Crime Mapping: A Gozitan Scenario Using the RISC Methodology

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Introduction

Gauging a risk of crime in a locality is a complex process, complex enough to warrant an in-depth scientific process to calculate the risk-of-crime status of each spatial area at the different NUTS level (NUTS 1_2 – Country, NUTS 3 – Island, NUTS 4 – District, NUTS 5 – Local Councils). Gozo has the unique status of occupying both NUTS 3 and NUTS 4 levels, however crime analysis is best carried out at NUTS 4 and NUTS 5 due to the availability of data at those detailed levels. In comparing the Gozo risk of crime to the other areas the method calls for a comparative analysis across all the NUTS 4 and NUTS 5 areas in terms of the national (NUTS 1_2) rates of risk. The model used is based on the RISC (Relative Index of Spatial Crime) Model (Formosa, 2007; CrimeMalta, 2008-2010) as developed from the Craglia et al (2000) research. RISC is a dynamic model reviewing each council's relative position to the national crime rate as based on a scientific process analysing both observed and expected (predicted) rates for the diverse socio-economic, landuse and crime parameters.

The Theoretical and Methodological Background

Analysis on risk assessments (Craglia et al, 2000; Craglia et al, 2001; Formosa, 2007) looked at estimating the potential of an area to host crime. These methodologies are based on epidemiological and demographic studies and can be used to produce a method that can give a clear picture of crime risk in small areas. This method can be extrapolated in the analysis of socio-physical studies such as deprivation, health, education and other cross-thematic research, in this case the incidence of crime (Hirschfield et al, 2001; Formosa, 2010). As an example, Standard Theft-from-Residences Rates (SRR) were established by calculating the observed and predicted offences in terms of the number of residential units in each spatial area, which indicated whether an area has a high risk of falling victim to such an offence. The methods used were based on the calculation of the national theft from residence rates per household and the resultant SRR was calculated for each spatial aggregation entity, in this case NUTS 4 and NUTS 5. This methodology ensures that each area is investigated in the same manner as all other areas irrespective of population size, locality land area, and each is placed on the same comparative level based on the spatial entity giving a rate rather than absolute figures. This ensures that Għasri which has the smallest population in Gozo, is placed on the same level as Birkirkara which has the highest population: transforming the absolute figure to rates such as population per square kilometer, place both on the same analytical base. The same methodology is utilised in terms of crime analysis that reviews the national rate and compared the same crime rate per 1000 persons or households and each area irrespective of size is compared to the main figure. Based on the expected relative national rate, the actual incidences are measured against that same rate and the relative higher or lower rate status is delivered.

This result gives the expected number of offences in an area, which can then be compared with the observed number of same-category offences. The result of the latter analysis would give an indication if an area is at lower or higher risk than the national rates. The method employed reviewed the correlations between different variables based on this method. Each variable's result was converted to ordinal groupings where the national rate is 1: 'no crimes', 'less than 1', '1 – national rate', '2 times', '2 to 5 times' and, 'over 5 times'. Each of these results was correlated against those of other variables for their relative strengths.

The RISC Model

The RISC process investigated each council and village in Malta at NUTS 5 level (Local Councils) of which there are 68 in the Maltese Islands: 54 in

Malta and 14 in Gozo. Based on data from 1998 to 2007, each council was analysed for its risk of crime on an annual basis by types of crime of which there are 18 main categories: 17 thematic categories and a Grand Total category. The main categories reviewed in this paper cover the 2007 data based on the Grand Total Offences, Theft from Residences and Thefts of or from Vehicles.

The analysis resulted in a league table of Gozo councils' risk of crime. The tables depict those Local Councils that are the safest to live in, the ones in between and those that are the worst off.

The RISC Results

RISC assessment is best viewed in terms of visualization outputs and Tables 1 and 2 depict the RISC levels for 2007 for the 3 data categories. Table 1 depicts the categories relative to the national crime rate, with shades ranging from while to black where white signifies (no offences or less than national) and black highest crime rate.

