



# **Project MARGIN**

**Conceptual report: a report summarising the indicators defining demographic, socio-economic and socio-geographic determinants of insecurity**

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# 1. Introduction

In Deliverable 2.1 of the MARGIN project, a database was collated to enable a comparative analysis between police recorded crime data and crime victimisation surveys across five European countries. In the present report, we present such an analysis in order to identify a range of demographic, socio-economic, and socio-geographic determinants of insecurity.

The available data enable two dimensions of insecurity to be addressed. The first, *victimisation*, can be measured through two sources: police recorded crime data and responses to questions regarding victimisation in a crime victimisation survey. This dimension of insecurity is known in the MARGIN project as the *objective dimension* as it attempts to capture individuals' actual experiences with crime. The second, *perceived insecurity*, relates to questions in the crime victimisation survey surrounding respondents' thoughts about crime, safety, and how their perceptions about crime alter their habits. This aspect is known as the *subjective dimension*. It has been shown previously that, although related, perceived insecurity and victimisation capture different aspects of insecurity. Moreover, there are some instances where people who have a very small risk of experiencing victimisation in fact have very high levels of perceived insecurity (see Doran and Burgess (2012) for a review).

In this report, we analyse consistencies in the MARGIN database with respect to a range of indicators of insecurity. It is important to determine indicators of insecurity in order to identify marginalised communities who tend to experience a disproportionate amount of victimisation and who also have high levels of perceived insecurity and fear of crime. Identification of such communities can enable directed policies to reduce levels of insecurity. The results of this analysis are intended to inform the development of the MARGIN victimisation survey being developed in Work Package 4.

In what follows, we first conceptualise the objective dimension by examining victimisation rates across the different study areas, as obtained from both police recorded crime and victimisation survey data. Next, we consider the subjective dimension by considering questions relating to different aspects of

perceived insecurity. After describing a number of problems that arise when attempting to directly compare questions across the different victimisation surveys, we turn to the identification of a range of demographic and socio-economic indicators which we find to be associated with particular aspects of perceived insecurity. We present the results of a range of regression analyses performed with this data. Finally, we discuss a range of potential socio-geographic indicators of insecurity, focusing particularly on the example of street robbery in Barcelona. We also discuss a range of other points to be considered in the identification of marginalised communities.

## **2. The objective dimension of crime**

### ***2.1 The measurement and comparison of crime-related phenomenon***

Police recorded crime (PRC) data and crime victimisation surveys (CVS) are two data sources that enable a measurement of the amount of crime in a particular area over a period of time. PRC data contains all crimes that are reported to and recorded by the police. In different countries, police have different reporting and recording practices, as well as different definitions of particular crimes, making international comparison of PRC data difficult. CVSs, on the other hand, do not depend on how the police define and record crime in different countries and instead rely on respondent experience. Asking questions such as whether each respondent has been a victim of a particular crime enables a researcher to estimate the extent of that particular crime problem by comparing the number of respondents who have been a victim to the number who have not over the same time period. The limitation with estimating the crime problem from CVS data is that respondents may have different interpretations of a particular crime or victimisation experience.

In some cases, the crimes asked about in CVS data are designed to match the crime types defined in equivalent PRC data. Comparing the PRC data to the CVS data enables the investigation of the so-called 'dark figure' of crime: the amount of crime that exists in the general population but is not reported to or recorded by police and so is not reflected in official police statistics.

Comparing the amount of crime in different locations cannot be done by just examining the counts of different crime events. This is because the size of the country or the number of available targets is likely to substantially influence the event count. As a result, crime rates are typically used, which measure the amount of crime per potential target. Crime rates more accurately measure the risk of a particular individual becoming the victim of crime in a given study area.

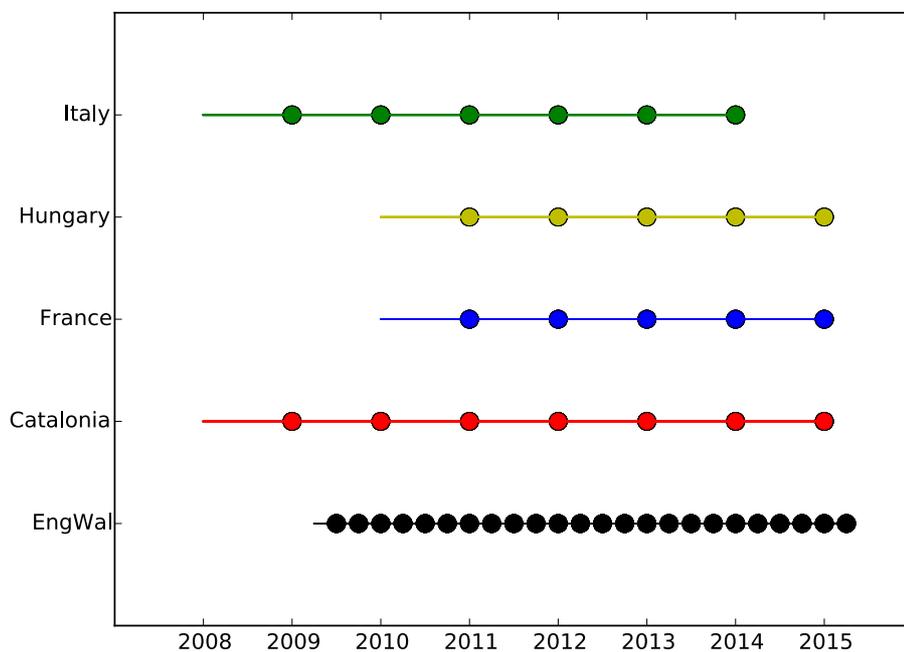
There are two dominant rates that are used widely in the crime literature: incidence and prevalence. Incidence rates give the number of crimes per

potential victim or per number of targets in a particular area. For example, if the crime of interest is a personal crime such as an assault or a robbery, then the incidence rate will report the number of crimes per population in an area. If the crime is a property crime, such as residential burglary, then the incidence rate will report the number of crimes per household. Prevalence rates measure the number of victims per potential victim. In the calculation of prevalence rates, the effect of repeat victimisations is removed, meaning that prevalence rates can be interpreted as the likelihood that a randomly selected individual from the study area will experience a victimisation. Prevalence rates often can not be calculated from aggregate PRC data due to the lack of reporting of unique victims. Instead, aggregate PRC data typically reports the total number of crimes.

In this section, we examine the objective dimension of insecurity using the MARGIN database. We first discuss the data available for this task before explaining how eight crime types were defined, which enable some form of comparison across the different study areas. We then present the results of this comparison before discussing our findings. It should be noted that the dark figure of crime in the different study areas is explored in Deliverable 3.1 of the MARGIN project and that this study uses the same data and crime definitions as presented in what follows.

## 2.2 Description of the data

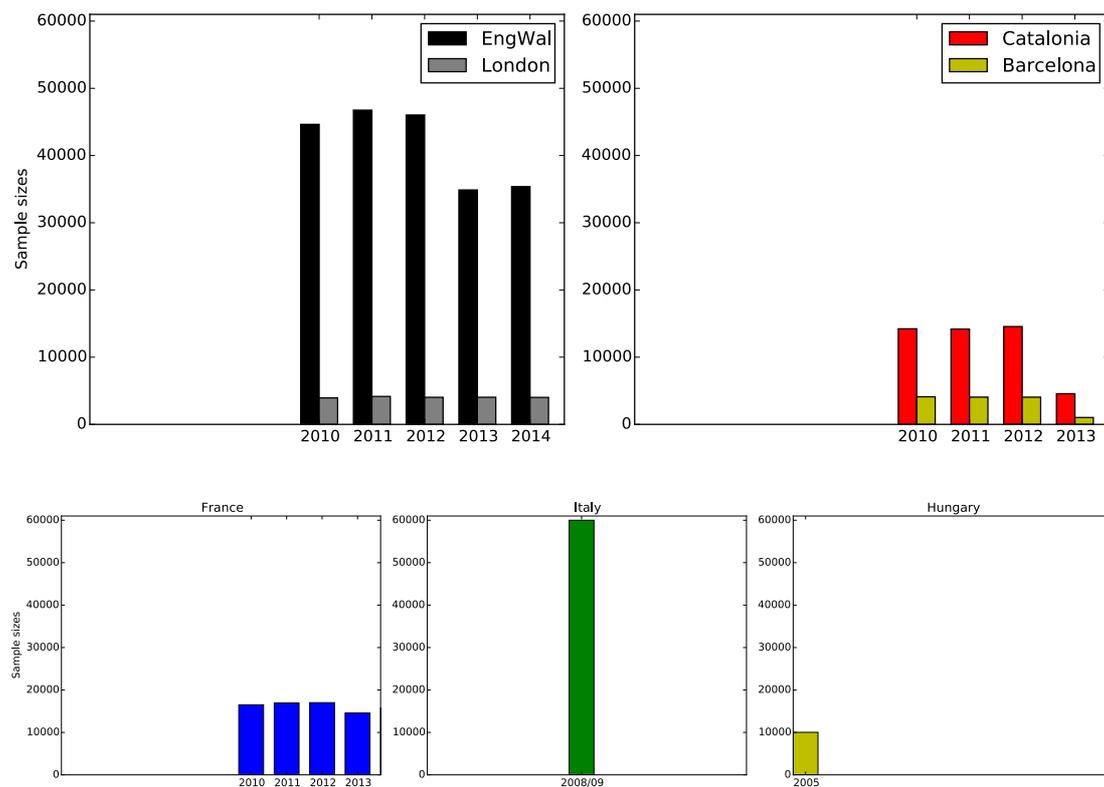
Deliverable 2.2 of the MARGIN project provides an overview of police recorded crime data and crime victimisation surveys in Catalonia, England and Wales, France, Hungary, and Italy. We refer the reader to this report for more details on how this data is collected. In Figure 1, we plot the temporal coverage of the PRC data. In this figure, time runs from left to right. Each dot represents the point in time at which the PRC data that is included in the database of deliverable 2.1 (and which is therefore included in the analysis that follows) is reported. The line preceding each dot represents the time period to which that data refers to. The years 2010 to 2014 inclusive are years for which PRC data is included for all study areas considered in the MARGIN project. PRC data is provided for the study areas shown in Figure 1 as well as for the six European cities of Barcelona, London, Paris, Budapest, Milan and Florence. Additionally, for the cities of Barcelona and Budapest, PRC data is available at the sub-city level. For more information on the geographies of the police recorded crime, see deliverable 3.1.



