

# Challenges to the veracity and the international comparability of Russian homicide statistics

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## Abstract

Homicide statistics are often seen as the most reliable and comparable indicator of violent deaths around the world. However, the analysis of Russian homicide statistics challenges this understanding and suggests that international comparisons of homicide levels can be hazardous. Drawing on an institutionalist perspective on crime statistics, official crime-based homicide statistics in Russia are approached as a social construct, a performance indicator and a tool of governance. The paper discusses several incentives to misrepresent official homicide data in contemporary Russia, including politicization of homicide statistics as a legacy of the Soviet era's falsified crime statistics and the role of policing. Mainly, the paper identifies and describes the exact legal, statistical and country-specific substantive mechanisms that allow homicide statistics to be distorted in Russia. By considering legal mechanisms alone, the more accurate homicide rate may be at least 1.6 times higher than that reported in the United Nations Office on Drugs and Crime Global Study on Homicide 2013.

## Keywords

Comparative criminology, homicide studies, politicization of crime statistics, production of homicide statistics, Russia

## Introduction

Homicide statistics are seen as the most reliable and comparable indicator of violent deaths around the world (for example, Archer and Gartner, 1984), and, as such, are often used to estimate global trends and patterns in lethal violence, to test theories and to guide

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policies to address homicide incidents in a country. Recent improvements in the availability of data on lethal violence have contributed to an increase in studies analysing cross-national trends in homicide (Baumer and Wolff, 2014; Eisner, 2008; LaFree, 2005; LaFree and Tseloni, 2006; Van Dijk et al., 2012). Although the absence of data on homicide in many parts of the world still represents the most critical problem for cross-national comparisons (Riedel and Regoeczi, 2004), this paper brings attention to the quality of homicide data that are available and deemed generally reliable.

As a source of knowledge, crime statistics can be seen as representing the reality of crime (the realist approach) and also as a product of social and institutional processes (the institutionalist approach) (Coleman and Moynihan, 1996). According to the latter perspective, analysing crime rates can help us better understand the agency producing them rather than crime itself (Black, 1970). This study draws on the institutionalist perspective and examines the process of production of homicide statistics in Russia.

Criminologists in Russia have repeatedly expressed their concerns about the unsatisfactory quality of crime statistics and especially homicide data in Russia, mainly owing to political pressure (Babaev and Pudovochkin, 2014; Inshakov, 2011; Luneev, 2005; Lysova and Shchitov, 2015; Shklyaruk et al., 2015). Incentives for police malfeasance in crime statistics in contemporary Russia reflect the notorious legacy of the Soviet era's falsified crime statistics when they were blatantly used to misrepresent reality (Tolts, 2012). Under the current presidency of Vladimir Putin, a strengthening focus on law and order provides similar incentives for officials in the police and statistics departments to 'adjust' crime statistics to the expected levels (Babaev and Pudovochkin, 2014; Walker, 2007). Moreover, as in the Soviet time, the particular mechanisms of collecting crime statistics that make misrepresentation possible are in place today (Inshakov, 2011; Shklyaruk et al., 2015; Volkov and Paneyah, 2012). Drawing on an institutionalist perspective on crime statistics (Coleman and Moynihan, 1996), this paper explains Russia's low levels of police-reported homicide rates in the 2000s as a product of political forces that create the notion of order and stability in the country and hence drive for regime legitimacy.

This paper, however, goes beyond the mere theoretical discussion of the incentives behind misrepresentation of homicide data in Russia. It identifies and describes the specific mechanisms that explain how differences in legal definitions and statistical rules and procedures for collecting homicide statistics, as well as country-specific factors, can affect homicide statistics in different ways. Given the essential role of the police in collecting and making homicide data public, I discuss how the police, as servants of the regime, contribute to the manipulation of homicide data in modern Russia. I examine various opportunities available to the Russian police to misrepresent homicide data. Among the three main types of opportunities or factors that affect official police-reported homicide statistics in Russia, substantive factors germane to the established investigative practices in relation to unidentified bodies and missing persons arguably represent the most serious challenges to the accuracy of Russian homicide statistics (Inshakov, 2011). My hope is that this paper will become one of the first in a series that discusses the production of homicide data in other countries, especially where official police-reported homicide data appear to be compromised.

This paper focuses on crime-based rather than public health homicide statistics. In recent years researchers have tended to use homicide data generated by public health

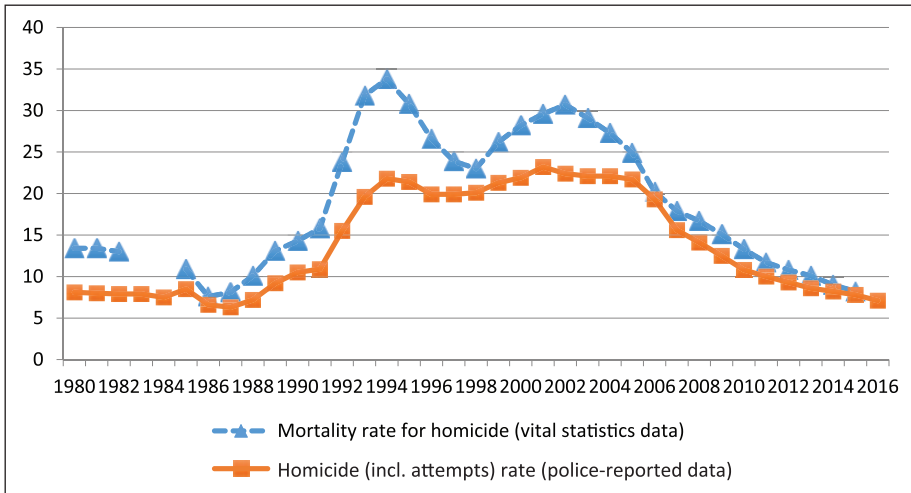
systems rather than police-based homicide data, because the former are seen as more reliable than the latter (for example, Baumer and Wolff, 2014; Nivette and Eisner, 2013). This practice may lead to insufficient use and attention to the quality of crime data on homicide, which, as one of the key indicators of criminal violence across the world, play an important role in monitoring security and justice. Moreover, the official police-reported homicide data are often used at the national level as a key indicator of violent crime levels in a given country. Indeed, crime data can be highly functional (as the examples of Finland and Sweden show; see Von Hofer and Lappi-Seppälä, 2014) and add relevant knowledge to important current criminological and crime policy issues (UNODC, 2014). Given the different rationales and procedures for producing each type of data, the researcher's choice of data should reflect the goals of the study.

The structure of this paper is as follows. First, the theoretical framework employed for analysing Russian homicide statistics is briefly introduced. Then I discuss the rates and trends in Russian homicide provided by the two major sources of information – police-reported and mortality data on homicide. The inconsistency between these two sources of data, which typically indicates the problems with the data, is also briefly explored. Then the paper discusses the political motivations for meddling with official police-reported homicide statistics in Russia and focuses specifically on the three types of mechanisms or factors that give the police opportunities to misrepresent Russian homicide statistics: legal factors, statistical factors and substantive factors. Finally, I discuss and estimate a more accurate homicide rate in Russia suitable for international comparisons and the challenges related to the ambiguity and complexity of statistical and substantive factors that can affect homicide statistics in different ways.

