Spatial Geography of Crime

This Factsheet introduces the spatial distribution of crime – its incidence and type, the nature of offenders and victims. There are five major aspects:

1. Mapping crime patterns
2. Links between socio-economic factors and the distribution of crime
3. Analysis of offenders' journey to crime
4. Offenders' image of the city
5. Economic analysis of criminal behaviour patterns.

This Factsheet introduces:

1. Initial theories of the spatial distribution of crime
2. Uses of crime mapping
3. Sources of data for crime mapping
4. Environmental explanations of spatial geography of crime

Mapping crime – how and why

Crime mapping has been made much easier by the development of GIS which includes techniques such as spatial database management and computer mapping systems to identify crime hot spots. Electronic maps produced by combining police databases of crime with digitised maps can

Table 1. Delinquency Residence Rates for the Concentric Zones of American Cities

	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5
Chicago	10.3	7.3	4.4	3.3	-
Richmond	19.7	12.2	6.4	-	-
Cleveland	18.3	10.2	7.8	7.0	5.1
Denver	9.4	7.1	4.2	3.7	3.2
Seattle	19.1	9.7	7.6	6.1	-

Fig 1. E.W. Burgess's zone model of urban development

I
Loop

II
Zone in
Transition

III
Zone of workingmen's
homes

IV
Residential zone

V
Commuters' zone

be used to represent crime density values (number of crimes per square kilometre) and to produce **chloropleth maps** which use colour to map crime density against variables such as housing type, unemployment rates, etc.

Crime maps can be used to:

*   help police to identify and target hot spots

*   predict where, for example, serial offenders will commit crimes

*   allow planning authorities to predict the effect of a new police station or a change in allocation of police resources on the distribution of crime with respect to bars, restaurants, shopping centres, etc.

By understanding how these developments affect crime it is hoped that we will be in a better position to plan our towns and city centres to minimise the incidence of crime.

Crime in American Cities

Shaw and McKay's (1942) long term study of juvenile delinquency in Chicago used Burgess' concentric zone model to map the homes of juvenile delinquents in several cities (Fig 1 and Table 1).
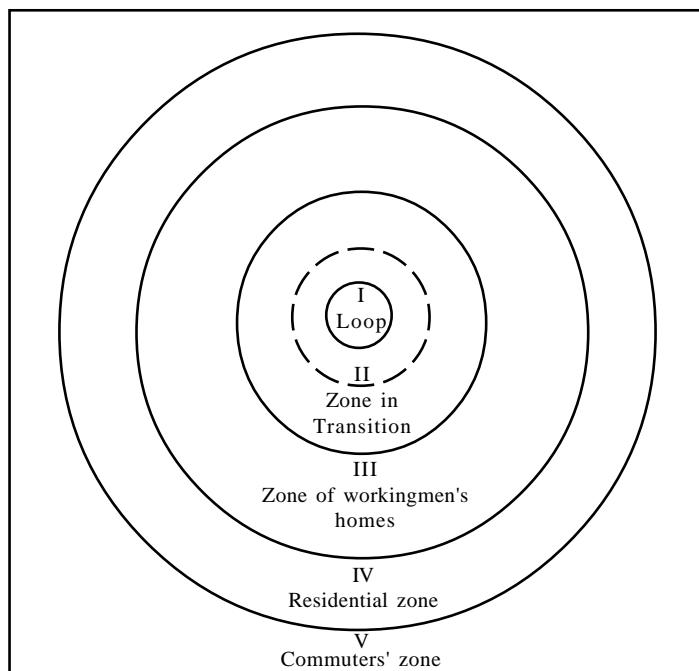
The study drew 3 conclusions:

1. Rates of juvenile delinquency were highest in the inner city and declined with distance from the city.

2. Other social problems, for example, unemployment rates also followed this pattern.

3. Although the ethnic composition of the inner city changed over decades, the general pattern of crime remained the same, ie. the pattern was stable.

It was suggested juvenile delinquency was greatest in the inner city because of the lack of social organisation there. This itself was a consequence of two factors:

(a) Constant population movement in the zone in transition. New immigrants were able to find cheap housing in this zone, but as they became economically established (got jobs and began to save) they moved out, allowing different immigrants – perhaps from a different country - to move in.

