

“Mapping crime and insecurity in the city of Athens during the economic crisis and beyond”

Prof. Christina Zarafonitou, Ass. Prof. Angelos Mimis, Dr. Dimitrios Kalamaras, Dr. Charalampos Karagiannidis, Dr. Eleni Kontopoulou & PhD Candidate Thanos Synolakis

Laboratory of Urban Criminology

Panteion University of Social and Political Sciences

<https://easte.panteion.gr/>

Working Group Panel: Space, Place and Crime

20-24 September 2022



Theoretical framework

- The relationship between economic factors and crime has been a matter of debate for criminologists since the 19th century.
- The relationship between economic factors and crime has been empirically investigated at a macro, meso and micro level of analysis (Zarafonitou, 2004).
- Many macro economic factors such as unemployment, Gross State Product (GSP), income inequality, Gross Domestic Product (GDP), real income, Consumer sentiment index etc. are taken into account in order to investigate the relationship between the economic situation and crime (Raphael & Winter-Ebmer, 2001· Goldman, 1977· Rosenfeld & Fornago, 2007· Rosenfeld & Messner, 2009· Arvanites & Defina, 2006).
- The relationship between macro economic factors and crime may vary according to different parameters such as: type of crime, time period explored, geographical unit of analysis, type of data sources, methods of statistical analysis, variables considered etc. (UNODC, 2011:9).
- The unit of geographical analysis is of great importance → Contemporary models of mapping and spatial analysis of crime in combination with a series of factors may highlight the peculiarities of crime in a given space and time and show more clearly the associations under examination especially at the micro level of neighborhood in the urban context (Zarafonitou, 2004).



Theoretical framework

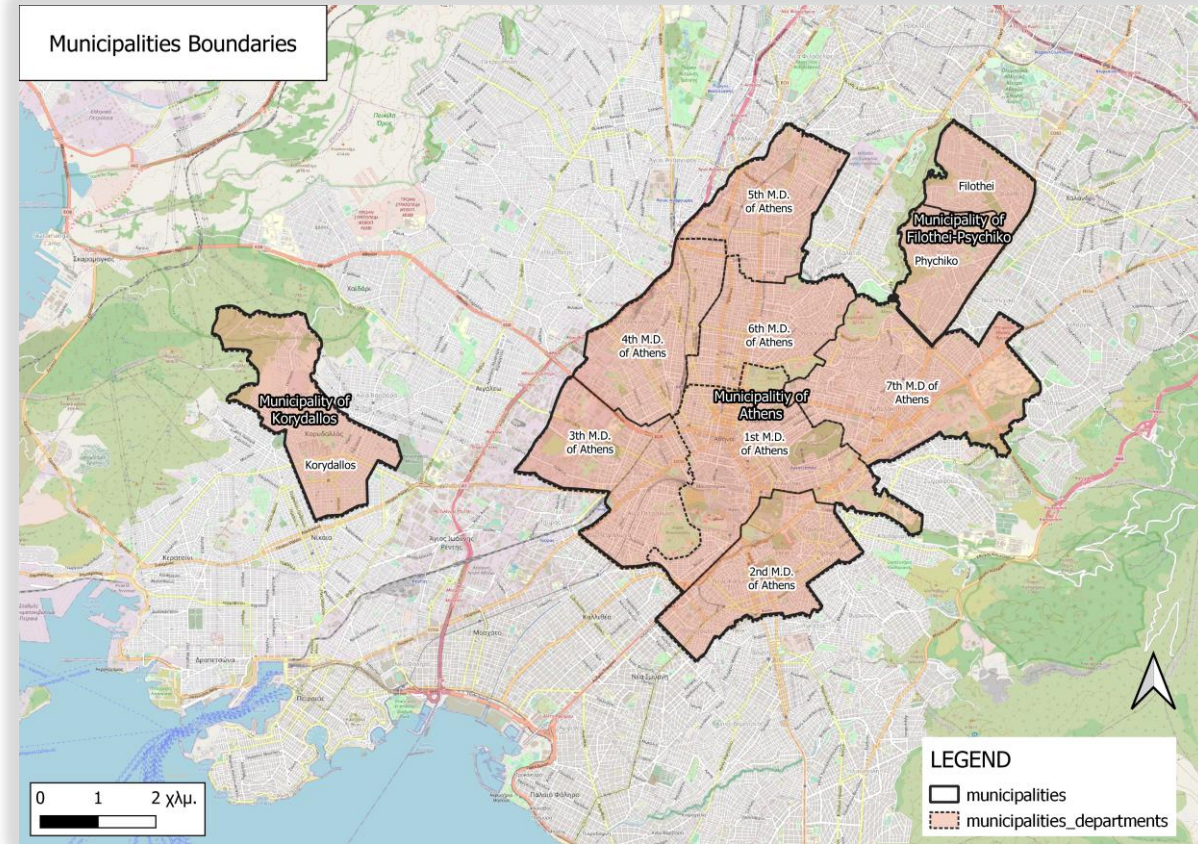
- Empirical studies show a relationship between factors such as the unemployment, economic insecurity, economic inequality, absence of social welfare measures, poverty or low socioeconomic status and fear of crime (Britto, 2013· Will & McGrath, 1995·Dammert & Malone, 2003·Pantazis, 2000).
- Fear of crime is *“a rational or irrational state of alarm or anxiety engendered by the belief that one is in danger of criminal victimisation”* (McLaughlin & Muncie, 2006:164).
- Fear of crime is at some degree independent of crime and victimisation rates (Garland, 2001:122· Zarafonitou, 2014:278).
- Factors related to fear of crime: individual characteristics, vulnerability of the subject, trust in the police and the criminal justice system, sources of information regarding crime, subjective risk perception, type and seriousness of crimes, experience of previous victimisation, social and environmental features of the spatial setting (Box, Hale, Andrews, 1988· Zarafonitou, 2002,2009· Killias, 1990).
- There is no equal distribution of fear crime in the urban context and there is a strong relationship between fear of crime and deprived urban areas with intense signs of social and environmental degradation (Hideg & Manchin, 2005· Lewis & Salem, 1986· Zarafonitou, 2011).

The study

- ❑ Our study conducted in the framework of the project “***Spatial aspects of Crime and insecurity in the era of economic crisis: Trends, dimensions and correlations***” which is funded by the Hellenic Foundation for Research and Innovation (Project Number HFRI-FM17-3898) under the scientific responsibility of Prof. Christina Zarafonitou, aims to examine the evolution of crime and fear of crime during the period of the economic crisis and beyond in Greece and especially in the region of Athens.
- ❑ ***Financial crisis*** refers to a situation in which “*the economy is characterized by a continual and noticeable reduction of the economic activity*” (Koufaris, 2010).
- ❑ The Greek financial crisis (debt crisis) begun in 2009. In 2018 the 3rd bailout package expired and in 2019 capital controls were removed.
- ❑ During the economic crisis there was a reduction of financial liquidity and business activity, an increase of unemployment and economic sectors related to housing construction, tourism, small-medium enterprises, and the shipping industry were hard-hit (Pagoulatos & Triantopoulos, 2009).

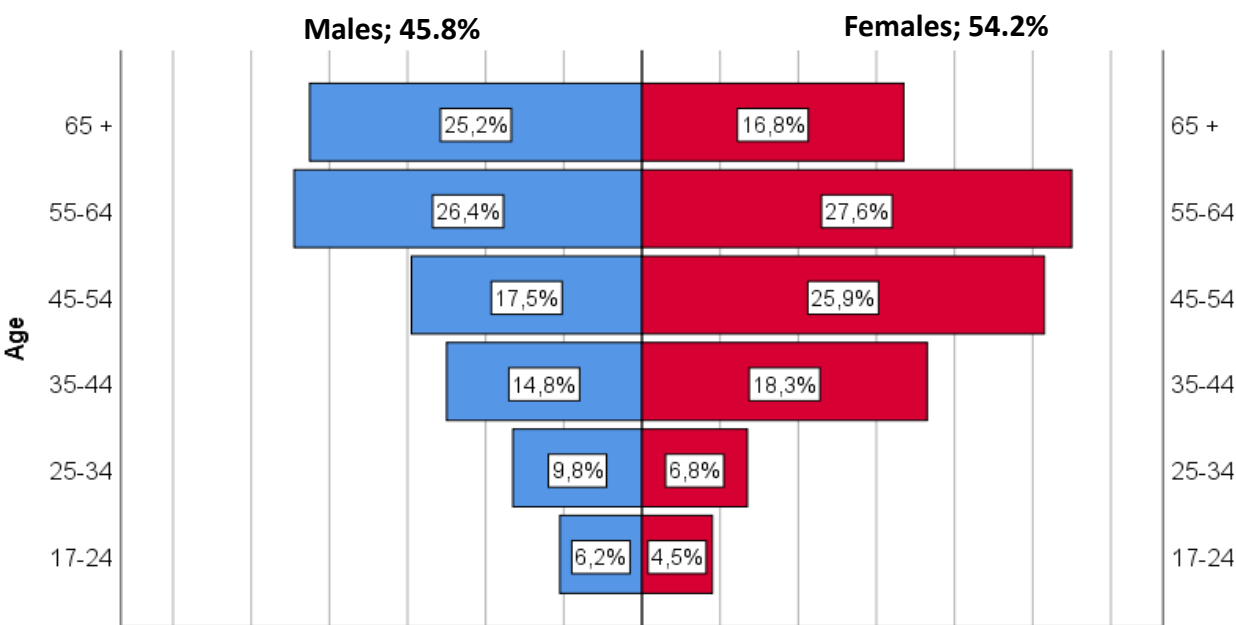
Methodology of the research

- **Sampling stage.** The proposed sampling design was that of the multidimensional stratified sampling from a sampling population defined on the basis of the population census of Hellenic Statistical Authority for the year of 2011.
- The sampling, was designed at a **household level** using 3 main strata and 7 secondary substrata
 - 736 filled questionnaires, 525 from residents of Athens Municipality, 71 from Korydalos Municipality, 150 from Filothei - Psychiko Municipality.
- **Data collection stage.** A self reported survey was conducted through interviews via Computer Assisted Telephone Interviewing (CATI) with the use of a questionnaire.
- **Statistical and Cartographic Analysis.** The results were transformed into an SPSS dataset and analyzed with descriptive and inferential statistics. Cartographic visualization and spatial analysis of the results was made in QGIS and R.