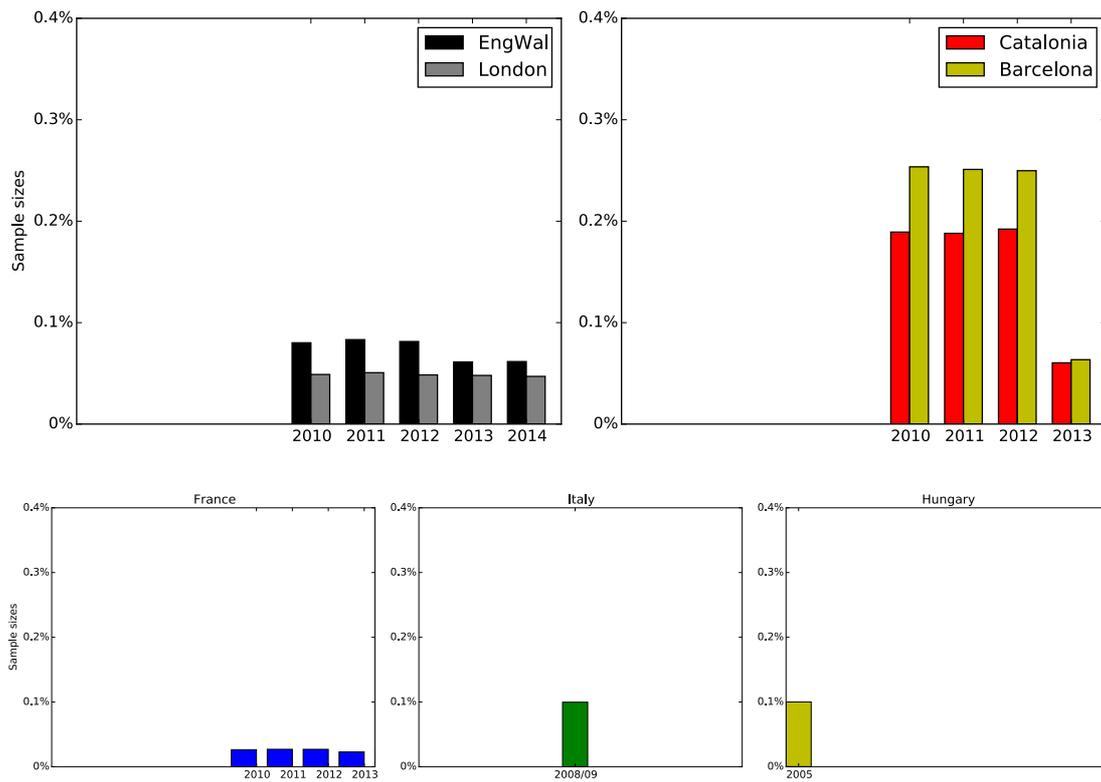
**FIGURE 1: TEMPORAL COVERAGE AND REPORTING DATES OF PRC DATA INCLUDED IN THE MARGIN DATABASE.**

Figure 2 shows the sample sizes and temporal coverage of the five victimisation surveys used in the analysis of this report. The victimisation surveys for England and Wales and for Catalonia enable the identification of those respondents who reside in London and Barcelona, respectively. In these cases, the sample sizes for London and Barcelona are also plotted.

A larger sample size means that the results and outcomes of any analysis can be thought to better reflect the underlying population. In this case, the size of the population that the survey is aiming to reflect varies across each of the five study areas. Thus, in Figure 3 we plot the sample size of each victimisation survey as a proportion of the population of the study area. We see that, while the victimisation survey in Catalonia is relatively small (particularly compared to the survey in England and Wales), it in fact captures a relatively large proportion of the population it aims to make inferences about.



**FIGURE 2: SAMPLE SIZES OF THE VICTIMISATION SURVEYS INCLUDED IN THE MARGIN DATABASE.**



**FIGURE 3: SAMPLE SIZES OF THE VICTIMISATION SURVEYS INCLUDED IN THE MARGIN DATABASE, AS A PERCENTAGE OF THE TOTAL POPULATION.**

### **2.3 MARGIN crime type matching**

Comparing levels of crime across countries is problematic due to the different definitions of crime and the way in which those definitions are recorded by police. Despite this difficulty, it is possible to analyse the amount of crime contained in the MARGIN database by considering just those crimes that are consistently defined across the study areas. One of the first tasks in WP3 was to assess the broad range of crime types that were described in both the PRC and the CVS data. We chose eight crime types where it was possible to identify consistencies in definitions and recording practices. Four of these were personal crimes and committed against individuals (violence against the person, harassment and threats, street robbery and theft from the person) and four were property crimes, more often committed against a household rather than a particular victim (burglary in a dwelling, vehicle related thefts, bicycle thefts and criminal damage).

In Figure 4, these eight crime types are shown for each of the five countries, for both PRC and CVS data. The cells in the table are shaded according to the degree of consistency in the definitions of the different crime types: a dark cell represents a definition that has a close correspondence to the MARGIN crime type in the left hand column whilst a lighter one means that the definition is not an exact fit or that the data is not available for that particular crime type in that study area. The asterisks in each cell are used to represent the geographic resolution at which data is available, from country level (one-star) to sub-city level (three-star).

|                             | UK  |     | Catalonia |     | France |     | Hungary |     | Italy |     |
|-----------------------------|-----|-----|-----------|-----|--------|-----|---------|-----|-------|-----|
|                             | PRC | CVS | PRC       | CVS | PRC    | CVS | PRC     | CVS | PRC   | CVS |
| Violence against the person | **  | **  | ***       | *** | **     | *   | ***     | *   | **    | *   |
| Harrasment and threats      | **  | **  | ***       | *** | **     | *   | ***     | *   | **    | *   |
| Street robbery              | **  | **  | ***       | *** | **     | *   | ***     | *   | **    | *   |
| Theft from the person       | **  | **  | ***       | *** | **     | *   | ***     | *   | **    | *   |
| Burglary in a dwelling      | **  | **  | ***       | *** | **     | *   | ***     | *   | **    | *   |
| Vehicle related thefts      | **  | **  | ***       | *** | **     | *   | ***     | *   | **    | *   |
| Bicycle theft               | **  | **  | ***       | *** | **     | *   | ***     | *   | **    | *   |
| Criminal damage             | **  | **  | ***       | *** | **     | *   | ***     | *   | **    | *   |

|                     |     |
|---------------------|-----|
| Neighbourhood level | *** |
| City level          | **  |
| Country level       | *   |

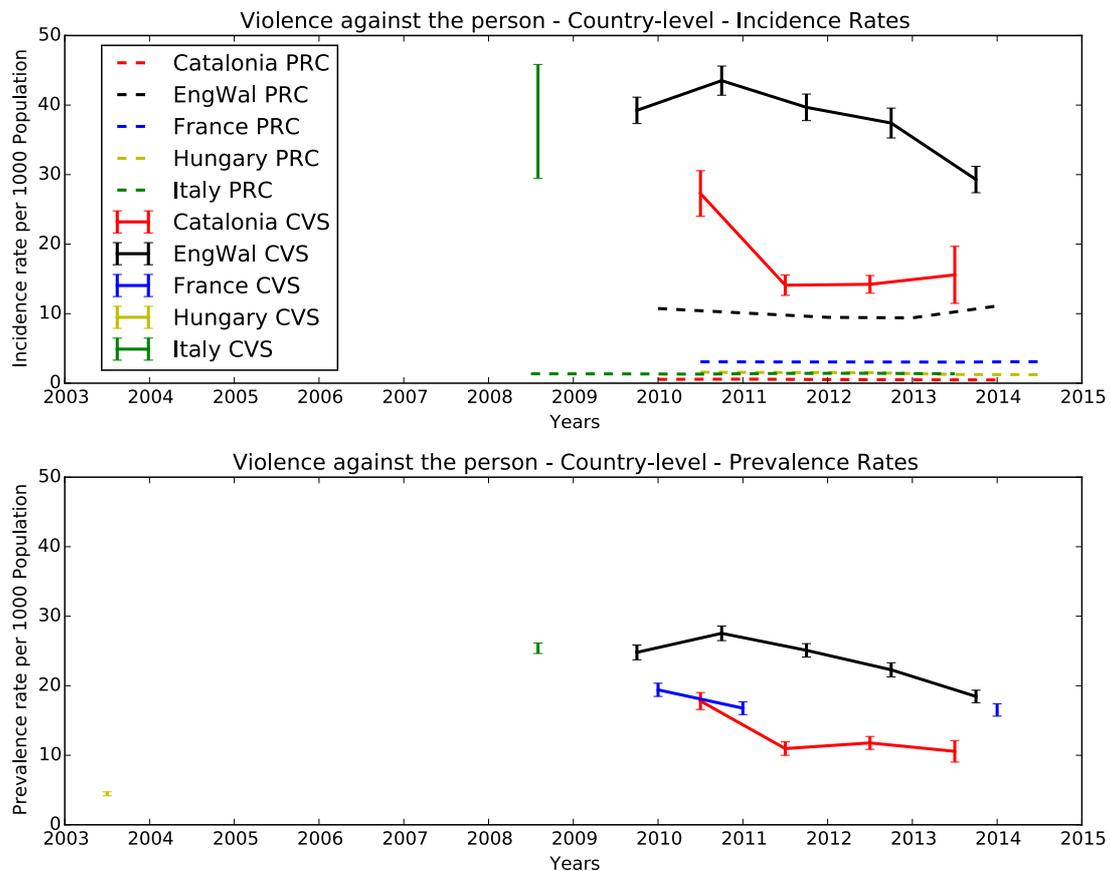
|                    |  |
|--------------------|--|
| Good match         |  |
| Partial match      |  |
| Poor match/no data |  |

**FIGURE 4: THE EIGHT CRIME TYPES CONSIDERED IN THE MARGIN PROJECT AND THE SUITABILITY OF THE MATCHING BETWEEN DEFINITIONS IN THE PRC AND CVS DATA OF EACH STUDY AREA. THE FIGURE ALSO SHOWS THE GEOGRAPHIC RESOLUTION OF THE DATA.**

Violence against the person and criminal damage are two crime types that are consistently defined across all PRC and CVS data in all study areas. Burglary in a dwelling is also relatively consistently defined; however, there are difficulties in obtaining burglary in a dwelling rates from the PRC data in Hungary, which records both robberies and thefts, but does not distinguish between the type of property that is stolen (e.g. individual or business) or the location of the crime (e.g. residential dwelling, outside on the street, or from a vehicle). Another example where there is a lack of consistency is in the definition of theft from the person in Catalonia. In the PRC data, “theft” crimes are reported but this type of crime contains both theft from the person and theft of commercial property such as shoplifting.

