

UDC 616.89-008.441.13-036.88:314.144

## ALCOHOL AS A RISK FACTOR FOR PREMATURE MORTALITY IN THE IRKUTSK REGION

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*The situation with alcohol mortality for the years 2010–2014 in the Irkutsk region has been monitored and analyzed. It was established that due to the statistics the percentage of people having died in the region from all causes related to alcohol consumption, amounted to about 2.5 % of the total number of deaths. According to expert estimates, this share can be up to 15 %. The territory "at risk" for alcohol mortality is defined. Among risk groups there are men 30–79 years old and women 35–49 years old. For the 2010–2014 male mortality due to alcohol was higher than the same in women, on average, by 2.5 times. "Alcoholic" mortality of rural population compared to urban was higher – 16.6 %. However, the decline of the indicator by 1.4 times from the total population is reported in 2014, including the able-bodied population. Rating of the Irkutsk region among 85 subjects of the Russian Federation in 2014 indicates a relatively satisfactory state for all causes of death caused by harmful use of alcohol. During the years 2010–2014 the volume of absolute alcohol consumption by the population of the Irkutsk region decreased from 9.3 to 8.4 liters. The significant changes in the structure of alcohol consumption was revealed: in 2014 the first place in the structure of consumption was taken by beer and light alcohol drinks – 47.4 against 40.7 %. It is shown that the supervision of the implementation of alcohol products, monitoring the scale of harm caused by alcohol, and promoting healthy lifestyles and raising the permitted age of onset of drinking alcohol from 18 to 21 years are still relevant strategies for prevention of premature mortality*

**Key words:** alcohol mortality, alcohol consumption, alcoholic cardiomyopathy, deaths from accidental alcohol poisoning, rating, territory and groups "at risk"; overseeing the sale of alcoholic beverages.

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Harmful alcohol use causes grave damages to population health and is seen as one of the risk factors leading to health deterioration all over the world [7, 25]. Nowadays in Russia alcohol use results in untimely deaths and social degradation. It also leads to increased crime rates, orphanage, health deterioration, disability, and suicide incidents [11]. Annually 3.3 million deaths all over the world are due to harmful alcohol use and it accounts for 5.9% of all deaths [25]. And here we should mention that all basic death cases related to population lifestyle, alcohol use included, can be eliminated [10, 11, 26, 27].

Inter-departmental commission of Russian Federation Public Health Ministry responsible for death cases analysis states that alcohol intoxication determines most deaths caused by external reasons among working population and it takes the second place in death cases structure after cardiovascular diseases (28.2% share in 2014) [4].

As it is pointed out in the analytical report, "WHO international experts' data prove that alcoholization is closely related to much wider range of significant death cases, primarily with digestive organs diseases (hepatocirrhosis,

pancreatitis, pancreatonecrosis etc.)...; respiratory organs diseases (advanced cases of pneumonia) and cardiovascular diseases (internal hemorrhages caused by hypertensive crisis, myocardial infarctions, strokes etc.)". Besides alcohol mortality as an integral index of life quality can depict the total situation with alcohol in the region and in Russia [15].

We can observe a rather high level of deaths caused by external reasons in Irkutsk region (the 15<sup>th</sup> place in 2014), murders and suicides included. Annually the region is among top ten problem areas in the Russian Federation if we take primary morbidity level of chronic alcoholism and acute alcohol intoxications (the 5<sup>th</sup>-9<sup>th</sup> places). Therefore, the issue of alcohol mortality research in the region is still vital.

**Research goal:** to evaluate current alcohol mortality in Irkutsk region

**Data and methods.** We have analyzed alcohol mortality figures in 42 municipal districts and Irkutsk region as a whole over the period of 2010-2014 years using "Population mortality distributed by death causes" C52 table and "Distribution of dead by their sex, age groups and

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death causes” C51 table provided by the Federal State Statistics Service. Death rates for urban and rural population in the context of sex and age were calculated for annual average population of Irkutsk region, taking the results of 2010 Russian Population Census into account. Comparative analysis was carried out with the use of data for Siberia Federal District (SFD) and the Russian Federation (RF). When analyzing standardized parameters we used WHO European standard. We also resorted to ranking method, expert judgments, economic damage evaluation and statistic method. Irkutsk regional rating in 2014 was defined among 85 Russian regions, ranking was made with parameters descending, Arkhangelsk and Tyumen region were taken without autonomies.