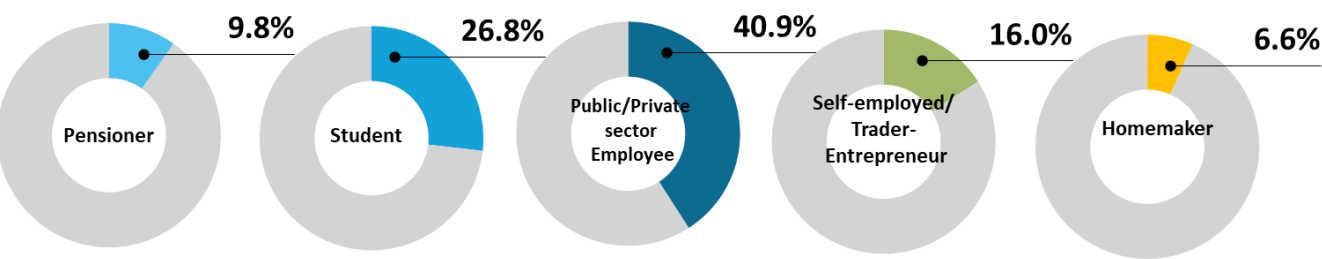


Sample characteristics

Gender/Age



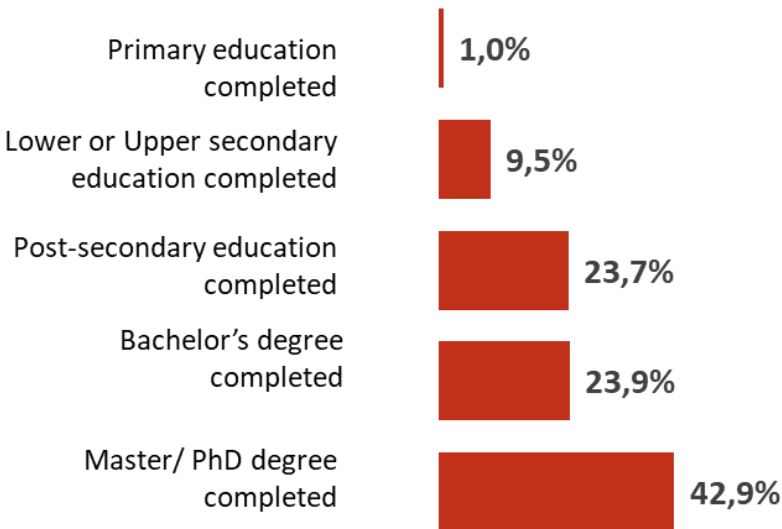
Employment Status



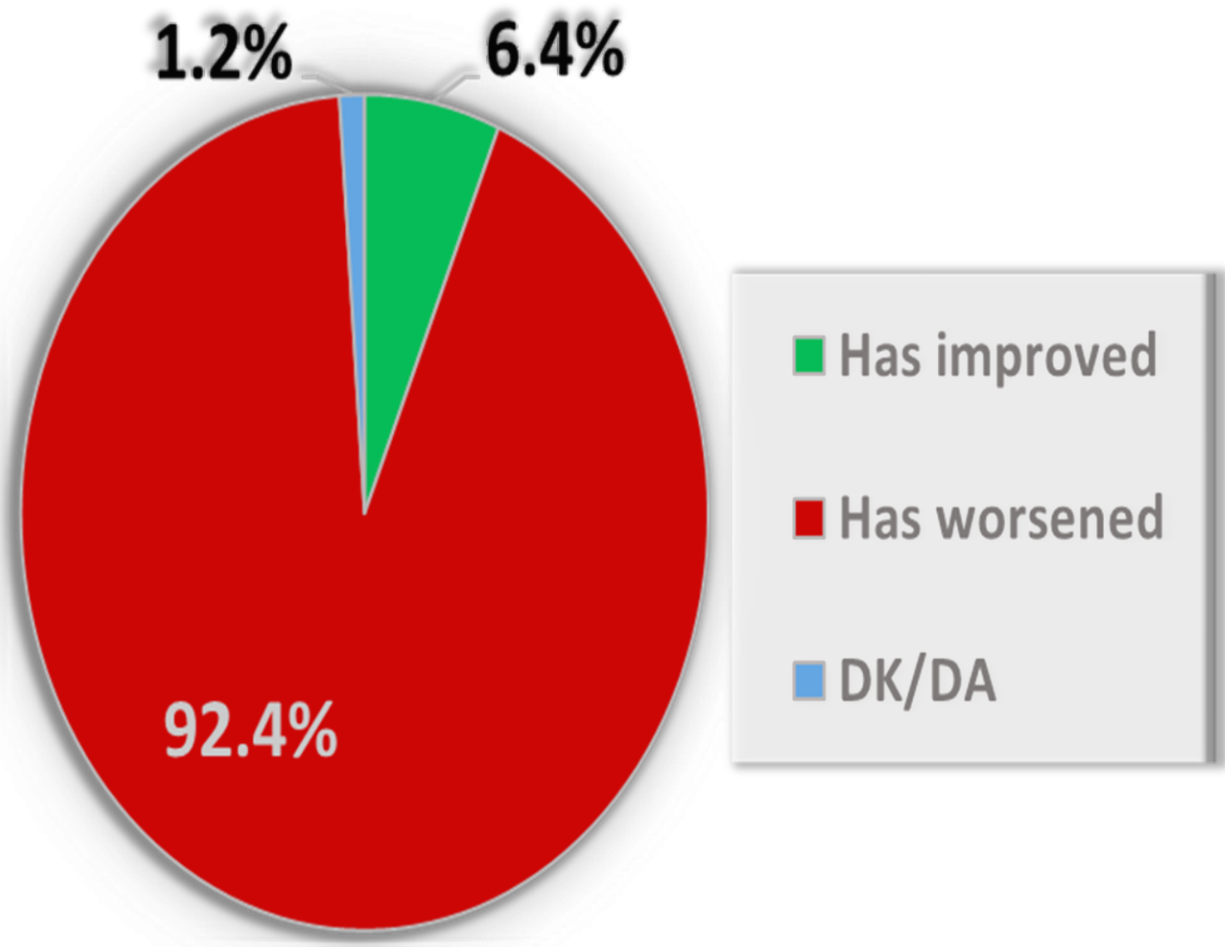
Marital status



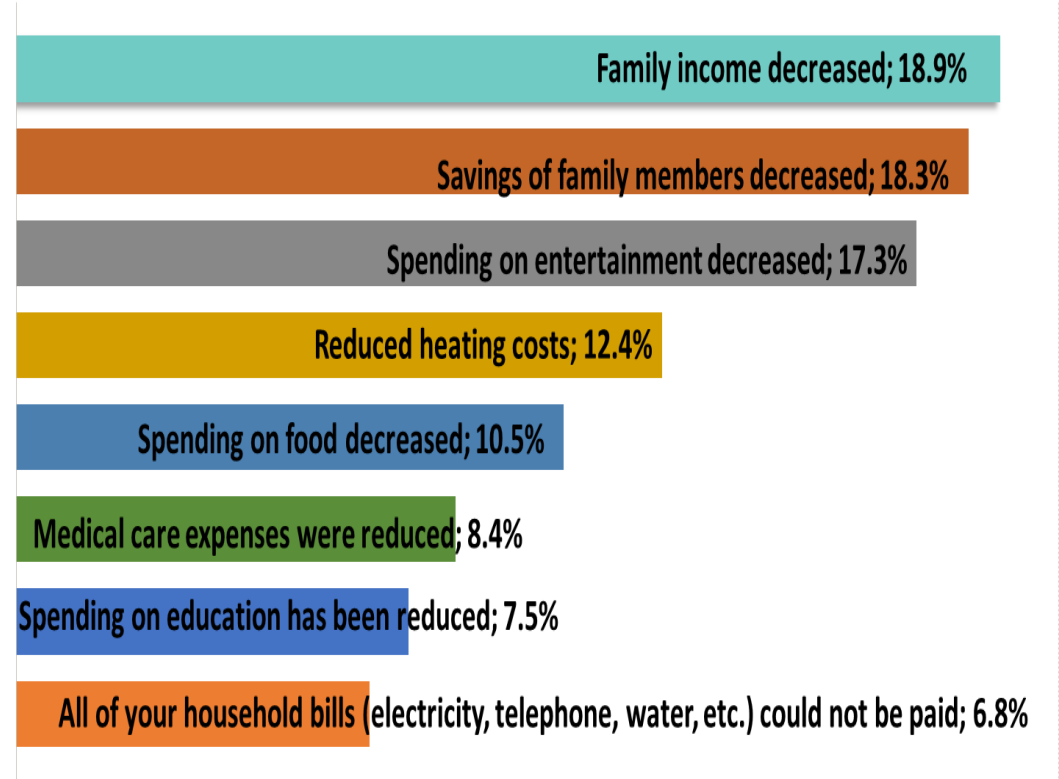
Educational level



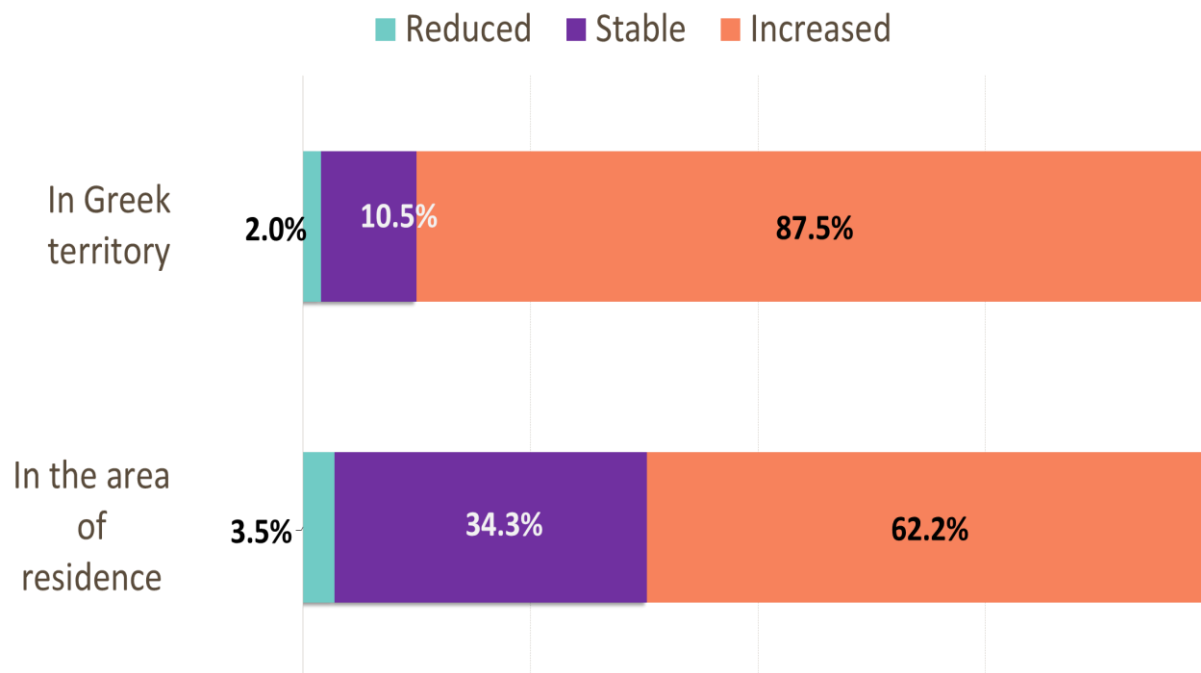
Your household's financial situation has improved or has worsened since the economic crisis?



