Gender Differences in Mortality from External Causes in the Sakha Republic (Yakutia)

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ABSTRACT

Background: The mortality rate from external causes in the Sakha Republic (Yakutia) is higher than the average figure for the Russian Federation as a whole.

Aim of the research: to study the sex-specific trends in mortality from external causes in the Sakha Republic (Yakutia) in the period 2016-2018.

Research Design: A retrospective comparative analysis of the sex-specific trends in mortality from external causes among the population in Yakutia in 2016-2018 was carried out basing on the official statistics data.

Materials and Methods: Official data from the Federal State Statistics Service were studied. For fatal road traffic injuries, data from the General Administration for Traffic Safety of the Russian Federation were used. To study the mortality from cold injuries, we selected code 302 in ICD-10 (Exposure to excessive natural cold).

Results and Discussion: The study revealed improvements in mortality among the population of Yakutia from all types of external causes, the exceptions being traffic accidents and accidental drowning. Working-age men still account for a great share in violent deaths (74.7% of suicides and 77.7% of homicides). In 2016-2018, human mortality from cold injury ranked third in the structure of external causes of death (suicide-20.9%, homicide-13.4%, cold injury-11.4%). For all the causes looked at, the mortality rate for men is several times higher than for women.

Conclusions: The improvements in mortality from external causes demonstrate different trends. Among the negative ones, it is the sustained high rate of violent deaths above the average figure for the Russian Federation. The mortality rate of the male population in Yakutia from violence, as well as accidental drowning and cold injury remains critically high.

KEY WORDS
preventable mortality, external causes, region of Russia’s Far North

INTRODUCTION

The Sakha Republic (Yakutia) is the largest constituent entity of the Russian Federation, situated in the Far North and is a part of the Far Eastern Federal District. The region has a vast territory (3,103.2 thousand square kilometers) and a low population density (0.3 people per square kilometer). As of 01 January 2019, the population of the republic amounted to 967 thousand people, of which 55.5% were women and 45% were men. Yakutia has a young population structure, with the average age of the population in 2018 being 33.5 for men and 36.1 for women. In terms of demographic features, the region has a high birth rate (13.7 per 1,000 population in 2018) and a positive natural population increase (5.9 per 1,000 population in 2018). Nevertheless, the population over 20 years (2000-2019) increased only by 4.5 thousand people (from 962.5 to 967.0 thousand) due to permanent migration and mortality.

In 2000-2018, the migration processes in the region were characterized by a population decline: in 2000-2015, an average of 6.2 thousand people were leaving the republic annually; in 2016-2018, the migration loss decreased to 3.9 thousand. Working-age people made 52.7% of the permanent migrants'. The changes in the main demographic indicators in 2016-2018 resulted in a decreased birth rate (from 16.0 to 13.7 per 1,000 population, i.e. by 14.4%) and mortality from all causes (by 8.4 to 7.8 per 1,000 population, i.e. 7.1%). The high birth rates, which at a certain stage compensated for mortality and migration outflow of the population and allowed maintaining a positive natural increase, demonstrated a clear tendency to annual decline since 2014.

A study of mortality based the current state statistics revealed that three classes of diseases dominate the situation with mortality in the republic, accounting for 79-80% of all deaths, namely, circulatory system diseases, neoplasms, and external causes. Obviously, premature mortality is primarily due to preventable causes. In terms of preventability, first come the causes of death depending on lifestyle and prevention of risk factors (82% for men and 67% for women). According to the 2018 data, external causes account for 15.6% of all mortality losses in the republic (7.9% in Russia*).

In retrospect, in the period 1990-2014, external causes in Yakutia steadily ranked second after circulatory system diseases in the structure of the causes of mortality, replaced by neoplasms in 2015. During that period, suicides predominated in the structure of external causes of death in Yakutia with the average share of 22.0%; homicides made
18.7% and transport accidents-9.8%). By their nature, the leading external causes of mortality are outside the control of public health system and are in the scope of activities of social services and law enforcement agencies (homicide, suicide, accidental alcohol poisoning, etc.). The rate of violent deaths is also an indicator of social problems in the society. This issue is especially pressing in the Arctic regions characterized by a low level of socio-economic development.

An decrease in the mortality rate from external causes in 2010-2015 amounted to 30.3% (from 195.3 to 136.2 per 100 thousand population)⁶. In 2016-2018, the decline rate was 9.5% (from 135.4 to 122.6 per 100 thousand population); however, different types of external causes demonstrated different trends.

The structure of mortality from external causes of the population in the Russian Federation does not include mortality from exposure to excessive natural cold (cold injuries), since the official state statistics do not take into account human losses from this external cause. However, the problem of heat loss due to cold injury is especially relevant for a region of Russia’s Far North.

The aim of the survey was to study the sex-specific trends in mortality from external causes in the Sakha Republic (Yakutia) in the period 2016-2018.

