

Impact of the Architecture and Environment Relation on Crime Rates: A Case Study from Turkey

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Abstract

There is a well known interdependence between the architecture and the environment. The most relevant effect on environment is the human activity such as urbanization. But in the new cultural environment era, violence is a complex scenario. Media violence causes "mean world syndrome" and relate to the amount of television exploitable in terms of crime and urban policy in the new cultural environment. Choice of vernacular architecture instead of dense apartment blocks allows the emergence of the traditional neighbourhood spirit. The relationship between the lack of vegetation and the steep crime rate is almost a neglected topic of research in urban and communication studies. We can get the best results with minimal cost as a way to benefit from this relationship. So the question then arises whether the crime rate in countries with a poor vegetation cover is usually higher than in countries with fertile vegetation? Another problem is to settle mass people into a limited area. The public housing policy is claimed to damage the psychology of the residences in a negative way due to a scarce nature around their settlement? There have been few studies about this issue, published in peer reviewed scientific literature. This study is aimed to be an important precedent for other studies whole over the world. Turkey has seven distinct geographic, climatic regions and a few cities where there is an industrial attraction that causes rapid population growth and housing shortages. In other words, there is a wide spatial difference in the vegetation cover. During this research, in order to neglect the factor of the immigrants, location of crime was taken into account for criminals. Effective assessment was conducted by applying statistical analysis to decide on the relation between the vegetation cover and crime rates of Turkey. Crimes were classified into three categories as felonies, misdemeanours and infractions. A felony crime is the most serious of criminal offenses. In terms of seriousness, the most frequent felony type of crime was picked up for the analysis. A city-wise analysis results clearly indicate that there is a significant relation between the vegetation cover and crime rates.

Keywords: Crime rates; Media violence; Felony; Vegetation cover; Vernacular architecture

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1. Introduction

Environmental regulation is the most important part of urban planning. People should not be forced to live in different forms from nature. This situation may arise psychological problems in humans. Such as architecture, landscape and environmental regulations should also be considered as an important factor in city planning and be noticed. The purpose of this research, Istanbul in particular, to show the natural tissue lost due to urbanization. The aim was particularly to underline the negative effects of the irregular and vertical development in a densely populated area. Beyond that the goal was to determine the effect of forcing people to live apart from the nature such as pushing people into psychological collapse and disorder.

Felony means a serious crime such as a murder or arson. It is the most serious of criminal offenses. Hence, in this study total number of the most frequent types of felony crime was picked up for the analysis regarding the seriousness of the results of the action. Selected research area is the districts of the Istanbul. Istanbul is the in Turkey, where almost the quarter of the country population is living. Hence, the research conducted in Istanbul reflects the whole country. Required felony crime data and the population statistics of the districts of Istanbul were gathered from government sources [1, 2].

Researches go deep inside the relation between the shape of the environment and the crime intention. Troy et al. [3] inspected this relation in their study in terms of the relationship between tree canopy and robbery, burglary, theft and shooting. Their statistical research was conducted in the Baltimore region of the United States of America (USA). The main motivation was to identify the relation between the tree density and the crime. Also they questioned the proper location of the tree canopy. They claim that the location of tree canopies, such as in public area or in non public area, affects the crime rates. According to their search [3],

there is found a strong inverse relationship between the certain crime rates and the density of trees or tree canopy. They pointed out that planting trees on public lands would possibly yield somewhat higher crime reduction with respect to planting on non public area.

