GoWell

GLASGOW COMMUNITY HEALTH AND WELLBEING RESEARCH AND LEARNING PROGRAMME

Briefing Paper 20

Neighbourhood Structures and Crime Rates in Glasgow

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GoWell is a planned ten-year research and learning programme that aims to investigate the impact of investment in housing, regeneration and neighbourhood renewal on the health and wellbeing of individuals, families and communities. It commenced in February 2006 and has a number of different research components. This paper is part of a series of Briefing Papers which the GoWell team has developed in order to summarise key findings and policy and practice recommendations from the research. Further information on the GoWell Programme and the full series of Briefing Papers is available from the GoWell website at: www.gowellonline.com

This Briefing Paper looks at patterns of crime rates across communities within the city of Glasgow to see if crime rates are related to structural factors (poverty, housing, demographic structures and retail provision) within neighbourhoods. The analysis covers the whole of the city of Glasgow rather than focusing only on the specific GoWell study areas.

Key findings

- The total number of crimes committed in Glasgow fell by 12% over the period under examination, 2000/1 to 2007/8.

- Crime rates for violent crime, criminal damage, drugs offences and miscellaneous offences are highest in social renting neighbourhoods.

- Property crime rates and vehicle crime rates are highest in areas with a mix of owner occupation and private renting.

- Total crime rates are lowest in areas which are predominantly owner occupied.

- When all structural factors were considered at the same time, the strongest association with crime rates was found for neighbourhood poverty, i.e. a positive association between crime rates and the level of income deprivation in an area.

- The second most important (positive) association was found between crime rates and the number of licensed alcohol outlets in an area. The relative importance of this structural factor has increased over time.

- Based on statistical modelling of the 2008 data:

    - A doubling of the local area poverty rate (from 20% to 40%) would be associated with approximately a 50% increase in the local crime rate, taking all other structural factors into account.

    - A doubling of the number of alcohol outlets in an area (e.g. from three to six) would be associated with almost a doubling of the local crime rate, taking all other structural factors into account.

- Increases over time in the following three structural factors were associated with an increase in the local crime rate, in descending order of effect: income deprivation; the proportion of lone parent households; the proportion of ethnic minority residents (the effect of this last factor being far less than the other two).

INTRODUCTION

Glasgow has for a long time been known as a dangerous place, first acquiring the title 'No Mean City' in the 1930s, along with a reputation for gangs and the infamous accolade as Britain's most violent city (Damer 1990; Davis 1998). Recent comparisons (for 2003) still show Glasgow having more violent crime than other Scottish cities (around three times the national average) as well as more crime of all types (around twice the national average) (Hutchins and Parkinson 2005). However, the crime situation within the city has been improving, as noted by a city monitoring project:

> **"Although Glasgow tends to have a higher proportion of recorded crimes and incidents compared to other local authority areas, the trend for most of these indicators has been declining since 2006."[1]**

Nonetheless, high crime rates are spatially concentrated with rates particularly high in the poorest parts of the city. One might conclude that this concentration of crime was simply a result of concentrating the poorest in society into particular communities. However, there are several reasons to investigate whether other structural factors in a neighbourhood are also associated with higher or lower crime rates.

- Successive Governments have sought to reduce the problems associated with the poorest areas in Glasgow through reducing the concentration of poorer families by the creation of more socially mixed neighbourhoods. The main policy tool used for this has been to increase the tenure mix in the most deprived communities, firstly through the Right to Buy (beginning in the 1980s), and then through the demolition of existing socially rented stock and the building of more mixed estates with increased percentages of owner occupied housing.

- Earlier GoWell survey findings showed that some disadvantaged communities in Glasgow had unusually high proportions of children and young people, as well as high levels of reported antisocial behaviour (GoWell 2007). This raises the question of whether or not demographic or household characteristics might be associated with crime rates or with a community's capacity for exercising informal social control over its members.

- It is well known in the UK at least that violent crime and disorder are linked to the levels and context of alcohol consumption (Rossow 1996) and that alcohol consumption has been rising due to a number of factors, including increasing availability through the number of outlets at which it can be bought (Booth et al 2012).

These things suggest that if we wish to explain spatial patterns of crime, we need to look at a range of structural factors including the economic, residential and retail environments and population structures within local communities.

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[1] See www.understandingglasgow.com

AIMS OF THIS STUDY

This research set out to explore whether there is an association between neighbourhood structural characteristics and crime rates. The study explores this question in relation to different types of crime and at two time points in the first decade of the 21st century. It also considers what impact change in neighbourhood structures have on neighbourhood crime rate.

KEY QUESTIONS

The key questions for the study were:

- Are there associations between neighbourhood structures and crime rates? If so:
    - Do these associations hold for different types of crime?
    - Does the influence of other structural factors remain after taking area deprivation/poverty into account?
- Are changes in neighbourhood structures associated with changes in crime rates?

METHODS

The research in this paper used data from two time periods, 2001 and 2008. Data was collected at datazone level. Datazones are a measure of neighbourhood used in Scotland, with an average population of 600 people.