Table 1: RISC "grey-scale" Code Key

Colour Code	Risk of Crime as against the National Rate
	Zero Risk: No Crimes Reported - 0
	Low Risk: Less than National Rate
	National Risk: Equal to National Rate = 1x
	High Risk: Up to Twice the National Rate
	Very High Risk: Between Twice and up to five times the National Rate
	Extremely High Risk: Over five times the National Rate

Table 2 compiles all the local councils of Malta and Gozo with the Gozitan localities in italics indicating both their relative position in the league of councils for that particular offence as well as the rate with which it had been tagged depicted in grey-scale.

The next sections will review the main three categories of Grand Total, Theft from Residences and Theft of and from Vehicles (refer to Tables 1 and 2).

An analysis of all the crimes reported in 2007 (see Figure 1) suggests that Gozo at NUTS 4 (District) level garners the lowest rates in the Maltese Islands, indicating that in its aggregate Gozo is the safest district, an issue which is the result of various factors: higher rates of observance by residents, higher social cohesion, insularity that creates a barrier to the weekend revelers who clog the Maltese leisure and recreation area of Paceville, rendering that area at the top of the league.

Overall, Gozitan localities achieve lower than national rates of reported offences especially in the Grand Total offence categories with only Żebbuġ registering up to twice the national rate, albeit on the lower side of that same scale. This is due to the aggregation of high rates of offences across the categories with the main offences emanating within the seasonal residential area of Marsalforn.

The other locality of note in Gozo which rates close to the national rate is that of Munxar, again outweighed by the presence of the leisure and recreation area of Xlendi.

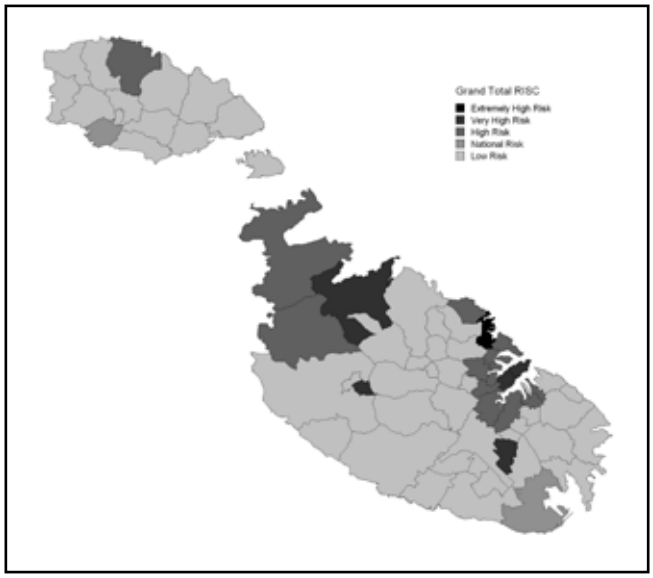

Figure 1: Grand Total Offences – 2007 All Councils

Theft from Residences

Gozo councils are not immune to theft from residences, with Għasri registering a very high RISC of over 2 times the national rate for 2007, an occurrence that is one of the highest in the islands.

[1] For updated RISC rates, refer to: Formosa S. (2008-2010), CrimeMalta website – www.crimemalta.com