**Results.** According to Irkutskstat 168.8 thousand people died in Irkutsk region in 2010-

2014 years; including 5182 deaths in the state of alcohol intoxication (3.1% of all deaths). Over the period 4167 people died due to all causes related to alcohol use (2.5% of all deaths). As experts judgments state, absolute number of people who died due to alcohol-related causes can reach 26.5 thousand people [22].

Over 2010-2014 years alcohol death rate decreased 1.4 times, from 40.71 to 28.68 per 100 thousand people ( $d < 0.05$ ). The same decrease is seen for working population, from 48.26 to 35.00 per 100 thousand people correspondingly (table 1). Over the last 5 years we can see death rates for most alcohol-related death causes decreasing 1.3-3.3 times ( $d < 0.05$ ), excluding alcohol liver disease mortality which increased 1.2-1.3 times ( $p < 0.05$ ).

Table 1

Alcohol mortality dynamics among Irkutsk region population in 2010-2014 years (per 100 thousand people)

Death cause	2010	2011	2012	2013	2014	GR (growth rate), %
<i>All population</i>						
Total number of deaths	1444.80	1397.68	1388.21	1364.90	1370.79	94.9
All alcohol-related causes, including	40.71	34.75	33.22	34.50	28.68	70.4
chronic alcoholism	1.77	0.12	0.04	0.04	0.00	–
alcoholic psychosis	0.08	0.00	0.00	0.08	0.04	50.0
nervous system damages caused by alcohol*	0.66	0.66	0.37	0.62	0.66	100.0
alcohol cardiomyopathy	20.38	17.39	17.13	15.41	14.81	72.7
alcohol liver disease	4.32	5.11	6.15	4.30	5.01	116.0
chronic pancreatitis of alcoholic etiology	0.53	0.21	0.41	0.33	0.29	54.7
accidental alcoholic intoxications	12.98	11.21	9.04	10.33	7.24	55.8
<i>Including working population</i>						
Total number of deaths	838.24	809.84	803.22	777.68	793.99	94.7
All alcohol-related causes, including	48.26	40.01	38.43	42.36	35.00	72.5
chronic alcoholism	2.00	0.14	0.00	0.00	0.00	–
alcoholic psychosis	0.13	0.00	0.00	0.07	0.00	–
nervous system damages caused by alcohol*	0.67	0.61	0.55	0.63	0.50	74.6
alcohol cardiomyopathy	23.43	19.80	19.77	17.93	18.18	77.6
alcohol liver disease	4.46	5.27	6.79	5.44	5.68	127.4
chronic pancreatitis of alcoholic etiology	0.47	0.27	0.48	0.35	0.14	29.8
accidental alcoholic intoxications	17.11	13.92	10.78	13.47	9.66	56.5

Note: \* including nervous system degeneration, alcoholic polyneuropathy and alcoholic myopathy.

We should note that over the last years there has been a trend of total alcohol mortality decrease, both in Russia as a whole and in separate districts, Irkutsk region included [8, 13, 17, 20].

General alcohol mortality rate in Irkutsk region fixed in 2014 was authentically 27.4% and 28.7% lower than average rate in Russia and average regional rate ( $d < 0.05$ ) (table 2). According

to that parameter Irkutsk region occupied the 58<sup>th</sup> place among 85 Russian regions.

In 2010-2014 years in Irkutsk region standardized death rates for accidental alcohol intoxications were about 6.7-12.3 cases per 100 thousand people (picture 1). In some years of the examined period accidental alcohol intoxication mortality among men was 2.9-3.7 times higher than corresponding mortality rates among women.

Table 2

Alcohol mortality in Irkutsk region as compared to SFD and RF in 2014 (per 100 thousand people; ratio to SFD and RF levels; rating among 85 regions)

Death causes	Per 100 thousand people			Ratio to level*		Rating in the RF
	IrR	SFD	RF	SFD	RF	
All alcohol-related causes including	28.68	40.20	39.50	0.71	0.73	58
chronic alcoholism	0.00	1.31	1.59	–	–	–
alcoholic psychosis	0.04	0.17	0.26	0.24	0.16	51
nervous system degeneration caused by alcohol	0.58	1.46	1.79	0.45	0.37	59
alcoholic cardiomyopathy	14.81	12.65	13.73	1.17	1.08	40
alcohol liver disease	5.01	5.73	8.56	0.87	0.58	57
chronic pancreatitis of alcoholic etiology	0.29	0.28	0.25	1.05	1.16	30
accidental alcoholic intoxication	7.24	15.63	10.65	0.46	0.68	54
alcohol intoxication and impact with uncertain intentions	0.50	2.38	2.15	0.21	0.23	46

Note: \* RF and SFD level is taken as 1.

