


Increased Gun Violence Among Young Males in Sweden: a Descriptive National Survey and International Comparison

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Abstract This population-based time-trend study examines gun violence rates among males in Sweden during the years 1996 to 2015 and compares the rate in Sweden to other Western European countries. Data were collected from six registries and are presented descriptively per 100,000 inhabitants. The risks among males in Sweden increased considerably in both lethal and non-lethal gun victimization and perpetration. Among males aged 15 to 29 there was a five-fold increase in risk for victimization in lethal and non-lethal gun violence during the 20-year observation period. In a comparative perspective the rate of gun homicide victimization among males 15 to 29 years was higher in Sweden compared to other Western European countries, while the risk for males over age 30 was at an average level. Based on the results of this study we conclude that gun violence among young males in Sweden has been on the rise and is at a high level compared to other Western European countries. The development of gun violence in Sweden can be characterized as endemic, prevalent in both population and socially vulnerable areas.

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Introduction

According to a recent report based on open-source data, funded by the European Union, the rates of lethal and non-lethal shootings in Sweden are among the highest in Western Europe. The difference in the rate of non-lethal shootings is especially high, and the victims of shootings in Sweden are considerably younger than victims in other countries. The report claims that the rates are related to the high numbers of criminal gangs in Sweden (Savona and Mancuso 2017a). According to the report, media sources revealed 440 lethal and non-lethal shootings in Sweden from 2010 to 2015, in a population of about 10 million. The corresponding numbers in countries of similar population size, such as Belgium (11.3 million), Greece (10.8 million), Portugal (10.3 million) and Austria (8.7 million), were 196, 251, 240 and 163, respectively (Savona and Mancuso 2017b). This implies that the rate of firearm-perpetrated violence in Sweden is comparatively high. However, given that the report is based on media reports, there is need for both a more reliable national verification and of cross-national comparisons of gun violence in Sweden. In homicide research a more straight-forward way to examine the question of homicide rates that circumvents the problems of legal definitions, recording practices and different clearance rates of mortality data is to count the actual numbers of dead bodies (e.g. thru cause-of-death registries) (Aebi and Linde 2012; Estrada 2005; UNODC 2013). However, the reliability and validity of such data has also been questioned (e.g. Rosenberg 1989; Mathers et al. 2005). Therefore, several researchers have conducted studies to examine the validity of cause-of-death statistics, as well (e.g. Bhalla et al. 2010). The study by Bhalla et al. report that the quality of data from the WHO cause-of-death registry varied considerably and that only 20 countries could provide high quality and reliable data. In short, it is well-known that the study of trends in crime over time and place is problematic. However, it is also known that homicide is probably is less sensitive to biases than many other types of crime.

The Global Trend of Gun Violence

The rates of lethal gun violence decrease in most countries that are not at war (UNODC 2013), and several countries report a decrease in lethal gun violence in recent years, including the U.S. (1990 to 2011; Wintemute 2015), Germany (1995 to 2010; Linde 2017), South Africa (2001 to 2005; Matzopoulos et al. 2014), Australia (1979 to 2013; Chapman et al. 2016), Jordan (1990 to 2000; Shotar et al. 2016) and Canada (1974 to 2008; Langmann 2012). On the other hand, some countries report no change in lethal gun violence, such as Finland (1990 to 1999; Mäkitie and Pihlajamäki 2002), Greenland (1985 to 2010; Christensen et al. 2016) and Chile (2000 to 2012; Otzen et al. 2015), while there are reports of increasing lethal gun violence in Brazil (1980 to 2010; Murray et al. 2013). In addition to a decrease in lethal gun violence there are reports of decreasing rates of non-lethal gun violence from the U.S. (1993 to 2012; Fowler et al. 2015) and Ireland (1996–2009; Lee 2011), while there has been no change in Denmark (1991–2009; Luef et al. 2016) and Finland (1990–2003; Mattila et al. 2006). In England and Wales, both lethal and non-lethal gun violence increased from 1998 to 2004 (summarized in Hales et al. 2006), but rates of gun violence, including lethal gun violence, have since fallen substantially according to statistics from the Office for National Statistics (ONS 2014). Thus,

excluding countries and settings at war and a few other exceptions, there is consistent evidence of decreasing gun violence in many different countries of the globe.

The Trend of Gun Violence in Sweden

The few existing scientific reports on violent crime trends in Sweden show that since the early 1990s there has been an overall decrease in intimate partner homicides (Caman et al. 2017), child homicides (Hedlund et al. 2016), homicides by individuals with psychosis (Sturup and Lindqvist 2014), homicide-suicide cases (Regoeczi et al. 2016) and alcohol-related homicides (Granath 2011). Previous research has also reported that gun modus was the strongest risk factor for not clearing a homicide case (Sturup et al. 2015). In Swedish statistics, a crime is considered to be cleared when the offender is prosecuted (National Council for Crime Prevention 2014). However, in Swedish homicide research a homicide is considered to be cleared when the offender is convicted in court (according to the highest court ruling of the case) or cleared by exceptional means, which means that the police are hindered from taking conviction measures due offender suicide or that the offender is too young (<15 years old) to be criminally responsible (Granath and Sturup 2018). This is a considerably more restrictive definition compared to many other countries, where a case often is considered to be cleared when the offender is arrested (whether the offender is later acquitted or prosecuted), so it is somehow troublesome to compare Swedish homicide clearance rates to other juridical settings. A recent paper reports that the clearance rate in firearm-perpetrated homicide in Sweden has decreased from about 95% in the early 1990s to 50% in the early 2010s (Granath and Sturup 2018). Furthermore, a newly published short communication on the Swedish city of Malmö suggests that the increase in gun-violence is due to a changing modus operandi of criminal networks characterized by increasing gun use and easy access to guns (Khoshnood 2017). It has also been reported that guns are often used in gang homicides in Sweden (Khoshnood and Våfors Fritz 2017). It can also be noted that in Europe overall, 13% percent of homicides are committed with guns (UNODC 2013), compared to 35% in present-day Sweden (National Council for Crime Prevention 2018), indicating a comparably higher rate of gun violence in Sweden. This increase is also in line with the 52% increase in the proportion of firearm homicides in Sweden between the periods 2005–2010 to 2011–2016, as reported by the Small Arms Survey (McEvoy and Hideg 2017). This is exceeded only by the increase in Israel (ibid.).

