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S.S. Sleptsov, S.S. Sleptsova, M.P. Dutkin, L.N. Afanasyeva

IMPROVEMENT OF WORK ON SUICIDE PREVENTION IN THE ARCTIC ZONE OF YAKUTIA

Introduction. Despite the declining overall suicide mortality rate in Yakutia, this issue remains acute in the Arctic zone of the republic. Research in this area should rely on primary medical documentation to develop effective suicide prevention programs.

Objective. To identify individuals at risk based on hospital documentation from the Arctic zone of Yakutia to improve regional suicide prevention programs.

Materials and Methods. This study utilized materials from the Yakut Republican Medical Information-Analytical Center (YRMIAC) covering 2013–2023, 263 medical death certificates of suicide victims, and forensic examination documents provided by central district hospitals (CDHs) in the Arctic zone of the Republic of Sakha (Yakutia) (AZ RS(Y)). Additional data on the number of children of the deceased and presumed causes of suicide were also requested. Statistical analysis was conducted using IBM SPSS Statistics v.26.

Results and Discussion. An analysis of suicides in the Arctic Zone of Yakutia from 2013 to 2023 revealed significant factors such as alcoholism, unemployment, and low education levels. Most suicide victims experienced depression or emotional crises, highlighting the need for comprehensive prevention programs. Improving monitoring and data collection in medical institutions of the AZ RS(Y) is key to combating this issue effectively. Recommendations include developing a regional suicidology registry and enhancing medical personnel training to work with high-risk patients.

Conclusion. The primary cause of excessive suicide mortality in the Arctic is not ethnocultural but socio-economic factors. Addressing this issue requires creating a suicidology registry and targeted prevention programs, which are crucial for improving the mental health of Yakutia's population.

Keywords: suicides, suicidal behavior, mortality, gender differences, suicide prevention, Yakutia, Arctic zone.

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Introduction. The issues of suicide prevention remain topical all over the world. According to WHO data, suicide takes the lives of more than 700 thousand people annually, and the average global mortality rate (per 100 thousand of us) as of 2019 was equal to 9.2. In the world ranking of countries, the Russian Federation ranked 9th with an indicator of 25.1 [6]. The data on suicides among men are even more tragic - the world average was at the level of 12.6, and for the Russian Federation - 43.6 (6th place in the world). At the same time, it should

be noted that all over the world, including Russia, including the Republic of Sakha (Yakutia), the overall mortality rate from suicides has a pronounced downward trend. Thus, if in 2000-2001 in Yakutia it was at the level of 39.4, then by 2023 it has gradually decreased to 13.2.

However, it is important to realize that for a long time a significant contribution to regional suicide rates has been made by the data obtained in the Arctic zone of the Republic of Sakha (Yakutia), which unites 13 uluses with a total population of about 64 thousand people. Thus, from 2010 to 2023, this coefficient in the Arctic Zone of the Republic of Sakha (Yakutia) exceeded the national average by an average of 2 times. Undoubtedly, this problem has been covered in scientific literature, but it should be recognized that so far the research has been based solely on the data of state statistics [2, 3]. In this regard, the aim of the work is to identify possible suicides from the risk group based on the data of primary documentation of hospitals of the RS(Ya). The obtained data will be used to improve suicide prevention programs in the region.

Materials and methods of research:

The materials of the Yakutsk Republican Medical Information and Analytical Center (YARMIAC) for 2013-2023, as well as data from 263 medical certificates of sui-

cide deaths and related documents of forensic medical examinations (RME) provided by central district hospitals (CDH) of AZ RS(Ya) were used. In addition, information on the number of suicidal children and the presumed cause of suicide was also requested. Statistical analysis was conducted using IBM SPSS Statistics v.26.

Results and Discussion. From 2013 to 2023, there were a total of 335 suicides in the Yakut Arctic, of which we were able to obtain more detailed information on 263 cases (78.5%). The absence of information on some suicides is explained by 2 reasons. Firstly, some of them actually lived outside their district, so their postmortem epicrisis were not received by the Arctic CDCs (for a similar reason, the data received from some ulus CDCs, e.g. Verkhnekolymsk CDC, shows that the number of suicides exceeds the data indicated in the YARMIAC data). Second, in some CDCs, documentation is extremely poor. For example, in Anabarsky ulus, with a population of only 3.5 thousand people, 38 suicides were committed in 11 years, that is, in some years (e.g., 2014-2015) the standardized mortality rate from the considered cause reached 265 people/100 thousand people. Nevertheless, the data on only 2 cases were preserved in the specified CRB (table 1). In spite of the presence of a full-time psy-