## 2.4 Crime rates over time

Despite the limitations that arise when comparing these crime types across different study areas, it is possible to calculate crime rates as obtained from both the PRC and the CVS data according to the crime type matching described in Section 2.3. In Figures 5 and 6, we plot the crime rates over time for the two crime types that had the highest consistency between the different study areas: violence against the person and criminal damage.



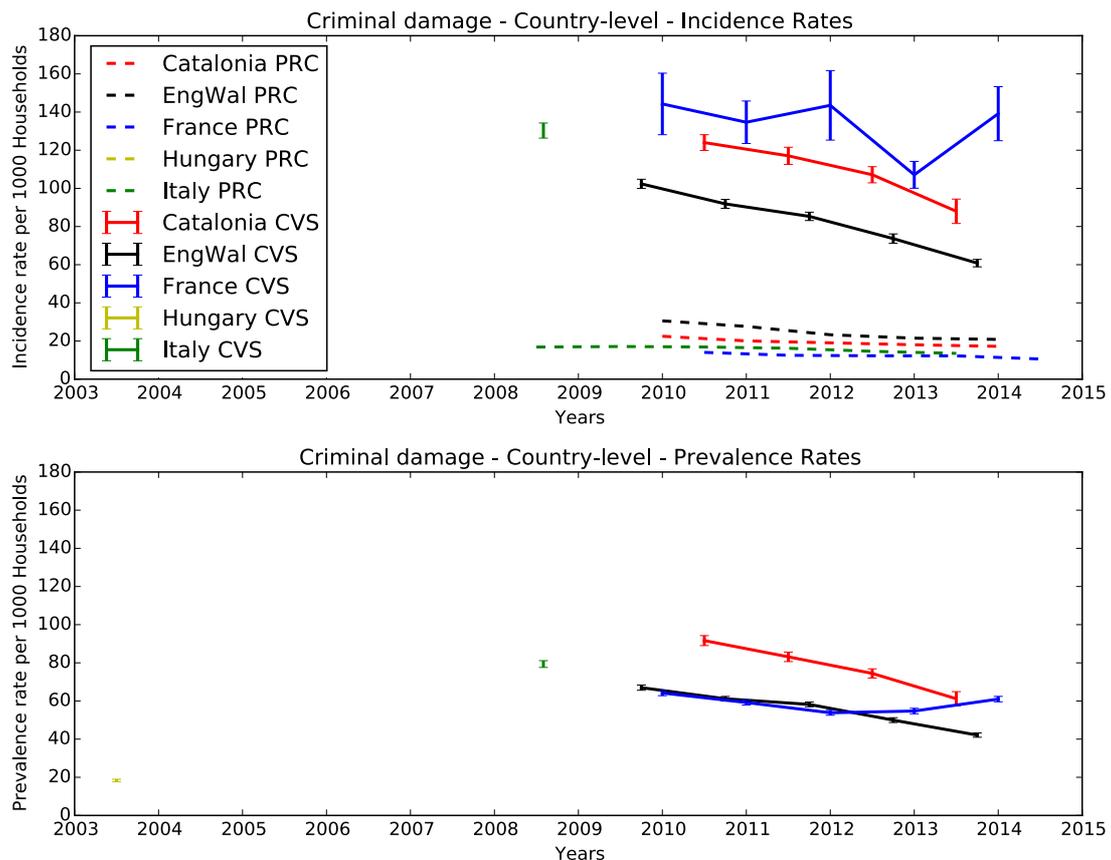
**FIGURE 5: INCIDENCE AND PREVALENCE RATES FOR VIOLENCE AGAINST THE PERSON.**

Figure 5 shows the incidence and prevalence rates for violence against the person over the time period for which we have data available, at the largest geographic scale in each study area. The solid lines represent the rates as calculated from the CVS data and the dashed lines represent the rates calculated from PRC data. The difference between the CVS and PRC rates

can be thought of as the 'dark figure' of crime. The error bars associated with the CVS rates are standard errors of the sampling procedure calculated using a bootstrap algorithm (Efron and Tibshirani, 1986).

We see that the rates in England and Wales and in Italy are the highest, but that, over time, a drop in the total volume of violent crime, as recorded by victimisation surveys, can be observed. This is consistent with the findings of a large number of studies at an international level (for example Van Dijk et al., 2005; Tseloni et al., 2010).

There is a slight increase in the incidence rate in England and Wales as calculated from PRC data in 2014, but this is likely to be due to improved reporting of violence against the person by the police, since the rate of actual crime levels, as calculated from the CVS data, continues to decrease.



**FIGURE 6: INCIDENCE AND PREVALENCE RATES FOR CRIMINAL DAMAGE.**

In Figure 6, the equivalent rates are plotted for criminal damage, the second of the two crime types that were found to have consistent definitions across all five study areas. In terms of criminal damage, France has the largest incidence rate but not prevalence rate, highlighting that a larger number of repeat victimisations with regards to criminal damage were found in France than in Catalonia and England and Wales. Again, a gradual drop in crime levels over time can be observed (with the exception of France), which is consistent with the drop in crime observed internationally elsewhere.

The conclusions of this type of analysis are limited by the definitional issues in the crime types, as discussed above. Because of this, the crime rates for just two crime types are presented and are those that were found to have the most consistent definitions across the study areas in the MARGIN project. For these two crime types, we see that rates of victimisation are relatively similar across the different study areas, providing support for our assertion that the definitions of these crimes are consistent. We also observe a drop in the rates as calculated from the CVS data over time, consistent with the drop in crime observed elsewhere. We see a large difference in the rates calculated from the CVS data and the PRC data, suggesting that the dark figure of crime is substantial in these study areas (see deliverable 3.1 for a more detailed study into the dark figure of crime).

The identification of indicators of the objective dimension of insecurity depends crucially on the geographic scale of analysis. The crime trends presented in this section are at an aggregate geography and will not reflect victimisation rates uniformly in each study area. Because of this, analysis should be performed at the neighbourhood level, which is likely to be more representative of the experiences of the population. We discuss socio-geographic indicators of victimisation at the neighbourhood level in section 5; but, for now, note the disparity between the PRC data and the CVS data at the aggregate level.

### 3. Measuring perceived insecurity

There are a range of questions asked of respondents in the crime victimisation surveys relating to feelings of safety, neighbourhood crime perceptions, fear of and worry about victimisation, and the trust in police, all of which can have an impact on an individual's perception of insecurity. In crime literature, it is often argued that these aspects of insecurity can be quite distinct from experiences relating to victimisation (e.g. Doran and Burgess, 2012). Having conceptualised objective insecurity as being related to experiences and levels of victimisation (and having measured these rates in these the different study areas), we now consider the subjective dimension of insecurity, which relates to how individuals view their safety and security, and whether these views have a detrimental impact on their habits and their behaviour.

In order to measure the subjective dimension of insecurity, it was first necessary to examine the types of questions asked of respondents in each study area's crime victimisation survey. In particular, it was considered whether it was possible to identify questions that would enable a direct comparison to be made between different countries. There are a small number of questions for which direct comparisons are possible. Table 1 shows two very similar questions asked in both the England and Wales survey and the Italy survey. These questions are concerned with how safe the respondent feels walking alone in their neighbourhood after dark. The table shows the proportion of responses obtained and shows that respondents in England and Wales were more likely to respond with the option 'very safe' (32.9%) than respondents in Italy (23.8%).

| England and Wales   |                   | Italy  |                  |
|---|-------------------|--|------------------|
| How safe do you feel walking alone in this area after dark? |                   | How safe do you feel when you walk alone at night in your neighbourhood? |                  |
| <i>Responses</i>  | <i>Percentage</i> | <i>Percentage</i>  | <i>Responses</i> |
| Very safe   | 32.9%             | 23.8%  | Very safe        |
| Fairly safe   | 40.1%             | 46.4%  | Quite safe       |
| A bit unsafe  | 18.8%             | 20.6%  | Not very safe    |
| Very unsafe   | 8.2%              | 9.2%   | Not safe at all  |

**TABLE 1: RESPONSES TO TWO QUESTIONS CONCERNING NEIGHBOURHOOD SAFETY IN THE SURVEYS OF ENGLAND AND WALES AND ITALY.**

Another comparison can be made when asking how safe the respondent feels when walking alone in their neighbourhood during the day in both England and Hungary. Examining these responses suggests that respondents in England and Wales are more likely to respond positively than respondents in Hungary.

| England and Wales   |                   | Hungary  |                  |
|---|-------------------|--|------------------|
| How safe do you feel walking alone in this area during the day? |                   | How safe do you feel when you are alone in your local street during the day? |                  |
| <i>Responses</i>  | <i>Percentage</i> | <i>Percentage</i>  | <i>Responses</i> |
| Very safe   | 79.2%             | 60.6%  | Very safe        |
| Fairly safe   | 18.4%             | 30.5%  | Rather safe      |
| A bit unsafe  | 2.1%              | 7.4%   | Rather unsafe    |
| Very unsafe   | 0.4%              | 1.6%   | Very unsafe      |

**TABLE 2: RESPONSES TO TWO QUESTIONS CONCERNING NEIGHBOURHOOD SAFETY IN THE SURVEYS OF ENGLAND AND WALES AND HUNGARY.**

A third direct comparison can be made between England and Wales, Hungary, and Italy regarding feelings of safety when the respondent is home alone at

night. In this case we see that respondents in England and Wales are most likely to respond 'very safe'. Comparing Hungary with Italy, we see that respondents in Hungary are more likely to respond 'very safe' but are also more likely to respond 'very unsafe'. Assigning an interval scale to these responses (i.e. so that 1 = very safe, 2 = fairly safe, 3 = fairly unsafe, 4 = very unsafe), we can calculate the average response for a participant in each country. Doing this, we find that respondents in Hungary are, on average, more likely to respond positively than respondents in Italy.

