggest that the distribution of crime is not random but varies in time and space (Sherman, Gartin & Buerger 1989). However, when the map of these locations is viewed (Figure 3) they are scattered across the city and do not tend to support the theory of Park, McKenzie, & Burgess (1925) in that a pattern which indicates concentric development from the centre could be identified. This may reflect the mature development of London as a city.

In examining these clusters it is beneficial to apply the Indices of Multiple Deprivation Data (Communities and Neighbourhoods 2007), a compilation of data which includes employment rates and health related information. The index uses a league table approach for all of the 32,482 LSOAs across the country with position '1' being the most deprived. The mean average league position of all London's LSOAs within this league table is 12,704, however, the mean average position of the 6% of LSOAs that account for the 42% of homicide places is 5,980. This shows a considerable difference in measured deprivation between the whole dataset of homicides and those within the concentration of 6% of LSOAs which contribute the 42% of all homicides.

The relationship between crime and deprivation is a complex one however it is a fact that the areas where homicide clusters in London are the more deprived of London's LSOAs. Such findings would tend to support the research of authors such as Dorling (2008) and, in particular, Rosenfeld, Bray, & Egley (1999) who identified that within a US context homicides clustered in areas of high levels of disadvantage. This finding does tend to lend itself to considerable policy related implications.

Second Level Analyses

The second level of examination focused on the players involved in the offences of homicide. The research questions explored whether the homicide concentrations were dependent upon the characteristics of either the offender or the victim and whether there were any correlations between the offender-victim characteristics within the homicide concentrations.

In exploring the characteristics of both victims and offenders a number of interesting issues were identified. Overall there was very little difference between the

characteristics of victims and offenders in the whole of London compared with those of the subset in the 42% concentration. As each aspect was analysed very similar results were identified for example in terms of gender 75.7% of victims in the whole dataset and 79.3% of victims in the sub-set were males. The specific patterns only emerged after a combined analysis of all the characteristics of victims and offenders.

From the analysis, it became clear that the Afro-Caribbean male was common in the frequencies of both victim and offender. When age was added to the mix it emerged that young Afro-Caribbean males were prevalent both within the whole dataset and that of the sub-set. This supports previous research. As Blumstein, Rivara, & Rosenfeld (2000) highlighted, homicide trends can only be really understood by exploring such detail as age, gender and racial group. This research has reinforced their findings. Young Afro-Caribbean males disproportionately represented their age groups within those that are victimised, i.e. 55.9% of those persons murdered between the ages of 15-19 are from within this group. Within the homicide concentrations this increased to 70.8% for the same age group. This accords with Braga, Papachristos, & Hureau 2010, who highlighted that the 'at risk' populations are young, minority males, living in disadvantaged neighbourhoods. The findings of this research appear consistent with other research and would tend to indicate that the development and implementation of violence reduction strategies can be informed and focused by analysis such as this. Consequently more bespoke strategies can be developed to increase the opportunities of reaching out to those particular 'at risk' groups and thus reduce the incidence of homicide.

When examining those who are prosecuted for homicide offences the same picture emerges. Across the whole of London over the 10 year period, young Afro-Caribbean men between the ages of 15-19 represented 57% of those persons prosecuted, and within the

homicide concentrations this increased to 63.3%. Within other age groups similar patterns emerged. This is consistent with previous research, i.e. Miethe & Regoeczi (2004), who identified that homicide offenders are disproportionately male, young, African-American and from poor and economically disadvantaged areas.

Such findings have considerable implications when considered from the perspective of the proposal that homicide and place are connected. As Sampson & Wilson (2005) commented within their research, social conditions where black people live lead to a high homicide rate. At the 2001 London census the population of the capital was 7,336,900 with Black, Asian and Minority Ethnic groups (BAME) accounting for 28.9%. Work has been conducted on population growth and projections of the demographics within the overall population over the coming years. It is estimated that the population of London will have grown to 8,788,700 by 2031. Of particular relevance is the assessment that the BAME population will have increased to 39.6% of this total. The BAME population was also noted as having a considerably younger age profile when compared with the white population (DMAG 2009). It is clear that with an increase in the number of young minority males and, in particular, those described within this profiling as Black Caribbean, Black African or Black Other, there is the great potential for significant high levels of victimisation and offending within these groups and for an increase in levels of homicide within London.