(b) Cultural heterogeneity – in other words the population of the zone of transition was made up of many different countries bringing many different cultures and religious and social values.

In short, the diversity of communities in the inner cities meant that no single set of community or cultural values could become strong enough to pull the entire city centre community together. The very factors which had allowed immigrants to find housing in the inner city also made it relatively easy for criminals and unconventional enterprises to set up. This meant that young people were exposed to people with very different moralities and attitudes to the law.

However, since this classic study many researchers in the UK and in other countries have shown that the spatial distribution of offences does not fit

neatly into zonal models. Studies of Sheffield in the 1970s, for example, found that there was no statistically significant link between offender rates and the rate of tenant turnover on council estates, or between offender rates and the social or class composition of the city centre and its suburbs.

Some researchers believe that spatial patterns can be explained in terms of the opportunities which there are to commit crimes. Two concepts are important:

1. **Target attractiveness** – this often relates to the monetary or symbolic value. Generally, affluent areas, or areas with large numbers of wealthy houses are the most attractive.

2. **Target accessibility** – sites which are hidden or have inadequate surveillance but are easily accessible are attractive.

An analysis by a crime prevention team of the relative risks of car theft from town centre multi-storey car parks in the UK, revealed that high volume short stay car parks with a constant stream of shoppers were the safest.

Research in the 1980s suggested that offenders usually commit crimes in areas that they know well; offences were most likely to occur when the opportunity to commit a crime intersected with a particular criminal's mind map of an area (Fig 2).

Fig 2. Intersection of a criminal's cognitive awareness space with opportunities to commit crime.
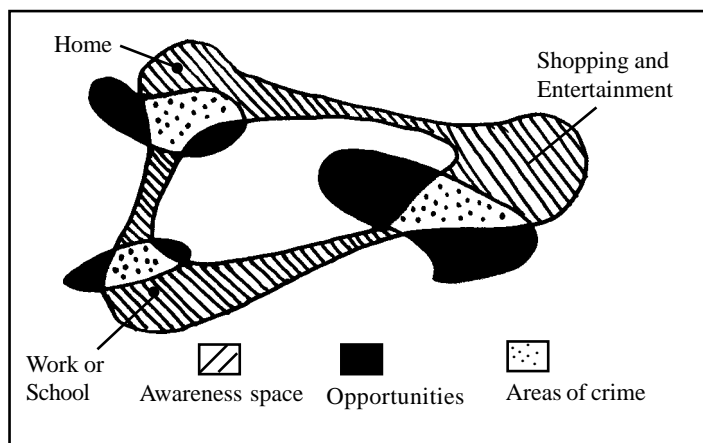
Knowledge of these interactions can, it is suggested, be used to predict crime rates and types of crime in an area. A study in Delaware County, Philadelphia supported this model. It revealed that burglars whose own homes were in the south of the county rarely committed burglaries there – households were poor and they were more likely to be caught in areas where they were well known. Most burglars were attracted to the north of the county and specifically to those areas which were adjacent to the roads and bus routes which they knew well. Even though the most affluent areas of the county were in the north-east, few burglars attempted to commit crimes there because they regarded it as unfamiliar territory.

