

# Mortality rates caused by gunshot injuries and fires associated with killings as the markers of socially negative development in a megapolis

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**Abstract.** The article examines criminal injuries in the city of Kemerovo and the Kemerovo region, which were considered as markers of social disadvantage of the region. In particular, death from gunshot injuries and fires associated with killings is selected as a marker. The authors analyze an internal nature of these markers, revealing causal relationships. The study was conducted on the basis of extensive empirical material, including the production of forensic medical examinations. We found that along with relatively stable values of our markers in the Russian Federation and the Kemerovo region, a slight decrease in criminal mortality is observed. However, in the context of declining indicators, the following is noted: (1) fires in which murders are disguised as an accident are not recorded, because there is no such indicator in the statistical reports; (2) a relatively high suicide rate exists due to a gunshot injury in Kemerovo; (3) increasing sophistication of those actions conducted by marginal personalities; (4) presence of several channels of an illegal sale of weapons and means of simulating spontaneous combustion. A number of sustainable solutions aimed at stabilizing the marginal environment are proposed. Eliminating a negative impact from these markers is a prerequisite for reducing tensions in society and, as a result, improving social welfare.

**Keywords:** gunshot injuries, fires, murder, crime

## 1. Introduction

In the context of globalization complicated by the activity of terrorists and extremist groups, social, legal, and anthropogenic security is considered to be essential markers of the sustainable development of cross-border regions [1]. At the same time, the severity of markers in a particular region is directly dependent on the security and implementation of objectively significant needs of each individual, society, and the state, as well as their protection from internal and external threats. It is quite natural that these sustainability markers of development are directly reflected in the state's strategic national priorities. The National Security Strategy of the Russian Federation put into action by the Decree of the President of the Russian Federation in 2015 [2] really includes a set of priority criteria such as criminological security, security in emergency situations, social security, demographic security, etc. However, we offer a slightly different approach to the assessment of sustainable development, using not directly measured indicators of the well-being of the region, but inverse criteria of disadvantage.

From the author's point of view, the markers of mass people's death can be used as such. In particular, if one considers official statistics for the Russian Federation and the Kemerovo region [3-6], that he/she would find that criminal fires and gunshot injuries occupy leading positions. We would also like to note that we are interested in criminal fires and gunshot injuries not only as indicators of statistics, which are reflected in statistical accounts, but their internal nature, and that nature fully depends on the socio-economic well-being of a particular region.

According to our data [7], the internal nature of the selected markers is characterized by: (1) *sophistication*, expressed not only in cruelty (when victims experience special mental and physical suffering) but also in an attempt to disguise a situation under an accident, suicide; (2) *group characteristics* (it is psychologically difficult to commit such crimes alone. If there is only one offender, then in more than 80% of cases, a crime is committed under various stimulants (alcohol, drugs, etc.); (3) its *transboundary nature* (since members of criminal groups are mostly "transiters," moving from region to region; (4) several *channels of an illegal sale of weapons*, means simulating spontaneous combustion; (5) *demonstrating a threat to society*, disregarding moral norms and rules of proper behavior; (6) a set of *non-motivated characteristics*, because some number of crimes studied by us are committed out of hooligan motives or because of mental disorder (pyromania).

Within this research, we set a goal to present the criminal death of people from fires (involving murder) and gunshot injuries as markers of socially negative development on the example of Kemerovo and the Kemerovo region. The following tasks were set: (1) to describe the markers of social and negative development of a region; (2) to reveal their essence; (3) to propose new sustainable solutions aimed at reducing socially negative impacts of these markers.

## 2. Materials and Methods

For solving problems, an empirical base is chosen, including: materials of 337 criminal cases filed for the murder involving fire and for which there are court decisions for the period from 1989 to 2018 [5]. Second, we also relied on 80 forensic medical examination acts of the Bureau of Forensic Medical Examination of the city of Kemerovo for the period from 2005 to 2018 [6]. A retrospective analysis of a firearm injury for the period 2014-2018 was conducted on the basis of 169 expert opinions by the State Budgetary Institution of Health Care of the Kemerovo Region of a Special Type "Kemerovo Regional Clinical Bureau of Forensic Medicine" (GBUZ KO OT KOKBSME) in Kemerovo, 44th of them examinations of corpses and 125 examinations of surviving victims. Also, we used statistical data from the official sites of the Ministry of Internal Affairs of Russia [3] and the Russian Emergencies Ministry [4].