## **Homicide statistics as a social construct**

The discipline of criminology has been haunted by a dark figure throughout its history. The collection and collation of massive quantities of information about crime (for administrative, managerial and control-related purposes) have become the responsibility of the state and state-sponsored agencies, which are regarded as the 'governmental' projects in criminology (Garland, 2001). Inextricably bound up with the knowledge and power of governments, crime data can be seen as a social construct, part of a political discourse and a tool of governance (Coleman and Moynihan, 1996; Lomell, 2010; Sacco, 2005). Moreover, with the advent of New Public Management reform (Hood, 2007), crime statistics also began to be a performance indicator. This means that 'crime statistics have been transformed from an input to an outcome, the incentive changing from increasing recorded crime (in order to increase funding) to decreasing recorded crime (in order to increase funding)' (Lomell, 2010: 142).

The homicide rate is often seen as the most reliable indicator of crime and stability in the country and, compared with other crimes, has rarely been approached from this critical institutionalist perspective (Von Hofer, 2000; with the exceptions of Andreev et al., 2015; Malby, 2010; Smit et al., 2012). Drawing on this perspective helps us examine both the incentives of the agencies that collect homicide data and the mechanisms these agencies use to misrepresent data.



**Figure 1.** Police-recorded homicide rate (including attempts) per 100,000 residents and mortality rate from homicide per 100,000 residents for 1980–2016.

Source: Police-recorded data are from Luneev (2005) for 1980–2002 and from MVD (n.d.) for 2003–16. Vital statistics data are from WHO (n.d.) for 1980–94 and from Rosstat (n.d.) for 1995–2015.

## Homicide statistics in Russia

In recent times, Russia has been one of the most violent countries in Europe (WHO, 2016a) and the world (Krug et al., 2002). Gradually increasing over the 20th century, the Russian homicide rate, as measured by police data, peaked in 1994 and again in 2001 at about 22 homicides per 100,000 persons. In the 2000s, however, the official homicide rate has demonstrated a dramatic decrease to about 7 homicides per 100,000 persons in 2016 (Figure 1).

Figure 1 also shows national homicide estimates based on vital statistics data. Although mortality-based estimates appear to be higher, especially in the mid-1990s and between 2001 and 2004, the rate has declined substantially in recent years (mirroring the decline in the police-reported homicide rate), reaching 7.8 per 100,000 in 2015 (Rosstat, n.d.).

The two organizations that are the main sources of international homicide data, the World Health Organization (WHO) and the United Nations Office on Drugs and Crime (UNODC), basically reproduce the estimates produced and reported by these two national systems. However (and surprisingly), the recently published *European Sourcebook of Crime and Criminal Justice Statistics* (ESB) reports the Russian homicide rate as varying between 1.0 and 1.6 per 100,000 persons in 2007–11 (Aebi et al., 2014: 34), which, if accurate, would make Russia one of the least violent countries in Europe. (The mean homicide rate for European nations is about 5 per 100,000, according to Aebi et al., 2014.) No explanation is provided for why these estimates differ substantially from the estimates provided by other sources. At the same time, both national and the ESB-reported estimates suggest that in recent years the Russian homicide rate has declined substantially – indeed, this would be one of the steepest declines among European countries (that is, 36 percent between 2007 and 2011, according to the ESB).

## *Consistency between police-reported and mortality data on homicide in Russia*

Agreement between public health figures and police-recorded homicide data is sometimes used to ascertain the quality of international homicide data (Malby, 2010). Despite the differences in the case definitions and units of measurement, some consistency in homicide estimates from these two systems is expected. However, in Russia, a large disparity is evident in the 1990s, as shown in Figure 1. Annual estimates from the vital statistics reporting system show an average of nearly 40 percent more homicides than the crime reporting system (Pridemore, 2003). After a brief convergence in 1998, the disparity between the homicide estimates reported by these two systems increased in the early 2000s and has almost disappeared in recent years. It is unlikely, however, that the convergence in the homicide estimates reflects the improved quality of official homicide data in Russia.

## *Quality of mortality data on homicide in Russia*

Although the focus of this paper is on the quality of crime-based statistics on homicide, it is important to note that mortality data are riddled with problems of their own. Russia uses a summarized list of causes of death, which means that the number of items in the classification of causes of death in Russia's vital statistics is considerably smaller than that in the ICD-10 system. The use of a summarized list of causes of death prevents the WHO from estimating the overall quality of mortality data provided by Russia (that is, by estimating the proportion of so-called 'garbage codes') but still allows the detection of the most obvious cases of miscoding. The major problems with homicide data from vital statistics sources tend to arise from the misclassification of homicides as events of undetermined intent (EUIs). The rate of external causes of death due to EUIs is exceptionally high in Russia – about 28 per 100,000 residents between 2000 and 2011 – and their proportion of all deaths from external causes substantially increased in the years following the collapse of the Soviet Union. Using an innovative method for reclassifying external causes of death categorized as EUIs, Andreev et al. (2015) assigned 33 percent of EUIs in Russia to homicide. The redistribution of EUIs resulted in a substantial elevation of the official mortality figures for homicide in the 2000–11 period. Specifically, the Russian age-standardized homicide rate for 2011 produced by Andreev et al. is 20.9 per 100,000 – nearly double the official vital statistics indicator of 11.5 per 100,000. Furthermore, the difference between Andreev et al.'s estimated and official rates of homicides increased in the 2000–11 period. For example, the level of homicide in 2000 would have been about 41 percent higher than the officially reported vital statistics data, whereas the 2011 level of homicide would have been about 82 percent higher than that reported by official vital statistics.

Estimates of homicides by other researchers appear to be consistent with these findings. For example, according to Antonova's (2007) estimates, the actual number of homicides at ages 20–39 years may have been about 1.5 times higher than the officially registered data, and at ages 40–59 the actual number of homicides may have been nearly twice as high as the official figure. Similarly, Semyonova and Antonova (2007)

examined suspiciously high rates of deaths among working people in Moscow in 2003 due to EUIs, falls and other accidents. Their detailed analysis of death certificates and the reclassification of these categories of cause of death increased the number of homicides and moved this cause of death from the fourth to the second position in the ranking of injury-related deaths.

Offering their version of EUI redistribution and focusing on the most frequent combination of the type of injury and cause, Ivanova et al. (2013) suggested that the 2010 level of homicides of men aged 20–59 would have been about 94 percent higher than was reported by official vital statistics, that is, about 23,000 deaths rather than 12,000 deaths. For women, the 2010 level of homicide would have been 66 percent higher than that reported by official statistics.

## **Incentives for manipulating homicide statistics in Russia**

### *Politicization of homicide statistics as a legacy of the Soviet era's falsified crime statistics*

The Soviet approach to reality was denial (Conquest, 2000). Therefore, distortions of population statistics regarding homicide, suicide, child mortality, prison population and other unsavoury phenomena were pervasive under the Soviet regime (Tolts, 2012). Stalin started using falsified population figures in 1934 and exaggerated the actual statistical estimate by about 8 million in order to conceal the dramatic consequences of his forced collectivization policy, which led to the 1932–3 famine (Tolts, 2012). In the 1930s and 1940s, many statisticians from the Central Statistical Administration who refused to release falsified data were arrested and some were executed.