A government report on shootings in Sweden in 2006 and 2014, respectively, noted an overall 20% increase in all types of shootings, with and without (injured) victims, and a 50% increase in shootings leading to either injuries or death (National Council for Crime Prevention 2015a). A shooting was about five times more likely to occur in an area officially labeled as a socially vulnerable area (LUA and URBAN15), and in practice the increase in shootings was limited to these areas, with only non-significant changes in per capita rates for the rest of the country. The official definition of socially vulnerable areas are based on levels of unemployment, social benefits and school results and are meant to capture the most disadvantaged urban neighborhoods (National Council for Crime Prevention 2015a).

Research on the U.S shows that urban gun violence is concentrated in small geographical areas (Weisburd et al. 2004; Ratcliffe and Rengert 2008) and, as an example, during the period 1980 to 2008, 50% of all gun violence in Boston occurred in 3% of the streets (Braga et al. 2010). A recent study reported equally strong concentrations of gun violence in the three largest cities in Sweden between 2011 and 2015. There were 938 shootings in Stockholm,

Gothenburg and Malmö, resulting in 348 killed or injured (79 victims were killed in 71 lethal incidents, while 355 victims were injured in 316 incidents) during the period (these areas had approximately 4.3 million inhabitants; Sturup et al. 2017). During the same time period, Denmark as a whole (with approximately 5.7 million inhabitants) had 160 shootings resulting in 40 cases with injury (Grip and Anthony 2017). Sturup et al. further report a near-repeat relationship between shootings, with a significantly increased risk for a new shooting within 500 m and 3 days from a shooting. In addition to the concentration of gun violence there also been a dramatic increase in the use of detonated hand grenades in Sweden, concentrated to the same areas as the shootings, from about one or two cases per year in the early 2010 to almost 40 in 2016 (Sturup et al. in review).

An EU-funded study on homicide in Sweden, the Netherlands and Finland in 2003 to 2006 reports that an equal share of homicides in Sweden and Finland are committed by guns (17% vs. 18%), however the proportion was considerably higher in the Netherlands (35%; National Council for Crime Prevention 2015b). With regard to clearance, the clearance rate in Sweden was 86%, which is considerably lower than the 98% reported in Finland (there was no information on clearance in 26% of the Dutch cases), although comparison of clearance rates should be done with caution. It should be noted, that the share of all homicides committed with guns in Sweden has increased since the late 1990s, and is now somewhat above 35% (National Council for Crime Prevention 2018) and that the clearance rate has decreased considerably (Granath and Sturup 2018).

This Study

It is advisable to identify the type of crime-related problem in question before trying to implement social policies (Goldstein 1990). In that vein, policy makers and law enforcement officials need to have an accurate understanding of the problem in order to be able to take appropriate measures against increasing gun violence among males. The aim of this study is to use administrative data to validate findings based on media reports on the high levels of gun violence in contemporary Sweden. Based on the review above, we hypothesized that:

1. There has been an increase in male lethal and non-lethal gun violence in Sweden from 1996 to 2015.
2. That the rate of male lethal gun victimization is higher in Sweden compared to other similar European countries.

Data and Methods

The study is based on national data on lethal and non-lethal gun violence and international data regarding lethal violence. The literature applies different cut-offs when examining gun violence across age strata; 10 to 24 years (Annest 2013), 12 to 24 years (Lowry et al. 1995) and 15 to 29 years (UNODC 2013). The majority of individuals involved in street gangs in Sweden are males in the age span 15 to 30 (Rostami et al. 2012a, b). As a result, we chose to focus on two age strata in this study: males aged 15 to 29 years and males 30 years and older. All calculations were done in SPSS (version 24) and Excel (version 15 for Mac), and are reported

as the number of incidents per 100,000 inhabitants. Data on gun perpetration and gun victimization among females are not reported in this paper.

National Data

The data were collected from three official Swedish data registries. Firstly, data concerning the number of victims treated in a hospital for a shooting incident (ICD-10 codes X93-X95) were collected from the National Patient Register. Secondly, the number of individuals killed by guns was collected from the National Cause-of-death Registry (using the same ICD-10 codes). Both registries are held by the National Board of Health and Welfare. Data was collected on both males and females aged 15 years and older. In cases where the same individual was listed in both registries, the hospital treatment was excluded, since the visit was likely to be related to the same incident that caused the death. Thirdly, all individuals suspected for completed and attempted gun homicide (murder and manslaughter) were collected from the register for Criminal suspects at the National Council for Crime Prevention. In addition, information on the size of the population aged 15 and above was acquired from Statistics Sweden. All data were collected for the years 1996 to 2015.