Dependent variables

Strathclyde Police provided geo-coded crime data at a postcode level for all crimes, except those of a sexual nature, for 1999-2009. Crime rates (per 10,000 of the population) were calculated for datazones within the Glasgow City Council area in three groupings: all crimes; person crimes; and property crimes. City centre datazones (11 in total) were excluded from the analysis due to their unusual, non-residential nature compared to other parts of the city. Crimes are geo-coded to their place of occurrence rather than to the location of the victim or perpetrator.

Neighbourhood structural, independent variables

The independent variables were organised into four groups:

Residential variables:

The following residential variables were included in the analysis:

- Dwelling types: % houses, % high flats, % other flats.
- Residential turnover (2001 only).
- Housing tenure structure.

Neighbourhood Structures and Crime Rates in Glasgow

Housing tenure structure was categorised using cluster analysis. Cluster analysis statistically groups datazones into identifiable types of neighbourhoods based on the tenure mix within the datazone. Five clusters were defined: Owner Occupied; Owner Occupied/Private Renting; Owner Occupied/Social Renting; Social Renting/Owner Occupied; and Social Renting. The balance between the tenures within each cluster type can be seen in Table 1.

**Table 1: Housing tenure clusters for Glasgow, 2001 and 2008**

	Cluster				
	Owner Occupied	**Owner Occupied/ Private Renting**	**Owner Occupied/ Social Renting**	**Social Renting/ Owner Occupied**	**Social Renting**
2001	Mean %	Mean %	Mean %	Mean %	Mean %
Owner Occupied	89	60	60	36	15
Social Renting	5	12	35	60	83
Private Renting	6	28	4	5	2
No. of datazones	151	100	140	166	137
2008					
Owner Occupied	88	59	60	34	12
Social Renting	4	10	33	58	86
Private renting	8	31	8	8	2
No. of datazones	156	108	147	169	113

The pattern of housing tenure neighbourhood types across the city at the two time periods are shown in Figures 1 and 2. A few changes over time can be identified:

- Some of the social renting neighbourhoods have changed to become social renting/owner occupied neighbourhoods.

- There has been an expansion over time in the extent of the owner occupied/private renting neighbourhoods, particularly on the north side of the city.

- More neighbourhoods have become entirely owner occupied in the south of the city.

