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Trends and distribution of drug-related and associated events: A case study of Vilnius

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Abstract. This case study provides an analysis on a concerning social issue in Lithuania. The author's recent research suggests that the use of drugs in the country is on the rise. Often drug addiction is recognized as a serious public health concern, potentially leading to severe health disorders and toward a downward spiral in life that often correlates with increased criminal activity. Additionally, research has shown a possible link between incidents related to drugs and incidents related to other possible crimes. This case study specifically analyzed the spatial dispersion of drug-related and other crime related events in Vilnius, the capital city of Lithuania. The findings reveal that the highest concentration of drug-related incidents was recorded in the vicinity of the Roma tabor, which historically exhibited the highest incident rates in the city. Following the government's decision to demolish the tabor in 2020, the area experienced an approximate 54% reduction in drug-related events. However, a subsequent increase in drug-related events was observed in several residential districts of Vilnius. Therefore, by examining the period before, during, and after the demolition of the tabor, the analysis provides valuable insights into the spatial patterns of events in Vilnius, Lithuania.

Submission Type. Case study.

BoK Concepts. [GS3] Use of geospatial information; [AM5] Basic analytical methods; [CV5] Map production.

Keywords. spatial distribution, drugs, crime.

1 Introduction

Research in crime geography suggests that criminal events are not randomly distributed across urban environments. Rather, studies show that events exhibit clear spatial and temporal regularities, clustering in specific areas of a city and reoccurring at a particular time. Furthermore, the distribution of events is very closely associated with demographic characteristics, land-use structures, and the economic condition of the local population. (Ceccato, 2005)

Global statistics indicate that the number of drug users worldwide has increased from 240 million in 2011 to 296 million in 2021 (5.8% of the global population aged 15-64, United Nations Office on Drugs and Crime). The relationship between drugs and crime is complex, highlighting the debate of whether drug use causes people to engage in criminal activity, or whether those who use drugs are already predisposed to such activity. Most drug users do not engage in any other non-drug-related crimes, and most criminals never use drugs. However, at the most intense levels of drug use, drugs and crime are directly and strongly linked, and high intensity drug use is strongly associated with continued and criminal activity (NCADD, 2025). Prior research conducted by the author in recent years has identified trends in the spatial distribution of potential criminal events. For example, the 2025 study of a broad variation of Lithuanian national, regional and local parks revealed a trend that events, ranging from drug-related to theft or abuse, are more likely to occur near park recreation areas, such as smaller lakes, parking and residential areas.

This study examines the topic of the Roma tabor, primarily focusing on the effect on the distribution of drug-related and other criminal related events, identifying relationships and common areas of concentration.

1.1 Literature review

The topic of the tabor in Vilnius has been examined to a limited extent, therefore research on this topic is vital. Earliest research papers on this topic were conducted in

2015, which found that over the span of four years (2011–2014), approximately a one-third of all Lithuanian drug-related events were linked to an address in the Roma Tabor community in the south of Vilnius (EPDT, 2015). This address was the only house that had been legally registered and as a result, a large majority of offences were connected to that specific address. The other 70 (approximate) houses within that community were not legally registered, as they have been built without the authorization of the Lithuanian government. Further analysis showed that over half of cocaine and heroin offences were transported from the Roma tabor to other Lithuanian cities including, but not limited to; Vilnius, Visaginas, Klaipėda, Previous research indicates that the Roma community in Vilnius suffers exclusion from public life and the labor market as well as experiencing health and housing issues (EDPT, 2010). The study suggests that social exclusion from the labor market may have pushed the Roma community towards drug trafficking as a principal source of income. This is supported by the United Nations (UN) who have identified that a large part of the adult Roma in the tabor has been convicted for illegal possession of narcotic and psychotropic substances.

To understand the reasoning behind the tabor and how it emerged, it is important to consider the historical context history behind it. The tabor is in Naujininkai, which is a residential-industrial district in the south of Vilnius, with a population of 36 082 (2023). The development of this district began after the central train station was built, thus the need for housing had risen. The main population of this district was the working-class people. For the Roma, the Vilnius tabor in the south of the district was a place which functioned as a place of residence, therefore providing safety. The tabor was a home to over 500 people, the biggest Roma settlement in the Baltics. Another study on the Roma tabor noticed that the ethnic minority possibly had an influence on the increased spread of drugs in the vicinity area. Before the camp was destroyed in 2020, the area was widely identified as a center for drug trafficking. According to the head of the Roma Community Center, drug trafficking began in 1997. Previous reports indicate, that after the independence of Lithuania, the mentality of the Roma population changed. It is believed that income from drug sales led to an irresponsible attitude towards the future.