When considering Burgess' work once more, as London expands, as it surely must do so to meet the demands of an increasing population, residential zones will continue to develop. With increasing affluence residents move further from the centre to the periphery. In Burgess' model the zone of transition was the ring closest to the centre which was identified with successive waves of migrants, older and low cost housing. In

this zone life was difficult with the greater potential for crime without the spatial and cultural stability of the outer rings (Graham & Clarke 2001). Within the future landscape of London will the increasing numbers of BAME groups in 21st century London be exposed to the 'Chicago' experience and initially reside in disadvantaged areas, thus creating a negative cycle mirroring a situation that has been found elsewhere in the world?

Sampson and Wilson (2005) identified that joblessness, deprivation and the social conditions where black people lived led to a high homicide rate. As has already been identified clustering of homicide was found and when examined against the Multiple Deprivation Index these clusterings were in the more deprived areas. Homicide is the leading cause of death for young black men in the USA. Whilst this research has not identified a picture as bleak as this, it is clear that the groups at high risk of becoming homicide victims or offenders do have some consistency with these findings. A clearer understanding of the social conditions within places or concentrations may assist in explaining variations in violence rates across London and therefore lead to the development of strategies which can contribute towards violence reduction.

In examining these findings a comparison has been made with elements of the work conducted by Wolfgang (1958). Wolfgang's work is one of the best known and most widely cited examples of a descriptive study and therefore provides a valuable opportunity to compare previous findings with those from contemporary London. There are limitations in the level of comparison as, for example, Wolfgang did not present the whole of the victim or accused analysis but conducted a comparison between African-Americans and White Americans. It is also noted that the cities of London and Philadelphia are not necessarily similar in terms of racial mix. In fact the scale of the cities are somewhat different with London having a population in the 2001 census of 7,336,900, (DMAG

2009), whilst Philadelphia had a population in the 2000 US census of 1,517,550 (true knowledge 2010). However, this analysis still provides the opportunity for some valuable comparisons. Whilst Wolfgang's work and this research have their differences it was still possible to conduct some replication of the areas of analysis. These are set out in the tables below.

The first comparison examined the analysis of victims by both gender and the limited ethnicity of the two groups studied by Wolfgang. As set out within Table 12 the results are not consistent. When examining the victimisation of African-American/Afro-Caribbean males there is a considerable difference, with Wolfgang's African-American group contributing over twice the number of victims as a percentage of the overall victimisation. Afro-Caribbean males within the London homicide statistics contributed considerably less to the overall homicide totals than those within Wolfgang's study. The white female victims were the most closely matched group.

Table 12: Comparison of victim groups by gender and limited ethnicity

Wolfgang	Current Research
African-American Victims	**Afro-Caribbean Victims**
Male 56% (n=331)	Male 27.1% (n=465)
Female 16.3% (n=96)	Female 5.9% (n=101)
White Victims	**White European Victims**
Male 20.1% (n=118)	Male 32% (n=548)
Female 7.3% (n=43)	Female 11.5% (n=198)

A similar picture can be seen in Table 13 by the comparison of those accused of homicide, analysed by both gender and ethnicity. Again the closest comparison between