The empirical base was processed by the author's questionnaire. The survey data was processed via such programs as MS Excel 2010 and Statistica 6.5. Reliability of our results ( $p$ ) was evaluated at the forecast significance level of  $p < 0.05$ . The degree of connectedness of independent indicators ( $r$ ) was estimated through the correlation analysis.

## 3. Results

In the Russian Federation, more than 130 thousand cases of fires were recorded, in which about 8 thousand people died, and about 10 thousand people were injured only in 2018 [4]. According to the same statistics, the fourth place is stably held by arson (more than 14 thousand) for more than 5 years. If we take into account "not established" (~ 1 thousand) and "other" (~ 14 thousand) causes of fires and conditionally put them in the line of causes "arson", then the latter would occupy the second position among the main causes of fires. In favor of this version, we say that 97-98% of all fire cases did not lead to initiating criminal proceedings (there was an official denial). The causes of fires were not established in more than 82% of cases [8]. And as E. V. Lantukh rightly points out [8], the matter here is not only in the latency of crimes (referring to the murders associated with fire) and the lack of a corresponding indicator in the statistical reporting, but in their concealment, including murders disguised as careless by fire, which is convincingly described in the monograph by A. L. Protopopov [9].

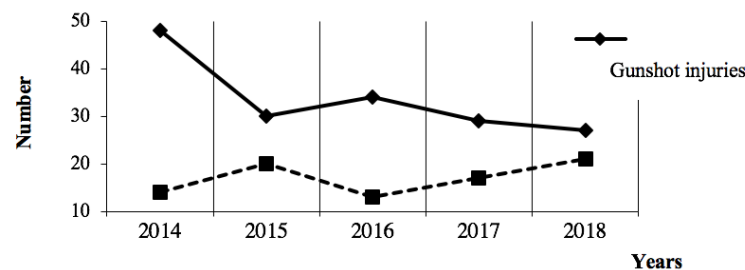
Since the official statistics for the Russian Federation and the Kemerovo Region do not take into account such indicators as the number of recorded gunshot injuries and fires associated with murder, we compare the crimes committed with the use of weapons and the number of arsons over the studied period in Table 1.

**Table 1.** Statistical indicators of criminal death in the Russian Federation and the Kemerovo region.

Markers	Russian Federation					Kemerovo region				
	2014	2015	2016	2017	2018	2014	2015	2016	2017	2018
Crimes committed with the use of weapons	7281	6939	6031	5434	6003	65	62	56	52	57
The number of arsons	17597	15996	14109	14907	14021	72	80	86	88	73

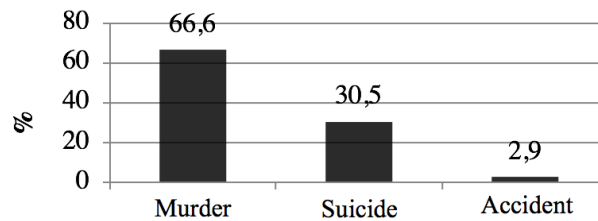
It can be conditionally considered that death from gunshot injuries is included in the indicator “crimes committed with the use of weapons,” whereas murders involving fire are included in the indicator “a number of arsons”. In 2018, a slight increase in crimes committed with the use of weapons is observed both in the Russian Federation and in the Kemerovo region. Conversely, a decrease in this indicator in the number of arsons is noted in 2018. The markers we study, both in the Russian Federation and in the Kemerovo Region, show a similar development trend. To test the hypothesis, we conducted a correlation analysis. Based on the high magnitude of the correlation coefficient both in the Russian Federation ( $r = 0.83$ ) and in the Kemerovo region ( $r = -0.73$ ), the two studied markers are most likely interdependent.

To verify this, we traced dynamics of death from gunshot injuries and fires associated with murders in Kemerovo from 2014 to 2018 (Figure 1). These dynamics are negatively conjugated, which reflects a high value of the correlation coefficient  $r = -0.70$ . With an increasing number of gunshot injuries in one year, a decrease in the number of fires associated with murder is observed. Conversely, the growth of another marker is noted with a decrease in gunshot injuries.