As this is an ongoing study, interviews with people from the demolished Roma tabor are planned, to fully understand their perspective of life, before and after the demolition.

2 Data and Methods

The main objective of this case study is to directly evaluate how the demolition of the Roma tabor in Vilnius influenced the spatial distribution of events recorded by the Lithuanian Police, even possibly finding strong links between the different types of events.

2.1 Data

This case study is based on the Register of Events Recorded by The Lithuanian Police (hereinafter referred to as RERP). It is the national police database that is used to register events by the Lithuanian police including reports of possible crime events, individuals taken into custody and other possible incidents. The RERP has existed since 2005, when the Lithuanian Police Commissioner signed an order establishing this register. The main goal of this administrative register is to "register objects in the register, collect, accumulate, process, systematize, store and provide data and documents from the register to natural and legal people, and perform other data management activities related to the register". This order defines the objects of the register as: (1) criminal offenses; (2) other violations of the law; and (3) events whose investigation is legally assigned to the police. The register also includes information on investigative actions taken, their outcomes, and decisions to refuse the initiation of pre-trial investigations (hereinafter referred to as events registered by the police) (Order of the Lithuanian Police Commissioner General, 2005).

It should be noted that all events that are identified in this research are equal to activities that may in some way be related to criminal activity, which means that an event is not necessarily a crime - it remains alleged until proven in court. This distinction aligns with the fundamental legal principle of the presumption of innocence, which holds a person innocent until proven otherwise. Additionally, this classification exists because data for this register is provided by representatives of various professions and fields – not only police officers, but also, for example, victims. There are cases where it is precisely the victims who provide the data. As stated, "Data is provided to the register by victims, police officers, officers of other law enforcement agencies, police supporters, security service or security unit employees, healthcare institution employees, and other persons who have witnessed incidents recorded by the police."

The RERP is the main source of data for this study, providing detailed information: the exact location of events according to coordinates, the exact time and date of these acts, comments or even a broader description. Collected over a period of 15 years from the date of the event, the data allows for excellent analysis and assessment of the recurrence of certain events in a selected area.

Considering the mentioned before, to achieve the study objectives, the RERP used for the case study is in a state where the data has been anonymized. This means that all events and their descriptions do not mention the names and surnames of possible offenders or injured people. This prevents personal data security breaches. For the

purposes of this case study, data collected on incidents in Vilnius, Lithuania from 2015 to 2024 will be used. The data is collected in vector and raster formats, and their attributes are identical in both formats. The following information is provided on all events:

1) Event date – this attribute indicates the exact date when the event took place; it is presented in the following format: year – month – day – hours: minutes: seconds.

2) The registration date is an attribute indicating the date when the event was recorded in the database. It is presented in the format: year – month – day – hours: minutes: seconds.

3) Type is an attribute that is divided into two parts in the database – the first and the second. The first part specifies the abbreviation of the recorded event, for example: drug-related incidents (DRG), public order violations (POV), violence-related incidents (VIO), thefts (TFT). In the second part, the data is divided into a more detailed classification of crimes, for example: crimes against people, traffic violations, etc.

4) X coordinates of the event - Coordinates of the event that are provided in Lithuanian Coordinate system (LKS)

5) Y coordinates of the event - Coordinates of the event that are provided in Lithuanian Coordinate system (LKS)

6) Location – an attribute that is also divided into two parts – the first and the second. In the first case, the approximate location of the event is indicated, for example, a street, a vehicle, or residential premises. The second case provides a more detailed location of the event, e.g., a multi-story parking lot or a gas station.

7) Municipality – an attribute indicating the municipality in which the event was recorded.

8) Eldership – this attribute indicates the eldership in which the event was recorded in the database.

9) Street – this attribute indicates the street where the event was recorded.

10) House – this attribute indicates the house where the event was recorded.

11) Apartment – an attribute that indicates in which apartment an event took place.