SLEPTSOV Spiridon S. – PhD in Biology, Associate Professor, senior research er, Laboratory of Clinical Population and Medical and Social Research, Address: Russia, 677000, Yakutsk, Republic of Sakha (Yakutia), Yaroslavsky str., 6/3, e-mail: sachaja@yandex.ru ORCID 0000-0002-2482-2928; **SLEPTSOVA Snezhana S.** – MD, Associate Professor, head of the Department of Infectious Diseases, Phthisiology and Dermatovenereology, e-mail: sssleptsova@yandex.ru, ORCID 0000-0002-0103-4750; **DUTKIN Maxim P.** – Candidate of Philosophy (PhD), Associate Professor, Department of Neurology and Psychiatry, e-mail: maksdutkin@mail.ru, ORCID: <https://orcid.org/0000-0002-6229-4345>; **AFANASYEVA Lena N.** – MD, head of the Basic Department of Oncology, Minister of Health of the RS(Ya), ORCID: <https://orcid.org/0000-0003-2592-5125>.

chiatrist-drug addict, cases of suicides are insufficiently recorded in the CRBs of Bulunskiy ulus. By the way, 32 cases of suicides were recorded in this ulus from 2010 to 2012.

In general, the share of suicides committed in the Yakut Arctic from the total number of suicides in the region averages 12.4%. Considering that no more than 6.4% of Yakutia's population currently lives in this territory, such figures are alarming. Of the 263 cases, 138 (52.5%) occurred in the provinces, 111 (42.2%) - in ulus centers, in 14 cases information about the place of death was not specified.

A significant part of the deceased was represented by men ($n = 201$ or 76.4%). Nevertheless, the gender ratio was 3.2 : 1, whereas in most regions of the Russian Federation the proportion of men is 4-5 or more times higher [5]. At the same time, the overwhelming majority of men were people of working age - the total share of people from 18 to 59 years of age amounted to 82.1%. A similar picture is also observed in the female sex, but the share of girls is significantly higher than in boys (table 2).

The distribution by ethnicity is as follows: Sakha - 171 people or 65.0%, representatives of indigenous minorities - 57 people or 21.7% (including 34 Evenks, 20 Evens, 2 Chukchi, 1 Yukagir), representatives of non-indigenous ethnicity, mainly Russians - 33 people or 12.5%, nationality was not specified in 2 people (0.8%). A positive strong correlation ($r = 0.81$, $p = 0.001$) was established between the share of non-indigenous population living in the uluses and the share of the latter among suicides (Figure). For example, in Verkhnekolymsky ulus, where 55% of non-indigenous people live, 15 suicides were recorded, 8 of which, or 60%, were committed by Russians. In other words, socio-economic factors, rather than ethno-cultural component, play a greater role in the formation of this indicator in the AZ of RS(Ya), which was previously noted in the works of N.B. Semenova [7, 8].

Table 3 shows that the majority of suicides had secondary general or secondary vocational education, while only 4.6% had higher education. This fact once again confirms that a high educational level is associated with a more favorable socio-economic position of a person in society and, as a consequence, is to a certain extent a protective factor of suicide risk. Therefore, it is not surprising that 1/3 of suicides (80 people) were unemployed. There were 33 pensioners (12.5%), employees of various budget-

ary institutions - 106 people (40.3%), schoolchildren and students - 25 people (9.5%).

We also found that among suicides the share of married persons amounted to 32.3%, and those who had children, including minors - 25.1%. Thus, 44.7% (21 persons) of fathers and 45.0% (9 persons) of mothers were under 35 years of age. Out of the total number of mothers, 5 women had two children each, and 7 women had many children, i.e. from 3 to 7 children. The share of widowed and

divorced men and women was insignificant.

The research has revealed in the Yakut Arctic the majority (76.2%) of suicide victims chose self-hanging (table 4). In second place is self-shooting, occupying up to 18.4% of the total structure of suicide methods. Undoubtedly, such a high rate is associated with the availability of firearms among the residents of the Far North. For comparison, in other regions of the Russian Federation, death by self-shooting was chosen by no more

Table 1

Dynamics of completed suicides in AZ RS(Ya) and mortality rates per 100 thousand inhabitants