After a temporary improvement in the quality of population statistics after Stalin's death, a worsening of population indicators further motivated the falsification of demographic data. A complex multi-level system of censorship suppression for demographic data was established and broadly used in the 1970s and 1980s. It was also common for the Central Statistical Administration to bend to pressure and adjust its numbers after Soviet leaders publicly announced specific numbers or expectations about population trends (Tolts, 2012). The Soviet authorities used concealment and falsification of statistical data as tools of political propaganda within and outside the country.

After a brief period of greater tolerance of the more or less unmodified crime statistics in the 1990s, there is evidence of a return to practices similar to those in Soviet Russia in the 2000s. Focusing on strengthening law and order during his presidency, Putin has regularly praised the declining rates of the most serious crimes, including murders, recorded by the police and also the increasing crime clearance rates at the annual meetings that reviewed the Interior Ministry's performance (for the recent one in 2016, see President of Russia, n.d.). Similar to the Soviet practices, these messages may well have been perceived and interpreted by officials in the police, hospitals and statistics departments as a direct call for action to reduce recorded violent crime statistics (Babaev and Pudovochkin, 2014; Walker, 2007). Rampant corruption (Obydenkova and Libman, 2015), 'telephone law' (Hendley, 2009) and a 'verticality of power' (exerting control

over the local powers from Moscow) created a breeding ground for implementing these political incentives.

### *Policing in the Soviet Union and Russia*

As servants of the regime in the Soviet Union, police officers were subject to intensive political indoctrination and the policing itself was highly ideological (Light et al., 2015: 221). Performance evaluation relied heavily on clearance rates (Favarel-Garrigues, 2011: 70), creating incentives to falsify reports. Even after open public criticism of the police during a brief period after the collapse of the Soviet Union, the evaluation by clearance rates remained (McCarthy, 2014; Volkov and Paneyah, 2012).

At the same time, the political role and the structure of the police changed in the 1990s and early 2000s. Owing to a severe economic crisis and general social disorder, police officers focused on supplementing their wages, often unlawfully, instead of serving the public by fighting crime. Some described this policing as ‘predatory policing’ (Gerber and Mendelson, 2008). Also, the police often aligned themselves with regional politicians and formed ‘politicized financial-industrious groups’ (Hale, 2006: 162–73). Although the ‘centralized politicization’ of the police in the USSR was replaced by ‘decentralized politicization’ (Light et al., 2015: 222), subordination to localized political interests continued to create incentives for the deliberate manipulation of crime data.

Moreover, the production of crime statistics in Russia closely depends on changes in police leadership. Research suggests that, before the year 2000, the number of registered crimes usually increased in the new police chief’s first year at the local, regional or national levels (to demonstrate the expected strengthening of law and order) and declined by the second year (to prove ‘successful’ work on fighting crime) (Gavrilov, 2009). After 2000, changes in the regulation of crime statistics issued by the Office of the General Prosecutor seemed to have a greater effect on crime rates than changes in the police leadership. Specifically, three main orders issued in 2001, 2003 and 2005 were intended to toughen liability for the deteriorating quality of crime statistics (Gavrilov, 2009). Indeed, the level of attempted and completed homicides officially recorded by the police in Russia seems to have peaked during these years, followed by the steady decline shown in Figure 1.

### *Homicide statistics as a measure of police performance*

In Russia, increasing homicide rates are seen as reflecting the negative performance of the police, while declining rates indicate the efficiency and high quality of the work of the police (Shklyaruk et al., 2015; Skomorokhov and Shikhanov, 2006; Volkov and Paneyah, 2012). The police, at the same time, are the principal agency in charge of collecting and making public this ‘suicidal’ information (Babaev and Pudovochkin, 2014). Therefore, the police are more concerned about demonstrating a positive performance than about the actual homicide rate. Furthermore, police officers face penalties for unsolved criminal cases, so there is a tendency for the police to officially recode homicide offences that can be easily solved or those already solved at the point of investigation. This in fact can explain the converging rates of recorded homicide offences and convicted offenders in Russia

recently (which will be discussed later in the paper and shown in Figure 3). Criminologists in Russia argue that this selective rather than continuous registration of crimes leads to a substantial artificial reduction in the number of homicides appearing in official Russia crime statistics (Babaev and Pudovochkin, 2014; Inshakov, 2011; Luneev, 2005).

## **Factors affecting official police-reported homicide statistics in Russia**

Given the incentives to misrepresent homicide data in Russia, I will now empirically describe the ways in which different factors affect official crime statistics on homicide produced at the national level in Russia. The factors discussed below do not have the same 'weight'. That is, an analysis of legal factors provides clearer ways for estimating homicide rates appropriate for international comparisons. Statistical rules and substantive factors, on the other hand, require much deeper analyses at the national level and may not allow for the calculation of more accurate homicide estimates.

### *Legal factors*

Legal factors broadly refer to the impact of the legal definitions of crime and to the characteristics of the legal process and its influence on police investigations and court decision-making. One of the main factors that affects the interpretation and comparability of official data on homicide is the way it is defined and classified in a country's criminal code (Aebi et al., 2014; Harrendorf, 2012; Smit et al., 2012). Official data on crime, including homicide, are usually compiled according to national legislation and concepts, which hamper international comparability.

*Legal definition of homicide in Russia.* Although the concept of homicide appears straightforward (that is, the intentional killing of a person by another person), it can be defined narrowly or in a more expansive manner (Smit et al., 2012). Article 105 of the Russian Criminal Code defines criminal homicide as 'an intentional causing of death to another person' and describes criminal homicide (part 1) and criminal homicide with aggravating circumstances (part 2).<sup>1</sup> Some of the aggravated circumstances include killing two or more people, a minor or a pregnant woman.

The Ministry of Internal Affairs (MVD), which is in charge of registering and investigating homicides in Russia, makes statistics on homicide publicly available through annual publications and online sources ([www.mvd.ru](http://www.mvd.ru)). In their reports, the MVD combines homicides registered under Article 105 (Criminal homicide or murder) with homicides defined in three other articles of the Criminal Code, that is, Articles 30 (part 3) (Attempted crime), 106 (Killing of a newborn child by a mother) and 107 (Killing in a state of strong emotional arousal). Homicides classified in Articles 106 and 107 are both intentional homicides committed under mitigating circumstances and hence constitute voluntary manslaughter. Attempted homicides (Article 30, part 3) contain all the characteristics of completed homicides (that is, intent to kill) but death of the victim is averted due to external circumstances (for example, interference of the police, the bullet missing the aorta, rapid medical assistance).



*Consistency between Russia's national definition of homicide and the international standard definition.* The standard definition of homicide given in a recently created first version of the International Classification of Crime for Statistical purposes (ICCS) regulates what constitutes homicide for statistical purposes (Bisogno et al., 2015). Intentional homicide is defined as 'unlawful death inflicted upon a person with the intent to cause death or serious injury' (UNODC, 2015: 17).<sup>2</sup> This definition is highly consistent with the definition of deaths due to assault in the International Classification of Diseases (ICD)-10, which defines 'assault' as 'injuries inflicted by another person with intent to injure or kill, by any means' (WHO, 2016b).<sup>3</sup> This definition has also been used in the United Nations Survey on Crime Trends and the Operations of Criminal Justice Systems (UN-CTS), the results of which were published in the Global Study on Homicide (GSH) 2013 (UNODC, 2014).