| England and Wales   |                   | Hungary   |                   | Italy  |                   |
|---|-------------------|---|-------------------|--|-------------------|
| How safe do you feel when you are home alone in your own home at night? |                   | How safe do you feel when you are alone at home at night? |                   | How safe do you feel when you are home alone at night? |                   |
| <i>Responses</i>  | <i>Percentage</i> | <i>Responses</i>  | <i>Percentage</i> | <i>Responses</i>                                       | <i>Percentage</i> |
| Very safe   | 69.0%             | Very safe   | 58.7%             | Very safe  | 43.7%             |
| Fairly safe   | 24.7%             | Rather safe   | 27.7%             | Quite safe   | 44.3%             |
| A bit unsafe  | 5.2%              | Rather unsafe   | 9.4%              | Not very safe  | 9.7%              |
| Very unsafe   | 1.1%              | Very unsafe   | 4.2%              | Not safe at all  | 2.3%              |

**TABLE 3: RESPONSES TO THREE QUESTIONS CONCERNING SAFETY IN THE HOME IN THE SURVEYS OF ENGLAND AND WALES, HUNGARY, AND ITALY.**

Unfortunately, since each victimisation survey considered in the MARGIN project is administered separately, the questions that are asked are largely different. In fact, the questions presented in Tables 1-3 are the only questions relating to perceived insecurity that can be compared directly. In order to enable direct comparison, the question must be asking about the exact same experience or feeling and the range of possible responses to the question must also be the same. In general, these conditions do not apply. There are often differences in the phrasing of the question, different likert scales used, and different types of response. To illustrate some of these differences, two further questions are shown in Table 4 and Table 5 relating to feelings of safety in France and Catalonia, respectively.

| France  |                    |
|---|--------------------|
| Do you personally feel unsafe in your neighbourhood or village? |                    |
| <i>Responses</i>  | <i>Percentages</i> |
| Often   | 3.3%               |
| Sometimes   | 9.6%               |
| Hardly ever   | 9.9%               |
| Never   | 77.1%              |

**TABLE 4: QUESTION RELATING TO FEELINGS OF SAFETY IN RESPONDENTS' NEIGHBOURHOODS FROM FRANCE VICTIMISATION SURVEY.**

| Catalonia  |                                    |                                   |
|--|------------------------------------|-----------------------------------|
| How safe do you feel in your neighbourhood/municipality? |                                    |                                   |
| <i>Responses</i>   | <i>Percentages (neighbourhood)</i> | <i>Percentages (municipality)</i> |
| 10 (very safe)   | 3.0%                               | 3.3%                              |
| 9  | 5.6%                               | 5.3%                              |
| 8  | 19.9%                              | 19.2%                             |
| 7  | 23.0%                              | 22.1%                             |
| 6  | 16.7%                              | 17.8%                             |
| 5  | 15.5%                              | 16.9%                             |
| 4  | 6.4%                               | 7.0%                              |
| 3  | 4.1%                               | 3.8%                              |
| 2  | 2.3%                               | 1.9%                              |
| 1  | 0.8%                               | 0.7%                              |
| 0 (very unsafe)  | 2.9%                               | 1.9%                              |

**TABLE 5: QUESTION RELATING TO FEELINGS OF SAFETY IN RESPONDENTS' NEIGHBOURHOODS AND MUNICIPALITIES FROM CATALONIA VICTIMISATION SURVEY.**

These questions are different to the questions considered in Tables 1 and 2 since they do not specify a time period over which the respondent considers their feelings. The specification of a particular time period is likely to alter the response, as can be seen by the responses to questions from England and Wales in Tables 1 (feelings of safety after dark) and 2 (feelings of safety during the day). The questions from France and Catalonia in Tables 4 and 5 are very similar (although the question from France is worded in the negative); however, the question from France uses a 4-point Likert scale and the question from Catalonia uses an 11-point Likert scale, making comparisons difficult. Furthermore, the question from France refers to frequency measures in the response, whereas the question from Catalonia refers to a personal judgement of an individual's feelings. All of these aspects make seemingly similar questions difficult to compare. It was found that many of the questions across the different victimisation surveys had differences such as these, making direct comparisons of the responses difficult.

One of the consistencies across the study areas, however, is that the majority of responses to questions regarding perceived insecurity are ordinal in scale. It is therefore possible to consider the characteristics of individuals across countries who are more likely to respond in certain ways (i.e. either highly on the scale or lowly on the scale). We can then use any associations that are found to compare that aspect of perceived insecurity across the study areas considered. We present results of such an analysis in Section 4.

## 4. Demographic and socio-economic indicators of perceived insecurity

In this section, we present the results of a series of regression analyses that are used to assess indicators relating to perceived insecurity. The results are presented in seven sections, each one relating to a different aspect of perceived insecurity. These seven sections were chosen by examining the consistency of the questions that are asked across the different study areas and considering the specific type of experience or feeling that is being asked about. The seven aspects of perceived insecurity that are asked about consistently in more than one study area, and which are therefore included in our analysis, are summarised in Table 6. Also shown in this table is a representation of the ordinal scale used in response to each of these questions. We assign one end of the scale to be a 'positive' response and the other end to be a 'negative' response. This is used in the presentation of the results that follow.

| No | Aspect of perceived insecurity           | Positive response        | Negative response       |
|----|--|--------------------------|-------------------------|
| 1  | Feelings of safety in the neighbourhood  | Feel more safe           | Feel less safe          |
| 2  | Feelings of safety in the home           | Feel more safe           | Feel less safe          |
| 3  | Perception of police presence            | Higher police presence   | Lower police presence   |
| 4  | Perception of police performance         | Rate the police highly   | Rate the police poorly  |
| 5  | Fear of crime affecting habits           | High fear of crime       | Low fear of crime       |
| 6  | Concern about crime more generally       | High concern about crime | Low concern about crime |
| 7  | Concern about crime in the neighbourhood | High concern about crime | Low concern about crime |

**TABLE 6: SEVEN ASPECTS OF PERCEIVED INSECURITY THAT ARE ADDRESSED BY THE ANALYSIS IN THIS SECTION.**

## 4.1 Variables available

Regression analysis of the CVS data is able to link the demographic and socio-economic variables that are asked of the respondents directly to their response. A disadvantage is that the range of demographic and socio-economic independent variables that can be included in the analysis is restricted to those that are asked in the victimisation surveys in each study area. The range of these variables is neither consistent across countries nor very extensive, meaning that only a relatively small number of indicators can be linked to the perceived insecurity question. Nevertheless, as we will demonstrate, the following analysis does enable us to make a range of conclusions regarding appropriate indicators of social insecurity.

In Tables 7-9, we show the availability of the demographic and socio-economic variables that are included in the CVS data and which we include in our analysis that follows. The variables can be split into three categories: those relating to the individual respondent, those relating to their household, and those relating to any form of victimisation that the respondent may have experienced. In these tables, a grey shaded cell means that that variable was included in the analysis for that particular study area.

|           | Individual |       |             |            |         |                      |        |             |       |              |        |             |
|-----------|------------|-------|-------------|------------|---------|----------------------|--------|-------------|-------|--------------|--------|-------------|
|           | Female     | Older | Un-employed | Low income | Student | Born outside country | Degree | Poor health | White | Time in nbhd | Single | Live w part |
| EngWal    |            |       |             |            |         |                      |        |             |       |              |        |             |
| Catalonia |            |       |             |            |         |                      |        |             |       |              |        |             |
| France    |            |       |             |            |         |                      |        |             |       |              |        |             |
| Hungary   |            |       |             |            |         |                      |        |             |       |              |        |             |
| Italy     |            |       |             |            |         |                      |        |             |       |              |        |             |

**TABLE 7: AVAILABILITY OF VARIABLES RELATING TO INDIVIDUAL CHARACTERISTICS OF RESPONDENTS IN THE CVS DATA.**

Individual characteristics shown in Table 7 that are included in the victimisation surveys include the gender, age, employment status and income of the respondent. It is also asked whether the respondent is a student,

whether they were born outside of the country in which the survey takes place, and about the educational attainment of the respondent. We selected degree level education attainment as our variable to include in the analysis since it has similar definitions in each of the five study areas. The crime survey for England and Wales also asks about respondents' perception of their own general health (where responses range from self-reporting 'good health' to 'poor health') and the ethnicity of the respondent; although it is the only survey to do so. We include these variables in the analysis as they have been shown to be potential indicators in previous studies. We also examine variables relating to the length of time the respondent has lived in the area, and their marital status, using measures of whether they are single or whether they live with a partner.

|           | Household  |          |          |       |          |
|-----------|------------|----------|----------|-------|----------|
|           | N children | N adults | Hhd size | House | Own home |
| UK        |            |          |          |       |          |
| Catalonia |            |          |          |       |          |
| France    |            |          |          |       |          |
| Hungary   |            |          |          |       |          |
| Italy     |            |          |          |       |          |

**TABLE 8: AVAILABILITY OF VARIABLES RELATING TO HOUSEHOLD CHARACTERISTICS OF RESPONDENTS IN THE CVS DATA.**

Household characteristics included in the victimisation surveys of the different study areas are shown in Table 8 and include the number of people living in the household (measured by either separating the number of children and adults or simply giving a total number), whether the respondent lives in a house (as opposed to a flat or other type of dwelling), and whether the respondent owns their home.

The victimisation variables included in our analysis are indicator variables that determine whether the respondent has been victim of one of the eight crime types that are defined in Section 2.3. Note that in all the victimisation surveys, there is a time period over which victimisation questions are asked so that a

respondent will only be treated as a victim if they are a recent victim of a particular crime type.

|           | Victimisation |       |          |         |           |          |               |            |
|-----------|---------------|-------|----------|---------|-----------|----------|---------------|------------|
|           | Robbery       | Theft | Violence | Threats | Vandalism | Burglary | Vehicle theft | Bike theft |
| UK        |               |       |          |         |           |          |               |            |
| Catalonia |               |       |          |         |           |          |               |            |
| France    |               |       |          |         |           |          |               |            |
| Hungary   |               |       |          |         |           |          |               |            |
| Italy     |               |       |          |         |           |          |               |            |

**TABLE 9: AVAILABILITY OF VARIABLES RELATING TO VICTIMISATION OF RESPONDENTS IN THE CVS DATA.**

In what follows, we describe our method in more detail before presenting our results. We then use these results to define a range of demographic and socio-economic variables of insecurity.

## 4.2 Method

Ordinal logistic regression models are used to link the response in the victimisation survey to the range of independent variables described in Section 4.1. This type of regression model is appropriate when the dependent variable is ordinal in scale, as is the case for the majority of the questions relating to perceived insecurity in this section. When there is a binary response to a particular question included as a dependent variable, a binary logistic model is used. Finally, there is one question relating to police presence in France for which the response does not fall on an ordinal or binary scale and instead is categorical (“sufficient”, “excessive”, “insufficient”, “non existent though necessary”, “non existent though not necessary”). In this case, a multinomial logistic regression model is used and the independent variables are judged as being significant if they consistently indicate that a respondent is more likely to respond with either “insufficient” or “non existent though necessary” and less likely to respond “excessive”, in comparison to the response “sufficient” (or vice versa).