2.2 Data and Software Availability

This case study uses data from the Address Register of the Republic of Lithuania as recent as of February 2026. Additionally, data from the 2021 Census and Housing data of the Lithuanian population. All the data sets are open and can be freely reached publicly via the web. Regarding the RERP it should be mentioned that this data source is not open, and only a simpler version of the register is available for the public. The simple version of this register provides information linked to geographic coordinates and summarized in statistical grids of 20, 10, 5 and 2.5 sq. km., provided as open data, which also doesn't provide any sensitive data. The main analysis **was** conducted using ArcGIS Pro software, version 3.6.

2.3 Methods

To reach the goals for the study, a comparative approach was applied to assess changes in incident patterns before and after the demolition of the Roma tabor. The analysis of the dataset was therefore divided into three parts: demolition, demolition year, and post demolition to enable a smooth comparison. The necessary event data was used from the RERP and filtered by municipality and event type. Drug-related events and selected associated events were extracted and processed in a GIS environment (ArcGIS Pro 3.6). Data selection, aggregation, and spatial filtering methods were applied to ensure consistency and comparability across time periods. Cartographic techniques were used to illustrate concentrations of incidents and to identify spatial shifts following the demolition of the Roma tabor.

3 Results and discussion

3.1 Results

During the study research period of 2015–2024, a total of 5 637 833 events were registered by the Register of the Lithuanian Police nationwide. Out of these events, 1 873 642 of them were recorded in Vilnius, underscoring the city's demographic and functional significance within Lithuania. Additionally, 20 703 drug-related events were documented in the capital alone. Although these figures refer to registered events rather than confirmed criminal offenses, the high concentration of events in Vilnius highlights its central role in national patterns and provides a strong motive for focusing the spatial analysis on the city and its districts.

The figures displayed below can be put in two categories. First, the figures show events related to drugs that are shown in a density style map, where the total number of events in Vilnius is shown, this allows for a simple, yet effective analysis of Vilnius City Municipality. Furthermore, the second part of the results can be described as the relative part. The results here are calculated based on the House and Census data, where the relative number of incidents is calculated per 1 000 inhabitants, this way the results are easier to compare in areas with very different population sizes, for example the

city center and a small neighbourhood far from the city, for this reason it is appropriate to use relative values.

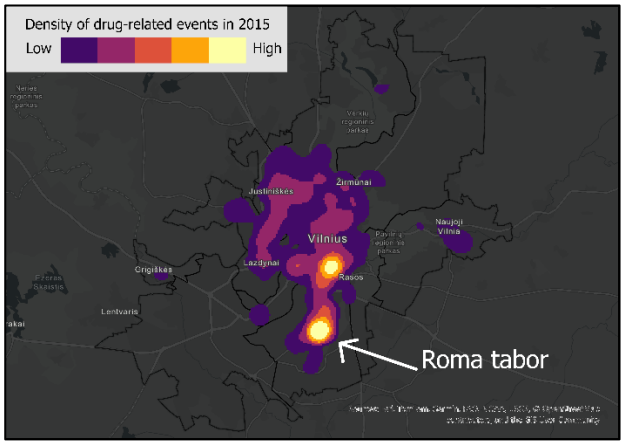

Figure 1. Density of drug-related events recorded by the Lithuanian police in Vilnius, 2015.

The first year of the research period (2015) shows that this was the most active year of the Roma tabor with a total of 2 282 events related to drug offenses in Vilnius were recorded, with the most affected areas being the city center (Old Town and New Town) and the Roma tabor where 894 events were recorded this year (Figure 1). The distribution of events up until the demolition of the tabor (2015–2019) fully solidifies the tabor's influence on spatial concentration of the RERP events.

Following the results we approach a year that not only marked the end of the tabor but was also approached with a global pandemic. Based on this study, the results show that the COVID-19 pandemic did not have such a big influence on the number of events recorded in Vilnius. The statistics show that 1 698 events related to drug use were recorded. Compared to the average number of incidents recorded per year (1 828), there were only 130 fewer cases in 2020. Additionally, the map also demonstrates that the biggest hot spot has moved from the tabor, notably during the pandemic the events had a wider distribution in the city.

After the camp was dismantled in March 2020 and the structures there were demolished, the hotspot remained for a while but began to recede. In 2021, the hotspot blended into the general background, and in 2022, it disappeared. However, hotspots have emerged and are growing in several former and new locations: Naujoji Vilnia (+29.79%), Užupis (8x, +804.35%), Šeškinė (+191.07%), Vilkpedė (+58.67%).