### MATERIALS AND METHODS

A retrospective analysis of data on the population mortality rate in Yakutia in the period 2016-2018 was carried out by the selective statistical method. Data from the Territorial Authority of the Federal State Statistics Service in the Sakha Republic (Yakutia) were used as a source of information. For fatal road traffic injuries, the data from the official website of the General Administration for Traffic Safety of the Russian Federation (GIBDD of the Russian Federation) (госавтоинспекция.рф) were used. For the mortality from cold injuries, we selected code 302 in ICD-10 (Exposure to excessive natural cold) as a selection criterion. The study was conducted using statistical, analytical, and mathematical methods, as well as comparative analysis methods.

### RESULTS AND DISCUSSION

In the period 2016-2018, Yakutia witnessed a decrease in the mortality rate from external causes by 9.5% (from 135.4 to 122.6 per 100 thousand population)⁷. A comparative analysis of mortality rates from various types of external causes in Yakutia in 2016-2018 showed an increasing trend in human losses in traffic accidents, whereas Russia as a whole saw a positive change⁸. The mortality rate from accidental alcohol poisoning was higher than the national average by 24% in 2017 and by 25.7% in 2018. The mortality from accidental drowning also exceeded the national average, with the 2016-2018 rates 2-3 times higher than the figures for the Russian Federation. The mortality rates from suicide and homicide were also 2-2.5 times higher, although the rate of violent deaths demonstrated a clear trend to decrease. (Table 1)

The structure of external causes of mortality in Yakutia in 2016-2018 was dominated by suicide (20.9%), followed by homicide (13.4%), and cold injury (11.4%) ranking third. The changes demonstrated a tendency towards a decrease in the number of deaths from suicide, homicide and cold injury. (Table 2)

The rate of decline in suicide mortality in the Sakha Republic (Yakutia) (from 30.2 to 23.8 per 100 thousand population) and the entire Russian Federation (from 15.8 to 12.4) was on a par and amounted to 21%. The decrease in mortality from homicide in Yakutia was going more rapidly (from 20.1 to 14.3 per 100 thousand population, i.e. by 28.9%) than the average in Russia (from 7.2 to 5.4, i.e., 25.0%). Despite the positive trend, an unfavorable situation remained in Yakutia regarding the suicidal behavior of the population. The suicide rate exceeded the corresponding indicator of the Russian Federation in 2016 by 1.9 times (30.2 per 100 thousand population against 15.8), in 2017-by 2 times (27.7 and 13.8, respectively), in 2018-1.9 times (23.8 and 12.4, respectively). The rate of mortality from homicides in Yakutia exceeded the national one by almost 3 times: in Yakutia-20.1 per 100 thousand population in 2016, 18.2 in 2017, and 14.3 in 2018; in the Russian Federation-7.2 in 2016, 6.2 in 2017, and 5.4 in 2018.

The mortality rates from accidental alcohol poisoning failed to demonstrate any clear trend. The mortality rates from traffic accidents and accidental drowning were increasing.

Working-age people (women from 16 to 54 inclusive, men from 16 to 59 inclusive years of age) accounted for the prevailing share of the deaths from external causes in 2016-2018: 86.2% from suicide, 88.1% from homicide, 76.9% from accidental alcohol poisoning, and 72.5% from accidental drowning. Working-age men accounted for 74.7% of all suicides, 77.7% of all of homicides, 58.2% of all cases of accidental alcohol poisoning, and 67.5% of all cases of accidental drowning.

Gender differences in mortality from various external causes are due to the fact that the mortality rate for men is several times higher than the rate for women from all the causes looked at. For instance, the mortality rate from accidental drowning for men is on average 11 times, from suicide and homicide 6 times, from all types of transport accidents, cold injury and accidental alcohol poisoning—almost 3 times higher than the corresponding mortality rates for women. Using the gradation of mortality rates, generally accepted in the field of public health, one can state that the male population of Yakutia demonstrates a very high mortality rate from accidental drowning, suicide, homicide and exposure to excessive natural cold, with the mortality rates above 21 per

### Table 1: Population mortality from external causes in the Russian Federation, Far Eastern Federal District and the Sakha Republic (Yakutia) in 2016-2018 (per 100 thousand population)

<table>
<thead>
<tr>
<th>External causes of death</th>
<th>Russian Federation</th>
<th>Far Eastern Federal District</th>
<th>Sakha Republic (Yakutia)</th>
</tr>
</thead>
<tbody>
<tr>
<td>All transport accidents</td>
<td>14.7</td>
<td>13.7</td>
<td>13.0</td>
</tr>
<tr>
<td>Including traffic accidents</td>
<td>13.8</td>
<td>13.0</td>
<td>12.4</td>
</tr>
<tr>
<td>Exposure to excessive natural cold*</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Accidental alcohol poisoning</td>
<td>9.6</td>
<td>8.4</td>
<td>7.5</td>
</tr>
<tr>
<td>Accidental drowning</td>
<td>4.4</td>
<td>3.5</td>
<td>3.3</td>
</tr>
<tr>
<td>Suicide</td>
<td>15.8</td>
<td>13.8</td>
<td>12.4</td>
</tr>
<tr>
<td>Homicide</td>
<td>7.2</td>
<td>6.2</td>
<td>5.4</td>
</tr>
<tr>
<td>Total number of deaths from external causes</td>
<td>114.2</td>
<td>104.0</td>
<td>98.5</td>
</tr>
</tbody>
</table>