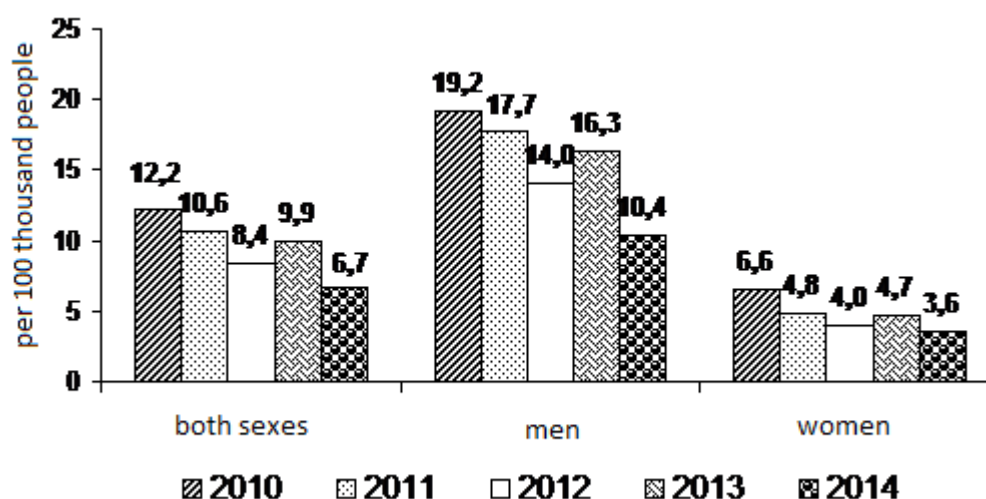


Figure 1. Standardized mortality rates dynamics in Irkutsk region, accidental alcoholic intoxications, over 2010-2014 years (per 100 thousand people, WHO European standard)

Nowadays alcohol cardiomyopathy is the primary death cause among all alcohol-related ones in Irkutsk region [8]. 358 people died of it in 2014 (51.6% of all alcohol-related death causes). Alcohol cardiomyopathy mortality rate was 14.8 people per 100 thousand and it exceeded average Russian rate and regional rate by 7.9 and 17.1% correspondingly ( $d < 0.05$ ) (table 2). Irkutsk region held the 40<sup>th</sup> place among 85 Russian regions as per alcoholic cardiomyopathy mortality. Number of people who died of chronic pancreatitis of alcoholic etiology in Irkutsk exceeded average Russian level and regional level by 15.5% and

5.5% correspondingly; as for all over death causes related to alcohol Irkutsk region rates were lower than in RF and SFD.

This positive trend of alcohol mortality decrease can be seen also in mortality analysis for urban and rural population in Irkutsk region (table 3). But still rural population mortality in Irkutsk region was on average 16.6% higher than urban population mortality. We detected higher mortality caused by alcohol cardiomyopathy, alcohol liver disease and chronic pancreatitis of alcohol etiology among rural population. On the contrary, mortality rates for deaths caused by accidental alcohol

intoxications among rural population were lower than among urban population, the only exception being 2014.

In 2010-2014 years mortality rates for deaths caused by alcohol liver disease and nervous system damage related to alcohol remained steady both among urban and rural population in Irkutsk region.

There are no registered calculated alcohol intoxications and impacts in Irkutsk region (which started to appear among suicide cases after amendments made to Federal State Statistic Services reports) but we see registered cases of alcohol intoxications and impacts with uncertain intentions: 2 cases in 2012; 81 cases in 2013; 12 cases in 2014.

We defined 11 municipal districts as “risk” territories in the context of alcohol mortality;

alcohol mortality rates in these districts were 1.6 times higher than the average region level ( $d < 0.05$ ) (picture 2). The minimum level was in Alarskiy district (4.8 cases per 100 thousand people), the maximum level was in Ust-Udinskiy district (144.2 cases per 100 thousand people). In 3 municipal districts there was no registered alcohol mortality.