Figure 1: Housing tenure clusters, 2001
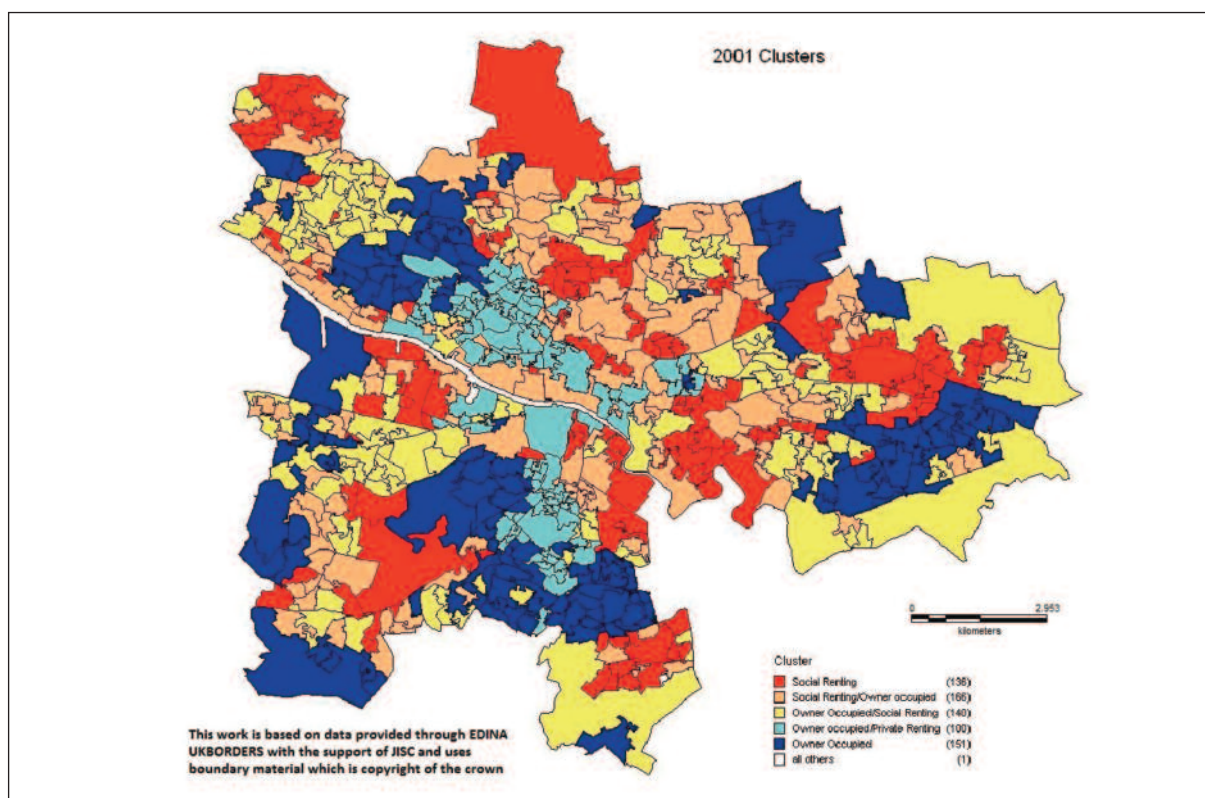
Figure 2: Housing tenure clusters, 2008
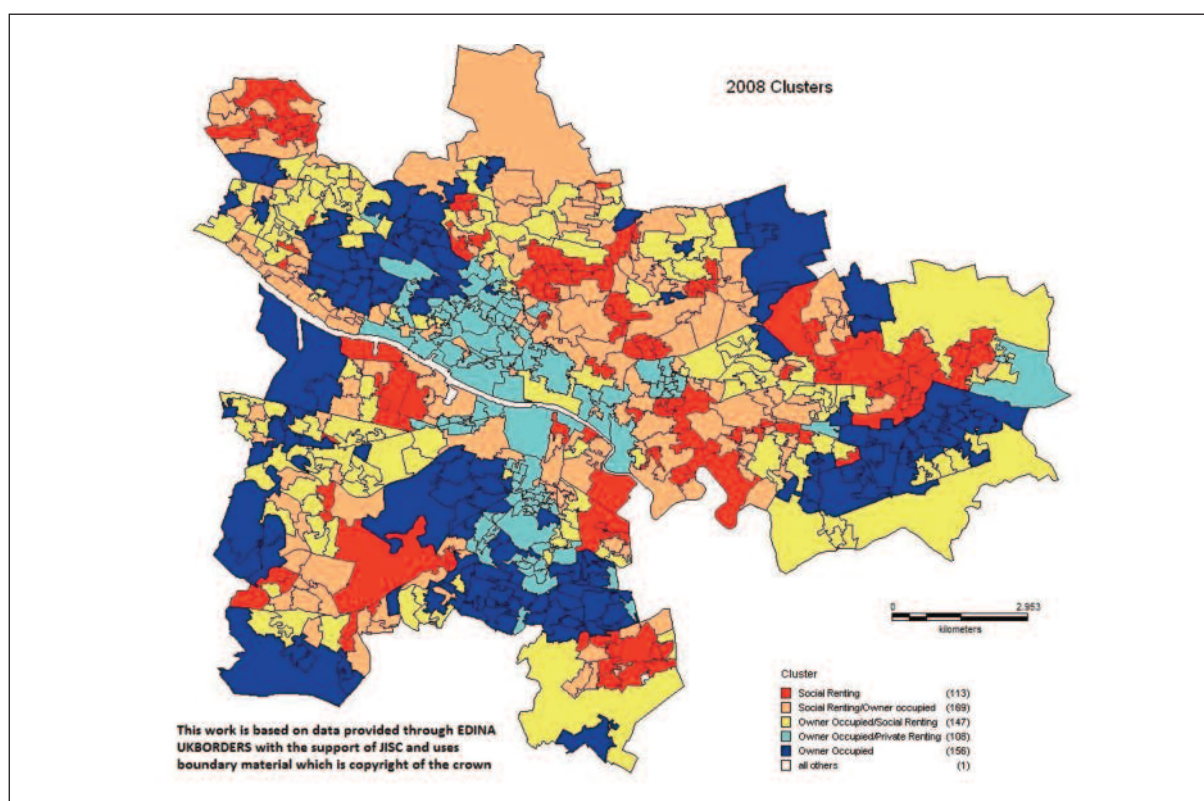
Demographic variables:

The following variables were included to represent an area's demographic structure:

- Youth populations: % of the population aged: 0-12, 13-15, and 16-19.

- Household types: % of all households which are: couples with children, older person households, adult-only households, and other households with children.

- Ethnicity: % of the population who are non-white.

Poverty:

% of the population living in income deprived households (broadly, households dependent on out-of-work benefits or pension credits).

Alcohol availability:

Number of outlets licensed to sell alcohol.

Data sources

Data on income deprivation was derived from the Scottish Indices of Multiple Deprivation 2004 and 2009.

Data on alcohol outlets for the years 2004 and 2007 was obtained from the 'Points of interests' dataset and was provided by the Ordnance Survey. This includes both on- and off-sales outlets such as pubs, clubs, off licenses, supermarkets and convenience stores.

Neighbourhood variables for 2001 were obtained from the Census, and for 2008 largely came from Glasgow City Council and for a variety of time periods as close to 2008 as was possible: household type from 2005; estimates of ethnicity from 2008; and tenure data from the Council Tax Register for 2008.

Population estimates (including gender breakdown) for 2008 were provided by the General Registrars Office.

Analysis

Linear regression models were used to examine the relationship between neighbourhood structures and crime rates. Separate models were run using data from 2001 and 2008 and also for the three crime groups. Models were also constructed to examine the change between 2001 and 2008.

Numbers of crimes

The number of crimes committed in the city dropped between the years 2001-2008, with overall crime down over 12% in 2007/8 compared with 2001. The biggest drops in crime over the period were for burglary (-53%), vehicle crimes (-46%) and robbery (-35%). Violence against the person was the only category of crime which rose by any significant amount (+14%) (Table 2).