District	years											in total	information collected in CRC
	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023		
Abyisky	2	2	1	6	1	1	0	0	2	1	3	19	19
Allaihovskiy	2	3	1	1	2	0	1	2	1	0	1	14	14
Anabarsky	3	9	9	4	0	2	2	4	3	0	2	38	2
Bulunsky	3	6	3	3	2	2	0	5	3	4	3	34	19
Verkhnekolymsky	1	1	2	1	0	1	0	0	0	1	2	9	15
Verkhoyansky	7	5	6	5	6	9	5	7	3	1	1	55	45
Zhigansky	1	2	1	1	2	0	3	2	1	0	3	16	19
Momsky	0	2	1	4	2	1	0	1	1	2	0	14	10
Nizhnekolymsky	2	0	1	1	1	0	0	3	3	2	3	16	10
Olenyoksky	4	3	0	0	4	2	0	2	2	1	0	18	18
Srednekolymsky	6	2	6	7	8	7	8	6	5	1	4	60	61
Ust-Yansky	4	1	4	3	2	1	3	2	0	3	0	23	24
Ev.-Bytantaysky	1	1	3	0	4	1	3	2	3	0	1	19	7
Total for AZs of RS(Ya)	36	37	38	36	34	27	25	36	27	16	23	335	263
Share of AZ RS(Ya), %	10.5	11.2	11.4	12.4	12.7	11.7	11.3	18.0	13.8	9.7	17.4	12.4	-
AZ RS(Ya)	51.2	53.5	55.3	52.5	49.8	39.8	36.9	53.2	40.0	24.9	35.8	51.2	-
RS(I)	35.8	34.5	34.7	30.2	27.7	23.9	22.9	20.5	19.8	16.5	13.2	35.8	-

Table 2

Age and gender structure of suicides

Gender	Gender Age category											
	12-17		18-44		45-59		60-74		75-90		total	
	n	%	n	%	n	%	n	%	n	%	n	%
Men	11	5.5	133	66.2	32	15.9	20	10.0	5	2.4	201	100
Women	8	12.9	40	64.5	7	11.3	5	8.1	2	3.2	62	100
Both sexes	19	7.2	173	65.8	39	14.8	25	9.5	7	2.7	263	100

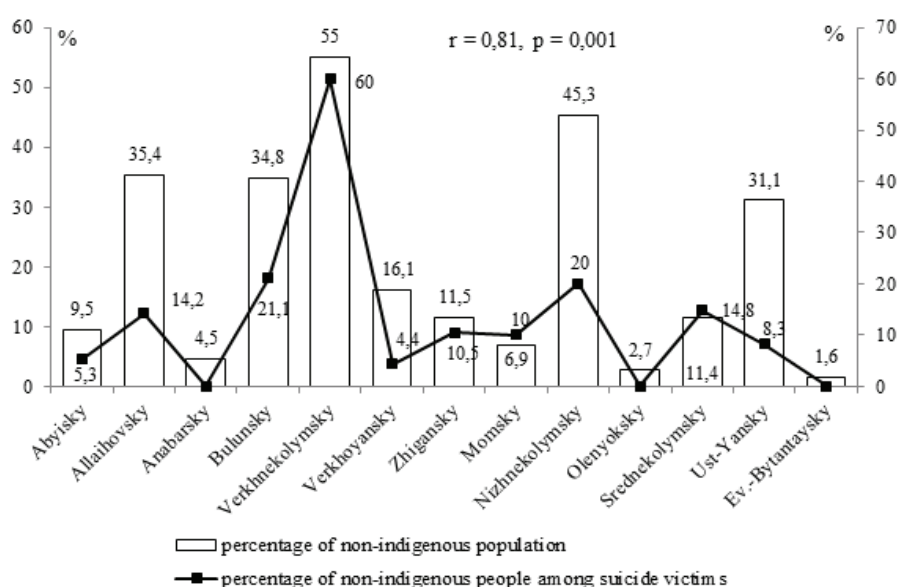
than 7.8% of men [9]. In women, self-cutting (9.7%) and poisoning (8.1%) rank second.

The study of suicide seasonality has long been of interest to researchers. Thus, more than a century ago, the classic of Western sociology Emile Durkheim noticed that «in spring people take their own lives more often than in fall» [4]. Some Russian researchers came to similar conclusions later [1, 10, 11]. In our data we obtained a similar pattern - from March to May there is an increase in suicides, which can be associated with a sharp contrast between the state of internal confusion of the suicidal person and the increase in social activity of people at this time (tab. 5). In our opinion, the decrease in the number of fall suicides is influenced by preparatory work for wintering and the beginning of hunting season, and some.