Another related study was conducted by Wolfe and Mennis [4]. The research area was the Philadelphia region of the USA. They conducted a research regarding the crime rate that involves two distinct outcome of the vegetation cover. The question on their mind was to understand the possible security effects of the vegetation cover that can encourage or suppress the crime rate. Several studies in the literature define vegetation as a suitable site for the crime [5, 6, 7]. Especially, Nasar and Fisher [7] dealt with the violence that took place in wooded areas near the campus, which is a very typical problem for the universities. Having prejudices on vegetation based on this specific problem is incorrect. The effect must equally be felt in every area of society. Results of their study simply indicate that the absence of vegetation has a negative impact on the crime. Violent crimes are inversely proportional to vegetation [8, 9]. Vegetation increases the public surveillance; as a result crime is gradually reduced [10]. Vegetation is a key factor to prevent urban crime. Urban socio - vegetation relationship is also dependent on the socio-economic conditions and quality of life [11], hence when considering the environmental policy high priority should be given to suburban areas.

Gilstad-Hayden et al. [12] conducted a research regarding the trees' crime prevention potential in New Haven, in the USA state of Connecticut (CT). Results of this study support the findings from previous studies conducted in other cities in USA. These cities were Chicago, Portland, Baltimore, Philadelphia, and New York respectively [3, 4, 8, 13, 14]. According to Gilstad-Hayden et al. [12]; tree canopy cover was inversely associated with crime, particularly violent crime, in New Haven, CT. It was observed that 10 % increase in tree canopy in New Haven, CT provided a 15 % decrease in violent crime and a 14 % reduction in property crime. Urbanization is a phenomenon that occurs with a combination of many factors, such as landscaping and gardening. If it is desired to prevent the rise of urban crime cases, it must be given absolute priority to reforestation [15]. Within their study, they have simply observed that there is a significant association between crime at the 150 m scale and the environmental design components of front yards and their surroundings. In addition to that, some other factors such as mean income of the residences, population density, and housing type are also important issues associated with the crime. Crime is also related to the success of the municipal landscaping services. According to Troy et al. [15], such as mass litters, dried grasses and uncut grasses due to the lack of municipal services, causes an emotional effect on crime. Trees enhance the strength

of social ties and communication between the neighbours [16]. Also, successful landscaping supplies more eyes on the street. More eyes on the street is also associated with the more control on the bad minded people and the suspicious events. According to Kuo and Sullivan [13], visibility preserving vegetation does not promote crime and in the contrary, it may even hinder crime in sub urban neighbourhoods.

An inequitable distribution of income in today's society, economic crisis, encouraging effects of number of publications and broadcasts in media and internet [17], traditional structure with honour killings and offenses are apparent factors that are increasing the number of crimes committed every day. In this study different from all causes, a linear impact of environment crime cases is dealt with.

Another factor influences crime rate is media. Perceptions of the world are heavily influenced by the images and ideological messages transmitted through media. That's why there is a widening gap between perception of environment and reality. In the era of media convergence, a commercial media system thrives on violence, stereotypes, and the cultivation of anxiety. A number of studies have shown that heavy exposure to violent media causes greater sense of insecurity.

George Gerbner conducted the longest running study of television violence. His seminal research suggests that heavy TV viewers tend to perceive the world in ways that are consistent with the images on TV. As viewers' perceptions of the world come to conform with the depictions they see on TV, they become more passive, more anxious, and more fearful. Gerbner called this the "Mean World Syndrome". Gerbner's research found that those who watch greater amounts of television are more likely to (Gerbner, G. Violence and Terror in the Mass Media. Reports and Paper on Mass Communication [18]:

- Overestimate their risk of being victimized by crime
- Believe their neighbourhoods are unsafe
- Believe "fear of crime is a very serious personal problem"
- Assume the crime rate is increasing, even when it is not

In addition, the media's rapid analysis and assessment of crime causes stigmatization of districts of a city. Stigmatization reaches as far as locality, whereby the "inner-city" and city-perimeter settlements have become major targets for media reporting on crime. Danilo Yanich [19] pointed out that news media presents an "urban-suburban dimension of crime", in which the city is deemed as dangerous. The "inner-city" has become a common label used in media reports on crime.

Table 1: Population and felony crime statistics for districts of Istanbul (high crime and lower crime zones were marked in distinct colours).