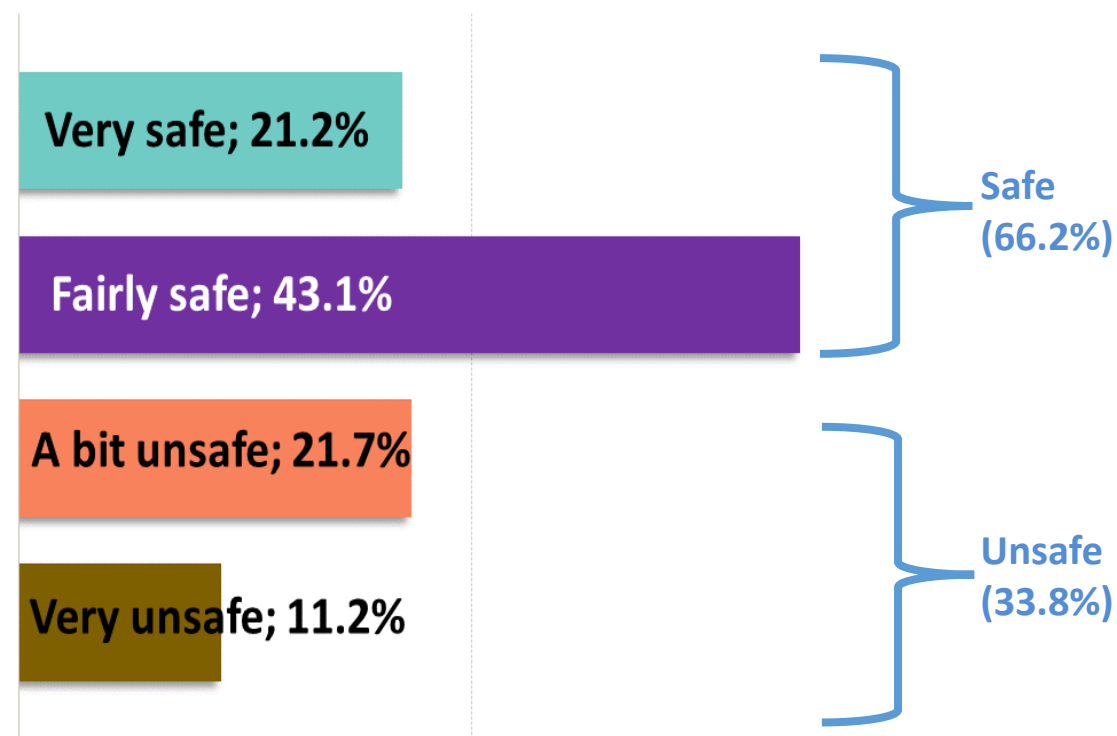
In which areas did the economic crisis affect your household?



Crime level evolution



How safe do you feel walking alone in your area of residence after dark?



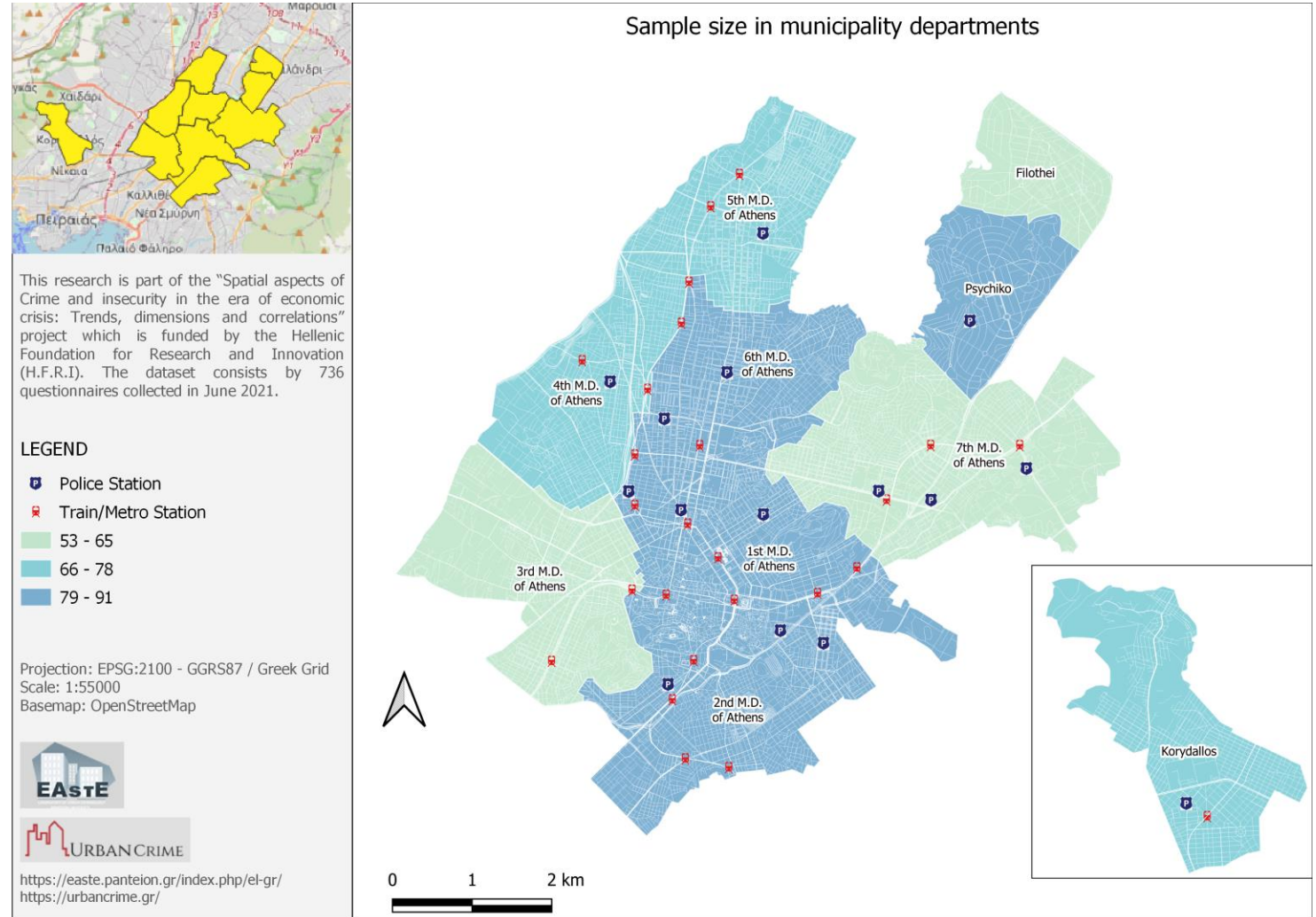
In the decade 2009-2019

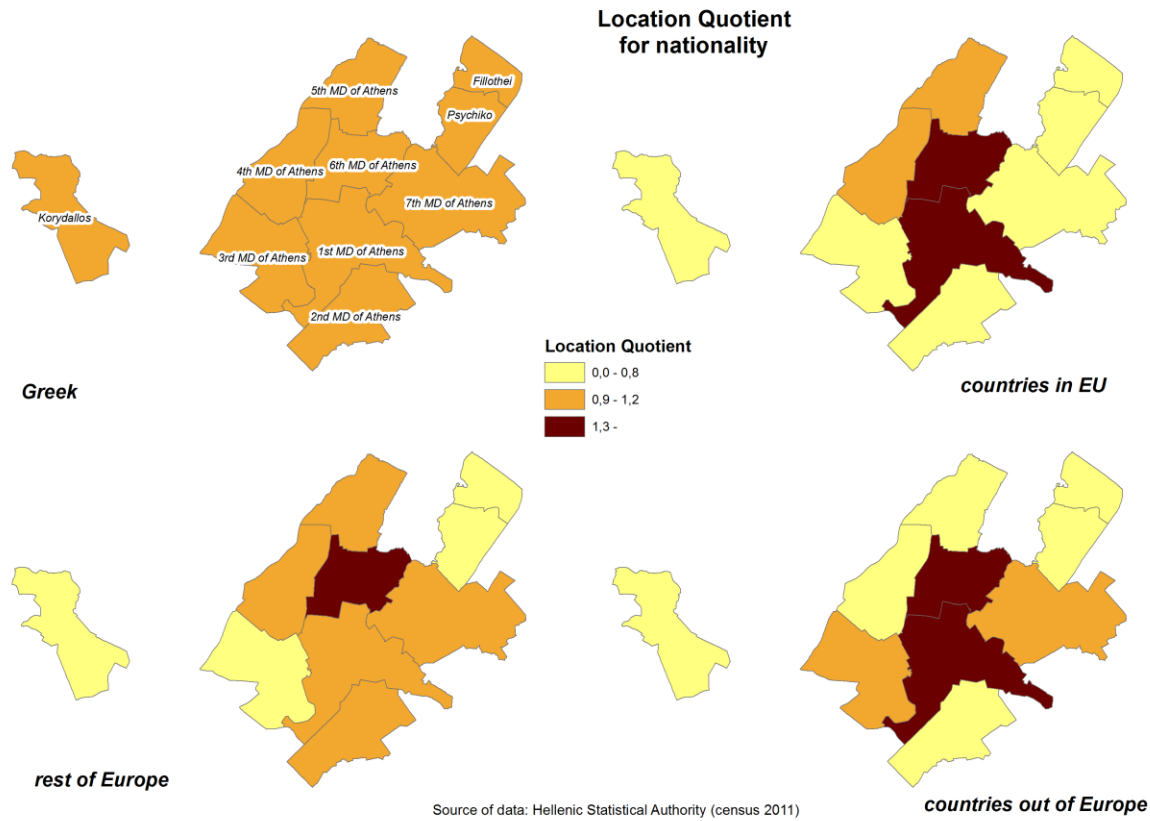
Sample size

In the map we illustrate the sample size at municipality department level. Train and metro stations as well as police stations can be seen.