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Studies examining the association of suicide with the day of the week are highly inconsistent. For example, A.J. Kposowa et al. [13], based on the analysis of more than 20 thousand cases of suicide, found that the highest risk is on Wednesday (24.6%), L. Bradvik [12] named Sunday as such a day (31%), M. Plöderl [14] showed that the risk of suicide is higher at the beginning of the week and decreases by the weekend. No pronounced pattern was found in our study. The time of death was indicated in 131 cases (49.8 %), of which 39 cases occurred from 6 : 00 to 12 : 00, 47 - from 12 : 00 to 18 : 00, 26 - from 18 : 00 to 00 : 00, 19 - from 00 : 00 to 6 : 00. Thus, the majority of suicides occur in the morning and afternoon.

It is well known that the majority of suicides are related to the use of psychoactive substances, but in a significant part



Proportion of non-indigenous population living in uluses and their share among suicides

Table 3

Some indicators of the social status of suicides

Indicator	Men		Women		Both sexes	
	n	%	n	%	n	%
Education						
higher education	7	3.5	5	8.1	12	4.6
secondary vocational	36	17.9	15	24.2	51	19.4
secondary general	125	62.2	29	46.8	154	58.6
basic general	1	0.5	1	1.6	2	0.8
school students	11	5.5	8	12.9	19	7.2
no data	21	10.4	4	6.5	25	9.5
Occupation						
employees of budgetary institutions	88	43.8	18	29.0	106	40.3
pensioners	25	12.4	8	12.9	33	12.5
unemployed	63	31.3	17	27.4	80	30.4
individual entrepreneurs	2	1.0	-	0.0	2	0.8
school pupils and students	14	7.0	11	17.7	25	9.5
no data	9	4.5	8	12.9	17	6.5
Marital status						
married	71	35.3	14	22.6	85	32.3
divorced	3	1.5	2	3.2	5	1.9
single	112	55.7	36	58.1	148	56.3
widows/widowers	2	1.0	1	1.6	3	1.1
no data	13	6.5	9	14.5	22	8.4
Presence of children						
available	46	22.9	20	32.3	66	25.1
not available	77	38.3	24	38.7	101	38.4
no data	78	38.8	18	29.0	96	36.5

of the deceased (42.9%, or 113 people), the results of blood alcohol concentration tests in the were not indicated in the documents. Alcohol intoxication at the time of death was documented in 74 cases (including 56 men and 18 women), the absence of alcohol influence was proved in 76 cases (including 51 men and 25 wom-

en). On the question about the supposed reason of suicide the answers were received for 83 people, from which in 43 cases (51,8 %) death was connected with the long-term depressive state of the suicidal person, 25 (30, 2 %) - with family quarrels (mainly against the background of alcohol abuse), 10 (12.0 %) - with se-

Table 4

Structure of ways of committing suicide in AZ RS(Ya)

Method of suicide	Men		Women		Both sexes	
	n	%	n	%	n	%
Self-hanging	156	77.6	45	72.6	201	76.2
Poisoning	2	1.0	5	8.1	7	2.7
Jumping from height	1	0.5	3	4.8	4	1.5
Self-shooting	37	18.4	3	4.8	40	15.2
Self-cutting	4	2.0	6	9.7	10	3.8
Self-immolation	1	0.5	-	-	1	0.4
Total	201	100	62	100	263	100

Table 5

Distribution of suicide cases by months and days of the week in AZ RS(Ya)

Month	n	%	Day of week	n	%
January	28	10.7	Monday	40	15.7
February	16	6.1	Tuesday	39	15.3
March	23	8.8	Wednesday	34	13.3
April	31	11.9	Thursday	27	10.6
May	31	11.9	Friday	39	15.3
June	23	8.8	Saturday	39	15.3
July	25	9.6	Sunday	37	14.5
August	23	8.8			
September	10	3.8			
October	17	6.5			
November	13	5.0			
December	21	8.0			

Note: 2 cases were missing in the data by month, 8 cases were missing by day of the week.

rious illness (mainly cancer), 4 (4.8 %) - with a difficult life situation (death of close relatives, friends), 1 (1.2 %) - with schizophrenia.

Conclusion: Suicidal behavior of residents of the Arctic zone of Yakutia requires special attention. But, unfortunately, in small societies the work to identify potential suicides, which should be considered all alcohol-dependent citizens or people with mental disorders, is not done properly for a number of reasons. For example, there is an acute shortage of examinations of the population by psychiatrists and narcologists, which is clearly evident from the data of state statistics, according to which the primary incidence of mental disorders in the AZ RS(Ya) for the last two decades is 3-4 times lower than in the Russian Federation on average. Preventive work is weak, and documents on committed suicides are often

filled in poorly. Therefore, it is necessary to create a regional suicidologic register and increase the level of training of medical staff to work with patients at risk.