In 2010-2014 years accidental alcohol intoxication mortality in Irkutsk region lowered 1.8 times from 12.98 to 7.24 cases per 100 thousand people ( $d < 0.05$ ) [2]. In 2014 accidental alcohol intoxication mortality was fixed in 31 municipal districts and it was higher than in the region on average in 17 municipal districts. We defined 7 municipal districts where it was 1.6-6 times higher than in the region on average as “risk” territories ( $p < 0.05$ ) (picture 3).

Table 3

Alcohol mortality of urban and rural population in Irkutsk region in 2010-2014 (per 100 thousand people)

Death causes	2010	2011	2012	2013	2014	GR (%)
<i>urban population</i>						
Total number of deaths	1410.87	1379.16	1374.70	1346.39	1365.04	96.8
All alcohol-related causes, including	40.10	34.03	31.18	33.73	27.42	68.4
chronic alcoholism	1.45	0.10	0.05	0.00	0.00	0.0
alcoholic psychosis	0.10	0.00	0.00	0.05	0.05	50.3
nervous system damages caused by alcohol	0.62	0.78	0.47	0.57	0.63	100.8
alcohol cardiomyopathy	19.48	16.32	15.51	14.81	14.81	76.0
alcohol liver disease	4.13	4.66	5.14	3.59	4.43	107.2
chronic pancreatitis of alcoholic etiology	0.52	0.10	0.52	0.36	0.31	60.6
accidental alcoholic intoxications	13.80	12.02	9.44	10.71	6.67	48.4
<i>rural population</i>						
Total number of deaths	1563.50	1469.88	1440.72	1436.67	1392.94	89.1
All alcohol-related causes, including	43.07	37.54	41.14	37.50	33.50	77.8
chronic alcoholism	3.00	0.20	0.00	0.00	0.00	0.0
alcoholic psychosis	0.00	0.00	0.00	0.20	0.00	–
nervous system damages caused by alcohol	0.80	0.20	0.00	0.81	0.80	100.1
alcohol cardiomyopathy	23.84	21.60	23.39	17.74	14.85	62.3
alcohol liver disease	5.01	6.86	10.08	7.06	7.22	144.2
chronic pancreatitis of alcoholic etiology	0.60	0.61	0.00	0.20	0.20	33.4
accidental alcoholic intoxications	9.82	8.07	7.46	8.87	9.43	96.1

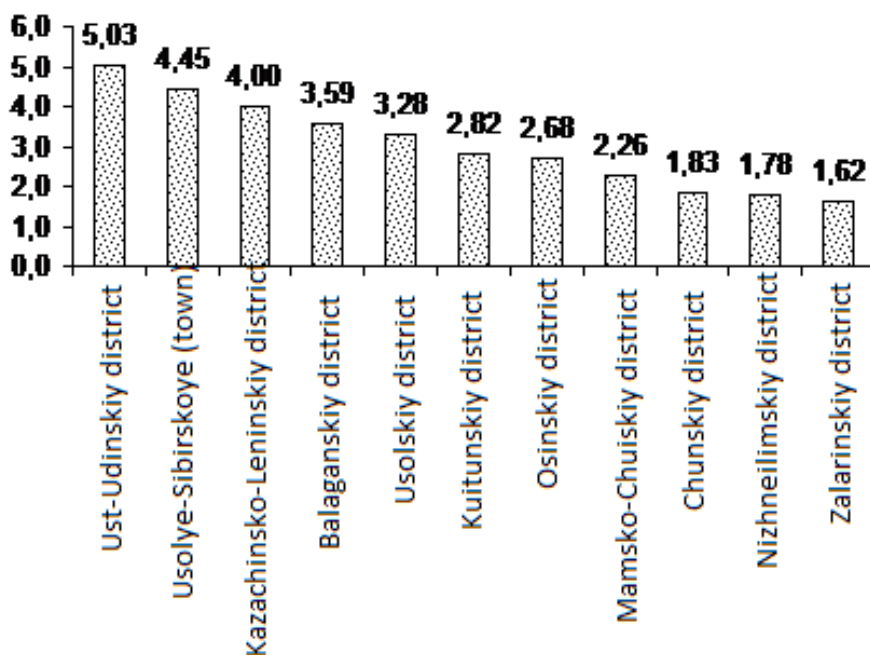


Figure 2. “Risk” territories in Irkutsk region in 2014 in the context of alcohol mortality rate (levels exceeding average regional level of 28.7 cases per 100 thousand people, times)