Spatial Distribution of Crime in England and Wales

Home Office statistics show that there are huge variations in the levels of violent crime recorded in England and Wales (Fig 3). Gwent has the highest rate of recorded violent crime (2039 offences per 1000 of the population), Hertfordshire the lowest (380 offences per 1000 of the population).
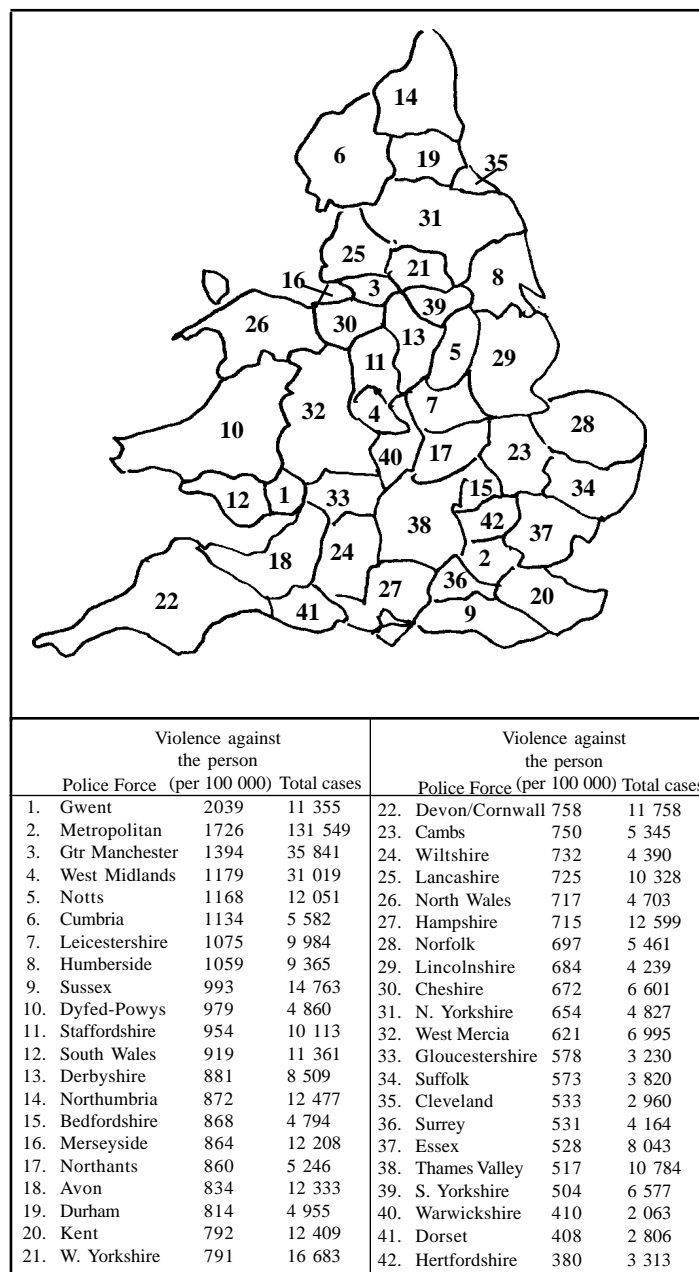
Rates of violent crime also differ greatly between large cities. Gwent has four main population centres; Newport, Cwmbran, Caerphilly and Pontypool. It is suggested that the high rate of violent crime in Gwent can be linked to:

1. High percentage of unemployed young males from former mining areas of Ebbw Valley, Tredegar and Rhymmey, whose main social activity is drinking.

2. The concentration of pubs and clubs in the centre of Newport which is described as a drinkers honeypot.

It is suggested that Hertfordshire's low rate of violent crime can be attributed to:

1. The relative affluence of the county's population.

2. The rural nature of the county which has no large inner city areas.

Fig 3. Violent Offences by Area

	Violence against the person				Violence against the person		
	Police Force	(per 100 000)	Total cases		Police Force	(per 100 000)	Total cases
1.	Gwent	2039	11 355	22.	Devon/Cornwall	758	11 758
2.	Metropolitan	1726	131 549	23.	Cambs	750	5 345
3.	Gtr Manchester	1394	35 841	24.	Wiltshire	732	4 390
4.	West Midlands	1179	31 019	25.	Lancashire	725	10 328
5.	Notts	1168	12 051	26.	North Wales	717	4 703
6.	Cumbria	1134	5 582	27.	Hampshire	715	12 599
7.	Leicestershire	1075	9 984	28.	Norfolk	697	5 461
8.	Humberside	1059	9 365	29.	Lincolnshire	684	4 239
9.	Sussex	993	14 763	30.	Cheshire	672	6 601
10.	Dyfed-Powys	979	4 860	31.	N. Yorkshire	654	4 827
11.	Staffordshire	954	10 113	32.	West Mercia	621	6 995
12.	South Wales	919	11 361	33.	Gloucestershire	578	3 230
13.	Derbyshire	881	8 509	34.	Suffolk	573	3 820
14.	Northumbria	872	12 477	35.	Cleveland	533	2 960
15.	Bedfordshire	868	4 794	36.	Surrey	531	4 164
16.	Merseyside	864	12 208	37.	Essex	528	8 043
17.	Northants	860	5 246	38.	Thames Valley	517	10 784
18.	Avon	834	12 333	39.	S. Yorkshire	504	6 577
19.	Durham	814	4 955	40.	Warwickshire	410	2 063
20.	Kent	792	12 409	41.	Dorset	408	2 806
21.	W. Yorkshire	791	16 683	42.	Hertfordshire	380	3 313