Russia's definition of homicide in general is consistent with this standard international definition. Specifically, crimes defined in Articles 105–107 include murder, honour killing, death as a result of terrorist activities, dowry-related killings, femicide, infanticide, voluntary manslaughter, extrajudicial killings, and killings caused by excessive use of force by law enforcement/state officials. However, the Russian definition deviates from the standard international definition in two important ways. First, Russia's national homicide statistics include attempted homicides and, more importantly, exclude serious assaults leading to death. Both deviations can affect the 'core' of intentional homicide and hence the statistical comparability of the police-recorded Russian homicide rate and the rate derived from the international sources listed above (Harrendorf, 2012).

*Attempted homicide.* Statistics on attempted homicide are not separately available in Russia. However, I was able to obtain access to first-hand police statistics,<sup>4</sup> which allowed me to document the number of registered homicide attempts between 2006 and 2016, as shown in Table 1. Table 1 demonstrates that there was a steeper decline in the number of police-registered attempted homicides compared with the number of police-registered completed homicides over the 10-year period (a 68 percent decline and a 60 percent decline, respectively). It also shows that the proportion of attempts among all homicides declined from 19 percent in 2006 to 11 percent in 2012 and then increased to 16 percent in 2016. The average proportion of attempted homicides was 14 percent between 2006 and 2016.

*Serious assault leading to death.* According to the Russian Criminal Code definition, only cases involving the intent to kill, not to inflict serious injuries that might still lead to death, would be counted as homicide; all other cases would be coded as intentional grievous bodily harm leading to death (Article 111, part 4, of the Criminal Code). Also, if a person did not immediately die after an attack but died days later (for example, the person died after three days in hospital), the event would probably be recoded as intentional grievous bodily harm leading to death and would not be included in the homicide statistics. Because in real life it is often difficult to differentiate intent to kill and intent to severely injure another person (who died from this injury), this constitutes a substantial grey area in the production of Russian homicide statistics.

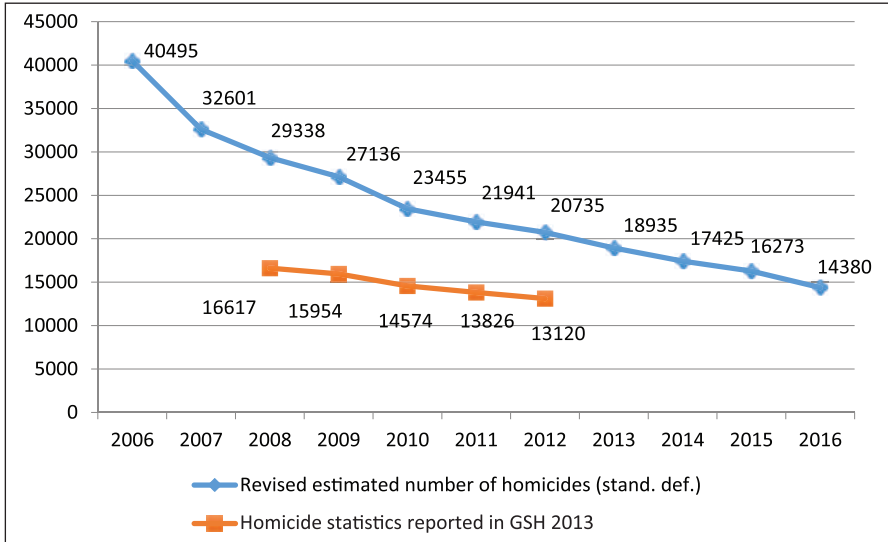
My examination of court decisions on criminal cases<sup>5</sup> classified in Article 111, part 4 (that is, serious assault leading to death) illustrates how the so-called 'negligently' caused

**Table 1.** Number of attempted and completed homicides registered in official police statistics in Russia, 2006–16.

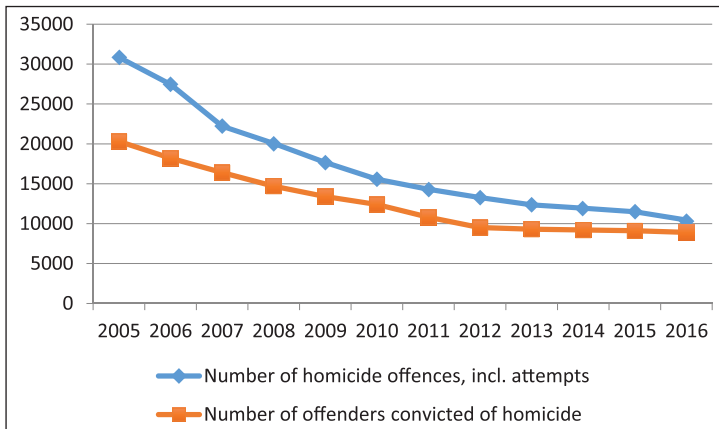
Year	Offences of completed and attempted homicides (Articles 30, 105–107 CC RF)	Offences of attempted homicide	Offences of completed homicide	Proportion of attempts among total homicides (percent)
2006	27,462	5267	22,195	19.2
2007	22,227	3926	18,301	17.7
2008	20,056	3318	16,738	16.5
2009	17,680	2444	15,236	13.8
2010	15,563	2008	13,555	12.9
2011	14,305	1664	12,641	11.6
2012	13,265	1430	11,835	10.7
2013	12,361	1426	10,935	11.5
2014	11,933	1508	10,425	12.6
2015	11,496	1623	9873	14.1
2016	10,444	1664	8780	15.9

death of some of the victims in fact strongly resembles homicide (but is not included in the police-reported homicide statistics). For example, in one case the victim's death was caused by 'not less than 175 punches with hands, feet and a wooden bar into vital organs of a victim: her head and trunk' (criminal case 1-112/2013, 8 April 2013, Smolensk). Another case of serious assault leading to death describes an offender who 'hit his victim on the head and, after she fell on a basement floor, threw a concrete slab of significant weight of 36 kg in the direction of the victim that damaged her head and led to her death' (case 1-62, 18 June 2012, Saint-Petersburg) (Rospravosudie, n.d.). In both cases, the offenders stated that they had no intention to kill and, despite these vivid descriptions of apparent homicides, these cases were not classified as homicides. These examples illustrate an alternative way of how cases of apparent criminal homicide can be recoded and shown in crime statistics so that homicide statistics do not reflect them. We believe this 'option' in the law can partly reflect the Soviet Union's notorious legacy of falsification and concealment of unfavourable statistical data that was discussed above.