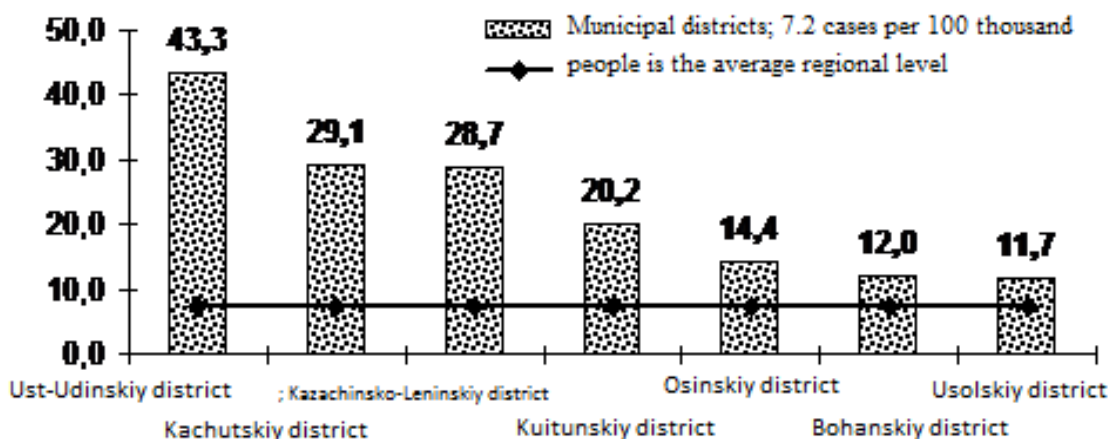


Figure 3. “Risk territories” in Irkutsk region in the context of accidental alcohol intoxication mortality (per 100 thousand people)

All over the world alcohol is considered to be exerting more harmful impact on men (6.0 % deaths, 7.4 % DALY), than on women (1.1 % deaths, 1.4 % DALY). Quality and quantity parameters of alcohol use differ among sex groups [26]. Boeva A.B. *et al* [18] interviewed adult population in Irkutsk regions and determined that 45.7% men drank alcohol on special occasions; 27.5% drank alcohol several times a month; 21.0% drank alcohol several times a week. As for women, the frequency of alcohol drinking amounted to 76.9; 6.0 and 7.5% correspondingly. Only 5.8% men and 11.6%

women stated they never drank alcohol. Such high rates of drinkers among interviewed adult population in Irkutsk region prove absence of individual health care and interest in healthy lifestyle [18].

Over 2010-2014 years alcohol mortality among men in Irkutsk region was on average 2.5 times higher than among women; accidental alcohol intoxication mortality among men was 3.2 times higher ( $d < 0.05$ ) (table 4). If we compare these data with 1970 years we can detect a higher level of alcoholization among women [18]. Alcohol mortality rate among men in Irkutsk

region decreased 1.4 times from 59.0 to 43.4 cases per 100 thousand people; the same rate among women decreased 1.6 times from 24.9 to 16.0 cases per 100 thousand people correspondingly ( $d < 0,05$ ). Also we have fixed statistically authentic 1.8 times fall in accidental alcohol intoxication mortality in the context of sex ( $t \geq 2$ ,  $d < 0,05$ ).