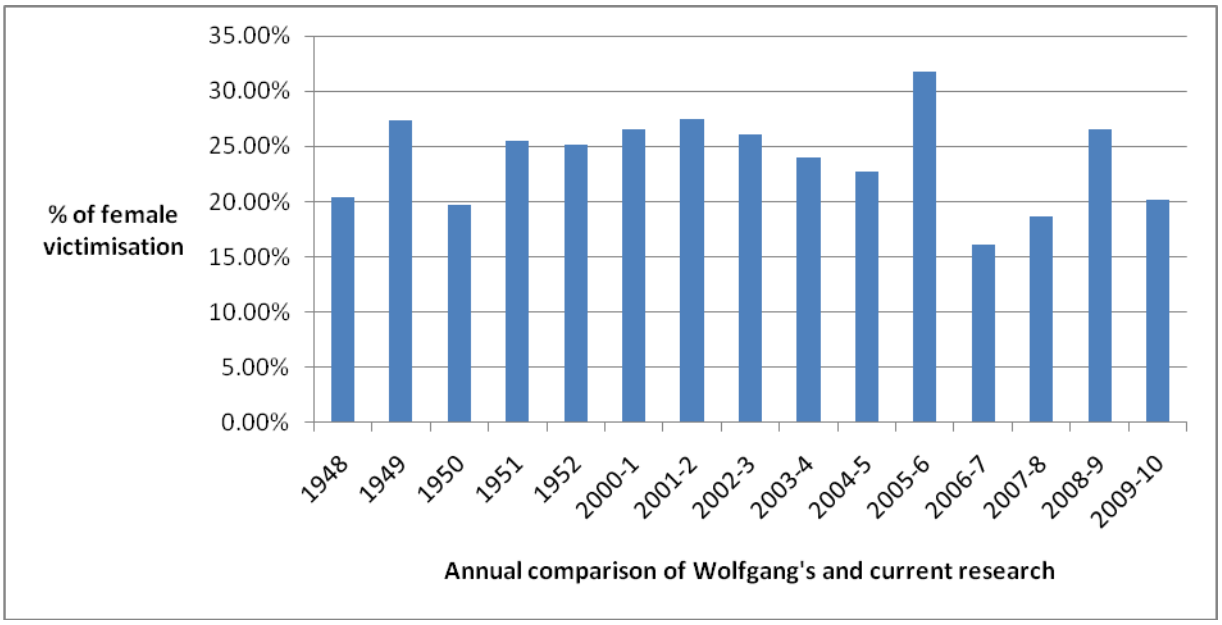
Wolfgang's analysis and that of London is within the White Female groups with less than 1 percentage point between them.

Table 13: Comparison of accused groups by gender and limited ethnicity

Wolfgang	Current Research
African-American Accused	**Afro-Caribbean Accused**
Male 60.2% (n= 374)	Male 41.4% (n=986)
Female 15% (n = 93)	Female 2.3% (n=55)
White Accused	**White European Accused**
Male 22.2% (n=138)	Male 31.4% (n=747)
Female 2.6% (n=16)	Female 3.4% (n=82)

In examining female homicide victimisation Wolfgang concluded that it displayed an inconsistent fluctuation across the 5 year period. As can be seen in Table 14 below, the number of female victims per year ranged from 19.7% in 1950 through to 27.4% in 1949. A similar picture is found within the London data across a 10-year period with fluctuations from 16.1% through to 31.7%. It is interesting to note that despite the variations that exist between Philadelphia in the 1940s and 1950s and London in the 21st century, fluctuations in numbers of female victims are comparable. It leads one to consider whether high profile campaigns targeting issues which may reduce female victimisation, such as domestic violence (Sweney, 2009), have had the effect that they aspired to.

Table 14: Comparison of female homicide victimisation



Temporal Analyses

Whilst examining factors concerning the victim, offender and location it was also appropriate to analyse temporal factors to compare those homicides within the clusters with the pattern of homicide across London as a whole. It is interesting to note that in essence there was very little difference between both sets of data and therefore there does not appear to be a temporal factor contributing to the homicide concentrations. Of considerable interest however, is the reduction in homicides over the research period resulting in the lowest number of homicides occurring in the most recent year. These reductions do not appear to have reduced in any particular geographic area and they are equally spread across both the whole dataset and within the homicide concentrations. The year on year reduction in numbers of homicides from 2003/04 through to 2009/10 is of considerable interest as it conflicts with the assessment above that proposes that as London's population changes it is likely that the number of homicides will increase due to the changing demographics of the population. This finding in itself deserves further

exploration to find out why this has occurred and it clearly has the potential to identify effective strategies which could assist in the development of evidence-based practice.

Continuing the comparison of this research with that of Wolfgang, monthly analysis failed to identify any particular pattern. Wolfgang concluded that monthly analysis failed to show any significant association (1958), an assessment that could be appropriately applied to this research where there was monthly variation of frequency with the highest frequency occurring in July in both studies. However, the second highest frequency occurred in March and the third equal in October and January in this research, which is not consistent with Wolfgang's work.

Within Wolfgang's analysis of the times at which homicides were committed, he identified that the hours between 8pm and 2am accounted for 50% of all homicides. As has already been commented upon, the data accuracy of the London homicides has raised some concerns due to the volume of occurrences that have been recorded as 0000 or 0001 hours. Acknowledging these possible data inaccuracies there is similarity in the pattern of offending with an increase from 1900 hours through to 0229 hours in London, a time period which accounted for 48.7% of all offences. Within the London data a similar picture is found across both the whole dataset and that of the homicide concentrations. Additionally, Wolfgang identified the least dangerous period as being between 0800 and 1400 hours with a similar picture occurring within London. It is fascinating to see that despite changes in society towards a more 24 hour lifestyle and the implementation of approaches such as 24 hour licensing laws within the UK (BBC 2005), the time spread of homicides does not appear to differ significantly between two cities fifty years apart.