Although national homicide statistics have been directly affected by the exclusion of serious assaults leading to death, homicide statistics for international comparisons should include serious assaults leading to death, according to the standard definition. However, this appears not to be the case with Russian homicide statistics reported to the international sources described above. Figure 2 illustrates the effect of including serious assaults leading to death (Article 111, part 4, of the Criminal Code) with the police-reported number of completed homicides (Articles 105–107) in Russia over the past 10 years; to accord with the UNODC standard definition, attempted homicides (Article 30) have been removed from the Russian police-reported statistics. Figure 2 compares this revised homicide figure with the homicide statistics reported in the GSH 2013 (UNODC, 2014). Although both trends are declining, revised estimates are at least 1.6 times greater than homicide statistics reported in the GSH 2013.



**Figure 2.** Revised estimated number of homicide offences in Russia, 2006–16, in accordance with the standard definition, together with Russian homicide statistics reported in the Global Study on Homicide 2013, 2008–12 (GSH).



**Figure 3.** Number of homicide offences, including attempts, and the number of offenders convicted of homicide in Russia, 2005–16.

### Statistical factors

International comparisons of homicide statistics can also be seriously compromised by differences in the statistical rules and procedures regarding the collection of homicide statistics in different countries.

**Table 2.** Trends in the number of reports of homicide offences to the police and the number of homicide offences, including attempts, registered by the police in Russia, 2013–16.

Year	Number of reports of homicide offences to the police	Number of homicide offences, including attempts, registered by the police
2013	31,284	10,935
2014	23,823	10,425
2015	40,128	9873
2016	54,216	8780

*When are data collected for official statistics?* Data on a crime can be collected by officials at the time an offence is first reported (input statistics) or when the police have completed the investigation (output statistics). However, some countries record data at an intermediate stage of the process (Aebi, 2010), and this is the case with Russian homicide statistics. A suspicious death in Russia is typically classified as homicide at the moment of making a decision to initiate the criminal proceedings on the reported case.

The total number of homicides reported by citizens (for example, bystanders or relatives) to the police has increasingly exceeded the number of homicides officially registered by the police in the 2000s. A group of scholars from the Research Institute of the Academy of General Prosecutor's Office headed by Professor Inshakov found that between 2001 and 2009 the number of homicides reported to the police tripled from about 14,000 to 45,000, whereas the total number of homicides recorded by the police was almost halved from 34,000 to 18,000 (Inshakov, 2011). As a result, in 2009 the police registered 2.5 times fewer homicides than were reported to the police. In recent years, similar trends still remain. Table 2 shows that, whereas the number of homicide offences reported by citizens increased by 73 percent between 2013 and 2016, the number of homicides recorded by the police, including attempts, steadily declined.

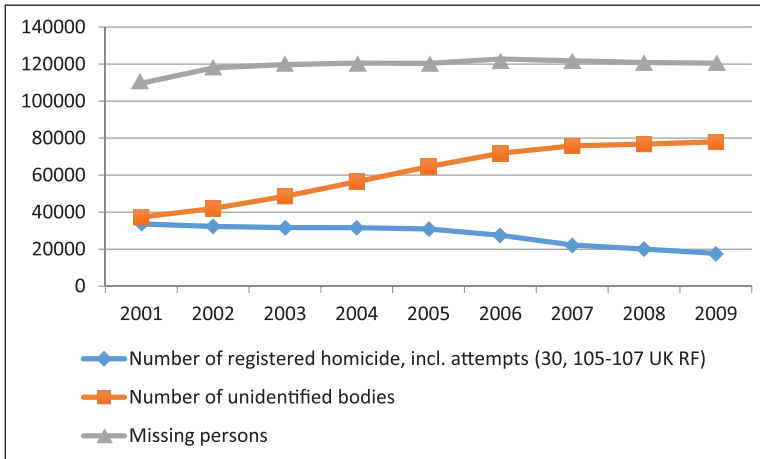
*What is the counting unit used in the statistics?* Each criminal justice institution uses counting units based on its own operational requirements. Police may use charges, suspects, victims and incidents, while courts may use cases, convictions and sentences. In the majority of European countries, both victims and incidents are usually used as the counting units for homicide in the national statistics (Aebi, 2010; Smit et al., 2012). Offenders are also sometimes used as an additional counting unit. In Russia, one homicide offence is counted per incident regardless of the number of victims or offenders. This means that the killing of tens or hundreds of people resulting from a bomb explosion would be recorded as one criminal homicide offence (Luneev, 2005: 409). Russia also collects statistics on the number of persons convicted of homicide, which are available to the public (Rosstat, n.d.). These data come from court records and are distinct from police records. Figure 3 shows that, in 2016, the number of convicted offenders had declined at a slower rate and converged with the number of homicide offences, including attempts. This seems to show that the conviction rate for homicide has been incredibly high in recent years.

*Is a principal offence rule applied?* In countries using a principal offence rule, only the most serious offence is recorded, whereas in countries without such a rule, each offence is recorded independently. Russia does not apply a principal offence rule. If a victim is kidnapped and then murdered, in Russian crime statistics this appears as two offences: as a kidnapping and as a homicide. Also, if the offender commits a homicide in a socially dangerous way that results in the death of an intended victim and also causes death and injuries to other people, several offences will be registered (for example, Article 105, part 2a, ‘Killing two or more people’, and part 2e, ‘Killing in a socially dangerous way’ and Article 111 ‘Intentional serious assault’). At the same time, repeated similar incidents by the same person (that is, driven by a common intent and committed closely in time) will be registered as one offence (that is, ‘killing two or more people’, Article 105, part 2a) (Gurkina et al., 2001). This is likely to lead to the underreporting of homicide offences in the Russian crime statistics.

### ***Substantive factors***

Substantive factors in relation to statistics on homicide offences refer primarily to country-specific factors that can affect homicide statistics in different ways. In Russia, substantive factors relate to the established investigative practices in relation to unidentified bodies and missing persons. Research studies reveal the unsatisfactory quality of the investigation of suspicious deaths and homicides in Russia, that is, obsolete and inadequate investigative equipment and technology, the absence of express methods to investigate suspicious deaths (especially those due to poisoning), and a limited number of forensic physicians (Bogdanova, 2011; Inshakov, 2011). Only about 15–30 percent of all decedents with visible signs of violent death received an autopsy. In addition, a forensic physician is seldom called to the scene of an apparent homicide (Akopov, 2015).

Between 2001 and 2009, whereas the official homicide rate appeared to plummet, there was a notable increase in the number of unidentified bodies and missing persons. The number of unidentified dead bodies doubled from 37,000 in 2001 to almost 78,000 in 2009 (or a 109 percent increase between 2001 and 2009) (Inshakov, 2011); some of these people presumably were homicide victims (Andreev et al., 2008; Gavrilova et al., 2008). In addition, whereas the total number of missing persons appears to have grown between 2001 and 2009 – from about 110,000 to 120,000 (Inshakov, 2011) – the number of missing persons who were officially declared for search by the police declined from 78,000 to 71,000 over the same period (Figure 4). When cases of missing persons are reported to the police, the police examine these cases and make a decision about the initiation of the search or of criminal proceedings on the reported cases. Russian police exercise substantial discretion in making these decisions. For example, between 2010 and 2014, the police initiated criminal proceedings only once every 14th case of reported missing minors (Avdeiko, 2015). Although many of the missing persons would have died from natural causes or simply started new lives, some of them met violent deaths and the official homicide rate clearly fails to convey the true scale of the problem.