Table 2: Crime types in Glasgow, 2000/1 and 2007/8

	Distribution of crimes by type (%)		Number of crimes		Change 2001-8 (%)
	2000/1	2007/8	2000/1	2007/8	
Burglary	5.8	3.1	8,595	4,044	-52.9
Criminal damage	10.6	12.4	15,711	15,993	
Drug offences	6.3	6.4	9,282	8,316	-10.4
Fraud & forgery	1.6	1.3	2,314	1,712	-26.0
Offences against vehicles	8.7	5.4	12,866	6,986	-45.7
Other miscellaneous offences	5.8	3.1	8,595	4,044	-52.9
Other theft offences	14.1	13.2	20,818	17,071	-18.0
Robbery	1.1	0.8	1,622	1,054	-35.0
Violence against the person	11.2	14.6	16,477	18,837	14.3
Total (%)	**100.0**	**100.0**	**147,567**	**129,334**	**-12.4**

Patterns of crime by tenure

Despite the changes in crime over time, crime rates across the tenure clusters were remarkably unchanged in the two time periods (Table 3). Key patterns include:

- Crime rates for violence, criminal damage, drugs and miscellaneous offences are all highest in the social renting neighbourhoods, with rates being slightly lower in the social renting/owner occupied neighbourhoods.

- Property (robbery, burglary and theft) and vehicle crime are highest in the owner occupied/ private renting neighbourhoods.

- Crime rates are lowest for all crime types in the owner occupied neighbourhoods.

Table 3: Crime rates (per 10,000 population) by housing tenure cluster, 2008

Crime Category	Housing Tenure Clusters 2008				
	Owner Occupied	**Owner Occupied/ Private Renting**	**Owner Occupied/ Social Renting**	**Social Renting/ Owner Occupied**	**Social Renting**
Violence against the person	110	261	168	281	393
Robbery	21	53	33	35	36
Burglary	125	192	128	142	161
Offences against vehicles	170	393	187	232	203
Other theft offences	175	465	219	315	257
Fraud and forgery	36	68	41	63	50
Criminal damage	154	206	210	293	357
Drug offences	63	133	96	176	301
Other miscellaneous offences	448	1,071	701	1,107	1,372
All crimes	**1,237**	**2,791**	**1,734**	**2,608**	**3,098**
Number of datazones	156	108	147	169	113

Neighbourhood structural influences on crime rates

Linear regression models for both 2001 and 2008 for all three categories of crime – all crime, property crime and person crime – indicate the following[2] :

- *The variables most strongly associated with higher crime rates within neighbourhoods are the level of income deprivation and the number of alcohol outlets.*

These effects are consistent over the two periods and across the different types of crime.

Figures 3 and 4 opposite show the patterns of deprivation and crime rates across the city in 2008.

A number of other variables were significantly associated with crime rates in either 2001 or 2008.

- In 2001 higher levels of turnover, a measure of the instability of the neighbourhood, were associated with higher levels of all crime and property crime (this measure was not available for 2008).

- In 2001, social renting and social renting/owner occupied neighbourhoods were associated with lower levels of property crime.

- In 2008, all other types of housing tenure neighbourhoods were associated with higher levels of all-crime and person-crime than predominantly owner occupied neighbourhoods. This may partly be due to the absence of a turnover measure for 2008, since areas of rented housing may experience more movement in and out than owner occupied areas which are more stable.

- In 2008, higher levels of ethnic minority population in a neighbourhood were associated with higher rates of all three types of crime. This shift since 2001 may reflect changes in the ethnic population of the city in the first decade of the 21st century. However, an initial examination of offender data indicated that in areas with high ethnic minority populations (>20%), most crimes were not committed by ethnic minority offenders[3] .

Measures of the youth population in an area, using three variables at each time period, were generally not associated with crime rates, apart from the number of 16-19 year olds being associated with less crime in an area in 2001.

Measures of household type were generally not associated with crime rates in either year, apart from a negative association between lone parents and property crime rates in 2001.

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[2] Statistical models for the two years explain between 40-50% of the variance in crime rates, so there may be other important factors that we have not been able to take into account.