Third Level Analyses

The final level of research involved bringing together all three elements of the offence: the victim, the offender/s and the location. The purpose was to explore any relationship between the location of the homicide offence and the home addresses of the victim and offender. This was achieved by analyzing the distance between the scene of the offence and the home addresses of the victims' and offenders'.

Through further spatial analysis of the data two specific findings were identified. Of particular note were the findings regarding those persons accused of homicide offences. Across the whole of the dataset 49.1% of all accused persons lived within 1 mile of the place where they committed the homicide. In addition concentrations of accused persons were identified in that 52.4% of them resided within only 8.7% of LSOAs. In terms of victims the findings were not quite so clear, however there was some limited clustering.

These findings appear significant when viewed from the perspective of place-based criminological theory. The relationship between the accused and the homicide location is fascinating as it appears, possibly surprisingly, that a considerable number commit offences close to their homes. This would tend to support some of the elements of both Rational Choice Theory (RCT) and Crime Pattern Theory (CPT). Why, if it was your intention to commit a murder, would you commit it near to where you live? If one considers from a RCT viewpoint that the accused makes decisions based upon risk, effort and reward (Rock 2002), this may influence their offending behaviour as they tend to commit such significant crimes in places they know and maybe understand. Then again if one considers CPT, that crime is committed as result of the offender's interaction with their social and physical environment and that offenders commit crimes in nodes (Brantingham & Brantingham, 1993b), then this would intuitively appear to connect with

committing offences close to their home addresses as these are places well known to the accused. Additionally CPT proposes that large volumes of crimes are committed at places frequented by lots of offenders. The concentration of accused persons within a small number of LSOAs may tend to support this theory. This research did not explore some of the more qualitative issues that may have provided greater understanding of offending behaviour but identification of such clustering could provide a stepping stone for further research.

It may however be a far less sophisticated issue that creates such a phenomenon. A recent study within the Netherlands examined the roles of a criminal's current and former residences in their decision to commit crime. The findings from this research identified that an offender chooses their locations to commit crime by cross-referencing their awareness space, i.e. as far as the eye can see on the routes and places they frequently visit (Bernasco 2010). These findings were particularly relevant for crimes such as burglary, however assault crimes were less clear. Nevertheless these findings do apply a common sense ideology when combined with criminological theories such as CPT.

Such research may provide significant learning and guide evidence-based practice for professionals when faced with homicide scenarios. Police officers investigating homicides will often use a variety of experts to assist them and the use, for example, of geographical offender profiling (Harries & Le Beau 2007) to prioritize areas for the identification of potential suspects may therefore be of significant value based upon this research.

Implications

The questions explored within this research have identified some noteworthy issues in particular with regard to the geographical clustering of homicide within London. The finding that 42% of homicides in London occurred within only 6% of places is of immense benefit to those charged with reducing such violence. When this finding is considered in conjunction with those groups identified as being at increased risk of victimisation or offending, and time periods when most offending occurs, a picture begins to emerge that will allow a far more informed evidence-based approach to be applied to the combating of homicide.

It is accepted that homicide as a crime is an exceptional offence and is a rare occurrence within the crime landscape (Riedel 1999). There are many other serious crimes which may not reach the threshold of homicide, such as assaults with intent to inflict serious harm or the discharge of firearms, which have not been included within this analysis. This makes this research narrow in its focus and potentially has an impact upon its results. Additionally this research has been limited to those cases 'classified' as homicide crimes (Home Office 2009) and uses only police data, hence a broader assessment of violence may provide additional valuable findings. Such an approach would provide an opportunity to utilize not only police data but also to explore those crimes which are not reported to police, through anonymous use of other agencies' data such as hospital accident and emergency departments. This leaves the important question of whether such an approach would identify similar issues.