Source: The Independent 03.01.00

However, the figures should be viewed with caution. Previous Home Office figures had shown that Gwent and Dyfed-Powis had shown the largest percentage decrease in notifiable offences between July 1993 and June 1995.

Home Office statistics also show large spatial differences in the type of notifiable offences reported in different areas. Notifiable offences are those known to the police for which a suspect, if apprehended and found to have a cause to answer, could elect to be tried by jury. These statistics reveal those areas which have the highest and lowest notifiable offences and illustrate that different areas suffer different types of crime – e.g. fraud and forgery were highest in Gloucestershire and Dorset, whilst violent crimes were highest in the metropolitan areas. Such statistics also illustrate some of the difficulties of comparing crimes statistics which have been drawn from different sources.

One interesting point which is often masked by the crime statistics, concerns multiple victimisation. This refers to the situation when one individual, household or business is repeatedly the victim of crime. In the 1996 British Crime survey, 19% of victims had been victimised more than once. Multiple victimisation is more common in high crime areas and multiple victimisation accounts for a significant proportion of all crime in some areas. However, of people who live in high crime areas, not everyone living in the area is victimised.

To summarise multiple victimisation is geographically skewed at the macro level (some areas show much greater rates than others) and at the micro level (even within a geographically high crime rate area, some individuals or households are never victimised).

Case Study: Stockholm

Wikström (1991) measured spatial offender rates in Stockholm. The spatial pattern of crime depended on the type of crime; crimes involving violence in public and vandalism and theft of and from cars was greatest in the city centre, but crimes involving family violence and residential burglaries were more widely scattered. The highest burglary rates were in wealthy areas especially those which were geographically adjacent to areas which had high offender rates.

Interpreting Crime Statistics
It can be notoriously difficult to compare crime statistics from different sources:

1. *Until very recently different police forces collected slightly different crime statistics which made comparisons difficult. Some forces compiled* **crime victimisation rates** *which measure all the offences committed against a certain part of the population wherever the crime was committed. Other forces compiled* **area offence rates** *which measure all offences committed in an area and include offences against businesses, residents or visitors.*

2. *Some data includes both offences which were policed reactively (ie. crime was reported and police responded) and actively (ie. where the police detected crime by mounting a campaign, e.g. against local prostitutes)*

3. *Some data assumes that because the highest crime rates are found in areas with a particular population composition, (e.g.. high ethnic minorities) that it is that part of the population which actually committed the crime. This may not be the case.*

It should be noted that the data in Fig 3 are the crimes recorded by the police and it is estimated that the amount of crimes actually committed is 3 to 5 times greater than this. Police forces differ in their willingness and ability to record all types of crime and the public's attitude to reporting different types of crime may vary over time. Reporting rates of property and car crime are heavily influenced, for example, by **whether the victims are penalised by their insurance companies for making claims.**

In order to take account of the fact that some police force areas are much larger than others, crime rates are expressed as the number of recorded offences per 100,000 of the population. Such figures do not, however, take account of the composition of the population or other important factors such as police approaches. For example, Nottinghamshire appears to have for many years an unusually high rate of crime; in 1995 Nottingham had the highest rate of offence per 100,000 of the population and a rate much higher than the neighbouring counties of Leicestershire and Staffordshire which are socially similar. Study of Nottingham's crime statistics showed that:

1. *A much greater number and proportion of recorded crime originated from admissions to the police*

2. *A much greater number and proportion of recorded crimes involved property of little value (£10 or under) Thus, it was concluded that Nottingham's high crime rate statistics were mainly due to police actions rather than a reflection of actual crime rates.*

The researchers concluded that it was very likely that Nottinghamshire had never been the most criminal area in the country.