[3] Although in a large proportion of cases (nearly 40%), the ethnicity of the offender is unknown or unrecorded.
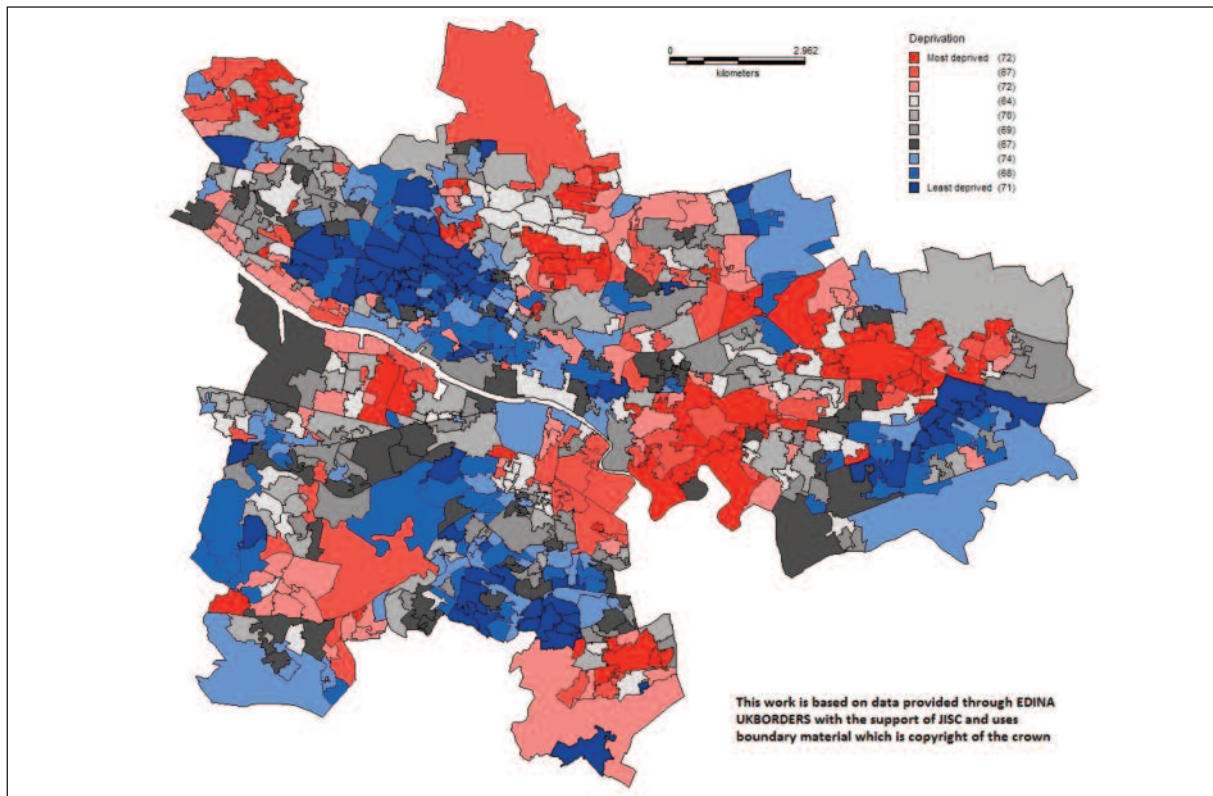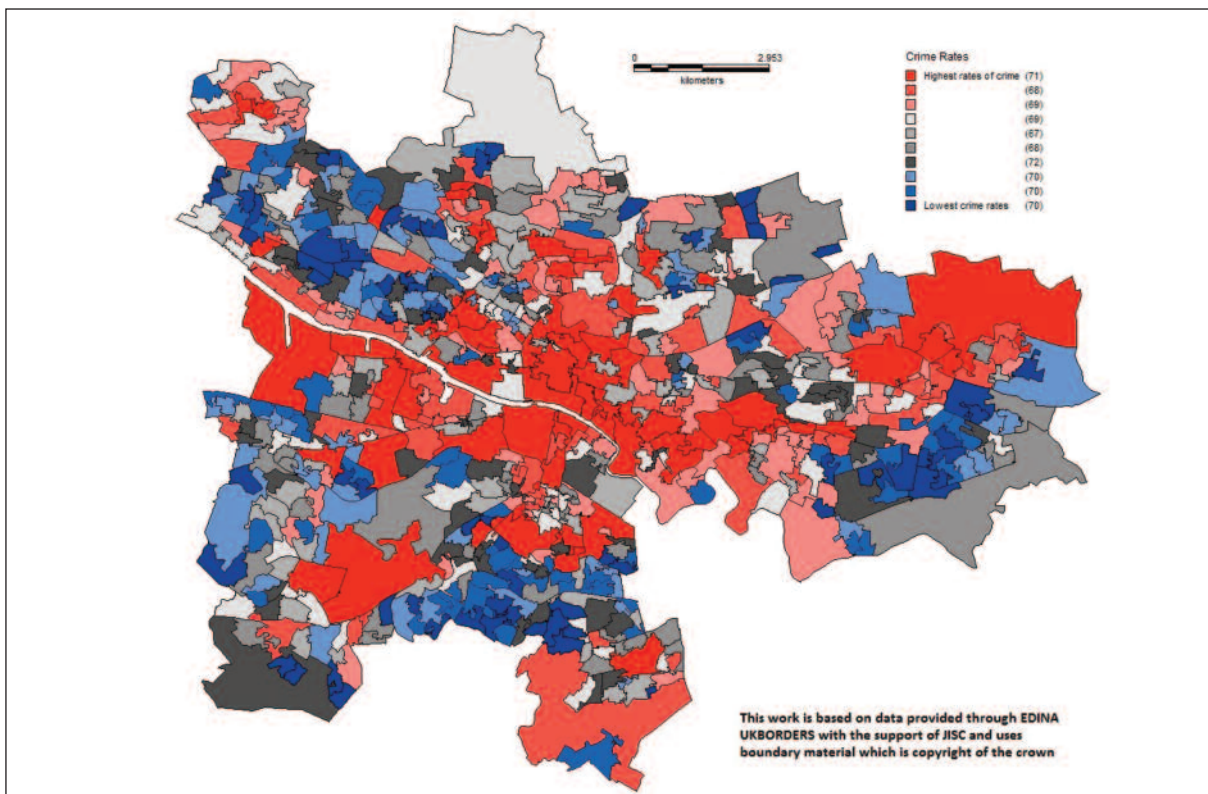
Figure 3: Deprivation in Glasgow, 2008

Figure 4: Crime rates in Glasgow, 2008

Change over time

The most significant factor associated with change in crime between 2001 and 2008 is deprivation.

