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Birds of Feather, Flock Together?

Examining spatial clustering in drug-related homicides and gun violence

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INTRODUCTION

Homicide is generally considered the most serious of all crimes (Smit et al., 2012) and according to this line of reasoning, constitutes the “tip of the iceberg” of underlying crime. As such, homicide is frequently used as an indicator of the level of violence in cross-national and historical studies. The same could be said for drug-related homicide, specifically. Many drug-related violent incidents remain unreported – including torture, physical assault, threats and so on. In the absence of a full picture of the level of drug-related violence, it can be necessary to use other related indicators for which data is more readily available (Groshkova, Liem, Cunningham, Sedefov and Griffiths, forthcoming), such as drug-related homicide (DRH). From this perspective, DRH would form a lethal tip of the iceberg of underlying drug-related criminal violence, which in turn could be an indicator of underlying drug market activity. If we indeed consider drug-related homicide as a tip of the iceberg of underlying criminal violence, then we would expect such homicides to cluster together in time and space with other types of criminal violence – in particular firearm-related homicides and other, non-lethal firearm incidents.

In this working paper we seek to assess to what extent DRH cluster together with firearm- related violence and whether these forms of violence could be used as indicators of underlying drug crime.

Drugs and Violence

The relationship between violence and drugs is not a straightforward one. Even though they can seem intuitively related, the causal mechanisms that link these two variables differ. To better understand these mechanisms, Goldstein (1985) has proposed a tripartite framework that has been widely used when studying the drug-violence nexus (Schönberger & Liem, 2019; Varano & Kuhns, 2017; EMCDDA 2018).

First, *psychopharmacological violence* has been defined as violence committed while either perpetrator or victim have been under the influence of drugs (Goldstein, 1985). Second, *economic-compulsive drug-related violence* is defined as economically oriented violence in order to support costly drug use (Goldstein, 1985). The primary motivation to commit this type of violence is to steal drugs or the means (money or goods that can be sold) with which to obtain drugs. Finally, *systemic violence* is violence occurring during the sale and distribution of drugs. Here, it is not drugs *per se* that are responsible for an increased level of violence, but dynamics of drug markets. Systemic violence includes territorial disputes and turf wars, so-called drug deals gone wrong, enforcement of normative codes, such as in gangs or drug-dealing hierarchies, robberies of drug dealers, retaliation by their dealers or their bosses, elimination of informers, punishment for selling fraudulent drugs or failing to pay one’s debts (Goldstein, 1985).

As opposed to Goldstein’s other two types, in systemic drug-related homicides, drugs rather constitute an element around which other elements that are generally linked to increased levels of violence tend to revolve: criminal organizations and, importantly, firearms (Miron, 2001). Here, the widespread use of firearms among drug dealers may stimulate others in the community to similarly arm themselves for self-defense and to settle their own (drug-related as well as non-drug related) disputes (Blumstein, 1995).

Drug Markets

In recent years, the Netherlands has become one of the main European centers for drug-related activities, from production (mostly synthetic drugs), to processing, distribution and consumption (Tops et al., 2018). This is said to be due to several factors: the logistically strategic position of the country and the presence of Europe’s largest port, Rotterdam (EMCDDA & Europol, 2019), the relative low price and availability of substances used for the production and processing of drugs and the relative tolerance of Dutch legal system towards drugs compared to other major countries (Tops et al 2018; van Gelder 2018).

Firearms

In the Netherlands, possession of firearms is generally prohibited. Due to this, the degree of firearm possession is relatively low- approximately 5% nation-wide- and is mostly centered around illegal markets.

There seem to be strong links between illegal firearm possession and organized drug crime: Among individuals active in the large-scale cocaine trade, illegal firearms are seen as part of their standard equipment (Ferwerda, Wolsink, Van Leiden, 2020). In recent years, there has been an uptick in the criminal use of automatic firearms (Boerman et al., 2017), which again could be a reflection of the Dutch market being a buyer's market, where potential buyers have many firearms to choose from (Boerman et al., 2017).

Police investigations reveal that illegal firearms mostly stem from Balkan and Eastern European countries, and are mostly sold to individuals and groups involved in the criminal market (Kleemans, 2007), ranging from Outlaw Motorcycle Gangs to (matured) criminal youth groups. Similar to the drug market, the Netherlands has been characterized as a transit country, rather than a destination in and of itself, when it comes to firearms trafficking (Ferwerda et al., 2020).

Homicides in the Netherlands

Homicides rates in the Netherlands have decreased in the last decades, a pattern similar to other Western countries, dropping from 1.7 per 100,000 inhabitants in the early 90's, to 0.9 per 100,000 inhabitants in 2007 (Ganpat & Liem 2012), 0.5 per 100,000 inhabitants in 2016 (Schönberger & Liem, 2019) and revolving around 0.7 in most recent years. The majority involve male-to-male, non-criminal disputes between friends, acquaintances, or strangers. Most perpetrators are aged between 20 and 25, and the overwhelming majority (considering men and women) are aged between 18 and 40 (77% of all homicides).