International Data

Comparative data on lethal gun victimization (ICD-10 codes X93-X95) among males 15 to 29 years and males 30 years and older were collected from a database of Cause-of-Death statistics administered by the World Health Organization (WHO). Three criteria were used for inclusion in the comparison sample; 1) Cause-of-Death data should be available for five consecutive years from 2008 at the latest, to reflect as recent conditions as possible, 2) The country should be deemed to have reliable homicide data according to Bhalla et al. (2010), and 3) The country should have a population larger than 2 million. Thirteen European countries fulfilled the criteria (5 year period in parenthesis): Austria (2010–2014), Denmark (2010–2014), Finland (2010–2014), France (2009–2013), Germany (2010–2014), Ireland (2009–2013), Italy (2008–2012), Netherlands (2011–2015), Norway (2009–2014), Portugal (2010–2014), Spain (2010–2014), Sweden (2011–2015) and United Kingdom (2009–2013). Population size data for these countries were collected from a database administered by EuroStat.

Results

National Survey on Gun Victimization and Gun Perpetration 1996 to 2015

The average rates of male lethal and non-lethal gun victimization in Sweden were 0.4 and 0.8 per 100,000 inhabitants in 1996 to 2015. In males 15 to 29 years, there are strong correlations between the rate of suspected lethal shootings and the rate of non-lethal shootings ($r=0.72$) and between the rate of victims of lethal violence and non-lethal violence ($r=0.58$).

As seen in Fig. 1 there has been an increase in both lethal and non-lethal gun victimization between 1996 and 2015 for males over age 15. Figure 1 is further disaggregated in Fig. 2, revealing a considerably steeper risk increase for males aged 15 to 29 than for males 30 years or older. Among males aged 15 to 29, there is an increase from about 0.3 to 1.5 per 100,000

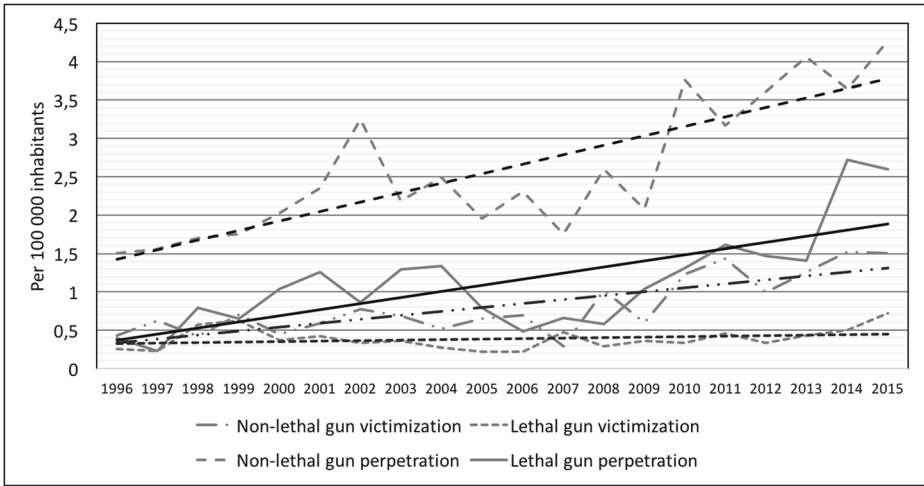


Fig. 1 Lethal and non-lethal gun victimization and perpetration rates in males over age 15 per 100,000 inhabitants in Sweden 1996 to 2015 according to the Swedish Cause-of-death registry, Hospital registry and Registry of criminal suspects (gray = observed, black = linear trend)

inhabitants in lethal victimization and from 0.8 to 3.7 in non-lethal victimization, which corresponds to about a 5-fold risk increase.

The same trends that were found for victimization were found with regard to perpetration, with increased rates especially for lethal gun perpetration in males aged 15 to 29 (Fig. 3). A drastic increase in risk was found in perpetration rates as well, from 1.0 to 7.0 per 100,000 in lethal gun perpetration and from 3.0 to 12.0 in non-lethal gun perpetration. When examining the ratio of risk for males aged 15 to 29 compared to the risk among males 30 years or older

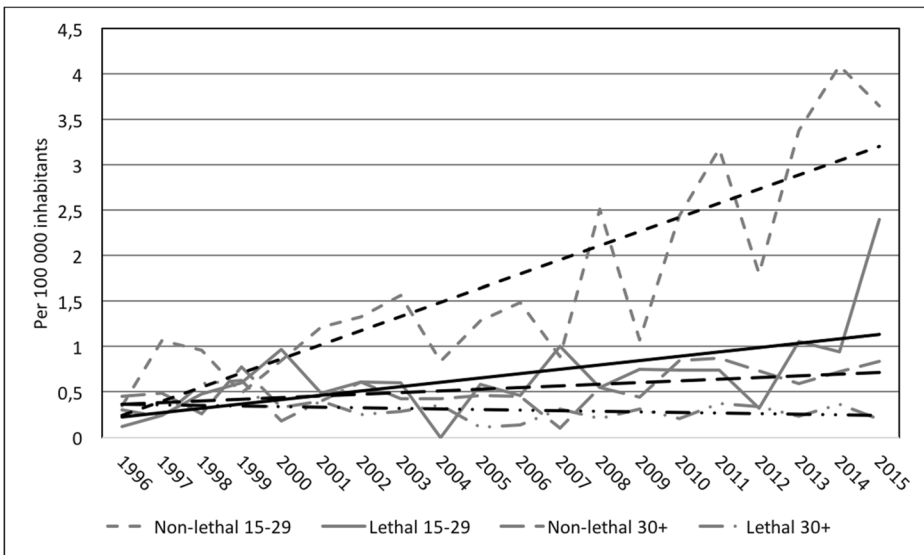


Fig. 2 Lethal and non-lethal gun victimization rates per 100,000 inhabitants in Sweden 1996 to 2015 in males aged 15–29 years and males 30 years and older according to the Swedish Cause-of-death registry and Hospital registry (gray = observed, black = linear trend)