> • *A rise in deprivation within a neighbourhood is associated with increased crime for all three categories of crime; or indeed vice versa, a reduction in deprivation is associated with a reduction in crime.*

The number of alcohol outlets has changed very little over the period and it is not surprising that there is no association between changes in alcohol outlets and changes in crime rates.

Some other factors also show strong associations with crime rates:

- Increasing numbers of lone parents is strongly associated with increasing crime rates for all three crime categories.

- A rise in private renting is associated with reductions in the all-crime and property crime rates.

- An increase in the number of 0-12 year olds is associated with a rise in personal crime but also a reduction in property crime.

Changes in levels of social renting were not associated with changes in crime rates. However, this may be due to the strong association between deprivation and social renting, with changes in deprivation linked to changes in crime rates (as reported above).

There is no change in crime rates associated with changing ethnicity. This suggests that the significance in 2008 may be because ethnic groups moving into Glasgow were moving to areas which already had high levels of crime.

The effects of deprivation and alcohol outlets on crime rates

It should be re-emphasised that the level of deprivation and the number of alcohol outlets in an area are the variables with by far the strongest associations with local crime rates, and that other variables have only small impacts on our ability to predict crime rates.

The impact of these factors can be seen in the diagrams opposite, where the predicted crime rates for deprivation and alcohol outlets for the two years can be seen. The graphs show that, controlling for everything else:

- If the level of income deprivation in an area is 40% rather than 20%, the local crime rate would be 2.05 times higher in 2001 and 1.47 times higher in 2008.

- If the number of alcohol outlets in an area is six rather than three, the local crime rate would be 1.82 times higher in 2001 and 1.94 times higher in 2008.

These modelling results suggest sizable differences between areas with low deprivation and low levels of alcohol outlets compared to areas where these factors are higher.