The municipalities included are

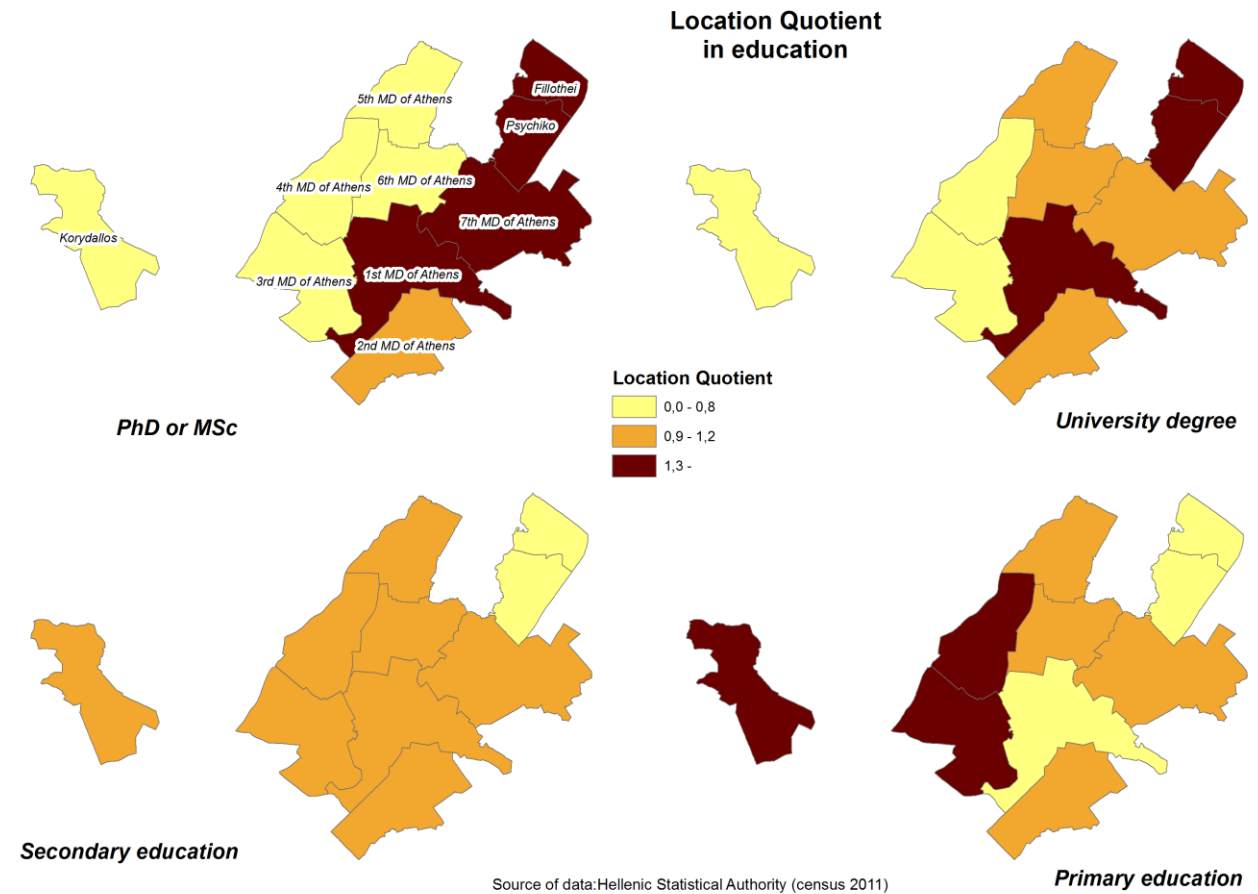
- Athens (7 MDs with 664k population),
- Filothei-Psychiko (2 MDs with 27k population) and
- Korydallos (1 MD with 64k population).





In the above map the Location Quotient on nationality of the permanent residents is displayed. The data are from the 2011 census.

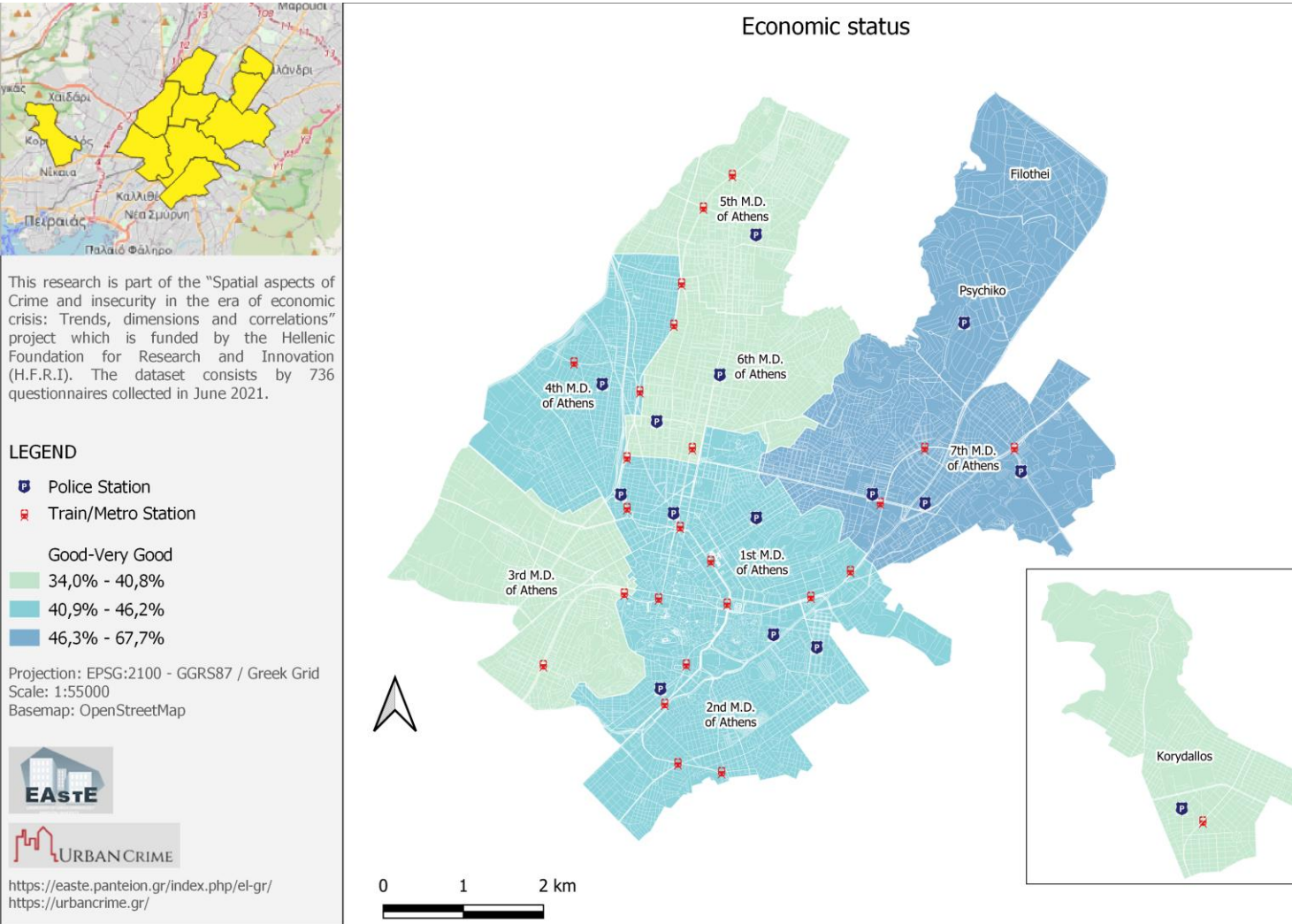
The non-Greek residents are over-represented in 1st/6th MD.



Similarly, the LQ in education is illustrated above.

The highly educated residents are over-represented in 1st / 7th and Filothei-Psychiko MD.

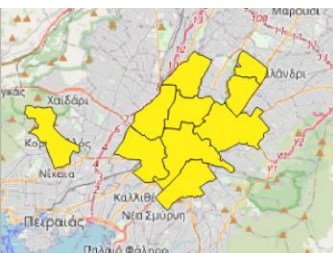
Economic status



In the map the percentage of the respondents that consider their economic status as good or very good is illustrated.

The highest % are present in Filothei/Psychiko and in the 7th MD of Athens and the lowest % are in Korydallos and in the 3rd, 5th and 6th MD of Athens.

It is worth noting that, in 2015, the mean income in the municipality of Filothei/Psychiko was 59.300€, in Athens was 26.400€ and in Korydallos was 19.500€.



This research is part of the "Spatial aspects of Crime and insecurity in the era of economic crisis: Trends, dimensions and correlations" project which is funded by the Hellenic Foundation for Research and Innovation (H.F.R.I.). The dataset consists by 736 questionnaires collected in June 2021.

LEGEND

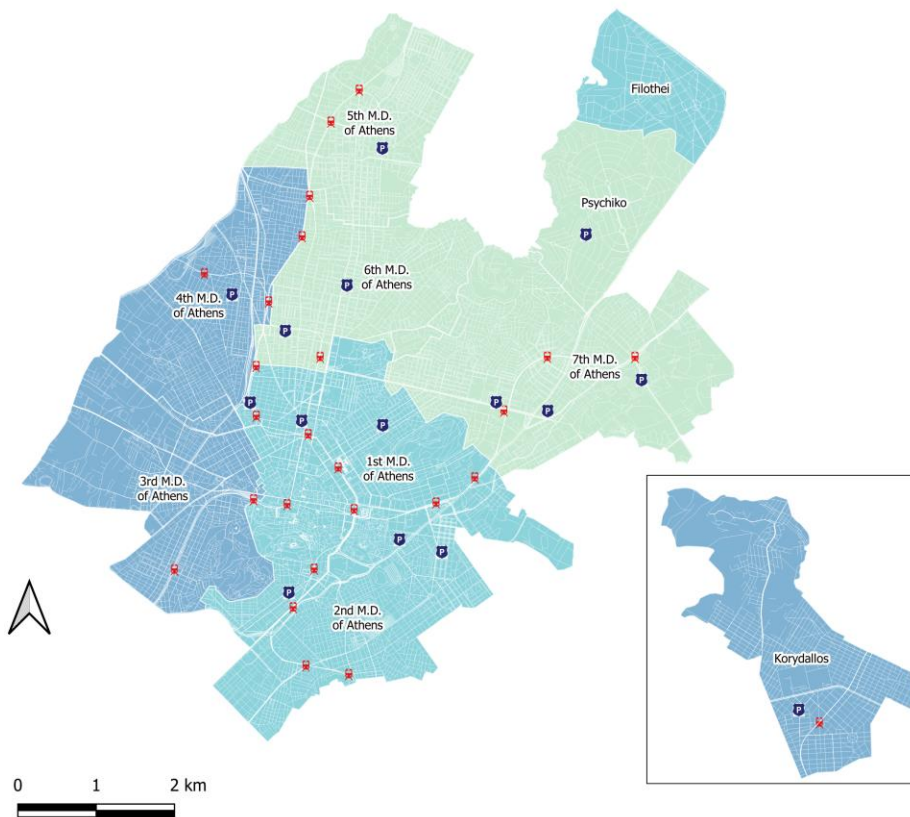
- Police Station
- Train/Metro Station
- 74,7% - 78,8%
- 78,9% - 82,2%
- 82,3% - 90,6%

Projection: EPSG:2100 - GGRS87 / Greek Grid
Scale: 1:55000
Basemap: OpenStreetMap