**Figure 4.** Trends in the number of registered homicides compared with trends in the number of unidentified dead bodies and missing persons, 2001–9.

Table 3 provides data on the number of missing persons, including those declared for search by the police in a specific year. Although the trends in the number of missing persons and those declared for search became more consistent between 2010 and 2016, the decline in the number of missing persons declared for search exceeded the number of missing people (percentage decline of 34 percent and 23 percent respectively).

Moreover, Table 4 shows that there is a substantial number of missing persons who remained missing by the end of the year, including those who were declared for search but were not found. If most of the latter 3000–5000 cases are in fact homicides, they would increase homicide numbers considerably (by about 20 percent based on the revised homicide estimates on Figure 2).

### Estimated homicide rates in Russia

We cannot rule out the possibility that the Russian homicide rate did indeed decline from one of the highest rates among other European countries and will soon reach the European mean (according to the recent ESB; see Aebi et al., 2014). We do have to acknowledge the improved quality of life and greater economic and political stability in Russia in the 2000s, which could potentially explain this rapidly declining homicide rate. At the same time, the theoretical-methodological focus on the production of Russian homicide data in this paper has uncovered a number of political incentives and specific factors that suggest a likely ‘underreporting’ of the level of homicide offences relative to the European average. Revised homicide estimates that correspondent to the standard definition are at least 1.6 times higher than those reported in the GSH 2013 (Figure 2).

In addition, trends in other violent offences that are to some extent related to homicide offences and expected to follow similar trajectories point to certain irregularities

**Table 3.** Trends in the number of registered missing persons, including those who were declared for search by the police in a specific year in Russia, 2010–16.

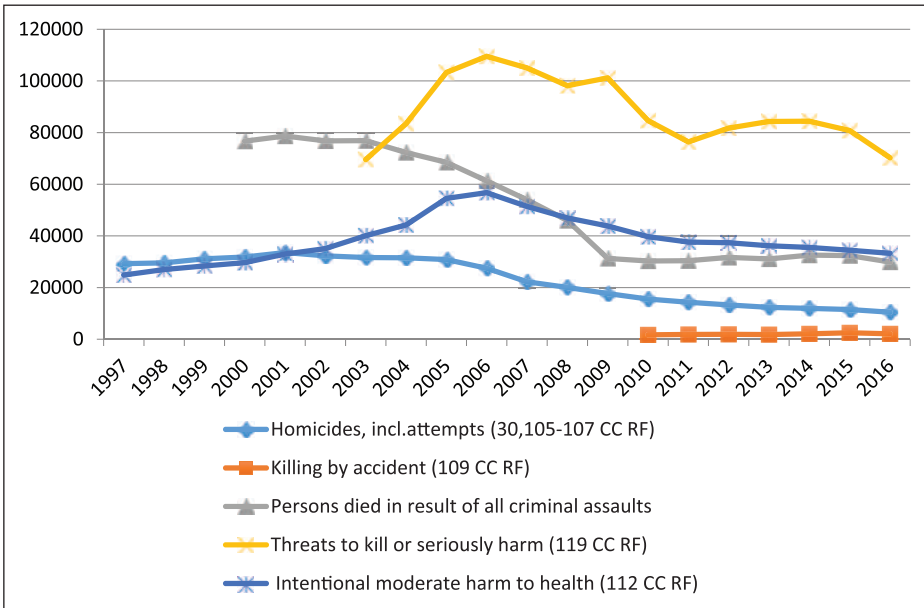
Year	Total number of missing persons reported in a specific year	Including
		Missing persons declared for search by the police in a specific year
2010	115,037	66,669
2011	112,343	64,576
2012	101,608	53,635
2013	102,721	54,487
2014	93,900	46,361
2015	93,085	46,711
2016	88,751	44,227

**Table 4.** Number of missing persons who remained missing, including those of them who were declared for search and were not found by the end of the year in Russia, 2010–16.

Year	Number of missing persons who remained missing in a specific year	Including
		Missing persons who were declared for search in a specific year and were not found by the end of the year
2010	47,830	4979
2011	47,553	4727
2012	47,479	4251
2013	47,751	3882
2014	46,116	3430
2015	44,630	3114
2016	42,041	2730

in homicide statistics in Russia. Specifically, Figure 5 demonstrates that although the number of homicide offences, including attempts, has declined steadily (especially after 2005), the number of homicides by accident, threats to kill or seriously harm, the number of people who died as a result of all criminal assaults, and the number of offences of intentional moderate harm to health appears to have levelled off. It is also noteworthy that the number of people who died as a result of all criminal assaults declined from 46,000 in 2008 to 31,300 in 2009 (almost 15,000 deaths just in one year), mostly because of 12,600 fewer deaths among men. It is difficult to explain this staggering decline.

Despite my attempts to produce revised homicide estimates (Figure 2), we are unlikely to find a predictable means of estimating more accurate homicide numbers. This is because underreporting is not only a function of the technical rules affecting crime counts, but also dependent on a number of other mainly substantive factors including the willingness of the police to accurately record offences, the function of crime statistics as



**Figure 5.** Comparative trends in the number of homicides, including attempts, and some other violent offences in Russia, 1997–2016.

a measure of police effectiveness, established investigative practices in relation to unidentified bodies and missing persons, and so forth.

### Conclusion

Homicide statistics are often seen as the most reliable and comparable indicator of violent deaths around the world. Compared with other crime statistics – for example, statistics on rapes and thefts – homicide numbers may indeed be more reliable and thus much more appropriate for international comparisons. However, the examples of Russian homicide statistics in this paper suggest that homicide statistics are not less of a social construct than statistics for other crimes. This paper has discussed several incentives for misrepresentation of official homicide data in Russia, including the politicization of homicide statistics as a legacy of the Soviet’s era falsified crime statistics, the role of policing in contemporary Russia, and homicide statistics as a measure of police performance. This paper has also revealed some areas where the production of homicide statistics is a particularly grey area and has discussed various factors that can affect homicide statistics in different ways.

Among these issues, legal factors (such as Russia’s legal definitions of homicide and their correspondence to the standard international definition) seem the most straightforward. Based on the analyses of these factors, I was able to produce some revised homicide estimates that appear to exceed those provided in the other international sources on



homicide data. However, the ambiguity and complexity of two other sets of factors, that is, statistical and substantive factors, make it nearly impossible to estimate a more accurate number of homicides. We can only argue about the plausibility of the trend in homicides compared with the trends in similar phenomena, which I attempted to illustrate in the latter part of this paper.

My analyses of the production of homicide statistics in Russia suggest that cross-national comparisons of homicide levels (as well as levels of other crimes) can indeed be hazardous. It appears that homicide statistics are a social construct and can be affected by a number of legal, statistical and substantive factors. Nevertheless, I argue that official homicide statistics are not insignificant in the cross-national context. The intention to make national statistics more appropriate for international comparisons can contribute to improved quality and a greater clarity of national statistics. Similar efforts by researchers in other countries could help check, validate and ensure a general consistency in the information from each country, similar to the data quality control efforts undertaken by the European Sourcebook Group (Aebi et al., 2014). Moreover, the ICCS is in the process of developing a criminal classification framework based on behavioural descriptions rather than legal codes. The goal of this initiative is to produce a consistent set of definitions to ensure that data on crime within the same category will refer to the same criminal act, irrespective of differences in national laws.