* no data available for the Russian Federation and the Far Eastern Federal District

### Table 2: Sex-specific mortality from external causes in the Sakha Republic (Yakutia) (per 100 thousand population)

<table>
<thead>
<tr>
<th>External causes</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>men</td>
<td>women</td>
<td>men</td>
<td>women</td>
</tr>
<tr>
<td>All transport accidents</td>
<td>16.9</td>
<td>5.7</td>
<td>19.9</td>
</tr>
<tr>
<td>Exposure to excessive natural cold</td>
<td>26.6</td>
<td>7.1</td>
<td>23.3</td>
</tr>
<tr>
<td>Accidental alcohol poisoning</td>
<td>14.6</td>
<td>4.3</td>
<td>15.8</td>
</tr>
<tr>
<td>Accidental drowning</td>
<td>21.5</td>
<td>2.0</td>
<td>24.2</td>
</tr>
<tr>
<td>Suicide</td>
<td>53.3</td>
<td>8.5</td>
<td>49.2</td>
</tr>
<tr>
<td>Homicide</td>
<td>33.5</td>
<td>7.5</td>
<td>32.9</td>
</tr>
</tbody>
</table>

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Gender Differences in Mortality from External Causes

The present stage is shaped by decreasing birth and mortality rates, and almost 3 times as many men as women (207 men (75%), 68 women (25%)). Working-age people accounted for the dominant share of the deaths (with the share of rural residents at 46.3%).

In Yakutia, a region with an extremely continental climate, where the mean winter temperature is 35-40℃ below zero, the mortality due to exposure to excessive natural cold was higher than in road traffic accidents over the entire study period. (Table 3)

It is notable that despite the vastness of the territory and low level of motorization in Yakutia, in 2018, the figures on human losses in traffic accidents are on a par (12.4 per 100 thousand population) with the data depending on the place of residence (urban/rural). Working-age people accounted for the dominant share of the deaths from cold injury: 88.8% in 2017, and 85.9% in 2018. The distribution of the deaths the working age accounts for the largest share of deaths from exposure to excessive natural cold in 2017-2018 revealed that people in the age range 30-69 accounted for the largest share of deaths from exposure to excessive natural cold and suicide-as low (rates from 7 to 10 per 100 thousand population).

A study of the age-specific mortality of the population in Yakutia from exposure to excessive natural cold in 2017-2018 revealed that people in the age range 30-69 accounted for the largest share of deaths from cold injury: 88.8% in 2017, and 85.9% in 2018. The distribution of the data depending on the place of residence (urban/rural) did not reveal any clear trend. For instance, in 2017, urban residents accounted for 37.5% (with the share of rural residents at 62.5%), in 2018-for 53.7% (with the share of rural residents at 46.3%).

The mortality rate of women from all types of transport accidents, accidental alcohol poisoning, accidental drowning can be interpreted as very low (mortality rates under 7 per 100 thousand population); from exposure to excessive natural cold and suicide-as low (rates from 7 to 10 per 100 thousand population).

In the information presented, particular attention should be paid to human deaths from cold injury in Yakutia, since the indicators of health loss (mortality, disability) are also relatively high. Numerous publications indicate that traffic injuries are one of the current global problems. In Yakutia, a region with an extremely continental climate, where the mean winter temperature is 35-40℃ below zero, the mortality due to exposure to excessive natural cold was higher than in road traffic accidents over the entire study period. (Table 3)

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Of the total number of deaths from cold injury (275), there were almost 3 times as many men as women (207 men (75%), 68 women (25%)). Working-age people accounted for the dominant share of the deaths (82.6% in men, 55.9% in women). (Table 4)

Out of 326 deaths from cold injury, cause of death reports attributed 7 (2.1%) cases as work-related and 10 (3.1%) cases as alcohol-related. In the majority of the cases, the cause of death was not identified.

CONCLUSION

Thus, the demographic situation in the Sakha Republic (Yakutia) at the present stage is shaped by decreasing birth and mortality rates, and migration loss of the population. The improvements in mortality from external causes in the context of various factors demonstrate different trends. Among the negative ones, it is the sustained rate of violent deaths above the average figure for the Russian Federation. The mortality rate of the male population in Yakutia from suicide, homicide, accidental drowning and cold injury remains critically high. Ranking third in the structure of mortality from external causes after suicide and homicide, cold injury makes a peculiarity of the region. The data presented indicate a high degree of preventability of the causes of premature mortality in the republic and the availability of reserves for its real improvement. The reduction of mortality from preventable causes is the best solution to the problem of premature mortality. In this regard, one of the main conditions is to reduce the spread of alcoholism among the population, since alcohol-abuse makes fertile ground for increased mortality from external causes, including violent deaths and traffic injuries, which are highly preventable. Improvements can be achieved, first of all, due to changes in people’s lifestyle and their attitudes to health.

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