

Crime regions in Lithuanian major cities and their suburbs

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Abstract:

Spatial data provides very important insights into the spatial patterns of criminal activity, allowing identify high-risk areas, understand crime trends, to assess the spatial relationships between crime and various social, economic and environmental factors. Using spatial data, decision makers can prepare targeted intervention measures, allocate resources effectively and implement proactive measures aimed at crime in cities and in the suburbs, which successfully identifies more efficient and sustainable solutions to increase public safety and community well-being. However, crime cannot be analyzed within cities alone; it is essential to extend this analysis to surrounding suburban areas to gain a comprehensive understanding of crime patterns. This holistic approach acknowledges that criminal activities and their influencing factors often transcend urban boundaries, impacting adjacent suburban regions.

In 2023, the research project titled “Crime Regions in Lithuanian Major Cities and Their Suburbs” was conducted at Klaipėda University in collaboration with Vilnius University. The study aimed to explore the crime regionalisation methods for Lithuanian major cities and their suburbs. The project utilized data from The Register of Events Recorded by the Police (RERP), encompassing registered events with characteristics of crimes, serving as reliable indicators of criminal activity. This paper presents the results of an analysis using big data on violent crime (VIO), property crime (PRO), and infringements against public order (IPP) recorded by the police from 2015 to 2020 in the territories of three major Lithuanian cities and their suburbs.

Investigating crime in major cities and their suburbs requires a multifaceted approach, from defining what constitutes a suburb to developing methods for precise identification of suburban areas. Suburbs are generally characterized by their proximity to urban centers, lower population density compared to cities, and residential and commercial land use. We use a variety of spatial data layers, including address points, population data, road networks and building footprints, to pinpoint suburbs. By analyzing these data sets and applying spatial analysis techniques such as density and proportion calculations, suburban boundaries can be determined. It was noted that there are no studies that use spatial analysis methods and geographic data to identify the suburbs of large cities. This study focuses much more on the spatial distribution and regionalization of crime, and the methodology for identifying suburbs needs to be improved. However, the methodology developed for extracting suburbs has demonstrated that spatial data and spatial analysis methods can be effectively applied in this type of research. This makes a novel contribution to spatial crime research.

Once suburbs are delineated, conducting spatial analysis of crime within these areas requires diverse methods to capture the complexity of the crime patterns. Three commonly employed methods include density maps, densities differences, and location quotients were applied. We found out that in the major cities, the majority of incidents are recorded in the central parts of the cities; violent incidents are more frequent in residential areas around city centers; the intensity of public order offences is highest in the central parts of cities; property crimes are highest in central cities parts with hot spots near shopping centers and main roads. In Lithuania, intensive research on the geography of crime commenced only in 2010. Spatial dispersion analysis and the insights it provides are invaluable for researchers across various fields, aiding in a deeper understanding of crime phenomena and facilitating more informed decision-making for its management.

We have produced a set of maps showing the results of standard spatial analysis methods. On one hand, these maps are excellent analytical tools to gain a better understanding of the crime phenomenon in any country or city. On the other hand, they may be difficult to understand for national and local politicians, development strategists and urban planners and managers, who are responsible for making decisions that are important for the entire population of the country or in particular geographical regions. Therefore, we looked for the methods of presenting spatial information in a simple and convenient way.

This distinction between major city districts and suburbs unveils insights into crime spatial patterns, driven by social, demographic, economic, and developmental factors unique to each territory. Excluding districts (territorial clusters) in each city, it has been found that in the central parts of the metropolitan areas, there are the highest number of incidents, while suburban areas tend to have no incidents or very few (especially in the case of Klaipėda). To date, there has been no research on crime regionalisation in Lithuania. This study addresses this gap by providing a detailed analysis of various regionalisation methods to assess their suitability for the data analyzed. The findings are expected to offer valuable insights into the patterns of crime distribution, contributing to the broader field of crime geography and supporting policymakers in developing targeted strategies for crime prevention and management. Through this comprehensive assessment, the study seeks to establish a foundational framework for future research on crime regionalisation in Lithuania.