District	Population (2014)	Area (km ²)	Density (per km ²)	Felony crime (2014)
Adalar	15,623	11.05	1413.85	2
Arnavutköy	236,222	506.46	466.42	8
Ataşehir	419,368	25.87	16210.59	25
Avcılar	425,228	42.59	9984.22	26
Bahçelievler	757,162	16.57	45694.75	51
Bakırköy	223,248	29.43	7585.73	30
Bayrampaşa	272,374	9.54	28550.73	36
Bağcılar	757,162	22.4	33801.88	74
Başakşehir	353,311	104.34	3386.15	40
Beykoz	249,727	310.36	804.64	21
Beylikdüzü	279,999	37.21	7524.83	2
Beyoğlu	242,250	8.96	27036.83	56
Beşiktaş	190,033	18.01	10551.53	30
Büyükçekmece	231,064	157.61	1466.05	5
Esenler	459,983	18.5	24863.95	28
Esenyurt	742,810	43.11	17230.57	2
Eyüp	375,409	228.14	1645.52	35
Fatih	419,345	15.93	26324.23	90
Gaziosmanpaşa	501,546	11.67	42977.38	61
Güngören	302,066	7.17	42129.15	30
Kadıköy	465,954	25.07	18586.12	78
Kartal	457,552	38.54	11872.13	31
Kağıthane	437,942	14.83	29530.82	57
Küçükçekmece	711,112	37.73	18847.39	48
Maltepe	487,337	53.06	9184.64	42
Pendik	681,736	179.11	3806.24	58
Sancaktepe	354,882	61.87	5735.93	21
Sarıyer	344,159	151.26	2275.28	43
Silivri	165,084	862.54	191.39	1
Sultanbeyli	321,730	28.86	11147.96	11
Sultangazi	521,524	36.26	14382.90	18
Tuzla	234,372	123.89	1891.77	15
Zeytinburnu	289,685	11.31	25613.17	48
Çatalca	67,329	1043.58	64.52	7
Çekmeköy	231,818	148.02	1566.13	13
Ümraniye	688,347	45.29	15198.65	20
Üsküdar	540,617	35.34	15297.59	51
Şile	33,477	779.11	42.97	3
Şişli	274,017	35.02	7824.59	54
Grand total	14,762,604	5,335.61	542,709	1,270

Media exposure to crime and crime-related events can be an effective crime prevention strategy, and useful tool for sensitizing and educating the public on underestimated or overlooked social problems.

2. Methodology

The key methodology used in this research is to compare the satellite image of the Istanbul with the crime rates.

Satellite image clearly shows the green areas. Beyond that the regression analysis was also applied to see if there is another factor such as the population or the density of the people has an impact on the crime rates. Also histograms were depicted in order to show the current crime rates in every districts of the Istanbul.

2.1. Using satellite images

Population statistics and felony crime rates were tabulated for year 2014. There are 39 districts of Istanbul and some of them are safer to live compare to others. People do not seek for the reasons of this safety

but tend to move these safer districts to live nowadays. However this is not a proper way for the solution of the safety problem. Because problematic zones in terms of safety are usually old settlements, where most of the shopping malls, educational, industrial and other key units were located. Critical districts among the crime rates were categorized and highlighted on the Table 1.

Districts of Istanbul and the satellite image that shows the green areas in Istanbul are shown in Figure 1. All green and barren areas are clearly seen from this satellite map. These barren areas are emerged as the result of the wrong city planning, bad architecture, faulty urbanization policies and the lack of the environmental sensitivity.