Based on the collected material, we can assert that the root cause of suicide mortality in the AZ RS(Ya) should be considered a socio-economic factor rather than an ethno-cultural one. The main risk group includes single young childless men of working age with secondary general or secondary vocational education, alcohol abusers, often unemployed or employed in various budgetary organizations. But at the same time the presence of a person's family and children, including minors, is not a guarantee that he will refuse a rash act - every third suicide victim was married, every fourth - had children. That is, it is obvious that the problem of suicides has a complex character, for the solution of which, first of all,

it is necessary to develop effective prevention programs, the basis of which is formed by the data of scientific research of both medical-biological and socio-economic directions.

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M.Yu. Strekalovskaya

FEATURES OF THE IMMUNE STATUS IN PRACTICALLY HEALTHY AND CANCER-AFFECTED RESIDENTS OF THE EUROPEAN NORTH WITH A HIGH CONTENT OF DOPAMINE IN PERIPHERAL VENOUS BLOOD

The study was conducted of 65 practically healthy people and 122 people suffering from oncological pathology of the gastrointestinal tract of various localization to study the immune status of practically healthy and oncological residents of the European region with an increased content of dopamine in peripheral venous blood. Thus, for the first time, it was established that the state of the immune status of residents of the European North with an increased content of dopamine in peripheral venous blood, in accordance with the state of health, has significant deviations in people suffering from oncological pathology compared to practically healthy residents of the territories of the European North. Thus, the average dopamine content in practically healthy people and in people suffering from cancer pathology, is 33.1 ± 3.93 and 133.66 ± 8 , respectively, the frequency of recording elevated dopamine concentrations in practically healthy people and in people suffering from cancer pathology is 7.69 ± 0.23 % and 59.84 ± 0.63 %, respectively. The average blood levels of transferrin and IgE in people suffering from oncological pathology are higher than in practically healthy people (119.89 ± 35.77 and 53.34 ± 7.21 , respectively). The increase in the average content of other parameters studied was insignificant. The frequency of elevated concentrations of other immunological parameters was established, which was significantly higher in patients with oncological pathology. Thus, the appearance of immune responses is established, i.e. the interaction of the immune system with the tumor, which represents a balance between the processes of immune activation and immune suppression and violation of the mechanisms of regulation of components of the immune system that occur in people with malignant tumors.

Keywords: dopamine, immune status, oncological pathology, cytotoxic lymphocytes, transferrin, IgE, autoantibodies to DNA and RNA, CIC, autoantibodies to phospholipids (IgM), autoantibodies to phospholipids (IgG)

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A survey of 65 practically healthy people and 122 people suffering from oncological pathology of the gastrointestinal tract of various localization was conducted to study the immune status of practically healthy and oncological residents of the European North with elevated dopamine levels in peripheral venous blood. Thus, for the first time, it was established that the state of immune status in resi-

dents of the European North with an increased dopamine content in peripheral venous blood, in accordance with the state of health, has significant deviations in people suffering from oncological pathology compared with practically healthy residents of the European North. Thus, the average dopamine content in practically healthy people and in people suffering from oncological pathology is 33.1 ± 3.93 and 133.66 ± 8 , respectively, the frequency of increased dopamine concentrations in practically healthy people and in people suffering from oncological pathology is 7.69 ± 0.23 % and 59.84 ± 0.63 %, respectively. The average blood transferrin and IgE levels in people suffering from cancer are higher than in practically healthy people (119.89 ± 35.77 and 53.34 ± 7.21 , respectively). The in-

crease in the average content of the other parameters studied was insignificant. The frequency of elevated concentrations of other immunological parameters was established, which was significantly higher in patients with oncological pathology. Thus, the appearance of immune reactions has been established, i.e. the interaction of the immune system with the tumor, representing a balance between the processes of immune activation and immune suppression and a violation of the mechanisms of regulation of the components of the immune system that occur in people with malignant tumors.

Introduction. Dopamine is interesting from the point of view of science because it performs various functions in the human body. It not only helps to think, move, form feelings, and make choices, but also

STREKALOVSKAYA Marina Yuryevna - junior researcher, mary.nesterowa2010@yandex.ru, <https://orcid.org/0000-0001-9944-7555>, N.P. Laverov Federal State Budgetary Institution of Science Federal Research Center for the Integrated Arctic Studies of the Ural Branch of the Russian Academy of Sciences (FITSKIA Ural Branch of the Russian Academy of Sciences)