Table 2: The NUTS 5 Offences

Grand Total		Residential		Vehicle
Council		Council		Council
SAN ĠILJAN		SAN ĠILJAN		FLORIANA
FLORIANA		SAN PAWL IL-BAHAR		PIETA
VALLETTA		MELLIEHA		PEMBROKE
MDINA		BORMLA		SAN ĠILJAN
SAN PAWL IL-BAHAR		*ĠĦASRI*		BIRGU
GUDJA		SWIEQI		VALLETTA
SLIEMA		LIJA		MDINA
TA' XBIEX		PEMBROKE		BORMLA
PIETA		MDINA		PAOLA
BIRGU		MSIDA		GUDJA
PEMBROKE		KIRKOP		MARSA
MARSA		MARSAXLOKK		HAMRUN
PAOLA		SAN ĠWANN		MSIDA
MELLIEHA		*QALA*		TARXIEN
BORMLA		*ŻEBBUĠ (Għawdex)*		GŻIRA
MSIDA		QRENDI		SAN PAWL IL-BAHAR
GZIRA		SLIEMA		SANTA VENERA
MĠARR		GŻIRA		MĠARR
HAMRUN		XGHAJRA		ŻABBAR
ŻEBBUĠ (Għawdex)		MARSASCALA		MARSASCALA
BIRŻEBBUĠIA		*FONTANA*		BALZAN
MUNXAR		MĠARR		QORMI
MARSAXLOKK		VALLETTA		SLIEMA
ISLA		BALZAN		MARSAXLOKK
MARSASCALA		TA' XBIEX		BIRŻEBBUĠIA
LUQA		DINGLI		*ŻEBBUĠ (Għawdex)*
ĠĦAJNSIELEM		PAOLA		ISLA
RABAT (Malta)		NAXXAR		SWIEQI
QORMI		*KERĊEM*		TA' XBIEX
SWIEQI		*MUNXAR*		LUQA
ĠĦASRI		ŻEJTUN		RABAT (Malta)
SANTA VENERA		LUQA		FGURA
BALZAN		BIRŻEBBUĠIA		ATTARD
KALKARA		MQABBA		MELLIEHA
TARXIEN		ISLA		*ĠĦASRI*
NAXXAR		*ĠĦARB*		*MUNXAR*
FGURA		*SAN LAWRENZ*		MOSTA
KIRKOP		ŻURRIEQ		KIRKOP
SAFI		ATTARD		BIRKIRKARA
FONTANA		SAFI		NAXXAR
RABAT (Victoria)		FGURA		KALKARA
SAN ĠWANN		SIĠĠIEWI		IKLIN
ŻEBBUĠ (Malta)		RABAT (Malta)		*ĠĦAJNSIELEM*
MOSTA		QORMI		ŻEJTUN
XGHAJRA		SANTA VENERA		SANTA LUĊIJA
ŻEJTUN		PIETA		LIJA
BIRKIRKARA		*XAGĦRA*		*SAN LAWRENZ*
SIĠĠIEWI		GĦARGĦUR		ŻEBBUĠ (Malta)
QRENDI		GĦAXAQ		SAFI
ŻABBAR		ŻABBAR		SAN ĠWANN
SAN LAWRENZ		HAMRUN		*RABAT (Victoria)*
ATTARD		BIRKIRKARA		DINGLI
LIJA		FLORIANA		ŻURRIEQ
GĦAXAQ		*SANNAT*		MTARFA
DINGLI		GUDJA		GĦARGĦUR
GĦARGĦUR		IKLIN		*XAGĦRA*
ŻURRIEQ		KALKARA		SIĠĠIEWI
ĠĦARB		ŻEBBUĠ (Malta)		GĦAXAQ
SANNAT		MARSA		XGHAJRA
NADUR		*RABAT (Victoria)*		*XEWKIJA*
SANTA LUĊIJA		*NADUR*		*KERĊEM*
KERĊEM		MOSTA		QRENDI
QALA		*ĠĦAJSIELEM*		*NADUR*
XEWKIJA		BIRGU		*FONTANA*
XAGĦAJRA		TARXIEN		MQABBA
IKLIN		*XEWKIJA*		*ĠĦARB*
MQABBA		SANTA LUĊIJA		*SANNAT*
MTARFA		MTARFA		*QALA*

Għasri, though comprising a small population, registered a high rate due to the relatively small number of households residing there as well as the number of non-Gozitan residents who may not occupy their homes throughout the year, rendering their property into an opportunity for predatory activity (Figure 2).

Qala, Żebbuġ and Fontana register higher than national rates whereas all the other councils have lower rates, thought it must still be said that every council experienced theft from residences in absolute terms.