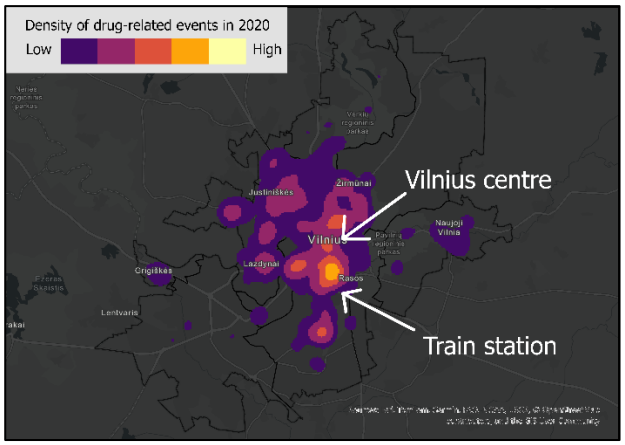

Figure 2. Density of drug-related events recorded by the Lithuanian police in Vilnius, 2020.

The following years after the full demolition of the tabor (2021–2024): The year 2022 finally marked the full disappearance of the former Roma tabor in the Naujininkai district, 2 068 events related to drug offences were recorded. If we wanted to single out new areas that could be called hotspots for drug offences, we must mention the north of the Tabor district. Currently, the Vilnius train station is located there, and unfortunately, most of the events have shifted towards that part of the city (Figure 3). Additionally, it is a must to mention that after the pandemic a high increase in the number of events in Vilnius was noted, this could be due to smaller hot-spots forming.

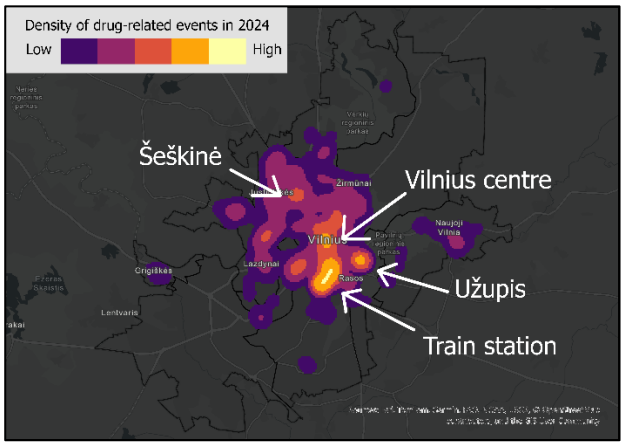

Figure 3. Density of drug-related events recorded by the Lithuanian police in Vilnius, 2024.

The situation based on relative counting provides the same insight with a slightly different perspective. Unlike density figures, which emphasize areas with a large count of events, relative counts help to truly identify a burden based on the relative number to residents. In 2015 (Figure 4), the highest relative values were also located near the tabor. Even with adjustments for population size, the surrounding area of the tabor remained of a high concentration. The city center displayed average values

without any high counts, which signals that while the total numbers were high, the intensity per 1 000 people was less extreme than in the tabor.

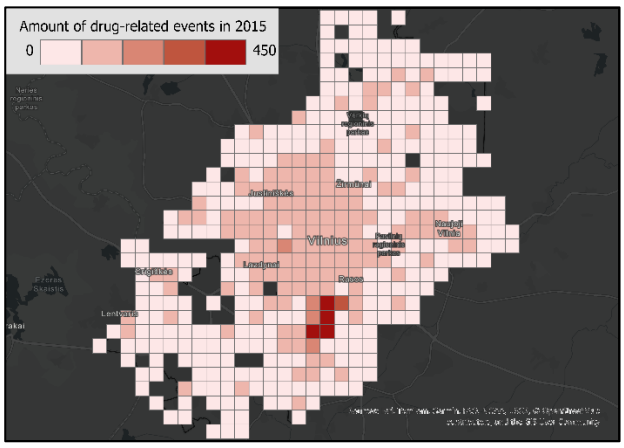

Figure 4. Distribution of drug-related events recorded by the Lithuanian police in Vilnius, 2015 (Relative)

Further, following the study, in the year 2020, where the relative counting provides better insights compared to density figures. Although the value remains high in the south of the city, the intensity seems to be less concentrated in the tabor (Figure 5). This kind of distribution signals that the tabor was not as effective as before. It is hard to pinpoint the sole reason for this distribution but because COVID-19 and the demolition started around this time, both things had an effect.