A key limitation already alluded to has been the quality and accuracy of the data used in this research. Whilst considerable work was done to reduce any negative effect, this has still impacted on the researcher's ability to examine all homicide locations, victims

and offenders within the period concerned. In terms of locations this only equated to 1.5% of the dataset (n=25) however poor quality data regarding home addresses of victims and offenders was of a higher level. This may have impacted upon the research results however it is anticipated that by using the method adopted within this research any effect would have been mitigated to the lowest level. It still however leaves the question of whether those not included were different in any way.

The findings presented in this research have the potential for far reaching implications upon which, for example, social policy maybe shaped or significantly changed. Research theory aims to use a sample of the population which is representative of the target population and reduce to a minimum any bias that may be within the sample group. By achieving this, any conclusions which are subsequently drawn will be applicable, e.g. generalizable, to the wider target population group (Bachman & Schutt 2007).

Overall it is proposed that this research has a strong foundation upon which it has based its findings. By adopting a 10-year period for the assessment of data it used an extended period of time for analysis of trends and volumes. London, as one of the major cities in the world, provided both the geographical scale and the volume of offences to allow thorough analysis. Data quality issues resulted in not all of the cases being analysed, however, the whole of the homicide population was used from this period with certain exceptions, thereby eliminating any potential bias in sample selection and thus establishing a competent basis for the generalizability of any findings. A considerable empirical basis was adopted within the research process and it is proposed therefore that robust validity exists within the methodology utilised. Additionally by adopting pragmatic methods of measurement, which have been used by other valid pieces of research (Wolfgang 1958),

with clear research questions and use of the whole dataset, measurement validity within the process was also achieved. Overall it is asserted that this research has considerable validity in both its methodology and findings.

This research provides a springboard for future analysis based upon the learning of limitations within this work. As this research was based on an exploratory secondary data analysis the datasets had already been assembled by the owning organisations and therefore limited analysis to certain variables. Equally data accuracy also limited the extent of analysis. These issues lend themselves to subsequent research, i.e. exploring the phenomenon of homicide concentrations, built upon data developed for the specific purpose, possibly within other locations within the UK.

Conclusion

The key finding of this research, that 42% of homicides in London occurred in only 6% of places over a 10-year period, is of considerable importance to those agencies engaged in the prevention and management of such crime. What is equally noteworthy is the good news story which is hidden within this data. The fact is that 74% of places in London did not experience any homicides at all within this 10 year period which would therefore suggest that London, in general, is a safe city. It is the divergence of these two statistics which highlights the most significant implication for policy makers and operational decision makers. Such findings correlate with the findings of others. As Eck (1997) highlighted, most places don't have crime and most crime is concentrated in a small number of places and therefore if we prevent crime at these places might we reduce the total crime.

The findings of this research support the proposition that violence prevention strategies should be focused upon place-based delivery to complement other prevention activity, such as offender based or city-wide education delivery. In reality that would mean that violence prevention strategies should be concentrated, like the crime patterns, into very specific locations identified by the use of methodology such as that adopted by this research, rather than broadly and inaccurately spread across larger geographical areas.

In a similar vein this research challenges the traditional random policing patrol strategy whereby officers are appointed to larger geographical areas to patrol. A more scientific approach needs to be considered as a result of these findings thus allowing officers to be deployed to patrol functions within specifically identified places in a more focused style instead of an approach which could be described as unpredictable or random.

With a larger focus upon visibility in the right places, such a patrol strategy would foster supportive conditions to prevent crime, understand the place-based issues which conspire to create such crime concentrations, deploy a more community based problem solving approach and therefore allow the best informed approach to respond to violent places and the needs of their communities.

Considerable research has already been conducted to assess the impact and value of policing within identified crime concentrations. By adopting place-based strategies it has been shown that crime hot spots policing has been effective in preventing crime (Braga 2001 and Sherman & Weisburd 1995). Equally initiatives focused within the identified hot spot have been shown to produce a diffusion of crime prevention benefits beyond the target area of the original focus (Sherman & Rogan 1995). This would tend to suggest that such approaches may provide considerable opportunity to impact upon the homicide concentrations identified within London.

But such issues and opportunities are not restricted to the Police Service. Many other social support agencies also commit significant resources to combating and preventing violence within communities. Social Services and other social provision should also logically be focused on those areas where the greatest contribution and impact can be made. When one considers the role of outreach workers and youth workers who may work on the streets with communities, would it not also be appropriate that they adopt the same suggested methods as the Police Service to ensure an increased focus to their work and the increased benefits of improved targeted activity?