Theft of or from Vehicles

Theft of or from vehicles is relatively low in Gozo as compared to the Maltese councils. All councils register low risks with Qala registering no crimes at all (Figure 3). This is a highly interesting scenario considering that Gozo has two leisure and recreation areas which should be main attractors for vehicle-related crime as experienced in all other leisure and recreation areas as Paceville. There are various reasons for such a low rate of offence, possibly due to 'guarded' parking areas, proximity of vehicle to residential unit, amongst others. On the other hand, as in all the categories

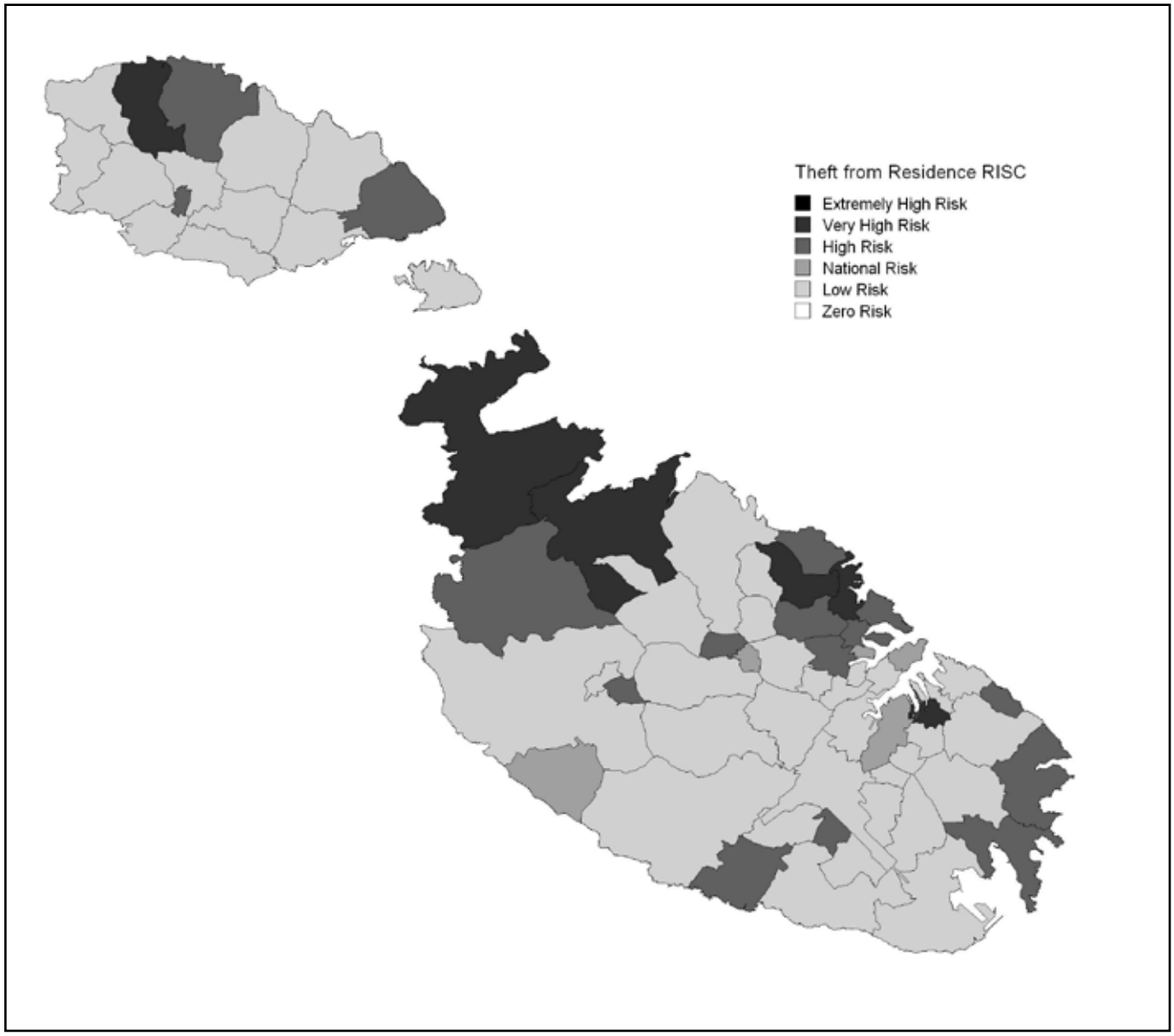

Figure 2: Theft from Residences – 2007 All Councils