**Figure 1.** Dynamics of the criminal death of people from gunshot injuries and in fires associated with murders in the city of Kemerovo.

Law enforcement agencies possessing such a tool will be able to predict the nature of changes in the studied markers and promptly stop these types of socially negative development in the metropolis. In Figure 2, we have built a fatal injury profile in Kemerovo over the past five years. The relatively high proportion (30.5%) of the number of suicides only caused by a gunshot injury is of particular concern. At the same time, the percentage of murders that are disguised as suicide or an accident is also unknown.



**Figure 2.** The structure of a gunshot injury in the city of Kemerovo over the past five years.

In Table 2, for example, we grouped the relationship of the markers under study with situations, victims, and motives. In addition to all other individuals, hired “torches” and “black realtors” represent the greatest social danger to the region. A group of hired “torches” destroy crime traces by fire for a fee. “Black realtors” independently destroy traces of illegal sale of apartments by fire, as a rule, together with their owners, which usually include retirees, drug addicts, etc.

**Table 2.** Some examples of the existing interdependence of markers of the socially negative development in a region and their relationship with situations, victims, and motives.

Markers	Characteristics of markers	Situation	Social groups of victims	Fault / Motive
1. Gunshot injuries 2. Fires associated with murders	Mass death of people	- Chaotic shots to the crowd	- “Casual” victims	- Hooliganism - For fear - No motive
		- Enclosed spaces; - Prop or another exit blocking	- “Casual” victims; - Close people	- Negligence - Pyromania - Greed - Hiring
	Disguise	- Contract killings; - Dramatization of an accident or a suicide	- Public figures, businessmen; - Close people	- For fear - Greed - Revenge
		- Hired “torches”; - “Black realtors”	- Pensioners; - Addicts, homeless	- Hiding traces - Greed

Another socially dangerous quality of the markers under study is the presence of channels for the illicit sale of weapons and means imitating spontaneous combustion: 1) through persons who are engaged in their handicraft production; 2) through persons engaged in illegal sales from military depots; 3) through the Internet. The Internet includes at least two sources of illicit marketing. The first is the dark sector of the Internet (darknet). In particular, there are several illegal online stores for illegal sales. The study of darknet statistics showed high activity of users in the Siberian Federal District, namely about 2-3 thousand registrations every month. The real percentage of users who illegally purchase weapons is unknown. The second source is instant messengers (Viber, Telegram), which has a capacity to mask users in the Internet.

**4. Discussion**

Of course, firearms, like fire, are capable of causing tremendous harm to people’s lives and health, property and national security in general. In this connection, such crimes are severely punished by national criminal law, recognized as grave and especially grave, and entail the most stringent measures of responsibility.

Based on the results obtained, we can formulate a working hypothesis: using a marginal person who is in a borderline state of mind, firearms, or fire as a means of concealing crime traces (or a direct murder weapon) is the result of a long-term psycho-emotional experience. In other words, the majority of such crimes are prepared in advance by a marginal person (who has long-term experiences on the basis of personal hostility towards his victim or to society as a whole). To a lesser extent, such crimes

are spontaneous. However, about 50% of persons covered with our research have certain mental disabilities in mental development that do not exclude sanity.

## 5. Conclusion

The research conducted indicates an unstable structure of a marginal environment, which is a borderline state of a society in which there are no criminals and crimes yet, but there are already (marginal) persons ready to commit illegal actions if a suitable provoking agent is found.

To stabilize the marginal environment, we propose the following new sustainable solutions: 1) to monitor markers of socially negative development of a region; 2) to monitor the darknet network for the illegal sale of weapons and equipment that simulate spontaneous combustion; 3) such an indicator as the number of murders disguised as an accident or suicide should be included into statistical reporting; 4) to implement socio-psychological and medical prevention of reducing suicidal attempts; 5) to apply a form of interaction between investigating authorities and forensic experts aimed at timely forecasting the markers' development dynamics.

Thus, the markers identified by us can actually be used as markers reflecting socially negative development trends in the metropolis.

## 6. Acknowledgments

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