<https://easte.panteion.gr/index.php/el-gr/>
<https://urbancrime.gr/>

Deterioration of the economic status of households due to the economic crisis



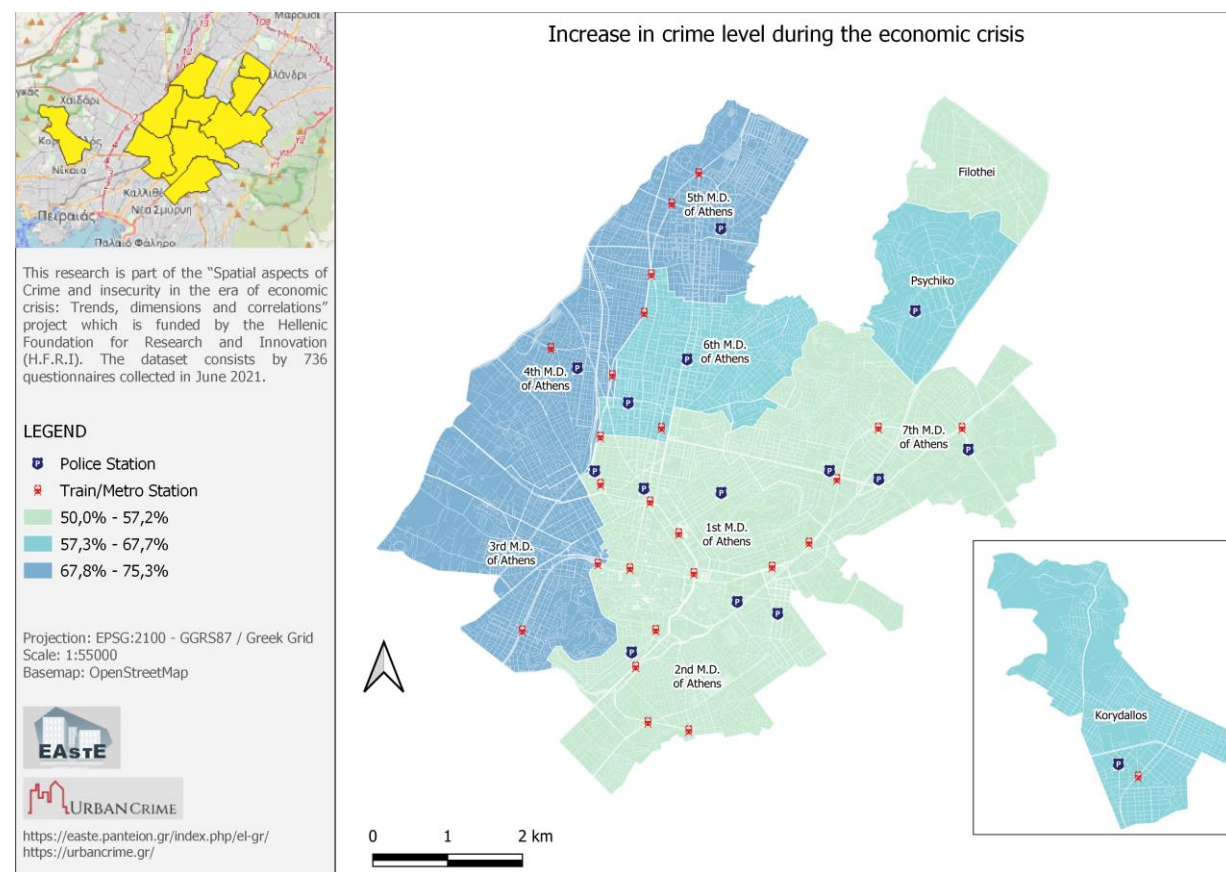
The effect of the crisis in the economic status of the households



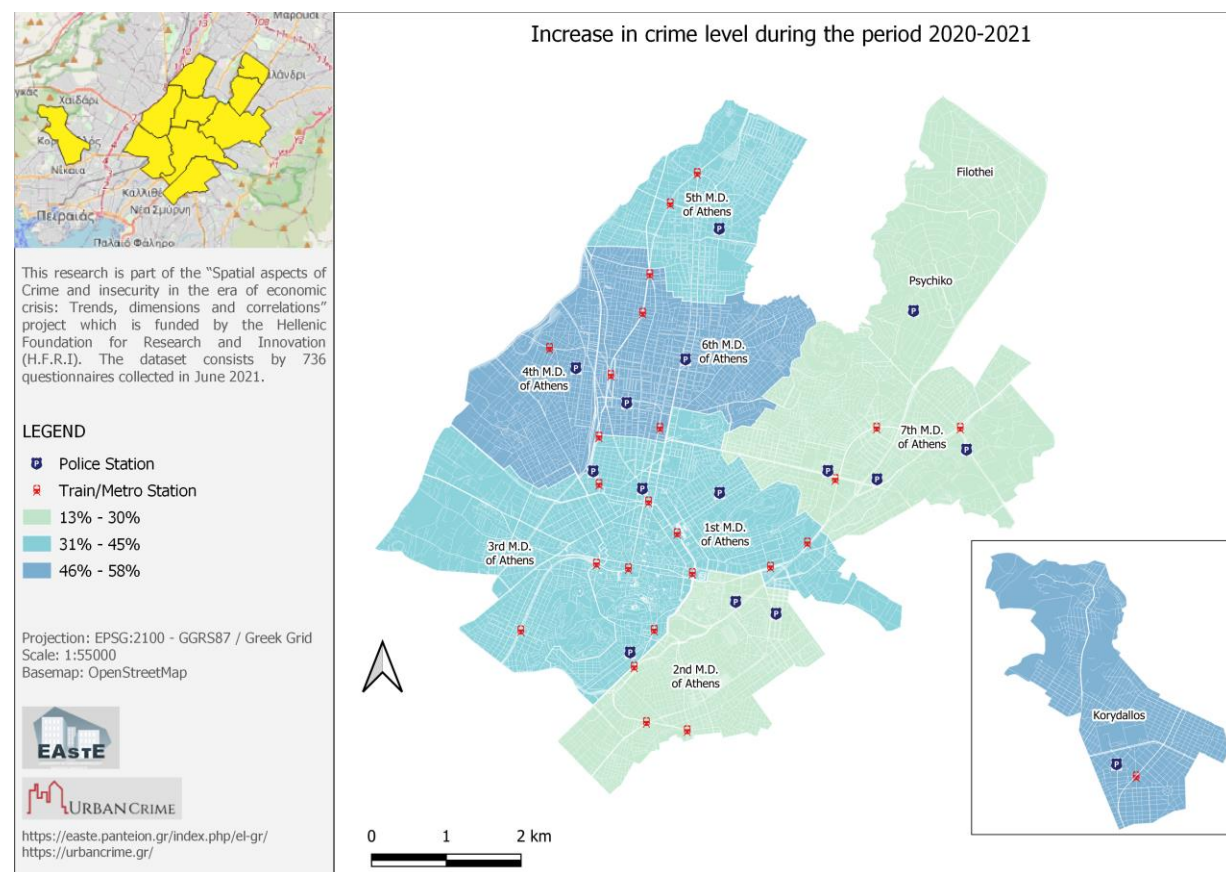
In the above map we illustrate the % of respondents that believe that their economic status has worsened during the economic crisis.

In the above map the hierarchical clustering of the MDs based on views of the respondents about the effects of the economic crisis on the economic status of their households is illustrated.

Crime level



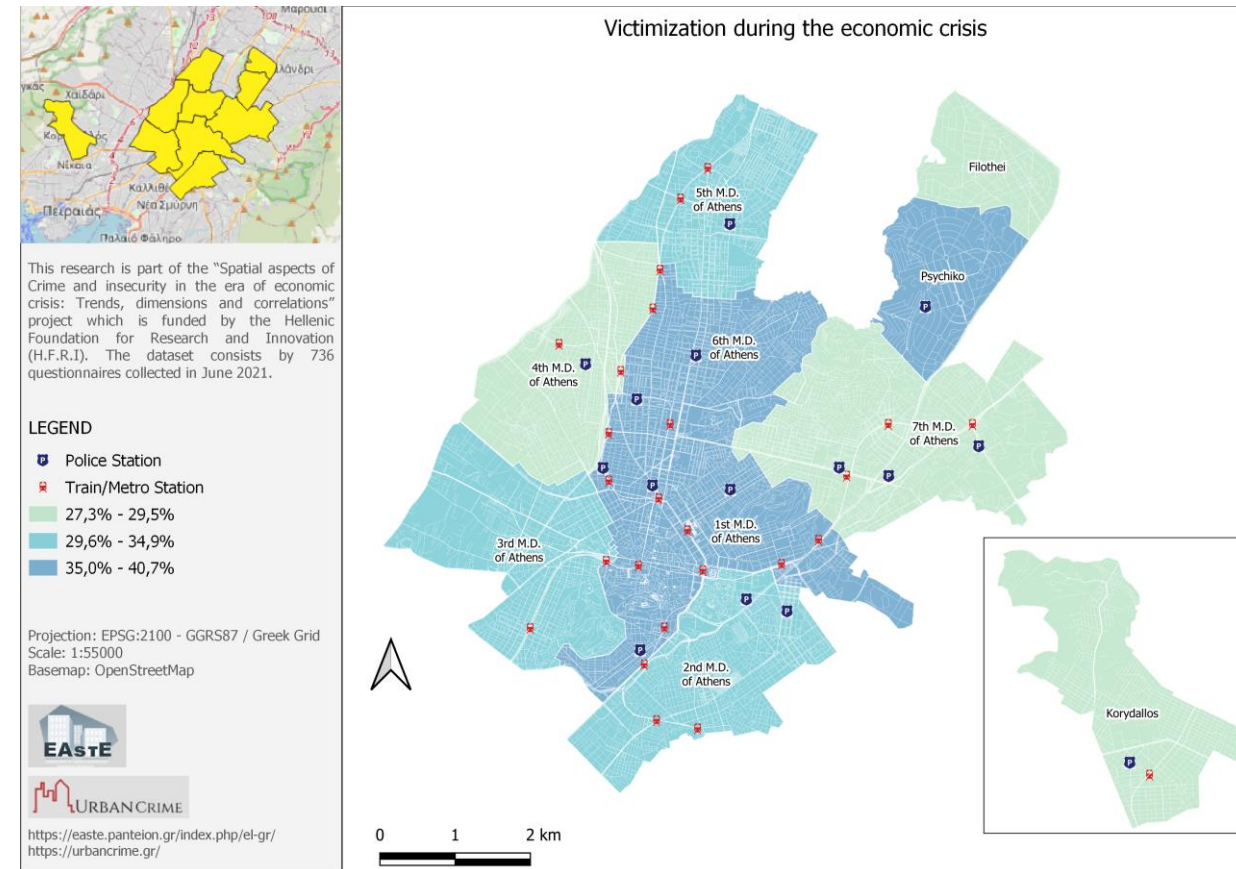
In the above map the percentage of the respondents that believe that the crime level has increased in their area during the economic crisis can be seen.