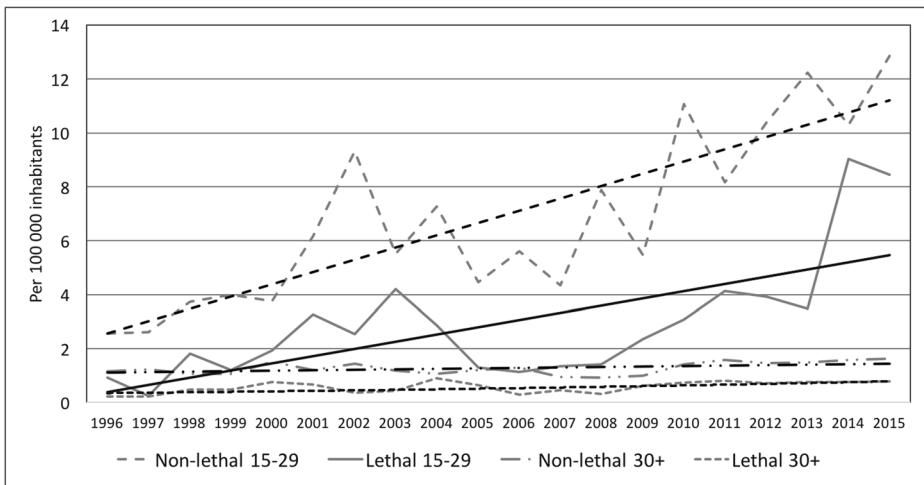


Fig. 3 Lethal and non-lethal gun perpetration rates per 100,000 inhabitants in Sweden 1996 to 2015 in males over aged 15–29 years and males 30 years and older according the Registry of criminal suspects (gray = observed, black = linear trend)

(e.g. the share of victimized 15–29 year olds divided by the share of victimized 30+ year olds), the ratio has increased in both lethal and non-lethal gun victimization (Fig. 4). This shows that the relative risk for gun violence victimization has been increasing for young men during the past 20 years. In the late 1990s young men used to be shot to death about as often as older men, but in the past few years, they have been shot to death at about four times the rate of men age 30 or older.

International Comparison of Gun Violence Victimization

Taking a closer look at our selected sample of 13 European countries, the average rate of lethal gun violence was 0.5 per 100,000 inhabitants among males 15 to 29 years and 0.3 among males 30 years and older. Figure 5 depicts the rates of lethal gun violence among males 15 to 29 years for 13 European countries. It is evident that Sweden, with a rate of about 1.1 per 100,000 inhabitants, has the highest rates of lethal gun violence in males 15 to 29 years old among all examined countries, while Ireland, Italy and the Netherlands also display high levels of lethal gun violence among males aged 15 to 29. Germany, Norway, the UK and Austria, on the other hand, displayed comparative low levels. However, as seen in Fig. 6, with a figure of 0.3 per 100,000 inhabitants, Sweden is at about the average level of lethal gun violence among males 30 years and older, while Italy and Ireland had the highest rate in that age category.

Discussion

National Trend

In this register-based population survey we confirm the hypothesized increase in lethal and non-lethal gun violence among males in Sweden during the last 20 years. This is in line with

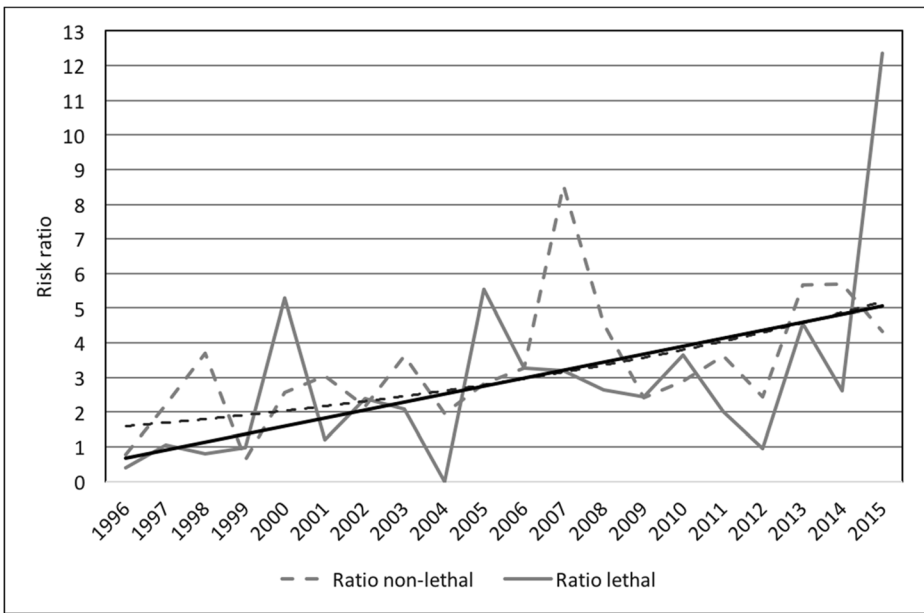


Fig. 4 Risk ratio for lethal and non-lethal gun victimization rates between males 15–29 years compared to males 30 years and older (gray = observed, black = linear trend)

what has been reported previously in male gun violence in Sweden over the last 20 years (Khoshnood 2017; Khoshnood et al. 2017; Sturup et al. 2017; Grip and Anthony 2017). We can now conclude with certainty that for males in Sweden, there has been an overall increase in