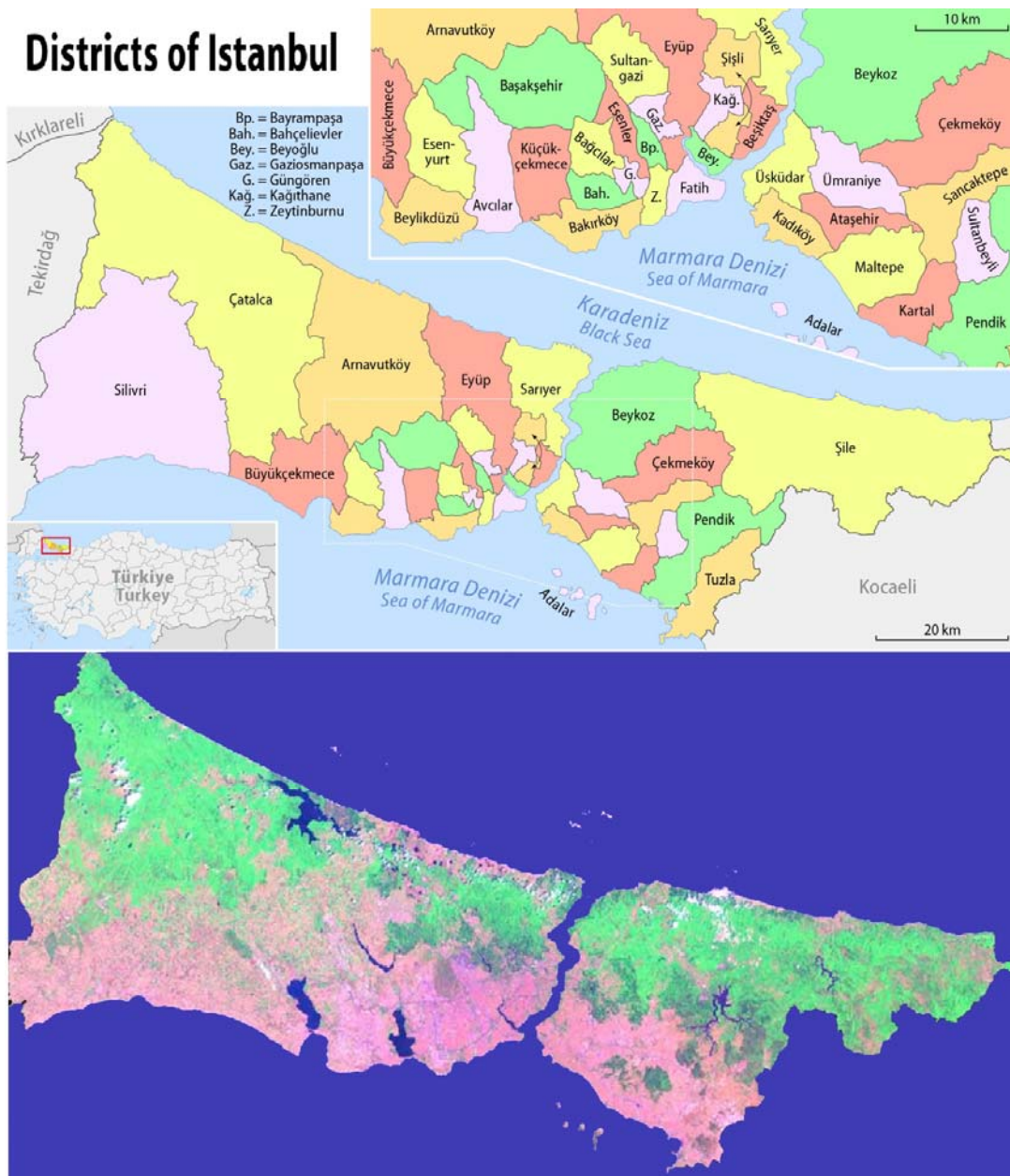


Figure 1. Districts of Istanbul and the vegetation cover

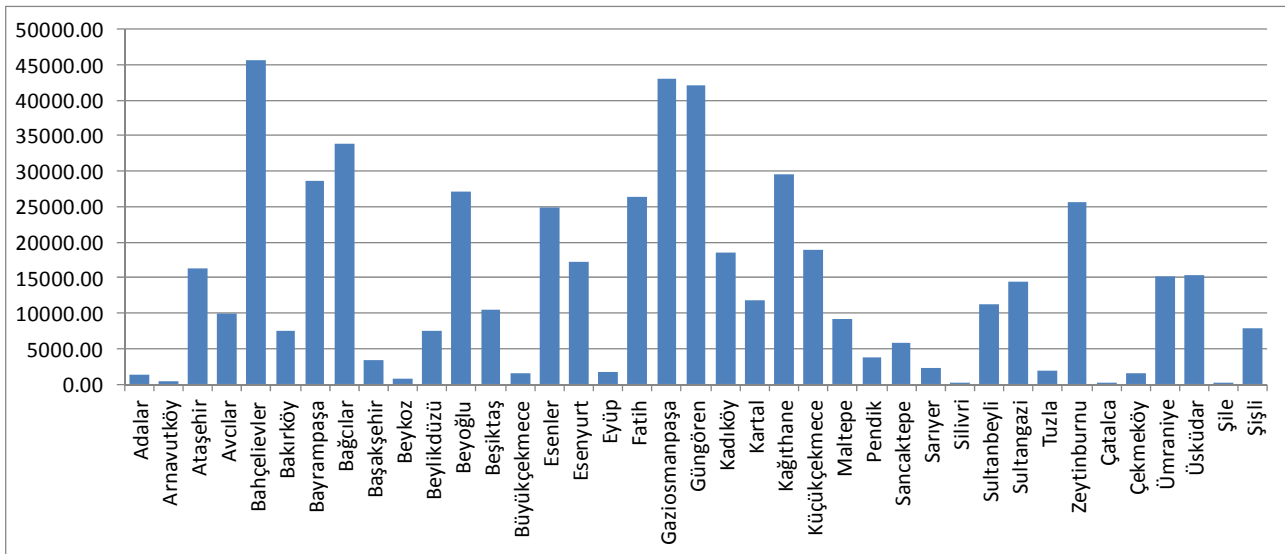


Figure 2. Population density distribution of the districts of Istanbul (population density versus district)

2.2. Histograms

It shows the distribution of individual measurements taken from a part or process bar graph. It is also referred to frequency distribution as shown by the length of any given value of the frequency bar. It provides easy to observe the shape of the distribution of the measurements, variation (dispersion) and headquarters. Patterns in measurements are observed. It provides clues regarding the cause of the problem and the reduction of the variation. In this study histogram was used to show the distribution of the population density per km² and felony crime rates of the each district of Istanbul (Figure 2).

2.3. Regression analysis

Regression analysis is applied to put out the relationship between a dependent variable and a single or multiple independent variables as a mathematical equation. In this study the dependent variable is the felony crime rate and the independent variables are the population, density of the population of each district, and the area of the each district, respectively. The coefficient of determination (R^2) indicates how much the dependent variable explained by the independent variables as a percentage. It is symbolized by R^2 . It gives a result between 0 and 1. Result closer to 1 means that there is a strong relationship between the independent and dependent variables.

3. Results and discussion

Results from the regression analysis clearly show that there is no direct relation between the felony crime rate

and population statistics (see Figures 3 and 4). Also there is no impact of the district area on the felony crime rate as seen from the Figure 5.

Felony crime densities in the districts of Istanbul were depicted on Istanbul map. While doing this colour indices were used as an indicator. Every district of Istanbul was painted according to the number of felony crimes occurred. For year 2014, number of felony crimes equal or over 30 was considered as the high rate. Similarly, number of felony crimes equal or lower than 10 was considered as the low rate. Number of felony crimes between these two values was considered as the moderate rate. Red colour stands for the high felony crime rates, yellow colour stands for the moderate crime rates, and blue colour stands for the low crime rates. Results clearly indicate that the crime density is higher mostly in areas with lower green areas. Conversely the lowest crime rate is existed in the areas with large wooded areas (See Figure 6). The media can play a democratic role about crime prevention and environment. Government and partners in crime prevention should work with media representatives in local crime prevention and safety strategies. Media literacy education also can help encourage and inform the ways future generations interact and make use of the media in crime prevention and urban safety efforts [20].