In the presentation of the results that follow, since the scales are different for many of the questions, the parameter values are not important, only their direction and level of statistical significance. Because of this, a colour scheme is used to present the results, where a blue cell means that respondents with the particular characteristic of the independent variable are more likely to respond “positively” to the question. A red cell means that respondents with the particular characteristic of the independent variable are more likely to respond “negatively”. The terms “positively” and “negatively” are defined for each aspect of perceived insecurity according to Table 6. This notation is summarised in Table 10.

|                       |  |
|-----------------------|--|
| “Positive” answer     |  |
| “Negative” answer     |  |
| No association        |  |
| Variable not included |  |

**TABLE 10: KEY FOR RESULTS IN THE FOLLOWING SECTIONS**

The presentation of the results that follow also include the level of statistical significance in the cells of each independent variable, indicated by the number of asterisks included in each cell. Three asterisks (\*\*\*) represents statistical significance at  $p < 0.001$ ; two (\*\*) represents  $p < 0.01$ ; and one (\*) represents  $p < 0.05$ .

The household and victimisation variables are included as separate tables beneath the individual variables. It should be noted that the rows of these table correspond to the rows of the table above them when linking these variables to the questions that are asked.

## 4.3 Results

### 4.3.1 Feelings of safety in the neighbourhood

|         |  | Female | Older | Un-employed | Low income | Student | Born outside country | Degree | Poor health | White | Time in nbhd | Single | Live w part |
|---------|--|--------|-------|-------------|------------|---------|----------------------|--------|-------------|-------|--------------|--------|-------------|
| Eng Wal | How safe do you feel walking alone in this area when dark?                   | ***    | ***   | ***         | ***        |         | ***                  | ***    | ***         | ***   | ***          |        |             |
|         | How safe do you feel walking alone in this area during the day?              | ***    | **    | ***         | ***        |         | ***                  | ***    | ***         | ***   | ***          |        | *           |
| Cat     | How safe do you feel in your neighbourhood?                                  | ***    |       |             | ***        | ***     | ***                  | ***    |             |       | ***          |        |             |
|         | How safe do you feel in your municipality?                                   | ***    | ***   |             |            | ***     | ***                  |        |             |       | ***          |        |             |
| Fra     | Do you personally feel unsafe in your neighbourhood or village?              | ***    | *     | *           |            | ***     |                      |        |             |       |              |        |             |
| Hun     | How safe do you feel when you are alone in your local street during the day? | *      | *     |             |            |         |                      |        |             |       |              |        | **          |
| Ita     | How safe do you feel when you walk alone at night in your neighbourhood?     | ***    | ***   | ***         |            | ***     | ***                  | ***    |             |       |              | ***    |             |

| N children | N adults | Hhd size | House | Own home |
|------------|----------|----------|-------|----------|
|            | **       |          |       | ***      |
| *          |          |          |       | ***      |
|            |          |          | *     |          |
|            |          |          | ***   |          |
| ***        | ***      |          | ***   |          |
|            |          |          |       |          |
|            |          |          |       | ***      |

| Robbery | Theft | Violence | Threats | Vandalism | Burglary | Vehicle theft | Bike theft |
|---------|-------|----------|---------|-----------|----------|---------------|------------|
| ***     | ***   | ***      |         | ***       | ***      | ***           | ***        |
| ***     | ***   | ***      |         | ***       | ***      | ***           | **         |
| ***     | ***   | ***      |         | ***       | ***      | ***           |            |
| ***     | ***   | ***      | ***     | ***       | ***      | ***           |            |
| ***     | ***   | ***      | ***     | ***       | ***      | ***           | **         |
|         |       |          |         |           |          |               |            |
| ***     | ***   |          | ***     | ***       |          | ***           | ***        |

### 4.3.2 Feelings of safety in the home

|         |   | Female | Older | Un-employed | Low income | Student | Born outside country | Degree | Poor health | White | Time in nbhd | Single | Live w part |
|---------|---|--------|-------|-------------|------------|---------|----------------------|--------|-------------|-------|--------------|--------|-------------|
| Eng Wal | How safe do you feel when you are home alone in your own home at night? | ***    | ***   | ***         | ***        |         | ***                  | ***    | ***         | ***   | ***          |        | ***         |
| Fra     | Do you personally feel unsafe at home?                                  | ***    |       | ***         |            |         |                      |        |             |       |              | ***    |             |
| Hun     | How safe do you feel when you are alone at home at night?               | ***    |       |             |            |         |                      |        |             |       |              |        |             |
|         | How safe do you feel when you are alone at home during the day?         | *      |       |             |            |         |                      |        |             |       |              |        |             |
| Ita     | How safe do you feel when you are home alone at night?                  | ***    | ***   | **          |            | ***     | ***                  | ***    |             |       |              | *      |             |

| N children | N adults | Hhd size | House | Own home |
|------------|----------|----------|-------|----------|
| ***        |          |          |       |          |
|            | ***      |          | ***   |          |
|            |          |          |       |          |
|            |          |          |       |          |
|            |          |          |       |          |

| Robbery | Theft | Violence | Threats | Vandalism | Burglary | Vehicle theft | Bike theft |
|---------|-------|----------|---------|-----------|----------|---------------|------------|
| ***     | ***   | ***      |         | ***       | ***      | ***           | ***        |
| ***     | **    | ***      | ***     | ***       | ***      | ***           |            |
|         |       |          |         |           |          |               |            |
|         |       |          |         |           |          |               |            |
| ***     | ***   |          | ***     | ***       | ***      | *             | **         |

### 4.3.3 Perception of police presence

|            |   | Female | Older | Un-employed | Low income | Student | Born outside country | Degree | Poor health | White | Time in nbhd | Single | Live w part |
|------------|---|--------|-------|-------------|------------|---------|----------------------|--------|-------------|-------|--------------|--------|-------------|
| Eng<br>Wal | The police in this area can be relied on to be there when you need them.                                    | ***    | ***   | ***         | *          | ***     | ***                  | **     | ***         | ***   | ***          |        | ***         |
| Fra        | Thinking about police presence in your neighbourhood, you would say that it is (Sufficient, excessive, etc) | ***    |       |             |            | ***     |                      |        |             |       |              | **     |             |
| Hun        | How often do you see a police patrol in your neighbourhood?   |        |       |             |            |         |                      |        |             |       |              |        |             |
| Ita        | How frequently the police goes by the street you live in, in car or by foot?                                | ***    | ***   |             |            |         | **                   | ***    |             |       |              | ***    |             |

| N children | N adults | Hhd size | House | Own home | Robbery | Theft | Violence | Threats | Vandalism | Burglary | Vehicle theft | Bike theft |
|------------|----------|----------|-------|----------|---------|-------|----------|---------|-----------|----------|---------------|------------|
| ***        | **       |          |       | ***      | ***     | ***   | ***      |         | ***       |          | ***           | ***        |
|            |          |          |       |          | ***     |       |          | ***     | ***       | ***      | ***           |            |
|            |          |          |       |          |         |       |          |         |           |          |               |            |
|            |          |          |       | ***      | ***     |       |          | *       | ***       |          | **            | **         |

### 4.3.4 Perception of police performance

|            |   | Female   | Older | Un-employed | Low income | Student | Born outside country | Degree  | Poor health | White    | Time in nbhd  | Single     | Live w part |
|------------|---|----------|-------|-------------|------------|---------|----------------------|---------|-------------|----------|---------------|------------|-------------|
| Eng Wal    | How good a job do you think the police are doing in this area?  | ***      | ***   | **          | ***        | ***     | ***                  | ***     | ***         | ***      | ***           |            | **          |
| Cat        | Please assess the services provided by the Mossos d'Esquadra from 0 to 10                                   | ***      | ***   | **          | ***        | **      | **                   | ***     |             |          | ***           |            |             |
|            | Please assess the services provided by the Guardia d'Urbana from 0 to 10                                    | ***      | ***   | **          | ***        | ***     | ***                  | ***     |             |          | ***           |            |             |
| Fra        | Thinking about police action against crime in your neighbourhood, you would say that it is? (Effectiveness) |          | ***   | ***         |            | ***     |                      |         |             |          |               | ***        |             |
| Hun        | Do you consider the efforts in crime prevention by the police to be sufficient?                             |          |       |             |            |         |                      |         |             |          |               |            |             |
| Ita        | How well does the police manage to control crime in your neighbourhood?                                     | ***      | ***   |             |            |         | ***                  |         |             |          |               | ***        |             |
| N children | N adults  | Hhd size | House | Own home    | Robbery    | Theft   | Violence             | Threats | Vandalism   | Burglary | Vehicle theft | Bike theft |             |
| ***        |   |          |       | ***         | ***        | **      | ***                  |         | ***         | ***      | ***           | ***        |             |
|            |   | ***      |       |             |            |         | ***                  | ***     | **          | **       | ***           |            |             |
|            |   | ***      | ***   |             | *          | ***     | ***                  | ***     | ***         | ***      | ***           |            |             |
| ***        |   |          | ***   |             | ***        |         | ***                  | ***     | ***         | ***      | ***           |            |             |
|            |   |          |       |             |            |         |                      |         |             |          |               |            |             |
|            |   |          |       | ***         | ***        | ***     |                      | ***     | ***         | ***      | ***           | ***        |             |

### 4.3.5 Fear of crime affecting habits

|                |   | Female | Older | Un-employed | Low income | Student | Born outside country | Degree | Poor health | White | Time in nbhd | Single | Live w part |
|----------------|---|--------|-------|-------------|------------|---------|----------------------|--------|-------------|-------|--------------|--------|-------------|
| <b>Eng Wal</b> | How much is your own quality of life affected by fear of crime? | ***    | ***   |             |            |         | **                   |        | ***         | ***   | ***          |        | ***         |
| <b>Ita</b>     | How much does the fear of crime influence your habits?          | ***    |       | ***         |            | ***     | *                    | ***    |             |       |              | ***    |             |

| N children | N adults | Hhd size | House | Own home | Robbery | Theft | Violence | Threats | Vandalism | Burglary | Vehicle theft | Bike theft |
|------------|----------|----------|-------|----------|---------|-------|----------|---------|-----------|----------|---------------|------------|
|            | *        |          |       |          | ***     | ***   | ***      |         | ***       | ***      | ***           | ***        |
|            |          |          |       | *        | ***     | ***   | ***      | ***     | ***       | ***      | ***           |            |