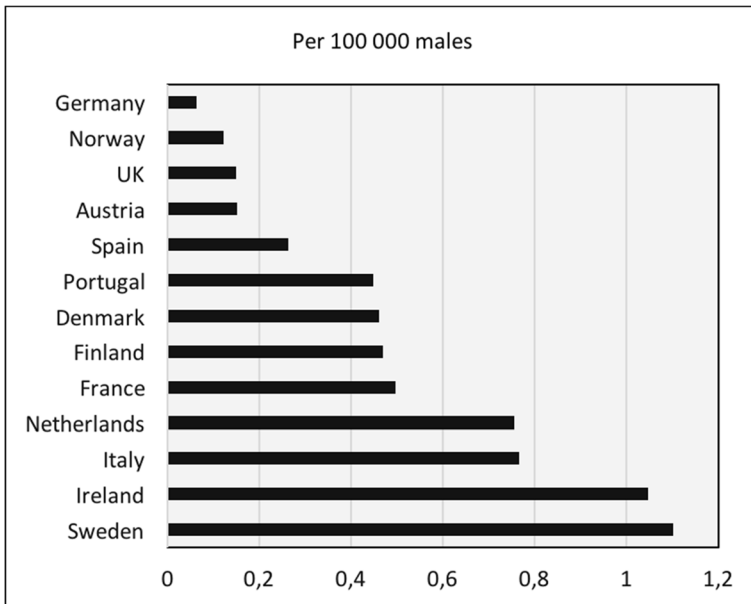


Fig. 5 Rates of lethal gun victimization among males aged 15 to 29 years in 13 European countries, data from the latest 5 years with available cause-of-death statistics from WHO

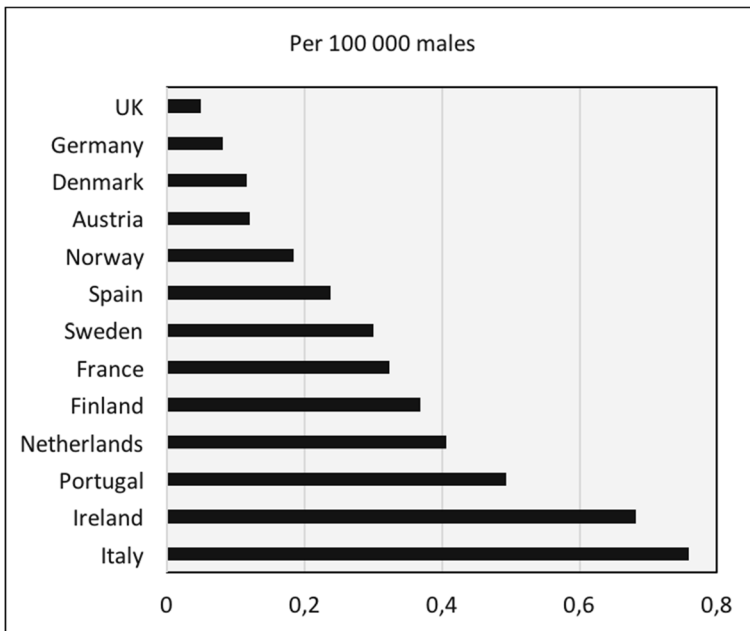


Fig. 6 Rates of lethal gun victimization among males aged 30 years or older in 13 European countries, data from the latest 5 years with available cause-of-death statistics from WHO

the risk of being a victim as well as the risk of being a perpetrator of a violent crime committed with firearms, and the increase has occurred mainly after 2007–2008. This risk is particularly pronounced in males aged 15 to 29 years (in line with prior findings by Khoshnood and Våfors Fritz 2017), and there is no corresponding increase in the risk for females. As implied by the correlation between non-lethal and lethal gun rates among males 15 to 29 years compared to all males age 30 years and older, these results are also in line with reports of young victims involved in organized crime (Savona and Mancuso 2017a).

The increase in gun violence is not evenly distributed throughout Sweden. As reported by Sturup et al. (2017) the level of lethal shootings is considerably higher in Malmö (1.0 per 100,000 inhabitants) compared to the other two metropolitan areas in Sweden (Stockholm 0.4 and Gothenburg 0.7). Even within the metropolitan areas, shootings take place mainly in disadvantaged neighborhoods (National Council for Crime Prevention 2015a; Sturup et al. 2017; Sarnecki 2016). This points to a wider trend, in which some types of crimes that have historically been more common in disadvantaged neighborhoods appear to be increasing substantially. These neighborhoods are labeled “vulnerable” in Swedish contemporary discourse. Vulnerable neighborhoods are often not clearly defined but tend to be characterized by low socioeconomic status and have a high share of residents with immigrant backgrounds. Since 2014 the national police have started producing lists of vulnerable neighborhoods, defining as vulnerable a neighborhood with high unemployment, high rate of social welfare, low school grades and a presence of criminal networks that have an impact on the neighborhood (National police, 2017). This is the same definition by the National Council for Crime Prevention (2015a) referred to earlier, but with the addition of criminal networks that have an impact on the neighborhood. In 2017 the police identified 61 such neighborhoods across Sweden, 23 of which were deemed to be “particularly vulnerable” (Swedish National Police 2017).

There has been an increase in some types of social disturbances in Sweden that are linked to the vulnerable neighborhoods, for example, the burning of cars. While the number of burning cars has been fairly stable at around 3500 per year, the share of burning cars deemed to have been intentionally started has increased from 12% to 38% between 1998 and 2015 (MSB 2016). It has been shown that intentional car burnings are associated with social disadvantage and segregation at the municipal level (Malmberg et al. 2013) and a study of Malmö suggests that this association holds also at the neighborhood level (Gerell 2017). Another problem associated with vulnerable neighborhoods is that of foreign fighters and other forms of extremist and antagonistic groups. A recently presented report on Swedish Islamist foreign fighters who have traveled to Syria and Iraq noted that over 60% were residing in socially deprived neighborhoods before their departure, particularly in the areas of Gothenburg, Stockholm, Malmö and Örebro (Gustafsson and Ranstorp 2017). These developments, which are tied to segregated and disadvantaged neighborhoods, suggest that trends of crime in Sweden are changing. Gun violence is increasing, but mainly among young males, and mainly in disadvantaged neighborhoods. The same neighborhoods are also overrepresented when it comes to social unrest and some forms of extremism, although it is unclear if or how these different social problems are related.