4. Conclusion

There are many problems affect the crime rates. Technological developments in the media resulted in improved impact on society. Media is a great storyteller of our time. It has become the common symbolic environment that interacts with most of the things we

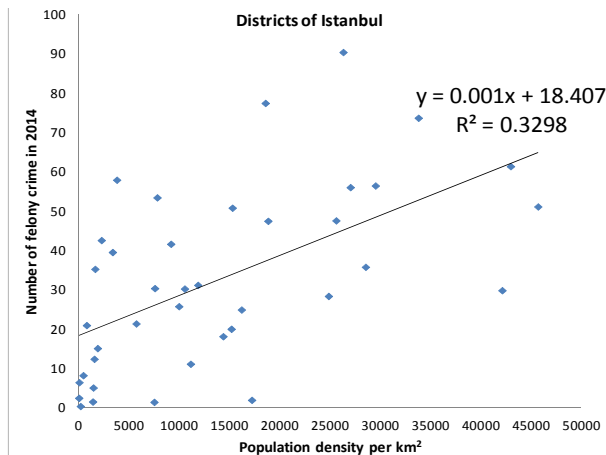


Figure 3. Statistical relation between the felony crime and the population density (Determination coefficient (R^2) is 0.3289)

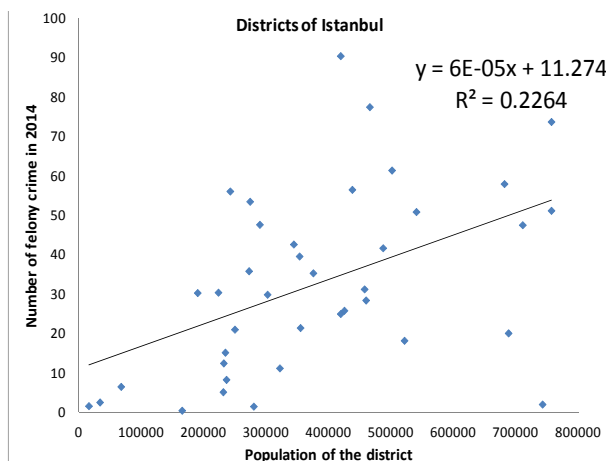


Figure 4. Statistical relation between the felony crime and the population (Determination coefficient (R^2) is 0.2264)

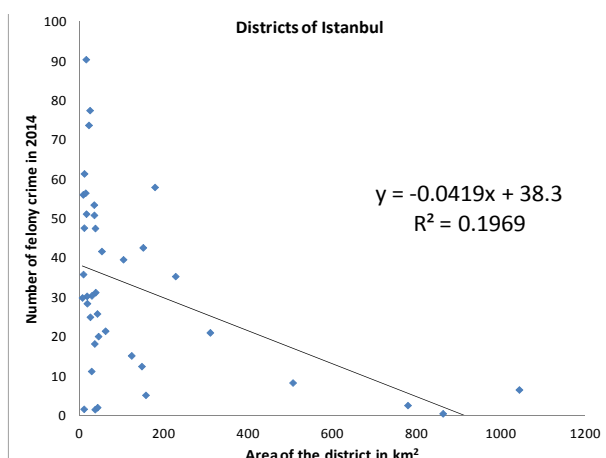


Figure 5. Statistical relation between the felony crime and the area of the district (Determination coefficient (R^2) is 0.1969)