### 4.3.6 Concern about crime more generally

|            |  | Female | Older | Un-employed | Low income | Student | Born outside country | Degree | Poor health | White | Time in nbhd | Single | Live w part |
|------------|--|--------|-------|-------------|------------|---------|----------------------|--------|-------------|-------|--------------|--------|-------------|
| Eng<br>Wal | How much is your own quality of life affected by crime?                                      | *      | **    | **          |            |         | ***                  | ***    | ***         | ***   | ***          |        | **          |
|            | How likely do you think you personally are to be a victim of crime in the next year?         | ***    | ***   | ***         |            | ***     | **                   |        | ***         | ***   | ***          |        | ***         |
| Fra        | Do you feel preoccupied with the problem of delinquency?                                     | ***    | ***   |             |            | *       |                      |        |             |       |              | **     |             |
| Ita        | During the last 3 months, was there a situation in which you feared to be a victim of crime? | *      | ***   |             |            |         |                      | **     |             |       |              | **     |             |

| N children | N adults | Hhd size | House | Own home | Robbery | Theft | Violence | Threats | Vandalism | Burglary | Vehicle theft | Bike theft |
|------------|----------|----------|-------|----------|---------|-------|----------|---------|-----------|----------|---------------|------------|
|            | ***      |          |       | *        | ***     | ***   | ***      |         | ***       | ***      | ***           | ***        |
|            | ***      |          |       | ***      | ***     | ***   | ***      |         | ***       | ***      | ***           | ***        |
|            |          |          | ***   |          | ***     | **    | ***      | ***     | ***       | ***      | ***           |            |
|            |          |          |       |          | ***     | ***   | ***      | ***     | ***       | ***      | ***           |            |

### 4.3.7 Concern about crime in the neighbourhood

|            |  | Female | Older | Un-employed | Low income | Student | Born outside country | Degree | Poor health | White | Time in nbhd | Single | Live w part |
|------------|--|--------|-------|-------------|------------|---------|----------------------|--------|-------------|-------|--------------|--------|-------------|
| Eng<br>Wal | How much of a problem, if at all, do you think crime is in your area?            | ***    | ***   | ***         | ***        |         |                      |        | ***         | ***   | ***          |        | *           |
| Ita        | How would you define the area/ neighbourhood you live in in terms of crime risk? |        | ***   |             |            |         | ***                  | ***    |             |       |              | **     |             |

| N children | N adults | Hhd size | House | Own home |
|------------|----------|----------|-------|----------|
| *          | **       |          |       | ***      |
|            |          |          |       | ***      |

| Robbery | Theft | Violence | Threats | Vandalism | Burglary | Vehicle theft | Bike theft |
|---------|-------|----------|---------|-----------|----------|---------------|------------|
| ***     | ***   | ***      |         | ***       | ***      | ***           | ***        |
| ***     | ***   | ***      | ***     | ***       | ***      | ***           | ***        |

## **4.4 Conclusions**

A number of consistencies can be identified in the results of the regression analyses. In this section, we examine the independent variables in turn and look at their association with the corresponding questions in the crime victimisation surveys.

Females are more likely to feel unsafe, both inside and out of the home. They are also more likely to be concerned about crime, are more likely to let fear of crime influence their habits and more likely to rate their local neighbourhood as being more risky in England and Wales. For these questions, being female is a strong and consistent indicator. There are mixed results for females when it comes to rating the police performance. In England and Wales and Catalonia, females are more likely to think the police are doing a good job; whereas in Italy, females are more likely to rate the police poorly. In France and Hungary, there is no association between gender and police performance, although females in France are more likely to say that the police presence is insufficient in their local area.

In comparison to their younger counterparts, older people are more likely to feel unsafe in their neighbourhood, except in France where they marginally feel safer. There are mixed results regarding whether they feel safe inside the home, with no association found in France and Hungary and opposite associations found in England and Wales and in Italy. Age is a significant indicator of rating the police highly, both in terms of performance and presence. In England and Wales, older people are more likely to downplay the fear of crime. They also have fewer concerns about crime in general (except in France where the opposite is true) and think that there is a low risk of crime in their neighbourhoods.

Unemployed people are more likely to feel unsafe in their neighbourhoods and in the home, except in Catalonia and Hungary where there is no association. There are mixed results regarding unemployment and trust in police. Unemployed people have fewer concerns about crime in England and

Wales but are more likely to say that the fear of crime adversely affects their habits in Italy.

In England and Wales, low income is a significant indicator of all forms of insecurity considered, but there were no significant results regarding income in Hungary. In Catalonia, low income was associated with feeling more unsafe in the neighbourhood but those with low incomes were also more likely to rate the police highly.

Students have mixed results when it comes to feelings of safety in their neighbourhood and in the home and they tend to rate the police quite highly, both in terms of performance and presence. There are mixed results when it comes to crime perceptions and concerns about crime and, in Italy, students are more likely to say that the fear of crime influences their habits.

Respondents who are born outside of the country where the survey is taking place are more likely to feel unsafe in their neighbourhood in England and Wales but less likely to feel unsafe in their neighbourhood in Catalonia and Italy. There are similar mixed results for feelings of safety in the home: in England and Wales, those born outside the country are more likely to feel unsafe but in Italy they are more likely to feel safe. They tend to rate the police highly, both in terms of presence and performance. There are mixed results when it comes to concerns about crime and fear of crime, with those born outside the country more likely to provide negative responses on these aspects in England and Wales but more likely to provide positive responses in Italy.

Degree educated respondents tend to feel safer in the neighbourhood and in the home. There are mixed results with regards to how well they rate the police, with the police receiving poor ratings from those who are degree educated in Catalonia. They tend to be relatively concerned about crime, both in their local neighbourhood and more generally. In Italy though, degree educated respondents are less likely to let fear of crime influence their habits.

In England and Wales, poor health is a strong indicator of all forms of perceived insecurity considered. Additionally, being white in England and

Wales is associated with feeling more safe in the neighbourhood and at home. There are mixed results when it comes to rating the police but being white is associated with lower concerns about crime and fear of crime. Health and ethnicity are only measured in England and Wales so we are unable to examine the consistency of these conclusions in the other study areas.

The length of time spent in an area is associated with more feelings of unsafety, both in the neighbourhood and in the home. Those who have spent longer in an area are also more likely to rate the police poorly and are consistently more concerned about crime both in general and in their local neighbourhood.

Single people tend to rate the police highly and have fewer concerns about crime than those living with partners. They are also more likely to feel safer in the home.

Living in a house or owning a house leads to more feelings of safety in the neighbourhood. Owning a house is associated with rating the police poorly whereas living in a house is more likely to lead to a positive police rating. Home owners are quite concerned about crime in general in England and Wales but tend to think their neighbourhoods have lower levels of crime.

Finally, being a victim of crime is associated with all forms of perceived insecurity considered.

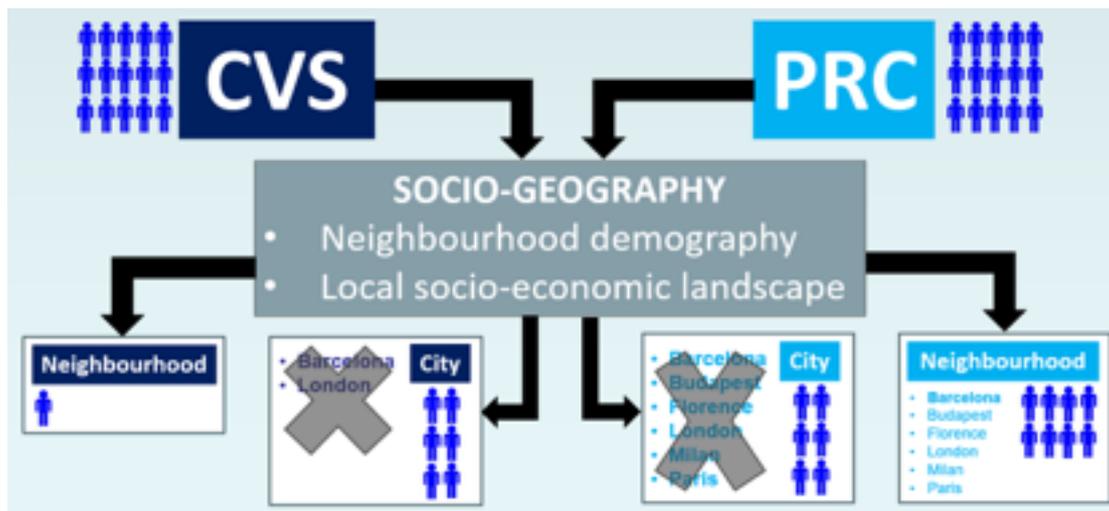
In Section 6, we summarise these conclusions into a set of indicators that can be used to identify groups who are more likely to respond in certain ways to different aspects of perceived insecurity. It is important to note, however, that different indicators are associated with different aspects of perceived insecurity. This suggests that perceived insecurity has many different dimensions to it, and individuals can respond to these dimensions in different ways. This finding should be borne in mind in the identification of marginalised communities.

## **5. Socio-geographic indicators**

### ***5.1. Geographic scale and socio-geographic indicators***

The neighbourhood within which a person lives is considered to have an impact on both the person's feelings of safety while in their home and their neighbourhood, and on their own personal experiences of crime. In order to examine these neighbourhood effects, this part of the project aimed to examine the use of various socio-geographic indicators of crime. The project task involved examining the use of socio-geographic variables that were consistent for each of the Project MARGIN cities and which showed consistent relationships with patterns of crime. These socio-geographic variables would then be used alongside the research findings on CVS, PRC and social insecurity indicators to help inform a taxonomy for selecting two neighbourhoods within each of the five MARGIN cities.