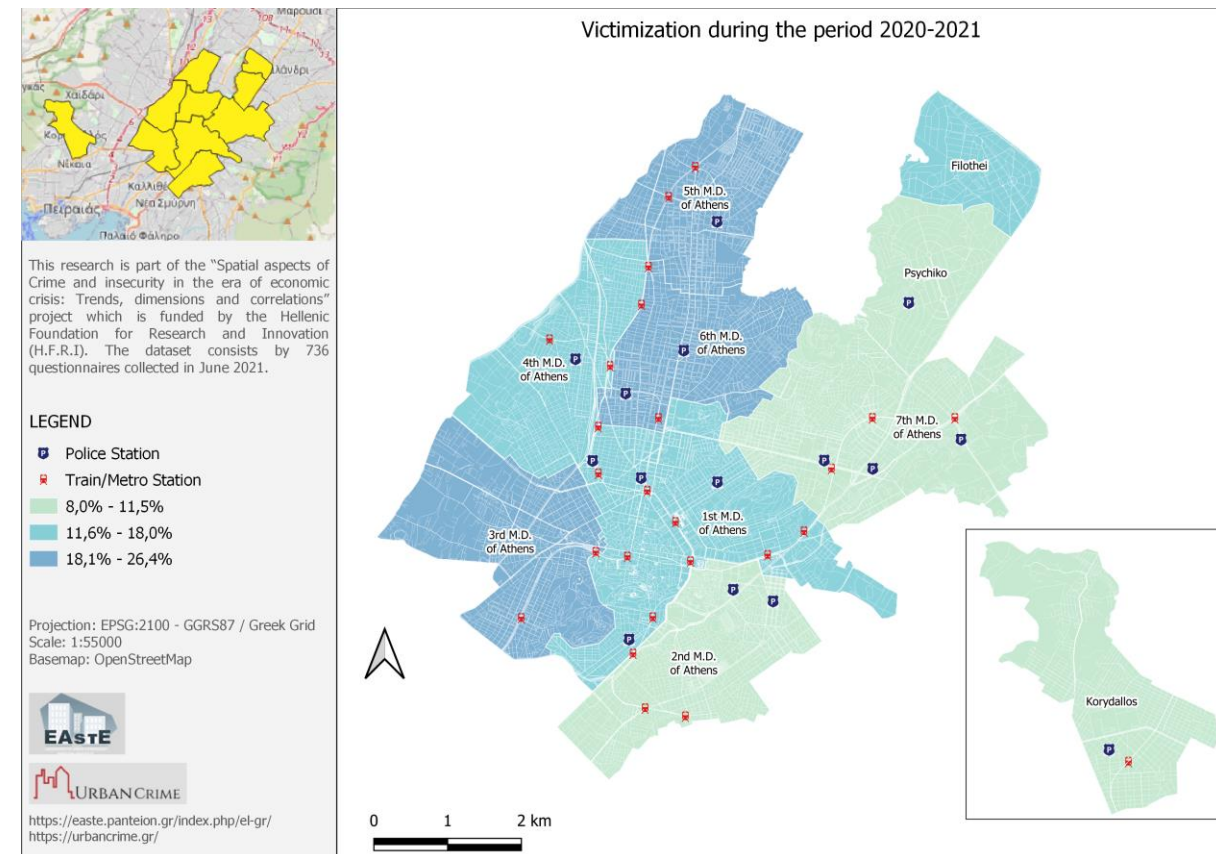
Similarly for the period 2020-2021.

The increase was considered high during the economic crisis and particularly in the west MDs of Athens.

Victimization



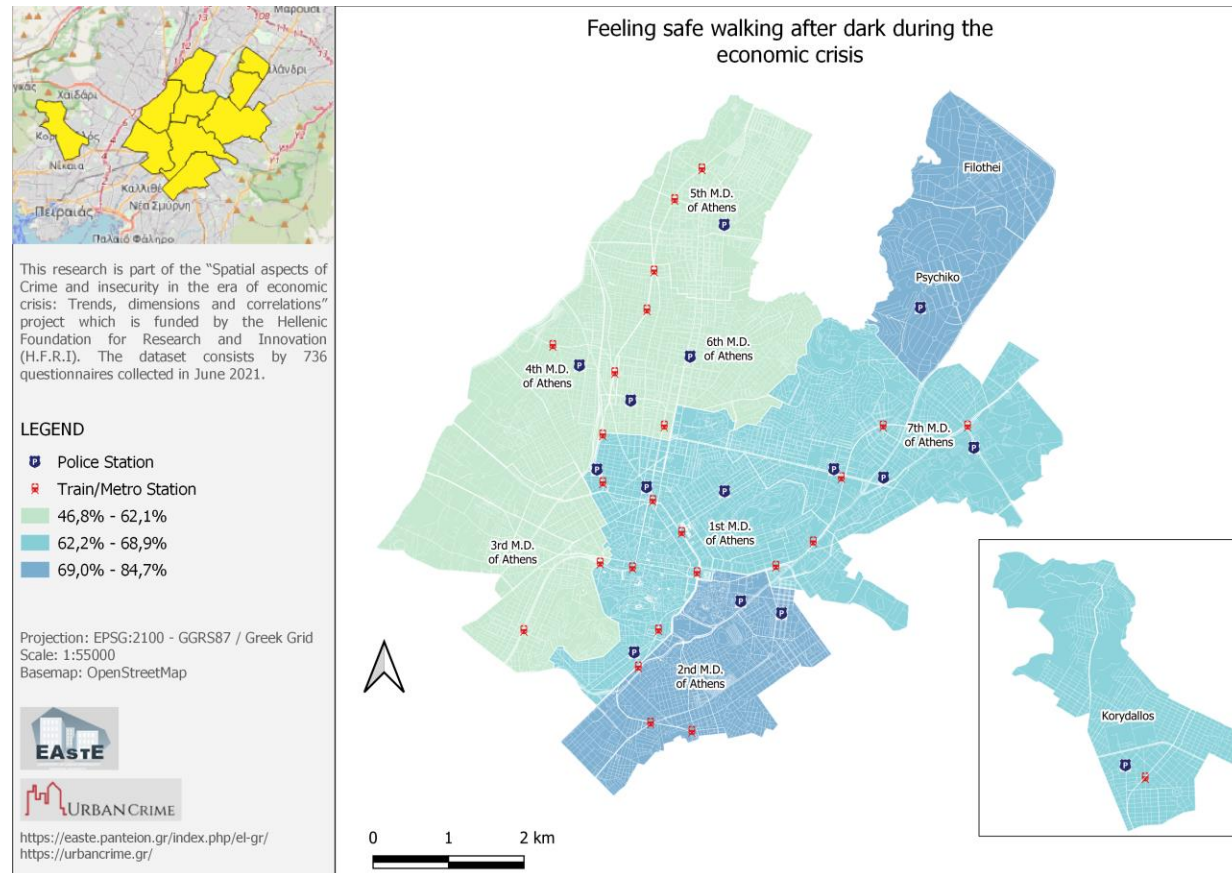
In the above map, we illustrate the percentage of the respondents, or a member of their family that have been victimized during the economic crisis.



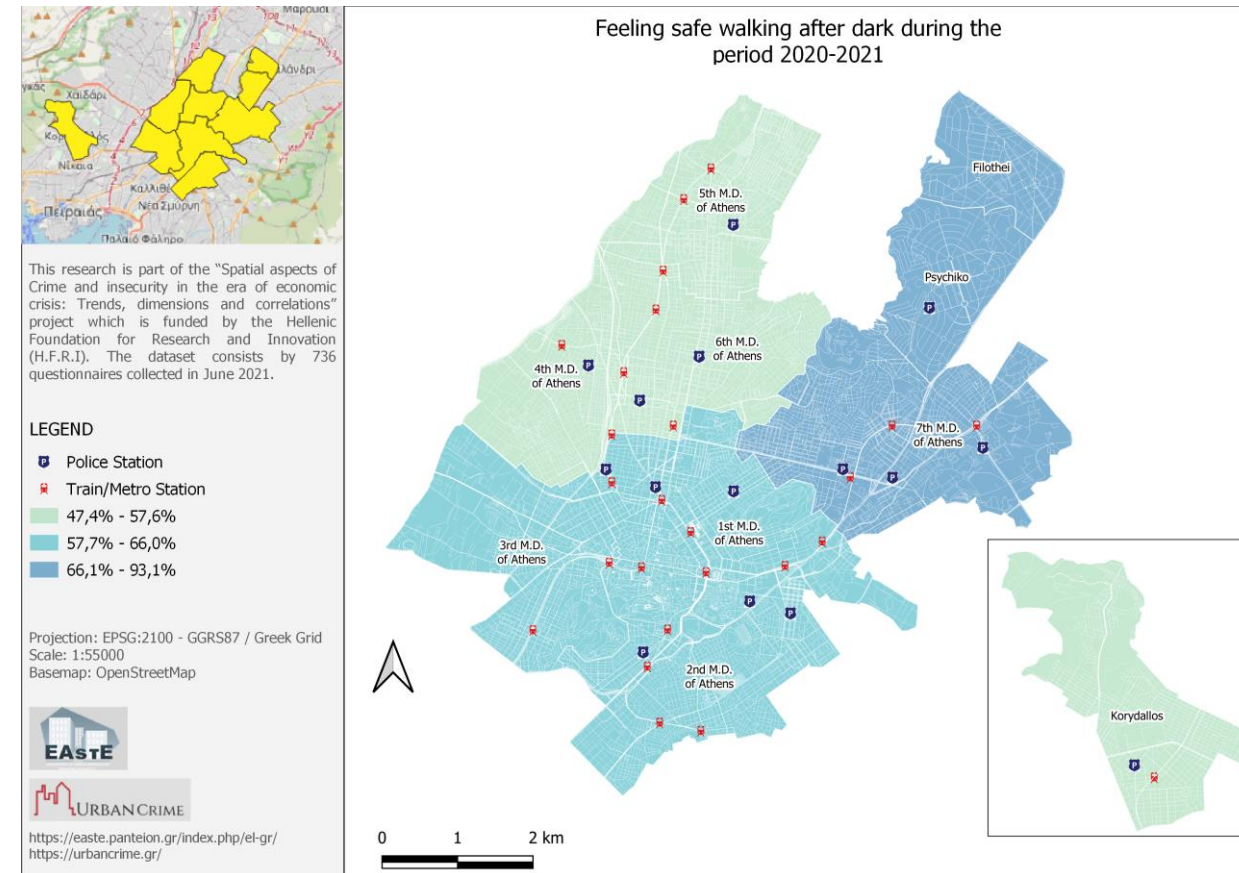
Similarly for the period 2020-2021.

The victimization in the economic crisis was higher in Psychiko and in 1st and 6th MDs of Athens.

Feeling safe



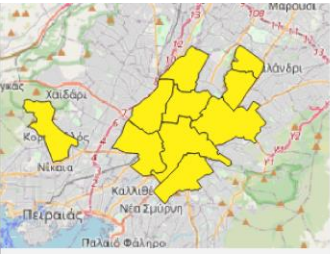
In the above map, we illustrate the percentage of the respondents that felt safe walking in their area after dark, during the economic crisis.