The International Comparison

We could also confirm our second hypothesis, that gun violence in males aged 15 to 29 is more prevalent in Sweden compared to other similar countries. For males age 30 and older, however, Swedish levels align with the average for Western Europe. This is also in line with what has been reported by Grip and Anthony (2017). The cause of this disparity with similar countries is an interesting finding that warrants more research into the underlying mechanisms explaining cross-country differences. It should be noted that data sources are of high quality and that these differences can safely be assumed to reflect empirical reality. Unfortunately, we were not able to collect cross-national data on non-lethal gun violence, another area in need of further investigation. As a country of hunters, Sweden has a substantial number of legal firearms, with about 15% percent of the population registered to own a firearm (Granath 2011). However, gun violence in Sweden is linked almost exclusively to illegal weapons. An intelligence report by the Swedish National Police (2013) indicates that almost all of the guns used in criminal milieus are illegal, and that the vast majority of guns stem from the Balkans. It is so far unknown whether the share of illegal guns is higher in Sweden compared to other countries or if the guns are just used more often within the criminal milieus. Savona & Mancuso (Savona and Mancuso 2017a, p. 39) argue that the demand for guns in Sweden is higher than the supply, leading offenders to use the guns they can access, rather than using the appropriate gun for the task. Another finding that further underscores the trafficking of weapon from the Balkan countries to Sweden is found in a cross borders ballistic study within the EFFECT project (Bowen and Poole 2016). The study examined ballistic hits in Serbia, Macedonia, Kosovo, Italy, Sweden, Denmark and Norway with the aim of investigating whether the same gun has been used on more than one occasion by comparing discharged cartridges from crime scenes as well as tests from recovered firearms. There were three international probable links from Sweden (two of these from Serbia) while there were no such links for Italy, Norway and Denmark (Bowen and Poole 2016). However, ballistic hits have also been reported between Sweden and Denmark (Gerard et al. 2017).

Implications

Our findings have implications for at least two areas in police operations and crime policy. Firstly, there is a need for new and improved preventive measures against gun violence among young male offenders in Sweden. Such programs have been developed internationally (Braga et al. 2018) but there are doubts whether programs developed in other settings can be easily replicated in Sweden. The second implication, which has been previously suggested (Sturup et al. 2015; Sturup et al. 2017), is that Swedish law enforcement agencies (Police, Prosecution authority, and Customs) need to find new and improved strategies and methods for investigating gun crimes and gun violence, and, in particular, increase the clearance rate of gun homicides.

Methodological Considerations

Several methodological issues are raised when comparing crime levels between countries (Bhalla et al. 2010; Mathers et al. 2005; Aebi and Linde 2012). However, it can be argued that homicide levels are the least problematic type of crime to compare (UNODC 2013). Also, we argue that this is especially true regarding gun homicides; if a body is found displaying gunshot wounds, the further death investigations will be very similar in most countries around the world. Even so, we choose to collect data only from countries where research has established that the data are reliable (Bhalla et al. 2010). On the other hand, cause-of-death statistics are a stable factor over time, as few factors influence the actual judgment of whether the action is a homicide or not, and in Sweden, as well as internationally, the cause-of-death registry is judged by most authorities in the scientific community to be the most valid measure of changes in major violent crimes (e.g. Estrada 1999; Estrada 2005; UNODC 2013). Another important notion is that the number of suspects is based on the number of individuals suspected, not the numbers of crimes. If these crimes are more often network-based (which we hypothesize), more individuals will be suspected for the same crime leading to inflated figures in suspected individuals, a factor that needs more research attention.

Conclusions

We conclude that Sweden has witnessed a steep increase in gun violence in males aged 15 to 29 years over the past 20 years. In addition to the increasing rate of gun violence we also find a comparatively high rate of gun violence in Sweden in relation to other West European countries among males 15 to 29 years. We do not argue that the overall level of violence has increased in Sweden, but we can report a sharp increase in gun violence in young males that can only be described as an endemic situation of gun violence. Our study calls for further research into the causal mechanisms at the micro-level in order to increase our understanding of the underlying mechanism behind the high prevalence of gun violence in Sweden, and to facilitate the development of evidence-based preventive interventions. Our report also calls for a more systematic comparison of gun violence between European countries, e.g., legislation, prevalence, prevention strategies, in order to identify mechanisms of importance for preventions of gun violence.