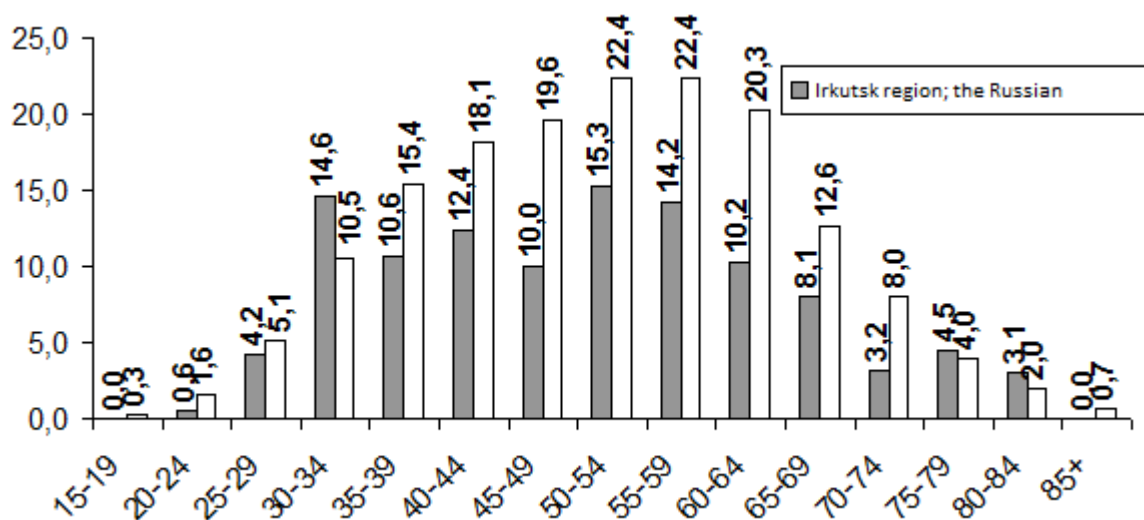
Table 4

Alcohol mortality dynamics for Irkutsk region population in the context of sex in 2010-2014 years (per 100 thousand people)

Parameter	2010	2011	2012	2013	2014	2014/2010
<i>All alcohol mortality causes</i>						
$P_{men}$	59.0	49.2	48.8	51.8	43.4	-1.4 times
$P_{women}$	24.9	22.3	19.8	19.6	16.0	-1.6 times
$P_{men}/P_{women}$	2.4	2.2	2.5	2.6	2.7	-
<i>Accidental alcohol intoxication included</i>						
$P_{men}$	19.9	18.2	14.5	16.4	11.2	-1.8 times
$P_{women}$	7.0	5.2	4.4	5.1	3.8	-1.8 times
$P_{men}/P_{women}$	2.8	3.5	3.3	3.2	2.9	-

There is high mortality among people aged 30-65 caused by alcohol use; these age groups are people with the most valuable professional skills and experience. Their untimely deaths cause damage to families, labor resources and national economy as a whole. Thus, in 2014 the highest accidental alcohol intoxication mortality was fixed among people in their 50ties (14.2-15.3 cases per 100 thousand people) and people aged 30-34 (14.6 cases per 100 thousand people). In the latter group accidental alcohol intoxication mortality was higher than in Russia in general (picture 4).

Alcohol mortality analysis in 2014 in the context of separate age groups has shown that the alcohol mortality rates among men aged 30-79 and among women aged 35-69 were authentically higher than the regional level (table 5). Accidental alcohol intoxication mortality among men aged 30-64 and 75-79 were statistically and authentically higher than the regional level ( $d < 0,05$ ). And we have determined 5 "risk" age groups among women in the terms of accidental alcohol intoxication mortality where the rates were more than 1.6 times higher than the regional level: 35-39, 45-49, 50-54, 55-59, 65-69 ( $d < 0,05$ ).



Picture 4. Age coefficients of accidental alcohol intoxication mortality among Irkutsk region population and the Russian Federation in 2014 (per 100 thousand people)

Table 5

Alcohol mortality of Irkutsk region population in the context of separate age-sex groups in 2014 (per 100 thousand people)

Age group	All causes				Accidental alcohol intoxication included			
	$P_{men}$	$P_{men}/P_{region}$	$P_{women}$	$P_{women}/P_{region}$	$P_{men}$	$P_{men}/P_{region}$	$P_{women}$	$P_{women}/P_{region}$
15-19	1.53	0.0	0.00	0.0	0.00	0.0	0.00	0.0