Similarly for the period 2020-2021.

Filothei/Psychiko and the 2nd MD of Athens have the highest percentages of respondents feeling safe during the economic crisis.

Police work



This research is part of the "Spatial aspects of Crime and insecurity in the era of economic crisis: Trends, dimensions and correlations" project which is funded by the Hellenic Foundation for Research and Innovation (H.F.R.I.). The dataset consists by 736 questionnaires collected in June 2021.

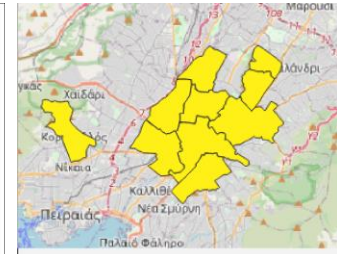
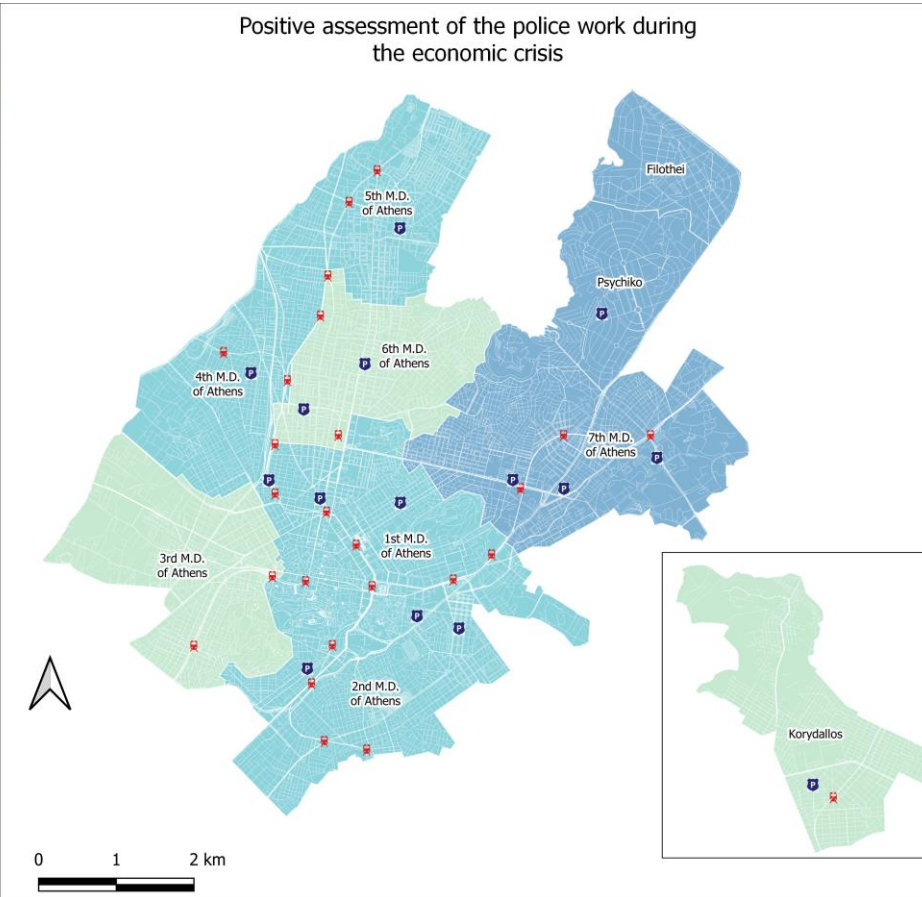
LEGEND

- Police Station
- Train/Metro Station
- 23% - 34%
- 35% - 46%
- 47% - 58%

Projection: EPSG:2100 - GGRS87 / Greek Grid
Scale: 1:55000
Basemap: OpenStreetMap



<https://easte.panteion.gr/index.php/el-gr/>
<https://urbancrime.gr/>



This research is part of the "Spatial aspects of Crime and insecurity in the era of economic crisis: Trends, dimensions and correlations" project which is funded by the Hellenic Foundation for Research and Innovation (H.F.R.I.). The dataset consists by 736 questionnaires collected in June 2021.

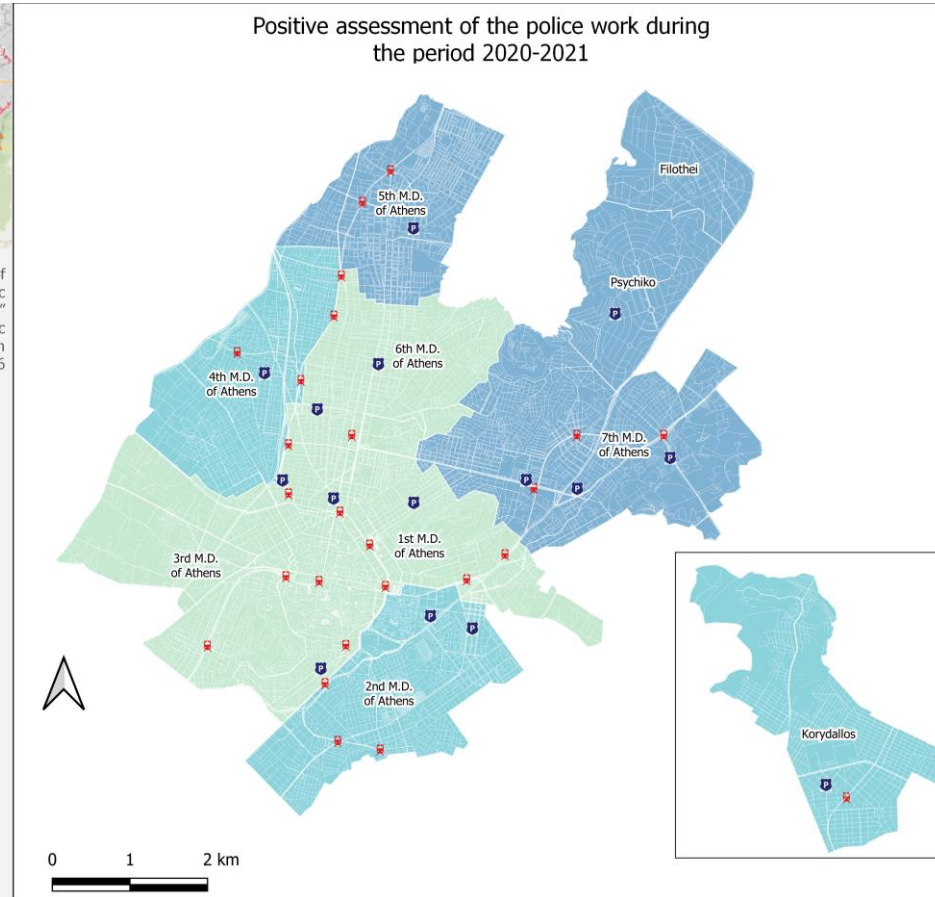
LEGEND

- Police Station
- Train/Metro Station
- 34,8% - 44,2%
- 44,3% - 50,8%
- 50,9% - 58,4%

Projection: EPSG:2100 - GGRS87 / Greek Grid
Scale: 1:55000
Basemap: OpenStreetMap



<https://easte.panteion.gr/index.php/el-gr/>
<https://urbancrime.gr/>



In the above map, we illustrate the percentage of the respondents that assess positively the police work during the economic crisis.

Similarly for the period 2020-2021.

The highest satisfaction of the respondents are in Fillothei/Psychiko and the 7th MD of Athens.

Modeling (spatial econometrics)

	During economic crisis % frequency	During 20-21 %frequency
dependent variable: Feeling safe	63.7	62.2
covariates:		
Male	46.0	
Age	51.5 (mean)	
Length of residence in the same area		
< 1 year	1.1	
1-10 years	12.1	
> 10 years (base)	86.8	
Tertiary education	74.8	
Economic Status		
Good	45.7	
Medium	45.0	
Bad (base)	9.3	
Victimization	34.6	16.4
Satisfaction from the police work	41.4	48.3
Number of valid cases	604	

Note: All variables are binary (0/1), except from the length of residence and the economic status that is ordinal and the age that is continuous.

The models examine the relationship between fear of crime and several socioeconomic characteristics such as gender, age, economic status, education, length of residence and crime experience (Tseloni & Zarafonitou, 2008).

The responses of walking alone after dark feeling very safe and fairly safe, have been coded into 1 in the variable “feeling safe”, those that have post-secondary education have been coded to 1 in the variable “Tertiary education” and those that responded that the police work is very or enough effective have been coded to 1.

The responses have been geocoded and we have built a Probit and a SAR Probit model (Lesage et al., 2011; Lesage & Pace 2009; Anselin, 2002).

The results have been produced in R by using the packages “spatialprobit” (Wilhelm και de Mattos, 2013) and “margins” (Leeper, 2021).

Probit model

	During the crisis	After the crisis
(intercept)	-0.20 (0.21)	-0.65 ** (0.21)
Male	0.45 *** (0.11)	0.56 *** (0.11)
Age	0.01 (0.06)	-0.06 (0.06)
Length of residence in the same area		
(>10 years)		
1 - 10 years	-0.36 * (0.17)	0.03 (0.18)
< 1 year	0.15 (0.52)	0.23 (0.52)
Tertiary education	0.34 ** (0.13)	0.56 *** (0.13)
Economic status		
(Bad)		
Medium	0.48 * (0.19)	0.52 ** (0.20)
Good	0.61 ** (0.19)	0.78 *** (0.20)
Victimization	-0.12 (0.11)	-0.20 (0.15)
Dissatisfaction from the police work	-0.49 *** (0.11)	-0.46 *** (0.11)
AIC	745.05	723.36
BIC	789.08	767.39

*** p < 0.001; ** p < 0.01; * p < 0.05.

In both models the statistically significant variables are the gender, the education, the economic status and the dissatisfaction from the police work.

In the models, males have greater probability of feeling safe as well as those that have tertiary education. On the other hand, those who are dissatisfied from the police work have lower probability of feeling safe. Also, those with a good economic status have higher probability of feeling safe in comparison with those with bad economic status.

Below we can see the marginal effects.