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References

- Aebi, M. F., & Linde, A. (2012). Regional variation in Europe between homicide and other forms of external death and criminal offences. In M. C. Liem & W. A. Pridemores (Eds.), *Handbook of European homicide research* (pp. 71–94). New York: Springer.
- Annest, J. L. (2013). Homicide rates among persons aged 10–24 years—United States, 1981–2010. *Morbidity and Mortality Weekly Report*, *62*(27), 545–548.
- Bhalla, K., Harrison, J. E., Shahraz, S., & Fingerhut, L. A. (2010). Availability and quality of cause-of-death data for estimating the global burden of injuries. *Bulletin of the World Health Organization*, *88*(11), 831–838.
- Bowen, E. & Poole, H. (2016). *Examination of Firearms and Forensics in Europe and aCross Territories*. Final report from the Effect Project. <http://www.coventry.ac.uk/Global/08%20New%20Research%20Section/FINAL%20EFFECT%20PROJECT%20REPORT.pdf>, 2016 (accessed 2018–04-11).
- Braga, A. A., Papachristos, A. V., & Hureau, D. M. (2010). The concentration and stability of gun violence at micro places in Boston, 1980–2008. *Journal of Quantitative Criminology*, *26*(1), 33–53.
- Braga, A. A., Weisburd, D. L. & Turchan, B. (2018) Focused deterrence strategies and crime control. An updated systematic review and meta-analysis of the empirical evidence. *Criminology & Public Policy*.
- Caman, S., Kristiansson, M., Granath, S., & Sturup, J. (2017). Trends in rates and characteristics of intimate partner homicides between 1990 and 2013. *Journal of Criminal Justice*, *49*, 14–21.
- Chapman, S., Alpers, P., & Jones, M. (2016). Association between gun law reforms and intentional firearm deaths in Australia, 1979–2013. *Jama*, *316*(3), 291–299.
- Christensen, M. R., Thomsen, A. H., Høyer, C. B., Gregersen, M., & Banner, J. (2016). Homicide in Greenland 1985–2010. *Forensic Science, Medicine, and Pathology*, *12*(1), 40–49.
- Estrada, F. (1999). *Ungdomsbrottslighet som samhällsproblem: utveckling, uppmärksamhet och reaktion* [The youth criminality as a social problem: changes, attention and reactions]. (Doctoral dissertation). Stockholm: Stockholm University.
- Estrada, F. (2005). Trends in violence in Scandinavia according to different indicators: An exemplification of the value of Swedish hospital data. *British Journal of Criminology*, *46*(3), 486–504.
- Fowler, K. A., Dahlberg, L. L., Haileyesus, T., & Annest, J. L. (2015). Firearm injuries in the United States. *Preventive Medicine*, *79*, 5–14.
- Gerard, F. J., Crookes, R. L., Elliott, S., Hellenbach, M., Stamos, A., Poole, H., & Bowen, E. (2017). The sharing of ballistics data across Europe and neighbouring territories. *Science and Justice*, *57*(5), 384–393.
- Gerell, M. (2017). Collective efficacy and arson: The case of Malmö. *Journal of Scandinavian Studies in Criminology and Crime Prevention*, *18*(1), 35–51.
- Goldstein, H. (1990). *Problem-oriented policing*. New York: McGraw-Hill.
- Granath, S. (2011). Homicide in Sweden. In M. C. Liem & W. A. Pridemores (Eds.), *Handbook of European homicide research* (pp. 405–419). New York: Springer.
- Granath, S., & Sturup, J. (2018). Homicide clearance in Sweden 1990–2013 with special reference to firearm-perpetrated homicides. *Journal of Scandinavian Studies in Criminology and Crime Prevention*. <https://doi.org/10.1080/14043858.2018.1449412>.
- Grip, L., & Anthony, I. (2017). Våldets polarisering i svenska städer [the polarization of violence in Swedish cities]. In C. Edling & A. Rostami (Eds.), *Våldsbejakande extremism: En forskarantologi [violent extremism: A research anthology]*. *SOU 2017:67*. Sweden: Kulturdepartementet.
- Gustafsson, L., & Ranstorp, M. (2017). *Swedish foreign fighters in Syria and Iraq: An analysis of open-source intelligence and statistical data*. Stockholm: Swedish Defence University.
- Hales, G., Lewis, C., & Silverstone, D. (2006). *Gun crime: the market in and use of illegal firearms*. Home Office Research Study 298, England.
- Hedlund, J., Masterman, T., & Sturup, J. (2016). Intra-and extra-familial child homicide in Sweden 1992–2012: A population-based study. *Journal of Forensic and Legal Medicine*, *39*, 91–99.