Beyond the place-based issues, this research has also identified considerable differences within the victimisation and offending rates of the parties involved in homicide. Of great concern are the levels of young Afro-Caribbean males who contribute

to both of these elements in particular the males aged between 15 and 24 years who account for over 25% of all persons against whom proceedings were commenced for homicide offences. Such findings are not dissimilar to other research (Blumstein, Rivara, & Rosenfeld 2000) who found disproportionate representation in such groups. It is therefore equally important that when applying place-based strategies, the demographics of the local communities are also understood. To reduce such violence, high profile initiatives have been instigated such as Operation Trident within London (BBC News Channel 2006). It is important however that such activity is coordinated with that of local policing initiatives, wider agency activity and, in line with this research, clearly focused upon those identified concentrated places where such homicides occur.

In conclusion this research identified significant clustering of homicide locations across London over a 10 year period. This undoubtedly challenges current work practices within public agences. If homicide offences are to be reduced then a place-based approach could contribute by ensuring a focus within the small places where such offences concentrate themselves. If the volume of homicides were reduced in the small 'places' it is likely that there would be a city-wide diffusion benefit.

Within the current public services context it is critical, particularly in times where all public services are facing the most signficant review of their funding and the likelihood of considerable cuts in funds, that the most effective use is made of available resources. It would seem eminently sensible that in addressing the community's needs, maximum impact is made of the available resources. By adopting place-based strategies, which are embedded within an evidence-based philospohy, a far more cost effective approach can be achieved whereby potentially greater results will be obtained in the reduction of crime.

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Appendices

Appendix 1

Definitions

Geo-code - The software used for the purpose of geo-coding was Mapinfo Professional. The system allows police information relating to place to be managed within an IT environment and by using coordinates plotted within a map format**.**

Homicide locations - The place as recorded by the police investigation. This does have its limitations as it may be where the victim was murdered or where the victim was found deceased.

Homicide Offence - The term homicide is made up of three separate criminal offences and any attempt at committing these offences. The offences are murder, whereby a person is killed through an unlawful act by a person intending to kill or seriously injure the victim, manslaughter, whereby a person is unlawfully killed by a person but without the intent to kill or seriously injure, and infanticide, whereby a baby under the age of 12 months is murdered by their mother whilst the mother's mind is unbalanced (Home Office 2010).

Local authority borough – London is divided up into 32 local authority boroughs that have the responsibility for all public services and facilities within the geographical boundaries.

Local Super Output Area – A geographical area designed for the collection and publication of small area statistics. LSOAs provide an improved basis for comparison throughout the country because units are more similar in size and population than, for example, electoral wards.

Metropolitan Police Service Area - The MPS area covers the 32 London boroughs which make up the Greater London Authority Area (GLA) but does not include the City of London or the underground network, which are policed by separate forces.

Offender – This individual is identified as the person against whom criminal proceedings have been instituted, i.e. charged with a homicide offence.

Police Crime Recording Year - The police are required to record crime for each year commencing the 1st of April and ending the 31st of March (Home Office 2009). This paper therefore examines homicide offences from the 1.4.2000 to 31.3.2010 to ensure the period coincides with the crime recording years.

Spider-graph – This tool draws lines between objects in a single table, or objects from two tables that have been joined. It then creates a new table of lines that connect the objects from the original table(s). The objects in this case were geo-coded locations of homicide locations and victims' and offenders' home addresses. Through computer calculation the programme is then able to calculate distances producing another table including a distance column that stores the length of each line.

Victim - Identified as those persons for whom a homicide type crime has been recorded.

Wards – Are an electoral district which is a sub-division of a local authority borough represented by one or more councillors.