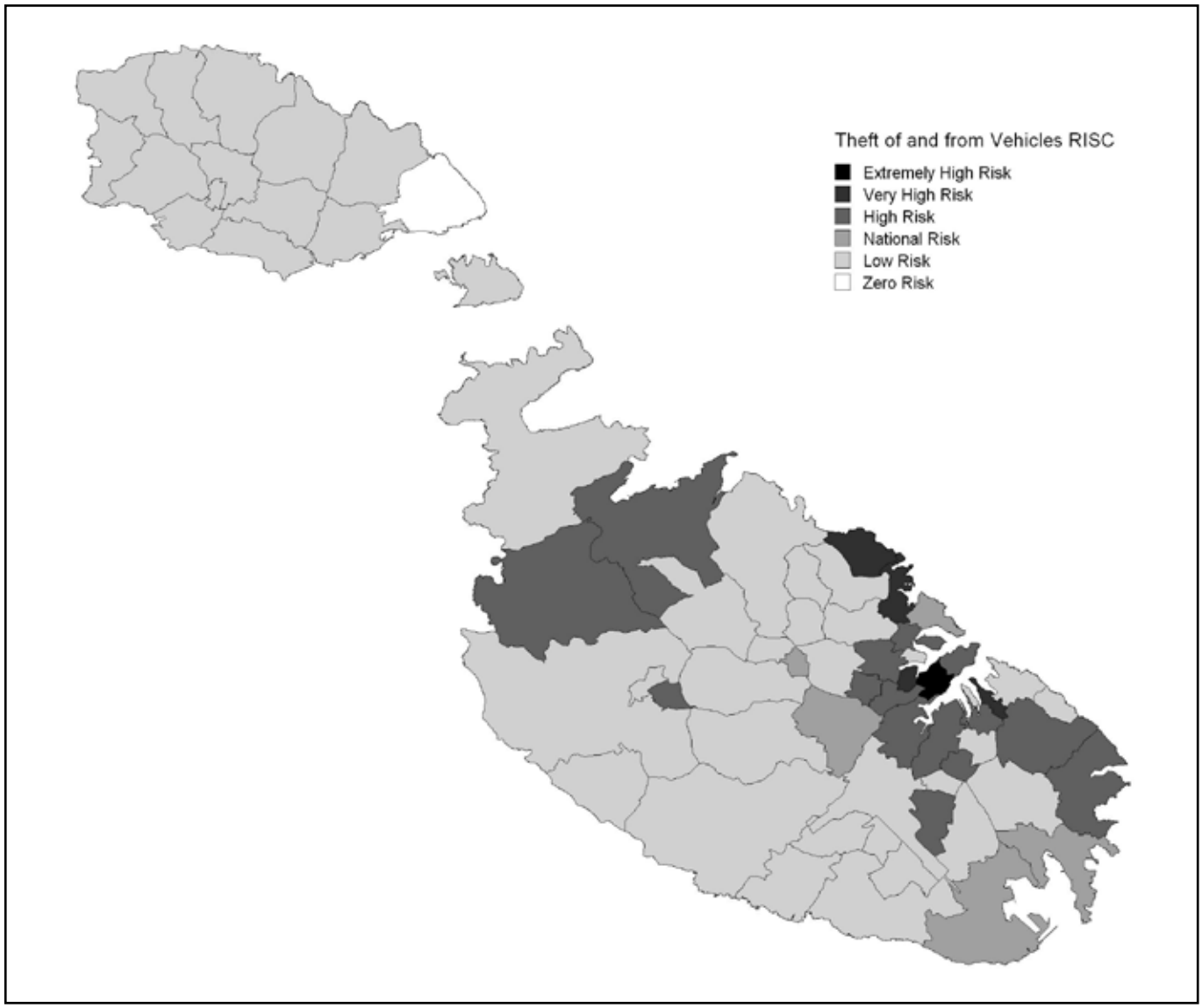

Figure 3: Theft of or from Vehicles – 2007 All Councils

of crime, there may be a higher dark figure rate, which dark figure represents unreported crime, not solely related to vehicle crime but all categories. Further study is required in this area.

In conclusion, although crime exists in Gozo, RISC rates in Gozo are relatively low in nearly all categories, though there are variations between one locality and another. As criminological analysis integrates new datasets, the cross-thematic analyses across time and space will enable the understanding of the social, physical and crime parameters that could be utilized for crime reduction targeting.

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