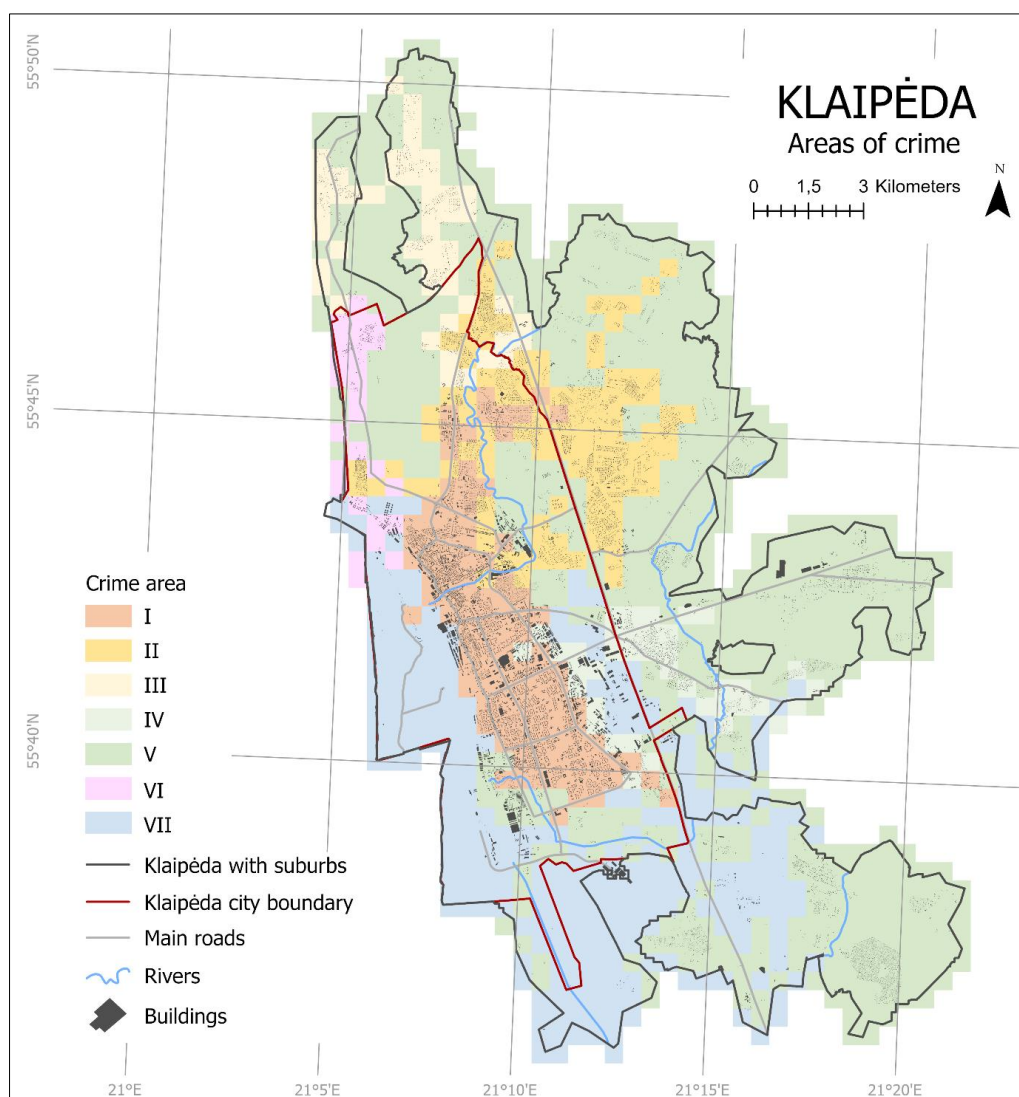


Figure 1. Areas of urban crime in Klaipėda