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## Notes

1. The aggravated circumstances include killing of two or more people; killing of a person or his or her relatives in connection with the performance of this person's official activity; killing of a minor or another person in a helpless condition, and also associated with kidnapping; killing of a pregnant woman; committed with particular cruelty; committed in a manner dangerous to other people (for example, explosion); committed by a group of people; killing for mercenary motives or for hire, as well as in connection with robbery, extortion or banditry; killing motivated by hooliganism; killing in order to conceal another crime or facilitate its commission, as well as associated with rape or violent acts of a sexual nature; killing on the grounds of political, ideological, racial, national or religious hatred or enmity or on the grounds of hatred or enmity towards any social group; and, finally, killing for the use of organs or tissues of the victim.
2. This definition includes murder; honour killing; serious assault leading to death; death as a result of terrorist activities; dowry-related killings; femicide; infanticide; voluntary manslaughter; extrajudicial killings; killings caused by excessive use of force by law enforcement/state officials and excludes death due to legal interventions; justifiable homicide in self-defence; attempted intentional homicide; homicide without the element of intent is non-intentional homicide; non-negligent or involuntary manslaughter; assisting suicide or instigating suicide; illegal femicide; euthanasia (UNODC, 2015: 33).
3. The statistical count of such deaths is often used to measure intentional homicides, and compared with criminal justice statistics for homicide counts.
4. A formal application was submitted to the Main Information and Analytical Centre of the Ministry of Internal Affairs and the required information was received within 30 days in

accordance with Article 29 of the Russian Constitution and the Federal Law 'On providing access to information on the activities of state bodies and local authorities' dated 9 February 2009 (# 8-FZ).

5. The texts of court decisions became available to the public in 2008 under the Federal Law 'On providing access to information on the activities of courts in the Russian Federation' dated 22 December 2008 (#262-F3). The website that collects the texts of all court decisions made available to the public in recent years in Russia is <https://rospravosudie.com/>. These court decisions include only cases where someone was charged, so that, for example, unsolved homicides are not represented in them.

## References

- Aebi MF (2010) Methodological issues in the comparison of police-recorded crime rates. In: Shoham SG, Knepper P and Kett M (eds) *International Handbook of Criminology*. Boca Raton, FL: CRC Press, 211–227.
- Aebi MF et al. (2014) *European Sourcebook of Crime and Criminal Justice Statistics 2014*, 5th edn. HEUNI Publication Series 80. Helsinki: Heuni. URL (accessed 7 June 2017): <http://wp.unil.ch/europeansourcebook/>.
- Akopov VI (2015) Criminal deaths: Distortions and statistical errors [in Russian]. *Medical Expertise and the Law* 1: 10–14.
- Andreev E, Pridemore WA, Shkolnikov VM and Antonova OI (2008) An investigation of the growing number of deaths of unidentified people in Russia. *European Journal of Public Health* 18(3): 252–257.
- Andreev E, Shkolnikov AM, Pridemore WA and Nikitina SY (2015) A method for reclassifying cause of death in cases categorized as 'event of undetermined intent'. *Population Health Metrics* 13(1): 23.
- Antonova OI (2007) Regional characteristics of Russian mortality from external causes [in Russian]. PhD thesis, Russian Academy of Sciences, Institute of Social and Political Studies.
- Archer D and Gartner R (1984) *Violence and Crime in Cross-national Perspective*. New Haven, CT: Yale University Press.
- Avdeiko A (2015) New procedure for investigation of missing persons. *Popular-legal Almanac of MVD* [in Russian]. URL (accessed 22 June 2017): <http://ormvd.ru/pubs/102/a-new-procedure-for-investigation-of-disappeared-citizens/>.
- Babaev MM and Pudovochkin UI (2014) *Problems of Russian Criminal Policy* [in Russian]. M: Prospect.
- Baumer EP and Wolff KT (2014) The breadth and causes of contemporary cross-national homicide trends. *Crime and Justice* 43(1): 231–287.
- Bisogno E, Dawson-Faber J and Jandl M (2015) The International Classification of Crime for Statistical Purposes: A new instrument to improve comparative criminological research. *European Journal of Criminology* 12(5): 535–550.
- Black D J (1970) Production of crime rates. *American Sociological Review* 35(4): 733–748.
- Bogdanova LN (2011) Detection of latent murders during prosecutor's investigations. *Criminal Law* 5: 109–114.
- Coleman C and Moynihan J (1996) *Understanding Crime Data: Haunted by the Dark Figure*. Buckingham, UK: Open University Press.
- Conquest R (2000) *Reflections on a Ravaged Century*. New York and London: W.W. Norton & Company.
- Eisner M (2008) Modernity strikes back? A historical perspective on the latest increase in interpersonal violence (1960–1990). *International Journal of Conflict and Violence* 2(2): 288–316.

- Favarel-Garrigues G (2011) *Policing Economic Crime in Russia: From Soviet Planned Economy to Privatization*. London: Hurst.
- Garland D (2001) *The Culture of Control: Crime and Social Order in Contemporary Society*. Chicago: University of Chicago Press.
- Gavrilov BY (2009) On the reality of criminal-legal statistics on crime. *Current Issues of Jurisprudence* 6: 4–10.
- Gavrilova NS, Semyonova VG, Dubrovina E, Evdokushkina GN, Ivanova AE and Gavrilov LA (2008) Russian mortality crisis and the quality of vital statistics. *Population Research and Policy Review* 27(5): 551–574.
- Gurkina EM et al. (2001) *Actual Issues of Qualification, Registration and Accounting of Certain Types of Crimes: Methodical Recommendations* [in Russian]. Moscow: Office of the General Prosecutor.
- Hale HE (2006) *Why Not Parties in Russia? Democracy, Federalism, and the State*. Cambridge: Cambridge University Press.
- Harrendorf S (2012) Offence definitions in the European Sourcebook of Crime and Criminal Justice Statistics and their influence on data quality and comparability. *European Journal on Criminal Policy and Research* 18(1): 23–53.
- Hendley K (2009) ‘Telephone law’ and the ‘rule of law’: The Russian 0case. *Hague Journal on the Rule of Law* 1(2): 241–262.
- Hood C (2007) Public service management by numbers: Why does it vary? Where has it come from? What are the gaps and the puzzles? *Public Money and Management* 27(2): 95–102.
- Inshakov SM (ed.) (2011) *Theoretical Foundations of Research and Analysis of Latent Crime* [in Russian]. Moscow: UNITI-DANA.
- Ivanova AE, Sabgayda TP, Semenova VG, Zaporozhchenko VG, Zemlyanova EV and Nikitina SY (2013) Factors distorting structure of death causes in working population in Russia. *Sotsial'nye aspekty zdorov'ia naseleniia* [Russian electronic edition]. URL (accessed 7 June 2017): <http://vestnik.mednet.ru/content/view/491/27>.
- Gerber TP and Mendelson SE (2008) Public experiences of police violence and corruption in contemporary Russia: A case of predatory policing? *Law & Society Review* 42(1): 1–44.
- Krug EG, Dahlberg LL, Mercy JA, Zwi AB and Lozano R (2002) *World Report on Violence and Health*. Geneva: World Health Organization.
- LaFree G (2005) Evidence for elite convergence in cross-national homicide victimization trends, 1956 to 2000. *The Sociological Quarterly* 46(1): 191–211.
- LaFree G and Tseloni A (2006) Democracy and crime: A multilevel analysis of homicide trends in forty-four countries, 1950–2000. *The Annals of the American Academy of Political and Social Science* 605(1): 25–49.
- Light M, Mota Prado M and Wang Y (2015) Policing following political and social transitions: Russia, Brazil, and China compared. *Theoretical Criminology* 19(2): 216–238.
- Lomell HM (2010) The politics of numbers. Crime statistics as a source of knowledge and a tool of governance. In: Shoham SG, Knepper P and Kett M (eds) (2010) *International Handbook of Criminology*. Boca Raton, FL: CRC Press.
- Luneev V (2005) *Crime in the XXth Century: Global, Regional and Russian Trends* [in Russian]. Moscow: Wolters Kluwer.
- Lysova A and Shchitov N (2015) What is Russia’s real homicide rate? Statistical reconstruction and the ‘decivilizing process’. *Theoretical Criminology* 19(2): 257–277.
- McCarthy LA (2014) Local-level law enforcement: Muscovites and their uchastkovyy. *Post-Soviet Affairs* 30: 195–225.
- Malby S (2010) Homicide. In: Harrendorf S, Heiskanen M and Malby S (eds) *International Statistics on Crime and Justice*. Helsinki: HEUNI, 7–19.