think and do. The commercial media system has nothing to tell, but has a lot to sell. It seems clear that in a globalized world, public pressure from media-aware consumers, professional media watch groups, media agencies, government institutions, NGOs, etc. can force the media to be a responsible media sector. Because media coverage of crime can be inaccurate, biased and promote harmful policies on crime control. The media is actually very powerful because it can influence and shape the perception of the public. Excessive and rapid growth in population is the leading problem against the urbanization. Improper urbanization brings together many problems. The main problem that the people face on is the destruction of the environment. Another problem is the aesthetically weak urban architecture. Governors usually do not consider the adverse psychological effects of this reality. This study addressed this issue through Istanbul. Histogram reveals that the population density is not effective on the crime rate as seen from the Eyüp, Sarıyer and Pendik districts, where there are low population densities but very high felony crime rates. Also Regression analysis and determination coefficient values clearly points out that there is no direct correlation between the crime rates and the population statistics and the areas covered by the districts. Results of this study support the idea that the tree canopy or the wooded area density is inversely proportional to the felony crime rates. Governors should not implement development plans without considering the environmental sensitivity and aesthetical architecture. Urbanization and environmental protection must be considered in harmony.

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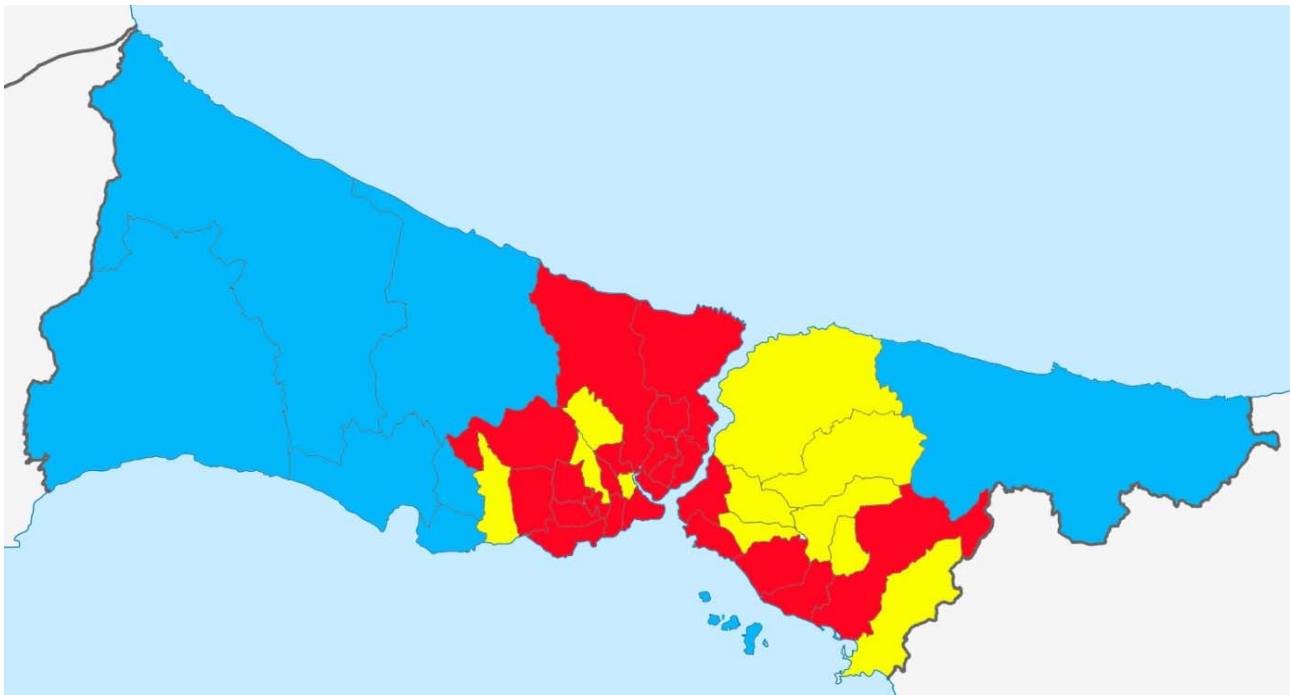


Figure 6. Felony crime densities in districts were depicted on Istanbul map using colour indices (red stands for high, yellow for moderate, and blue for low crime)

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