In recent years, whilst the overall homicide trend continues to decline, there has been an increase in the proportion of drug-related homicides (DRH). This could indicate that drug-related homicides are relatively immune to social changes that have lowered overall homicide rates. Such trends could be linked to a similar phenomenon experienced in other European countries, such as Sweden, where levels of violence linked to criminal group activity have increased in recent years, whereas almost all other types of violence have decreased (Sturup et al., 2019).

Geographical Component

It has been noted that crimes in general tend to cluster at specific places and the characteristics of these same places allow for the duration and longevity of criminogenic acts (Caplan, Kennedy, & Piza, 2013). Thus, that the risk of crime victimization and crime offending is not randomly dispersed, and the geography and spatial dimension has an important impact in its distribution (Blumstein, 1995). Analyzing the geographical distribution of drug-related homicides can thus reveal linkages between other types of (lethal) violence. Moreover, it can allow us to identify whether drug-related homicides and other types of criminal violence tend to be randomly distributed or, more likely, whether they tend to concentrate in specific areas, and to what extent such areas – according to the type of violence – overlap.

Thus, analyzing spatial patterns of DRH and compare them to spatial patterns of other types of (lethal and non-lethal) criminal violence can unveil specificities and/or communalities. In addition, understanding the spatial dimension of DRH and how it relates to underlying other types of violent crime is not only of theoretical, but also of societal importance: On an operational level, it can allow police to tailor intervention strategies and better utilize their resources. For example, identifying clusters of violent crime, or hot spots (very small geographical units with disproportionately high levels of crime) may increase the effectiveness of crime prevention efforts, as police may focus their resources on these geographical micro-units (Weisburd & Telep, 2014).

METHOD

For the purpose of this study, we will compare DRH to the following other types of (lethal) violence: firearm homicides; non-lethal firearm incidents; and hand grenade incidents. As previously stated, existing research indicates that DRH, in particular of the Systemic type, are linked to specific modus: firearms.

Following this logic, both firearms homicides and non-lethal firearms incidents (shootings) and hand grenades could possibly be used as an indicator of DRH and underlying drug-related violence that often remains unreported. Initially, we apply data visualization, mostly through the use of maps, as a starting point for analyzing spatial patterns of crime (Lum, 2008). Moreover, plotting the data brings the necessary flexibility for the data to “tell a story”, from which one can generate new ideas and hypothesis rather than simply test existing ones (Maltz 2010).

Data sources

Dutch Homicide Monitor

Homicide cases were extracted from the *Dutch Homicide Monitor* (DHM), a monitoring system that captures detailed information on all homicides in the Netherlands in the period 1992-2019. The DHM is part of the European Homicide Monitor (EHM), a European-wide data collection initiative, that follows a uniform structure (Granath et al., 2011; Aarten & Liem, forthcoming). The DHM considers homicide as an intentional criminal act of violence, which results in the death of one or more individuals. This definition covers all murders, (involuntary) manslaughters and infanticides. Attempted homicides, suicides, abortion, euthanasia, and assistance with suicide are not included in the data (Granath et al., 2011; Liem, Suonpää, et al., 2018).

Dutch Firearm Violence Monitor

Non-lethal firearm cases were extracted from the Dutch Firearm Violence Monitor (DFVM), a monitoring instrument that contains information on firearm-related violent incidents in the Netherlands in the period 2015-2019 (for a detailed overview, see Leiden University, 2020). The DFVM is based on 4 sources, including media; police and court reports and the DHM.

Dutch Hand Grenade Monitor

Finally, we used information captured in the Dutch Hand Grenade Monitor (DHGM), a dataset that comprises information on the use and retrieval of modern hand grenades in the Netherlands in the period 2015-2019.

Spatial level of analysis

Location was operationalized into neighborhoods, for which we used zip code areas. Using postcodes might present some limitations as often their boundaries do not coincide with real neighbourhood boundaries and this can have a distortional effect when representing the data on the maps. Yet, zip codes represent the best nationwide classifications of neighborhoods in the Netherlands (Nieuwbeerta et al., 2008).

ANALYSES

Between 2011-2019, a total of 1168 homicides took place in the Netherlands, of which 273 homicides (or approx. 23 % of the total) were confirmed to be drug-related homicides. The majority of DRH are concentrated in the three largest cities in the Netherlands, also known as the G3: Amsterdam, Rotterdam and (in minor measure) The Hague. Moreover, DRH tend to occur more frequently in the southern provinces of the country (those bordering Belgium) namely North Brabant and Limburg, while very few DRH occurred in the north and east of the Netherlands. This pattern becomes more pronounced when only considering systemic drug-related homicides alone, which account for approximately 64% of all DRH. On the contrary, when comparing DRH with overall homicides (excluding DRH) DRH are more clustered, while overall homicides seem to be more equally distributed across the country. Map 1a shows the spatial distribution of DRH in the Netherlands

Maps 1: DRH (a), firearm homicides (b), non-lethal firearm shots (c) and hand grenade incidents(d) in the Netherlands by postcode area, 2011-2019

a) DRH



b)Firearms homicides



c)Non-lethal firearm shots



d)Hand grenade incidents (2015-2019)