- MVD (n.d.) Sostoyanie prestupnosti [Situation with crime]. Official website. URL (accessed 7 June 2017): <http://mvd.ru/Deljatelnost/statistics/reports>.
- Nivette AE and Eisner M (2013) Do legitimate politics have fewer homicides? A cross-national analysis. *Homicide Studies* 17(1): 3–26.
- Obydenkova A and Libman A (2015) Understanding the survival of post-Communist corruption in contemporary Russia: The influence of historical legacies. *Post-Soviet Affairs* 31(4): 304–338.
- President of Russia (n.d.) Expanded meeting of Interior Ministry Board. Official website. URL (accessed 28 January 2018): <http://en.kremlin.ru/events/president/news/51515>.
- Pridemore WA (2003) Measuring homicide in Russia: A comparison of estimates from the crime and vital statistics reporting systems. *Social Science and Medicine* 57(8): 1343–1354.
- Riedel M and Regoeczi WC (2004) Missing data in homicide research. *Homicide Studies* 8(3): 163–192.
- Rospravosudie (n.d.) Russian justice [in Russian]. URL (accessed 7 June 2017): <https://rospravosudie.com/>.
- Rosstat (n.d.) Federal Agency of State Statistics: Crime. URL (accessed 7 June 2017): [http://www.gks.ru/wps/wcm/connect/rosstat\\_main/rosstat/ru/statistics/population/infraction/#](http://www.gks.ru/wps/wcm/connect/rosstat_main/rosstat/ru/statistics/population/infraction/#).
- Sacco V (2005) *When Crime Waves*. Thousand Oaks, CA: SAGE.
- Semyonova VG and Antonova OI (2007) Veracity of mortality statistics (based on injury- and poisoning-related mortality in Moscow) [in Russian]. *Sotsial'nye aspekty zdorov'ia naseleniia* [Russian electronic edition]. URL (accessed 22 June 2017): [http://vestnik.mednet.ru/index2.php?option=com\\_content&task=view&id=28&pop=1&page=0&Itemid=30](http://vestnik.mednet.ru/index2.php?option=com_content&task=view&id=28&pop=1&page=0&Itemid=30).
- Shklyaruk MS, Skougarevskiy DS, Begtin IV and Skivskiy IS (2015) *Criminal Statistics – Through Openness to Manageability* [in Russian]. Saint Petersburg: Institute for the Rule of Law. URL (accessed 7 June 2017): [http://www.enforce.spb.ru/images/Staff/Crimestat\\_memo\\_2015\\_IRL\\_KGI.pdf](http://www.enforce.spb.ru/images/Staff/Crimestat_memo_2015_IRL_KGI.pdf).
- Skomorokhov RV and Shikhanov VN (2006) *Criminal Statistics: Problems of Reliability*. Moscow.
- Smit PR, De Jong R and Bijleveld C (2012) Homicide data in Europe: Definitions, sources and statistics. In: Liem M and Pridemore WA (eds) *Handbook of European Homicide Research: Patterns, Explanations, and Country Studies*. New York: Springer.
- Tolts M (2012) The failure of demographic statistics: A Soviet response to population troubles. Paper presented at the IUSSP XXIVth General Population Conference, Salvador-Bahia, Brazil, 18–24 August 2001 [revised as of 12 July 2012].
- UNODC (2014) Global study on homicide 2013. Trends, context, data. URL (accessed 18 July 2014): <http://www.unodc.org/gsh/>.
- UNODC (2015) International Classification of Crime for Statistical Purposes, Version 1.0. Vienna: UNODC. URL (accessed 7 June 2017): <http://unstats.un.org.proxy.lib.sfu.ca/unsd/statcom/doc15/BG-ICCS-UNODC.pdf>.
- Van Dijk J, Tseloni A and Farrell G (eds) (2012) *The International Crime Drop: New Directions in Research*. New York: Springer.
- Volkov VV and Paneyah EL (eds) (2012) *Law Enforcement in Russia: Structure, Functioning, Ways of Reforming*. Saint Petersburg: Institute of Problems of Law Enforcement at the European University in Saint Petersburg. URL (accessed 15 May 2018): [http://www.enforce.spb.ru/images/Fond\\_Kudrina/irl\\_pravookhrana\\_part\\_1\\_final\\_31\\_12\\_ich.pdf](http://www.enforce.spb.ru/images/Fond_Kudrina/irl_pravookhrana_part_1_final_31_12_ich.pdf)
- Von Hofer H (2000) Crime statistics as constructs: The case of Swedish rape statistics. *European Journal on Criminal Policy and Research* 8(1): 77–89.
- Von Hofer H and Lappi-Seppälä T (2014) The development of crime in light of Finnish and Swedish criminal justice statistics, circa 1750–2010. *European Journal of Criminology* 11(2): 169–194.

- Walker EW (2007) Crime without punishment – The Litvinenko affair and Putin’s culture of violence. *Georgetown Journal of International Affairs* 8: 97.
- WHO (2016a) European mortality database. URL (accessed 7 June 2017): <http://data.euro.who.int/hfamdb/>.
- WHO (2016b) *International Statistical Classification of Diseases and Related Health Problems. 10th Revision*. Version 2016. Geneva: World Health Organization. URL (accessed 7 June 2017): <http://apps.who.int/classifications/icd10/browse/2016/en#/X85-Y09>.
- WHO (n.d.) Health statistics and information systems. URL (accessed 22 June 2017): <http://www.who.int/healthinfo/statistics/en/>.