Appendix 2

Frequency distribution of homicide locations within wards 1.4.00 to 31.3.10

Number of homicide locations within ward	Frequency of wards with equivalent value	% of homicide locations across whole dataset	Cumulative % across dataset
16	1	1%	1%
14	1	1%	2%
13	2	2%	4%
11	2	1%	5%
10	6	4%	9%
9	7	4%	13%
8	13	6%	19%
7	18	8%	27%
6	32	12%	39%
5	48	15%	54%
4	48	12%	65%
3	86	16%	80%
2	89	11%	91%
1	144	9%	100%
0	127	0%	100%
Total	624	100%	100%

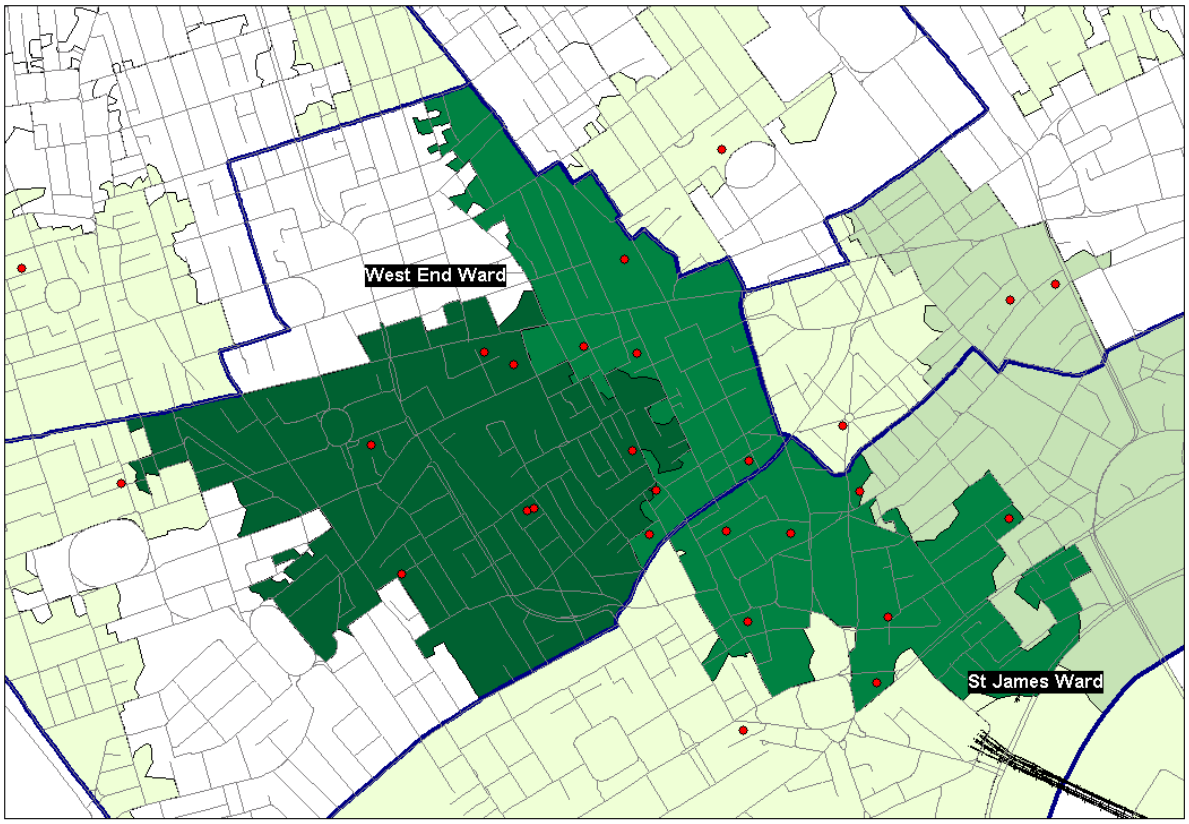
Appendix 3

Frequency analysis of homicide locations within LSOAs – 1.4.2000 to 31.3.2010

Number of homicide locations within LSOA	Frequency of LSOAs with equivalent value	% of homicide locations	Cumulative % of homicide locations
7	1	0.4%	0.4%
6	2	0.7%	1.1%
5	5	1.5%	2.6%
4	14	3%	5.6%
3	51	9%	14.6%
2	214	26%	42%
1	954	58%	100%
0	3520	0%	100%
Totals	4761	100%	100%

Appendix 4

Map of homicide concentration within Westminster Local Super Output Areas



Appendix 5

Police Ethnicity Identification Code

White European - e.g. English, Scottish, Welsh, French, German, Swedish, Norwegian, Polish, and Russian.

Dark Skinned European - e.g. Greek, Cypriot, Turkish, Sicilian, Sardinian, Spanish, Italian.

African-Caribbean - e.g. West Indian, Guyanese, Black African (including those with lighter complexion).