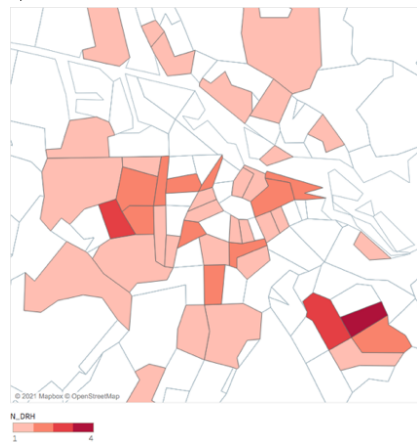
During the time period under consideration, 2011 -2019, a total of 346 homicides were committed using firearms. Comparing DRH and homicides committed with firearms (excluding those classified as DRH), we encountered some similarities in their distribution (Map 1b). Homicides committed with a firearm also tend to cluster around large urban centers, in particular Amsterdam and Rotterdam, as well as in the southern provinces of the country (those bordering Belgium), while very few occurred in the north and east. Similarly, non-lethal shootings (a total of 1246 between 2015 and 2019) occurred more frequently in the G3, and in the provinces of North Brabant and Limburg (although this type of events are present in the north and east provinces of the Netherlands in bigger numbers than DRH and firearms homicides-see map 1c). Thus, at a national level, spatial distribution of DRH tend to coincide with that of gun (lethal) violence, as well as with hand grenade incidents (that are also heavily concentrate in the main cities and in the south- see map 1c).

Zooming in on the city level again some similar patterns emerge between DRH and the other type of violent events analyzed here. For example, looking at Amsterdam (maps 2), which is where most of homicides occurred, there are some areas where postcode zones with the largest number of events seem to concentrate. In particular, in Amsterdam this area corresponds to the south east part of the city, where we have the postcode areas with the most DRH and firearms homicides events nationwide. Another area where this type of lethal violence seem to concentrate constitutes the west of the city, although with differences in the specific postcodes (see maps 2, panel a and b). These areas have a

relatively high number of shootings (maps 2, panel c), especially the south-east part of the city, where hand grenades episodes also tend to be more numerous (panel d).

Maps 2: DRH (a), Firearms homicides (b), Non-lethal firearms (c) and hand grenades (d) in Amsterdam

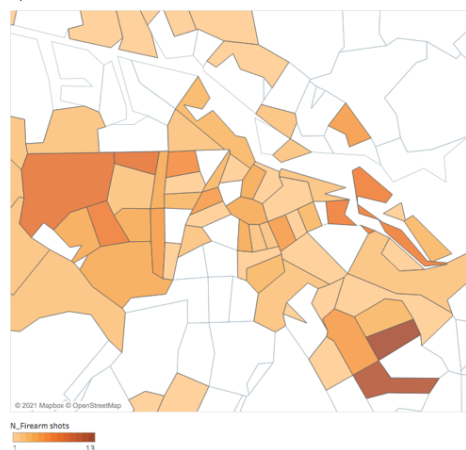
a) DRH



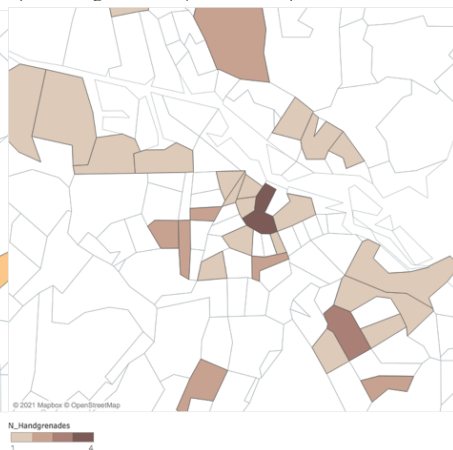
b) Firearm homicides



c) Non lethal firearms shots



d) Hand grenades (2015- 2019)



Discussion & Limitations

Findings show that deadly drug-related violence in the Netherlands is not evenly distributed, but rather tends to concentrate in cities, and even specific neighborhoods. The tendency to cluster around urban centers is more pronounced in systemic DRH, which are also the large majority of DRH in the country. The same tendency to concentrate around cities can be noted for lethal and non-lethal firearm-related violence. This indicates that these type of violence is mostly a urban phenomenon. Urban areas are more confronted with crime, which can be attributed to lower levels of social cohesion and informal social control, combined with the fact that criminals, including chronic offenders, tend to live more frequently in cities rather than in rural areas (Bruinsma, 2007). One may argue that this particularly accounts for those involved in drug-related crime. The finding that drug-related homicides, particularly systemic DRH, as well as lethal and non-lethal firearm-related violence tends to cluster in the largest cities (and in some specific areas in and around Amsterdam) could be seen as an indicator of underlying drug trafficking activities.

It should be noted that correctly classifying the role played by drugs in a homicide case is faced with several challenges, to the point that such information is typically not registered in operational (police), prosecutorial or judicial homicide databases. Such databases typically lack information on whether then perpetrator was under the effect of drugs (Schönberger & Liem, 2019), an issue which could make it difficult to correctly categorize psychopharmacological drug-related homicides in particular.

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