Predicted crime rate for alcohol outlets 2001

Predicted crime rate for deprivation 2001

Predicted crime rate for alcohol outlets 2008

Predicted crime rate for deprivation 2008
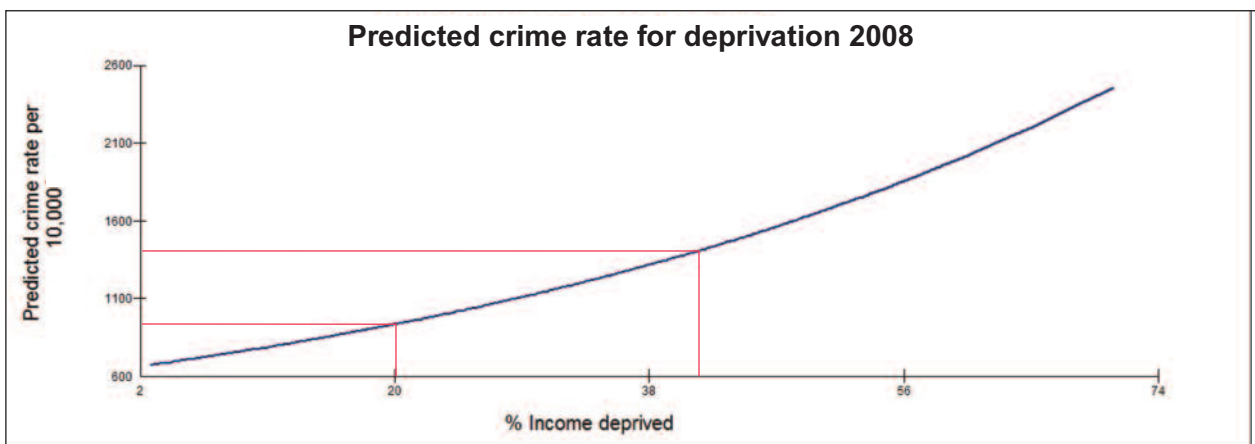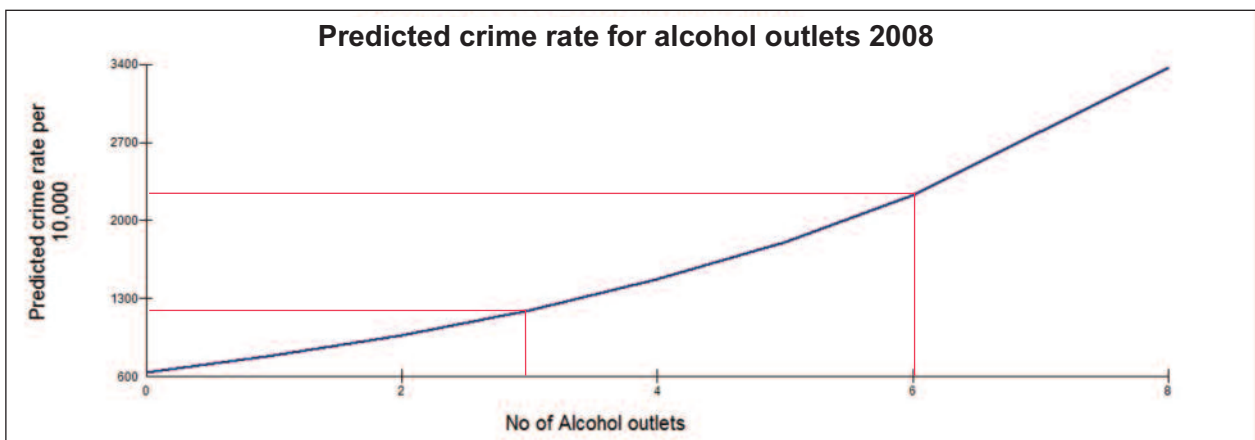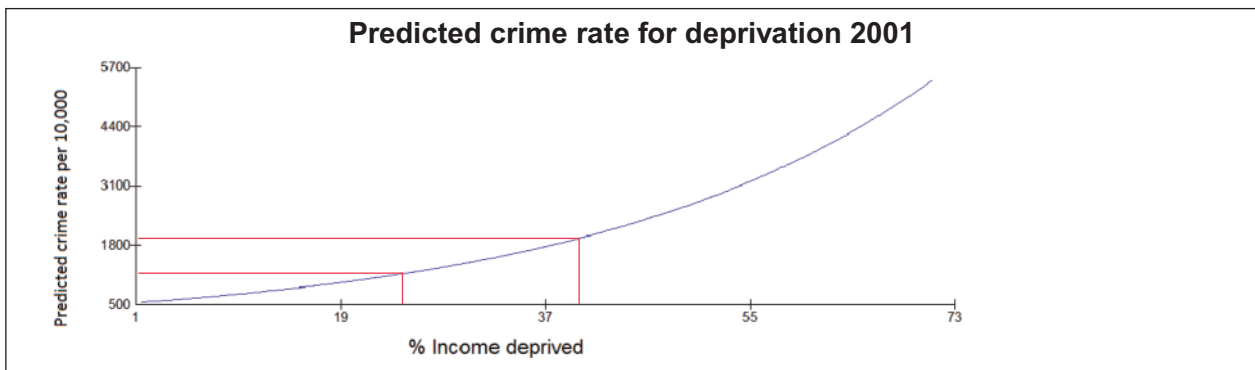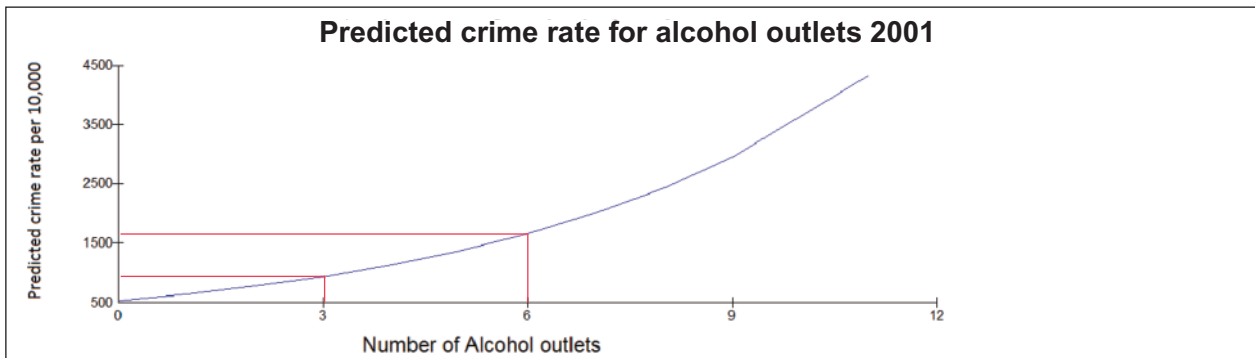
WHAT THIS STUDY SHOWS

We have been able to distinguish which of a number of neighbourhood structural characteristics are more or less associated with local crime rates. We have shown that:

- The strongest association with local crime rates was found to be the level of poverty or income deprivation in an area.

- The second strongest association with local crime rates was found to be a particular component of the consumption, leisure and retail environment, namely the number of outlets in an area, of all types, licensed to sell alcohol.

- The most important residential characteristic may be turnover, i.e. the degree of (in) stability in terms of the number of people moving in and out of the area[4] . This would be consistent with social disorganisation theory which suggests that in areas of high mobility, social networks and informal social control are weakened.

- Demographic characteristics of the local population were not generally associated with local crime rates; for example, the number of children and young people in an area was not significantly associated with crime rates. However, increases over time in the number of lone parent households in an area is associated with higher local crime rates.

- In the more recent year under study, crime rates were higher in areas with larger ethnic minority populations. However, the effect of ethnicity was much smaller than that of other important factors[5] .