The initial part of the task to examine socio-geographic indicators involved reviewing data that were available for examining neighbourhood effects. Figure 7 illustrates how the two main sources of information on victimisation relate to data from each country's respective CVS and PRC data. To examine the socio-geographic effects of the neighbourhood, data on the demography within each neighbourhood for each of the five MARGIN cities, and data on the local socio-geographic landscape would be required. CVS data were available for the cities of Barcelona and London, but data at this geographic scale were considered too coarse to enable the examination of neighbourhood effects. CVS data were also available for these two cities at the sub-city level, but the sample sizes of CVS respondents at the sub-city level were not large enough to enable accurate determination of neighbourhood effects against CVS responses. PRC data were available for each of the five MARGIN cities, but again, data at this scale were considered too coarse to enable the examination of neighbourhood effects. PRC data were available for Barcelona, London and Budapest at the sub-city level and could be used to examine the relationship between police recorded crime and neighbourhood effects.



**FIGURE 7. LIMITATIONS ON THE USE OF CVS AND PRC DATA FOR EXAMINING NEIGHBOURHOOD EFFECTS ACROSS THE FIVE MARGIN CITIES.**

To examine neighbourhood effects on the distribution of crime, seven socio-geographic variables were identified. These variables were identified based on their hypothesised relationship with the geographic distribution of crime and on their known availability for London. The variables were grouped into four categories as follows:

- Population: population density
- Housing: housing density; housing ownership; housing type
- Socio-economic: deprivation (including income, employment, health, geographic access to services, education and the living environment)
- Local landscape: land use; urban classification.

An initial test was conducted to examine the availability of these data at the neighbourhood level for Barcelona. This test would then inform the practical and consistent use of data describing the socio-geographic landscape against patterns of crime that could be used for each MARGIN city.

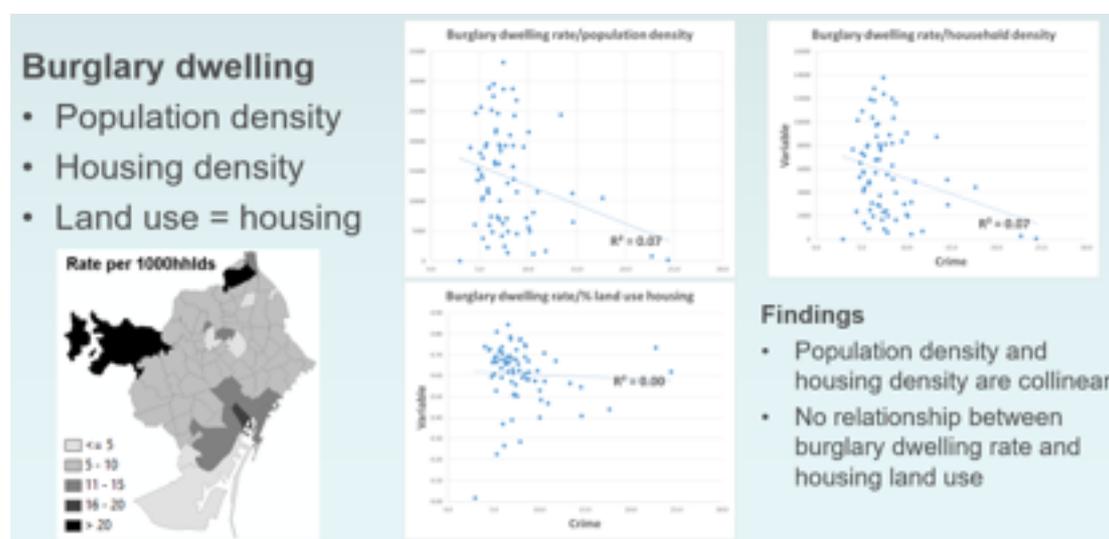
## **5.2. Socio-geographic indicators of victimisation in Barcelona**

Of the seven socio-geographic indicators that were identified for examining the relationship between neighbourhood effects and the distribution of crime, only three were available for Barcelona – population density, housing density and land use. The land use data were comprehensive, describing the areal coverage of each neighbourhood that was housing, office, industry, commercial, education, hotels and tourism, places of worship, vehicle parking, and used for sports. For each of the socio-geographic variables, and for each land use category, the data were analysed to examine the geographic relationship between these variables and the distribution of crime. The analysis involved a three stage process:

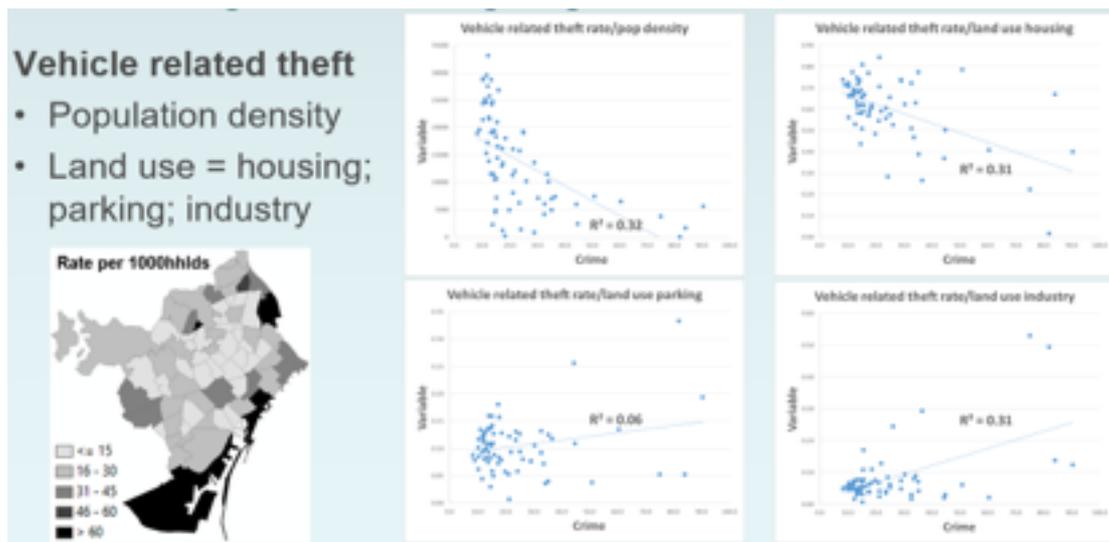
- The identification of variables that could be logically hypothesised to be related to crime. This involved an ordinary least squares (OLS) regression analysis of crime categories in relation to the socio-geographic variables.
- If a global relationship from the OLS regression was considered to be interesting (i.e., a relationship appeared to exist), the global relationship was examined further to test for the performance of single and multiple socio-economic variables in relation to the distribution of crime, the significance of the relationships, and to identify if the relationships were statistically bias (e.g., if spatial autocorrelation existed between the standard errors for the relationship between the distribution of crime and socio-economic variables that were identified to be related to crime).
- If the results of the statistical diagnostic tests revealed there to be no model bias, the data were then subject to further analysis to examine neighbourhood effects using geographically weighted regression (GWR). The GWR analysis would help identify if the consideration of spatially varying relationships between the distribution of crime and the socio-economic variables strengthened the relationship displayed in the variables, and, therefore, further emphasised the neighbourhood effects that were at work in helping to explain the distribution of crime.

Figures 8 to 10 show the results after examining the relationships between burglary dwelling, vehicle related theft and robbery against the socio-geographic variables that were available for Barcelona. The analysis of burglary dwelling against population density, housing density and housing land use found no variables to be related (see Figure 8). The results indicated population density and housing density to be collinear, which further analysis confirmed. This resulted in only using population density, rather than both population density and housing density in further analysis.

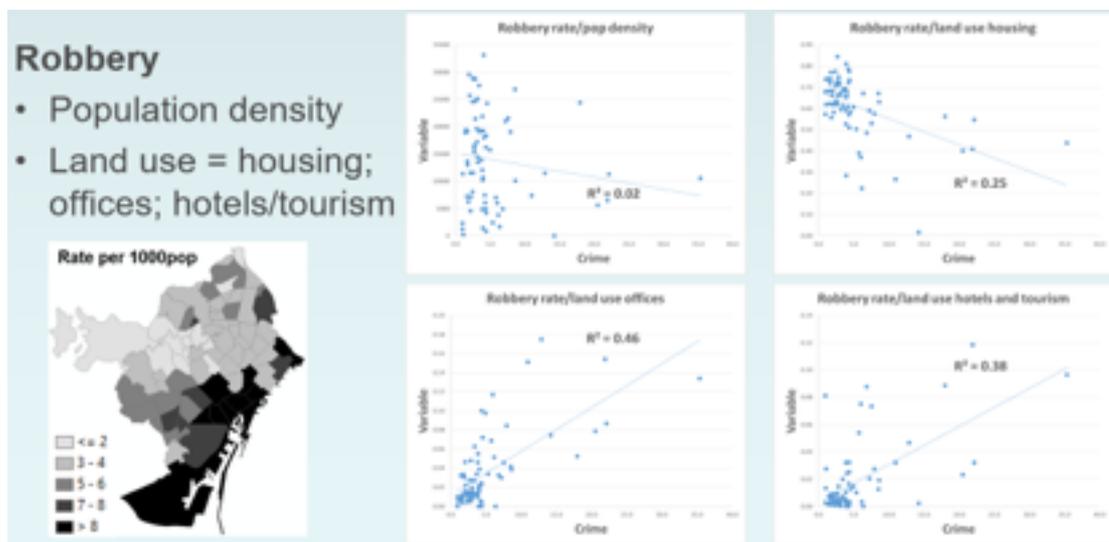
The analysis of vehicle related theft in relation to population density and several types of land use (see Figure 9) indicated that vehicle-related crime was negatively correlated to population density and housing land use, and positively related to the distribution of industry (i.e., vehicle crime rate increased with higher levels of industry land use across Barcelona). Figure 10 shows the relationship between robbery and population and with several forms of land use. The robbery results showed that, similar to vehicle related theft, the geographic distribution of robbery was negatively related to housing land use. In addition, the results for robbery showed strong correlations with the distribution of offices and hotel/tourism across Barcelona.