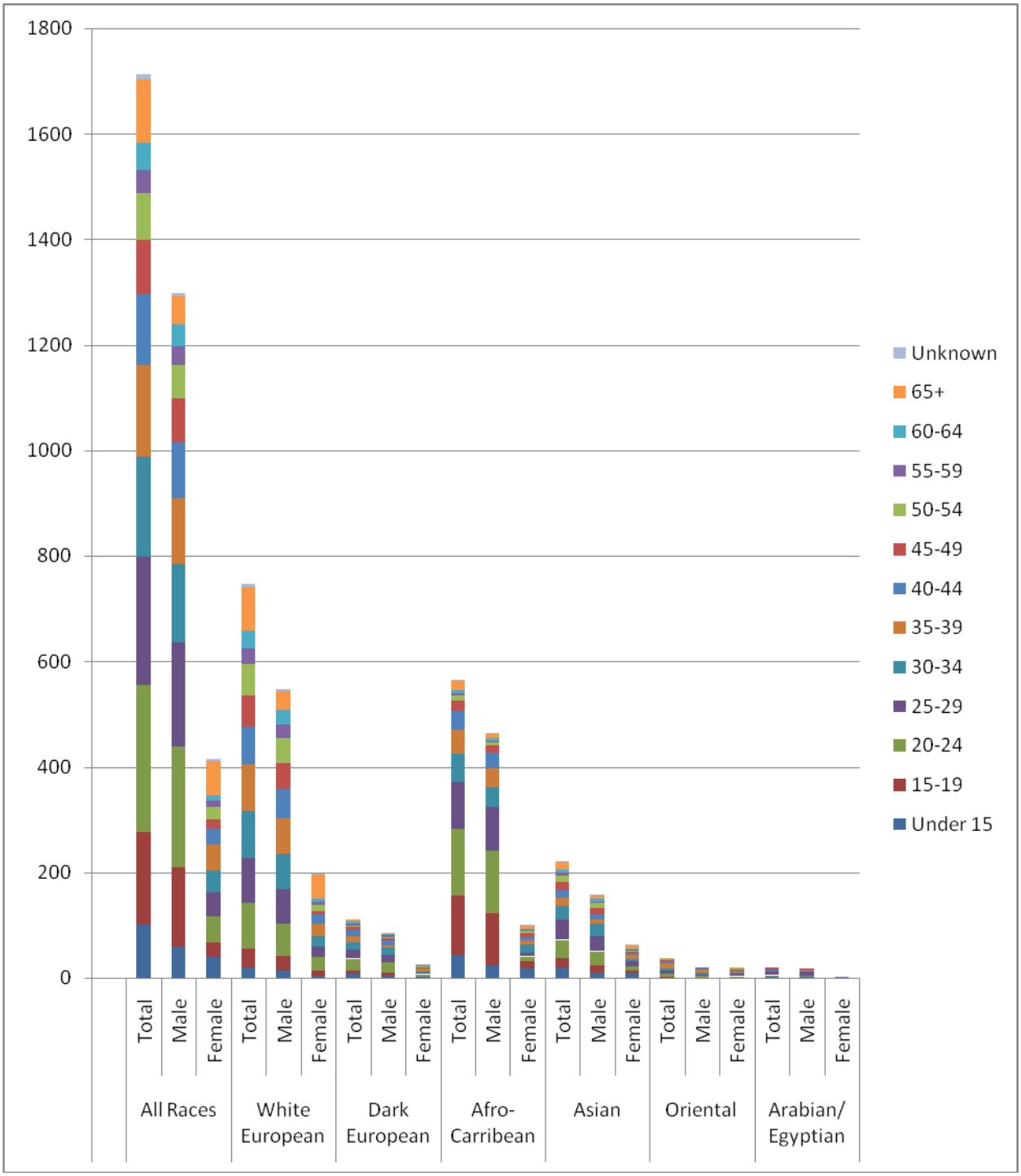
Asian - i.e. South Asian (Indian, Pakistani, Bangladeshi or Sri Lankan).

Oriental - including South-East Asian, e.g. Malayan, Burmese, Filipino, Mongolian.

Arabian/ Egyptian - e.g. Algerian, Tunisian, Moroccan and North African.

Appendix 6

Combined analysis of victim data – 1.4.2000 to 31.3.2010



Appendix 7

Combined analysis of accused persons data – 1.4.2000 to 31.3.2010