- Khoshnood, A. (2017). The increase of firearm related violence in Sweden. *Forensic Sciences Research*, 2(3), 158–160.
- Khoshnood, A., & Väfors Fritz, M. (2017). Offender characteristics: A study of 23 violent offenders in Sweden. *Deviant Behavior*, 38(2), 141–153.
- Khoshnood, A., Fritz, M. V., & Ekelund, U. (2017). Nineteen victims of homicide and attempted homicide in Sweden—Their injuries, cause of death, and offender relationship. *The American Journal of Forensic Medicine and Pathology*, 38(3), 241–248.
- Langmann, C. (2012). Canadian firearms legislation and effects on homicide 1974 to 2008. *Journal of Interpersonal Violence*, 27(12), 2303–2321.
- Lee, S. (2011). Trends in admission to hospital for assault in Northern Ireland, 1996/97–2008/09. *Journal of Public Health*, 33(3), 439–444.
- Linde, A. (2017). The Impact of Improvements in Medical Care Resources on Homicide Trends: The Case of Germany (1977–2011). *European Journal on Criminal Policy and Research*. <https://doi.org/10.1007/s10610-017-9340-7>.
- Lowry, R., Sleet, D., Duncan, C., Powell, K., & Kolbe, L. (1995). Adolescents at risk for violence. *Educational Psychology Review*, 7(1), 7–39.
- Luef, S. M., Lauritsen, J. M., & Faergemann, C. (2016). Trends in weapon-related injuries from violence in Odense municipality, Denmark 1991–2009. *Danish Medical Journal*, 63(11), e5285–e5285.
- Mäkitie, I., & Pihlajamäki, H. (2002). Fatal firearm injuries in Finland: A nationwide survey. *Scandinavian Journal of Surgery*, 91(4), 328–331.
- Malmberg, B., Andersson, E., & Östh, J. (2013). Segregation and urban unrest in Sweden. *Urban geography*, 34(7), 1031–1046.
- Mathers, C. D., Ma Fat, D., Inoue, M., Rao, C., & Lopez, A. D. (2005). Counting the dead and what they died from: An assessment of the global status of cause of death data. *Bulletin of the World Health Organization*, 83(3), 171–177c.
- Mattila, V. M., Mäkitie, I., & Pihlajamäki, H. (2006). Trends in hospitalization for firearm-related injury in Finland from 1990 to 2003. *Journal of Trauma and Acute Care Surgery*, 61(5), 1222–1227.
- Matzopoulos, R. G., Thompson, M. L., & Myers, J. E. (2014). Firearm and nonfirearm homicide in 5 South African cities: A retrospective population-based study. *American Journal of Public Health*, 104(3), 455–460.
- McEvoy, C. & Hideg, G. (2017) *Global Violent Deaths 2017*. Small Arms Survey, Graduate Institute of International and Development Studies, Geneva.
- MSB. (2016). *Räddningstjänst i siffror 2015 [Emergencies in numbers 2015]*. Stockholm: Swedish Civil Contingencies Agency.
- Murray, J., de Castro Cerqueira, D. R., & Kahn, T. (2013). Crime and violence in Brazil: Systematic review of time trends, prevalence rates and risk factors. *Aggression and Violent Behavior*, 18(5), 471–483.
- National Council for Crime Prevention. (2014). *The clearance rate in Sweden and in other countries*. Stockholm: National Council for Crime Prevention.
- National Council for Crime Prevention. (2015a). *Skjutningar 2006 och 2014 [Shootings 2006 and 2014]*. Stockholm: National Council for Crime Prevention.
- National Council for Crime Prevention. (2015b). *Det dödliga våldet i Sverige 1990–2014 [Homicides in Sweden 1990–2014]*. Stockholm: National Council for Crime Prevention.
- National Council for Crime Prevention. (2018). *Konstaterade fall av dödligt våld 2017 [confirmed cases of homicide 2016]*. Sweden: National Council for Crime Prevention.
- ONS (2014). Chapter 3: Recorded Offences Involving the Use of Weapons. In ONS (2014), *Crime Statistics, Focus on Violent Crime and Sexual Offences*. Office of National Statistics, UK.
- Otzen, T., Sanhueza, A., Manterola, C., Hetz, M., & Melnik, T. (2015). Homicide in Chile: Trends 2000–2012. *BMC Psychiatry*, 15(1), 312.
- Ratcliffe, J. H., & Rengert, G. F. (2008). Near-repeat patterns in Philadelphia shootings. *Security Journal*, 21(1–2), 58–76.
- Regoezci, W., Granath, S., Issa, R., Gilson, T., & Sturup, J. (2016). Comparing homicide-suicides in the United States and Sweden. *Journal of Forensic Science*, 61(6), 1524–1530.
- Rosenberg, H. M. (1989). Improving cause-of-death statistics. *American Journal of Public Health*, 79(5), 563–564.
- Rostami, A., Leinfelt, F., & Brotherton, D. C. (2012a). Understanding gang leaders: Characteristics and driving forces of street gang leaders in Sweden. *Free Inquiry in Creative Sociology*, 40(2), 1–20.
- Rostami, A., Leinfelt, F., & Holgersson, S. (2012b). An exploratory analysis of Swedish street gangs: Applying the Maxson and Klein typology to a Swedish gang dataset. *Journal of Contemporary Criminal Justice*, 28(4), 426–445.
- Sarnecki, J. (2016). *Brottslighet och motåtgärder i socioekonomiskt utsatta områden [Crime and resilience in social disadvantaged areas]*. In Hela staden – Bryt segregationen. Stockholm: Fores.

- Savona, E., & Mancuso, M. (Eds.). (2017a). *Fighting Illicit Firearms Trafficking Routes and Actors at European Level. Final Report of Project FIRE*. Milano: Transcrime – Università Cattolica del Sacro Cuore, Italy.
- Savona, E., & Mancuso, M. (Eds.). (2017b). *Fighting Illicit Firearms Trafficking Routes and Actors at European Level. Methodological Annex of the Final Report of Project FIRE*. Milano: Transcrime – Università Cattolica del Sacro Cuore, Italy.
- Shotar, A., Alzyoud, S. A., Al-Shreideh, M., Obeidat, J., Al Said, M. M., Al Habsi, J. B., & Alkhatib, A. J. (2016). Pattern of firearm fatalities in the north of Jordan. *European Scientific Journal*, 12.
- Sturup, J., & Lindqvist, P. (2014). Psychosis and homicide in Sweden—A time trend analysis 1987—2006. *International Journal of Forensic Mental Health*, 13(1), 1–7.
- Sturup, J., Karlberg, D., & Kristiansson, M. (2015). Unsolved homicides in Sweden: A population-based study of 264 homicides. *Forensic Science International*, 257, 106–113.
- Sturup, J., Rostami, A., Gerell, M., & Sandholm, A. (2017). Near-repeat shootings in contemporary Sweden 2011 to 2015. *Security Journal*, 31(1), 73–92.
- Swedish National Police (2013). *Shootings in the three metropolitan areas*. Intelligence report HD110/13 [original in Swedish], Swedish National Police.
- Swedish National Police. (2017). *Utsatta områden [Disadvantaged areas]*. Stockholm: Swedish National Police.
- UNODC (2013) *Global study on homicide*. United Nations Office on Drugs and Crime, United Nations.
- Weisburd, D., Bushway, S., Lum, C., & Yang, S. M. (2004). Trajectories of crime at places: A longitudinal study of street segments in the city of Seattle. *Criminology*, 42(2), 283–322.
- Wintemute, G. J. (2015). The epidemiology of firearm violence in the twenty-first century United States. *Annual Review of Public Health*, 36(1), 5–19.