	During the crisis	After the crisis
Male	0.155 ***	0.187 ***
Age	0.000	-0.001
Length of residence in the same area		
(>10 years)		
1 - 10 years	-0.126 *	0.009
< 1 year	0.049	0.073
Tertiary education	0.118 **	0.194 ***
Economic status		
(Bad)		
Medium	0.175 *	0.187 **
Good	0.221 **	0.274 ***
Victimization	-0.041	-0.068
Dissatisfaction from the police work	-0.168 ***	-0.156 ***

*** p < 0.001; ** p < 0.01; * p < 0.05.

SAR probit model

	During the crisis	After the crisis
(Intercept)	-0.35 (0.28)	-0.52 (0.31)
Male	0.47 *** (0.11)	0.59 *** (0.12)
Age	0.00 (0.00)	-0.00 (0.00)
Length of residence in the same area (>10 years)		
1 - 10 years	-0.36 * (0.17)	0.02 (0.18)
< 1 year	0.17 (0.54)	0.15 (0.51)
Tertiary education	0.32 * (0.13)	0.51 *** (0.13)
Economic status (Bad)		
Medium	0.49 * (0.19)	0.55 ** (0.21)
Good	0.60 ** (0.19)	0.78 *** (0.22)
Victimization	-0.14 (0.11)	-0.17 (0.15)
Dissatisfaction from the police work	-0.47 *** (0.11)	-0.47 *** (0.12)
ρ	0.32 *** (0.10)	0.34 *** (0.09)

*** p < 0.001; ** p < 0.01; * p < 0.05.

	Posterior mean		
	Direct effect	Indirect effect	Total effect
Male	0.159 ***	0.076 ***	0.235 ***
Age	0.000	0.000	0.000
Length of residence in the same area (>10 years)			
1 - 10 years	-0.121 *	-0.057 *	-0.179 *
< 1 year	0.056	0.027	0.083
Tertiary education	0.110 *	0.051 *	0.161 *
Economic status (Bad)			
Medium	0.167 *	0.080 *	0.248 *
Good	0.205 **	0.098 **	0.302 **
Victimization	-0.046	-0.022	-0.069
Dissatisfaction from the police work	-0.160 ***	-0.076	-0.236 ***

*** p < 0.001; ** p < 0.01; * p < 0.05.

	Posterior mean		
	Direct effect	Indirect effect	Total effect
Male	0.193 ***	0.098 ***	0.291 ***
Age	-0.001	-0.000	-0.002
Length of residence in the same area (>10 years)			
1 - 10 years	0.009	0.004	0.012
< 1 year	0.050	0.027	0.078
Tertiary education	0.169 ***	0.084 ***	0.253 ***
Economic status (Bad)			
Medium	0.180 **	0.090 **	0.271 **
Good	0.257 ***	0.129 ***	0.385 ***
Victimization	-0.056	-0.027	-0.083
Dissatisfaction from the police work	-0.155 ***	-0.077	-0.232 ***

*** p < 0.001; ** p < 0.01; * p < 0.05.

Conclusions

- The sectors mostly affected by the economic crisis in Greece are the unemployment, the poverty, the trade, the quality of life and crime.
- The majority of the sample reported that their household's financial situation worsened during the economic crisis, especially in terms of the family income and savings as well as the expenses for entertainment, heating and food.
- Impact of the economic crisis on the Municipality: closing shops, increase of unemployment, degradation of quality of life and reference to further social and environmental degradation follows.
- Crime is reported to have increased in 2009-2019 in the Greek territory and also in the area of residence.
- The majority of the sample reported feeling safe walking alone after dark during the economic crisis.

Conclusions

Korydallos MD. The economic status of the respondents is not considered good. The economic status of the household worsened during the economic crisis and the effect was high on various sectors.

During the economic crisis, victimization is lower while after that we notice an increase in crime levels, with a low % of feeling safe but lower % of victimization in comparison with the other MDs.

6th MD of Athens. The economic status of the respondents is not considered as good. The deterioration of the economic status of the household is high.

In the 6th MD during the economic crisis, we notice a high % of victimization with low feeling of safety while in the following years (2020-2021) we notice an increased % of crime level, in victimization and a low % in feeling safe walking after dark.

(similar conclusions can be drawn for other MDs of Athens e.g. 3rd , 4th , 5th)

Psychiko MD. The economic status of the respondents is considered as good. The effect of the economic crisis in the economic status of the household has a lower % in comparison with other MDs.

During the economic crisis, victimization is higher as well as the % of feeling safe while after that we notice a low % in the increase in crime levels and victimization, along with a high feeling of safety in comparison with the other MDs.

Filothei MD has similar but better results except that during the economic crisis, victimization is low .

Conclusions

- Two models have been built. The first refers to the economic crisis period while the second refers to the last two years 2020-2021. The models have been spatially extended.
- In all the models the statistically significant variables are the gender, the education, the economic status, the satisfaction from the police work and the coefficient of spatial dependence ρ .
- More specifically, men have higher probability to feel safe, as well as respondents with high education. Also, the dissatisfaction from the police work has a negative impact in the probability to feel safe walking after the dark. Finally, good and medium economic status have a positive impact on the safety feeling in comparison with base status which is the bad economic status.
- As far as the model of the economic crisis and the corresponding of the period 2020-2021 are concerned, when comparing the impact of the covariates on the safety feeling, we notice that in both spatial and aspatial model, there is an increase in the effect of the gender, education and economic status. Also, the satisfaction of the police work in the spatial models remains constant.
- At the end, the statistically significant and high value of « ρ » in both models, denotes an important spatial dependence of the probability of the respondents to feel safe with their “neighbors”.

Selected references

- Arvanites, Th. & Defina, R. (2006). Business cycles and street crime. *Criminology*, 44(1), 139- 164.
- Box, S., Hale, C., & Andrews, G. (1988). Explaining fear of crime. *The British Journal of Criminology*, 28(3), 340-356.
- Britto, S. (2013). Diffuse anxiety: The role of economic insecurity in predicting fear of crime. *Journal of Crime and Justice*, 36(1), 18-34.
- Dammert, L. & Malone, M.F. (2006). Does it take a village? Policing strategies and fear of crime in Latin America. *Latin American Politics and Society*, 48 (4), 27–51.
- Garland, D. (2001). *The culture of control. Crime and Social Order in Contemporary Society*. Oxford University Press: Oxford.
- Hideg, G. & Manchin, R. (2005). Environment and safety in European capitals based on the data of the European International Crime Survey (EU ICS). Gallup Europe, EUICS Working Papers.
- Koufaris, G. (2010). The global financial crisis and the stock markets. *Xrima*. Issue of January-February (in Greek).
- Killias, M. (1990). Vulnerability: Towards a Better Understanding of a Key Variable in the Genesis of Fear of Crime. *Violence and Victims*, 5(2), 97-108..
- Leeper, TJ (2021). *margins: Marginal Effects for Model Objects*. R package version 0.3.26.
- LeSage, J. and Pace, R. K. (2009). *Introduction to Spatial Econometrics*. CRC Press.
- LeSage, J., Pace, R. K., Lam, N., Campanella, R., and Liu, X. (2011). New Orleans business recovery in the aftermath of Hurricane Katrina. *Journal of the Royal Statistical Society*, 174 (4), 1007-1027.
- Lewis, D.A., & Salem, G. (1986). *Fear of crime: Incivility and the production of a social problem*. New Brunswick, Transactions.
- McLaughlin, E. & Muncie, J. (2006). *The Sage Dictionary of Criminology*. 2nd edition, Sage Publishers: London-California-N.Delhi.
- Pagoulatos, G. & Triantopoulos Ch. (2009). The Return of the Greek Patient: Greece and the 2008 Global Financial Crisis. *South European and Politics*, 14 (1), 35-54.
- Pantazis, C. (2000). Fear of Crime, Vulnerability and Poverty. Evidence from the British Crime Survey. *The British Journal of Criminology*, 40, 414-436.

Selected references

- Raphael, S., & Winter-Ebmer, R. (2001). Identifying the effect of unemployment on crime. *Journal of Law and Economics*, 44(1), 259-283.
- Rosenfeld, R. & Fornango, R. (2007). The impact of economic conditions on robbery and property crime: The role of consumer sentiment. *Criminology*, 45(4), 735-769.
- Rosenfeld, R., & Messner, S. (2009). The crime drop in comparative perspective: the impact of the economy and imprisonment on American and European burglary rates. *The British Journal of Sociology*, 60(3), 445-471.
- Tseloni, A., and Zarafonitou, C. (2008). Fear of Crime and Victimization. *European Journal of criminology*, 5(4), 387-409.
- UNODC (2011). Monitoring the impact of economic crisis on crime. Rapid Impact and Vulnerability Analysis Fund.
- Will, J. A. & McGrath, J. H., (1995). Crime, Neighborhood Perceptions, and the Underclass. The Relationship between Fear of Crime and Class Position. *Journal of Criminal Justice*, 23(2), 163-176.
- Wilhelm, S., and de Mattos, M. (2013). Estimating Spatial Probit Models in R, *The R Journal*, 5 (1), 130-143.
- Zarafonitou, Ch. (2002). *The fear of crime. A criminological approach and inquiry based on ana empirical study of the phenomenon within the city of Athens*, Athens-Komotini, European Studies in Law, A. Sakkoulas Publ. (in Greek & English).
- Zarafonitou, Ch. (2004). Empirical Criminology. Nomiki Vivliothiki: Athens (in Greek).
- Zarafonitou, Ch., Courakis, N. (eds.) (2009). *(In)security, punitiveness and criminal policy*, Athens-Komotini, Sakkoulas Publ, (in Greek).
- Zarafonitou, Ch. (2011). Fear of crime in contemporary Greece. Research evidence. In Zarafonitou Ch. (Guest Editor), Fear of Crime. A Comparative Approach in the European Context. *CRIMINOLOGY*, SPECIAL ISSUE, 50-63.
- Zarafonitou, Ch. (2014). Criminal victimisation in Greece and the fear of crime: A “Paradox” for interpretation. *International Review of Victimology*, 277-299.

- THANK YOU FOR YOUR ATTENTION



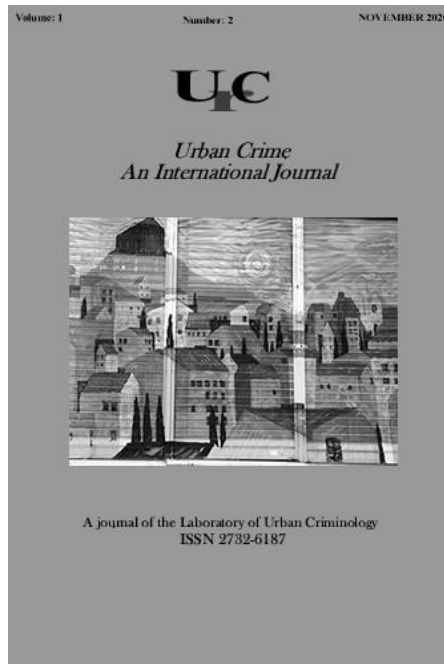
chrizara@panteion.gr



Laboratory of Urban Criminology

Contact us : easte@panteion.gr

More Info : <https://bit.ly/2H4kmoi>



Urban Crime - An International Journal

Contact us : urbancrimejournal@gmail.com

More Info : shorturl.at/flnrx



The research project was supported by the Hellenic Foundation for Research and Innovation (H.F.R.I.) under the “1st call for H.F.R.I. Research Projects to support Faculty Members & Researchers and the Procurement of high-cost research equipment grant” (Project Number HFRI-FM17-3898) (<https://www.elidek.gr/>)