**FIGURE 8. BURGLARY DWELLING ANALYSED IN RELATION TO SOCIO-ECONOMIC VARIABLES FOR THE CITY OF BARCELONA.**



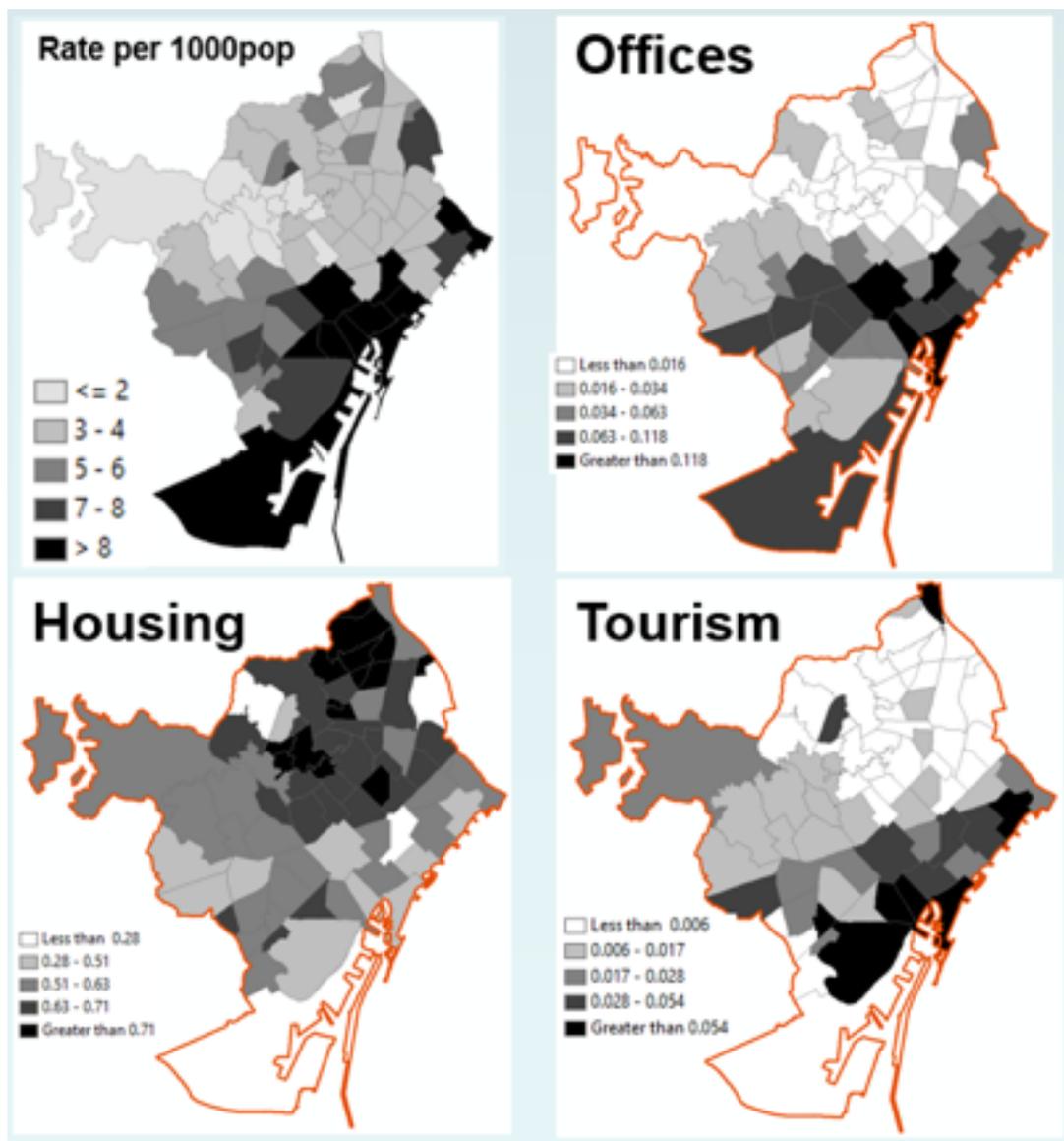
**FIGURE 9. VEHICLE RELATED THEFT ANALYSED IN RELATION TO SOCIO-ECONOMIC VARIABLES FOR THE CITY OF BARCELONA.**



**FIGURE 10. ROBBERY ANALYSED IN RELATION TO SOCIO-ECONOMIC VARIABLES FOR THE CITY OF BARCELONA.**

Following the results of the analysis of robbery across Barcelona, further statistical tests were conducted between the spatial distribution of robbery, population and different types of land use to examine the performance of these variables in a single explanatory model, the significance of the model, and if the model was bias. A model that combined housing, industry and hotels and tourism was found to perform best in explaining the distribution of robbery, with each variable found to be significant, and the model not to be

biased. To illustrate the relationship between robbery and these three variables, Figure 11 shows maps of the distribution of each across Barcelona. For example, the maps show how the distribution of housing is negatively related to the distribution of robbery, but how offices, hotel and tourism both, in slightly different ways, are positively related to the spatial distribution of robbery. The relationship between housing, offices and hotels/tourism against robbery were examined further using GWR, with the results indicating that each land use variable had a stronger relationship with robbery when local neighbourhood effects had been considered.



**FIGURE 11. THE DISTRIBUTION OF ROBBERY ACROSS BARCELONA IN RELATION TO THE DISTRIBUTION OF HOUSING, OFFICES, AND HOTELS/TOURISM.**

### ***5.3. Socio-geographic variables in other cities and the use of socio-geographic variables in a taxonomy for identifying marginalised neighbourhoods***

The objective in examining the relationship between socio-geographic variables and the distribution of crime was to determine variables that could be used to help indicate how the effects of the local neighbourhood environment influence the marginalisation of people that live within these neighbourhoods. In turn, these socio-geographic variables would be used as part of the taxonomy for selecting two neighbourhoods in each MARGIN city. The analysis of socio-geographic variables has revealed two important findings. First, that data on socio-economic variables is inconsistent between London and Barcelona for examining neighbourhood effects. London and Barcelona are the two cities that have the largest range and most comprehensive data of the five MARGIN cities that can be used for examining neighbourhood effects. If it is difficult to identify similar data in London and Barcelona for examining neighbourhood effects, it is likely these data will not be available either in Budapest, Milan or Paris.

Secondly, the analysis of crime patterns across Barcelona has illustrated the strong spatial relationship between several crime types and land use which is predominantly made up of industry, offices, hotels and for other tourist functions. The focus of the MARGIN project is towards residential areas. The results of crime types such as robbery and vehicle crime have helped illustrate that crimes of these type (i.e., to the person and against property that is not necessarily connected to the home) are highest in non-residential areas. This means that in the selection of variables that indicate neighbourhood effects on crime in residential areas, only those that correlate with burglary to a dwelling (the only one of the seven crime categories that can be determined to have taken place in a residence) should be used. However, the relationship between socio-geographic variables and burglary dwelling across Barcelona showed offered little that could be of use.

If socio-geographic variables are to be used to assist in the selection of marginalised neighbourhoods, these variables should provide some measure of the neighbourhood environment. In the UK (and for London), the Index of Multiple Deprivation is considered to provide an accurate measure of the neighbourhood environment, in a manner that may influence a person's perception of crime, their feelings of safety and their victimisation of crime. However, without a similar measure in Barcelona, an indicator of deprivation can not be used in Barcelona to help inform the selection of neighbourhoods. As an alternative, it is considered that house prices (which are available for each neighbourhood in Barcelona) could be used as a proxy measure of deprivation, or at least as a measure of differences in the neighbourhood landscape. If measures of deprivation are not available for the other MARGIN cities, data on house prices could also be used as an alternative measure for indicating differences in the environmental landscape between neighbourhoods in each city.

Further analysis of the variables that could be used for measuring neighbourhood effects is now being conducted to help inform the taxonomy of neighbourhoods, and test the applicability of this taxonomy on the selection of two neighbourhoods in each of the five MARGIN cities.

## **6. Conclusions**

The purpose of this report is to identify a range of demographic, socio-economic and socio-geographic indicators of insecurity. The identification of such indicators will enable a taxonomy of neighbourhoods to be developed, from which two neighbourhoods within each MARGIN city will be selected as locations to undertake the fieldwork in the project.

We first presented the objective dimension of insecurity, as measured by victimisation rates in both PRC and CVS data. We identified eight crime types that enable some form of comparison over the five study areas in the MARGIN project. The objective dimension of insecurity represents one component of a forthcoming taxonomy of neighbourhoods in the study areas;

however, the importance of a fine geographic scale of analysis when it comes to the selection of neighbourhoods via victimisation rates was noted. The amount of crime is well-known to vary spatially at local levels and so any indicators of victimisation need to also correspond to this level in order to more accurately represent the experiences of individuals in those neighbourhoods.

We next consider the subjective dimension of insecurity and concluded that, due to differences in the victimisation surveys of the five study areas, a direct comparison of the questions was not possible. Instead, we turned to a series of regression models that enabled us to test a range of demographic and socio-economic variables in terms of their association with different aspects of perceived insecurity.

It was found that:

- Being female is a strong indicator of insecurity relating to feelings of safety, fear of crime, and crime perceptions.
- Younger people are less trusting in police and tend to perceive higher levels of crime, yet typically feel safer in their neighbourhood.
- Unemployed people are more likely to feel unsafe in their neighbourhood and home.
- Being a student is a consistent indicator of rating the police highly.
- Those born outside the country where the survey takes place are more likely to rate the police highly.
- Degree educated respondents tend to feel safer yet are often concerned about crime levels (though there is no evidence that this concern affects their habits).
- Single people tend to rate the police highly and have fewer concerns about crime than those living with partners.
- Living in a house or owning a house is associated with feeling safer in the neighbourhood.

- People who have spent longer in the neighbourhood are more likely to have high levels of perceived insecurity across all aspects considered.
- In the UK, poor health is a strong indicator of all forms of perceived insecurity but this variable is not measured elsewhere.
- Being a victim of crime is associated with all forms of insecurity.

In spite of these encouraging findings, it was also evident that different indicators are associated in different ways with different aspects of perceived insecurity. Thus, any taxonomy of different neighbourhoods that uses these indicators should take this into account and be precise about what it means by the subjective dimension of insecurity it is attempting to capture.

Identifying socio-geographic indicators using the CVS is difficult due to the small sample sizes involved at the neighbourhood level. Any findings will not necessarily be representative of the population at this fine scale of geographic resolution. Because of this, a study using the PRC data was used to identify a range of socio-geographic indicators of victimisation. With any use of PRC data, the 'dark figure' of crime has the potential to serve as a source of bias when considering individual experiences of victimisation, as highlighted in Section 2 and in Deliverable 3.1. Nevertheless, seven socio-geographic indicators were described and explored in relation to PRC data at the neighbourhood level of three different crimes in Barcelona. Focusing particularly on Robbery, it was shown how a geographic weighted regression analysis can be used to examine consistencies between the neighbourhood effects and socio-geographic indicators.

The difficulty in obtaining consistent data on socio-geographic aspects at the neighbourhood level in the five cities of the project was discussed. These points will be elaborated on further in the description of the taxonomy used to select the neighbourhoods for the field work in the remainder of the project.

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