In the post demolition time (2021–2024; Figure 6) the relative counts further confirm that the demolition of the tabor had a high influence on how most of the events scattered around the city. Now, instead of one clearly dominant hot spot, the city deals with multiple cells across the south and slightly less intense in the center. All of this points to the fact that the former tabor functioned as a highly concentrated place of events related to drugs. The destruction of the tabor didn't remove the events, but it contributed to a more spatially diverse pattern across Vilnius.

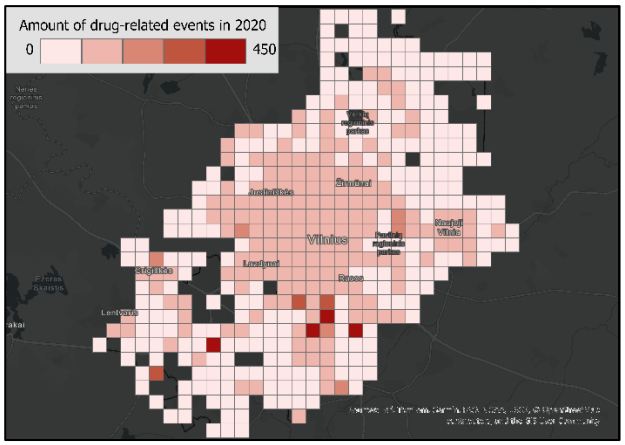

Figure 5. Distribution of drug-related events recorded by the Lithuanian police in Vilnius, 2020 (Relative)

Overall, the results show that drug-related events in Vilnius clearly have a pattern rather than a random distribution. Before 2020, it could be said that the Roma tabor and the surrounding area functioned as a clear hot spot. Additionally, this study analyzed the link between drug-related events and other events, but it is too early to make assumptions and bold statements, that is why additional analysis and research is required in the upcoming weeks.

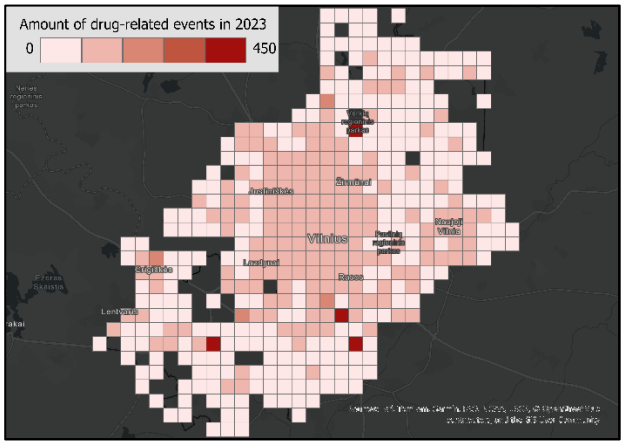

Figure 6. Distribution of drug-related events recorded by the Lithuanian police in Vilnius, 2023 (Relative)

3.2 Discussion

From 2015 to 2024, 20 703 events related to drugs were recorded in the territory of Vilnius City Municipality, with the most affected parts of Vilnius being Naujininkai (until the tabor existed), the city center, and later most of the residential areas.

This study helps to understand the dynamics of drug-related events, as before the demolition of the tabor, it was easier to see and to track the main issue and the possible distribution of drugs. Now, in the year 2025, as most

residential areas have the same issue, it becomes a harder task for the Lithuanian police force to battle.

The period of 2015 to 2024 saw an increase in the number of events registered. After the pandemic, it was possible to see that the amount fluctuated, but the last years (2024, 2023) saw an average increase of around 500 events. Multiple emerging hotspots seem like a harder task to combat, when comparing it to the one hotspot of the tabor.

Ultimately, the statistical data provides a useful overview of the dynamics and spread of possible drug-related events, but numbers alone do not fully explain the complexity of the situation. As mentioned before, a deeper dive into the life of Roma people now is expected also, which would greatly improve the understanding of this data now.

Declaration of Generative AI in writing

The author declares that they have used Generative AI tools in the preparation of this manuscript. Specifically, the AI tools were utilized for language editing and improving sentence structure but not for generating scientific content, research data, or substantive conclusions. All intellectual and creative work, including the analysis and interpretation of data, is original and has been conducted by the author without AI assistance.

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