DISCUSSION: INTERPRETATION AND IMPLICATIONS OF THE FINDINGS

Clearly, tackling poverty or income deprivation is a key strategy for reducing local crime rates. But our findings suggest that not only is it important to lift individual households out of poverty – through policies which address individual employability, economic opportunity and connections between the jobless and opportunities – but that it may also be important to reduce concentrations of poverty in local areas. Hence, tenure mixing policies for deprived areas may be beneficial for crime rates as there is a strong association between poverty and social renting. Indeed, we found crime rates to be lower (by around 16% in 2008) in areas where social renting was mixed with a substantial owner occupied sector compared with areas that are predominantly social renting. Therefore:

- If tenure mixing policies are able to lower area poverty rates, they may also form a useful part of a strategy to reduce local crime rates.

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[4] In the 2001 model for total crime, turnover was significant, but none of the tenure clusters or property types were. In the 2001 model for property crime, the standardised coefficient for turnover was +0.253 compared with -0.224 for the social renting cluster and -0.147 for the social renting/owner occupation cluster.

[5] In the 2008 model for total crime, the standardised coefficient for ethnicity was 0.093, compared with 0.358 for deprivation and 0.398 for alcohol outlets.

The fact that crime rates are also strongly associated with the number of places selling alcohol in a local area is not surprising, nor is the fact that alcohol outlets operate independently of deprivation – a recent study conducted in Glasgow showed that while the number of alcohol outlets does vary by level of area deprivation, it does not do so systematically (Ellaway et al 2010).

Alcohol outlets generate their own particular crimes in and around venues (e.g. violence and other disturbances), but alcohol also acts as an accelerant, or 'inhibitor-reducer', for opportunistic crime (i.e. unplanned crimes perpetrated when an opportunity arises), and plays a part in many other crimes (e.g. domestic violence). Of course, having more places selling alcohol both reflects levels of demand or consumption and helps generate more demand/consumption, i.e. the more available an addictive product is, the more some people will take the opportunity to access it.

There have been important policies introduced in Scotland in recent years to tackle problems associated with alcohol over-consumption and dependence. Legislation has focused particularly on issues of the accessibility of alcohol to young people, low prices or cheap alcohol, and the promotion of alcohol consumption by retailers and others. However, when it comes to the number of places licensed to sell alcohol in any particular area, policy provision seems weaker. While licensing boards are required under legislation to consider whether there are any areas of 'overprovision' within their jurisdiction, there are weaknesses in this approach[6]:

- 'Overprovision' of alcohol outlets (which may in any case not be the most suitable term) is largely undefined and guidance on its estimation lacking.

- There may be no automatic commitment to refuse license applications in an area of 'overprovision'.

- Any such refusal can be overturned on appeal.

- There may be no intention to actually reduce the number of licensed outlets over time in any area.

Glasgow Licensing Board objectives include those of preventing crime and disorder and protecting and improving public health, which also exist as national licensing objectives. Along with other recent research which has indicated that the density of alcohol outlets is also associated with health outcomes such as teenager admissions to hospital for alcohol-related conditions (Alcohol Concern 2011), our findings suggest that the following policy development may be warranted:

- Further consideration should be given at national and local level to the rationale, definition and operation of licensing policies related to the 'overprovision' of alcohol outlets in local areas.

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[6] There are instances where more robust approaches on the issue of overprovision have been attempted, including the use of a range of statistics to define areas of overprovision (e.g. West Dumbarton) and the refusal of license applications (e.g. Edinburgh).

Our finding that crime rates in 2008 were higher in areas with larger ethnic minority populations is interesting and potentially important given that some parts of the city have experienced large and rapid increases in such population groups since the millenium. Crime rates in such areas may reflect a number possible influences which we are unable to tease out here.

In light of this we would suggest that:

- Further investigation is required to identify which types of crime may be more common in areas of high ethnic diversity, and to explore what factors seem to be influential in this regard, either in the perpetration of crime or in a reduced ability to prevent crime in such areas.

The other demographic factor we found to have a significant association with local crime rates was the rise in lone parent families in many areas over the past decade, which was associated with higher crime rates. This is consistent with criminological theories of 'family disruption' and 'social disorganisation', i.e. that lone parenthood and the family and friendship changes that accompany it lead to weaker social controls over children and young people, either directly via parents or indirectly via the parents' social networks. Given other GoWell findings that respondents with children are more concerned than others about youth antisocial behaviour (see GoWell 2010) and that lone parents are more likely to feel unsafe at night, we consider that:

- Further research would be desirable to establish whether, and if so why, lone parents may experience the following: greater vulnerability to crime and safety issues; 'thinner' social networks; and weaker supervisory capacity over young people, particularly in areas where lone parents are more numerous.

NEXT STEPS: REFINING THE ANALYSIS

We aim to update and refine our analysis by using:

- More recent crime data from Strathclyde Police. In doing this, we could examine the influence of structural factors upon more specific types of crime, rather than just broad categories of crime.

- More recent data on alcohol outlets from the Glasgow Licensing Board. In this regard, we would look to distinguish between the effects of different types of outlet, such as on-sales versus off-sales.

- Demographic and residential structural data from the 2011 Census.

- Ideally, we would source all data for the same period, i.e. 2011-12.

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