20–24	4.72	0.1	0.00	0.0	1.18	0.1	0.00	0.0
25–29	20.26	0.5	5.69	0.4	6.45	0.6	1.90	0.5
30–34	52.75	<b>1.2</b>	9.95	0.6	26.38	<b>2.4</b>	2.99	0.8
35–39	69.65	<b>1.6</b>	20.46	<b>1.3</b>	15.09	<b>1.3</b>	6.46	<b>1.7</b>
40–44	66.71	<b>1.5</b>	28.30	<b>1.8</b>	19.62	<b>1.8</b>	5.90	1.5
45–49	81.80	<b>1.9</b>	35.00	<b>2.2</b>	13.63	<b>1.2</b>	6.73	<b>1.7</b>
50–54	80.42	<b>1.9</b>	43.15	<b>2.7</b>	18.16	<b>1.6</b>	12.95	<b>3.4</b>
55–59	85.91	<b>2.0</b>	33.03	<b>2.1</b>	24.94	<b>2.2</b>	6.19	<b>1.6</b>
60–64	96.50	<b>2.2</b>	22.88	<b>1.4</b>	16.93	<b>1.5</b>	5.72	1.5
65–69	58.78	<b>1.4</b>	27.51	<b>1.7</b>	9.28	0.8	7.34	<b>1.9</b>
70–74	50.37	<b>1.2</b>	13.87	0.9	5.04	0.5	2.31	0.6
75–79	57.97	<b>1.3</b>	0.00	0.0	15.81	<b>1.4</b>	0.00	0.0
80–84	38.23	0.9	4.05	0.3	12.74	1.1	0.00	0.0
85+	0.00	0.0	5.69	0.4	0.00	0.0	0.00	0.0

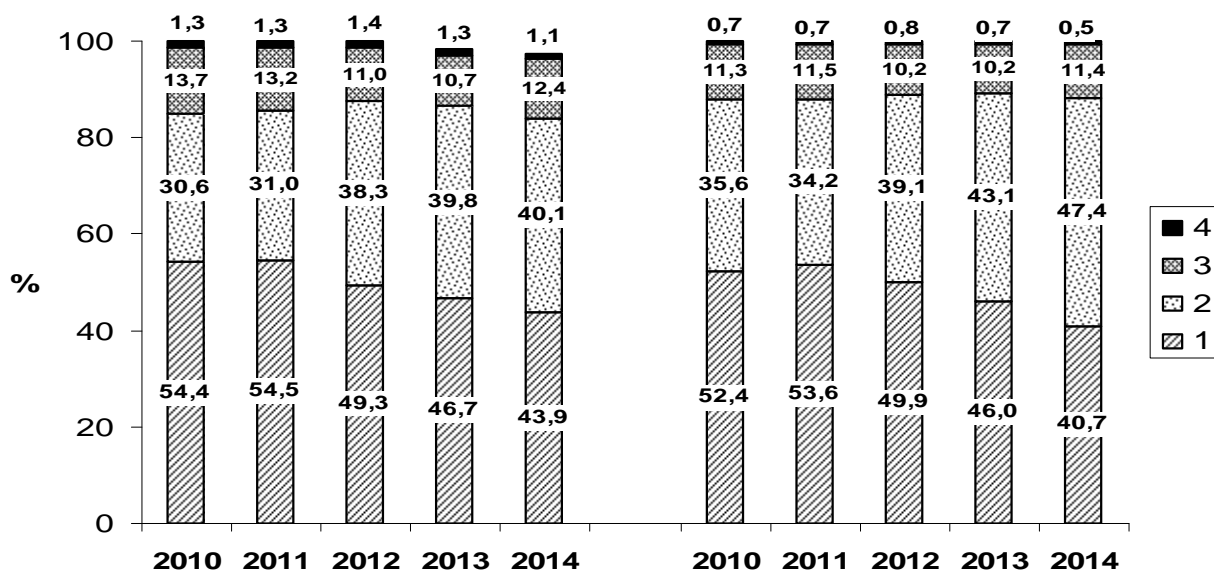
Note: we used **bold type** to show mortality rates which were statistically and authentically higher than the regional level ( $t \geq 2, d < 0.05$ ).

Undoubtedly decrease in absolute alcohol consumption per capita (on the basis of 100% ethanol) from 9.3 liters in 2010 to 8.4 liters in 2014 led to fall in alcohol mortality in Irkutsk region in 2010-2014 [3]. But despite this decrease the absolute alcohol consumption remains very high [16] just as in Russia as a whole; it was 8.3 in 2014 [17]. It exceeds the WHO standard of 8.0 liters. Each liter consumed over this level takes away 11 months from a man’s life and 4 months from a woman’s life [1].

Federal State Statistic Service official data do not give a true picture of alcohol consumption as the share of illegal alcohol in production and consumption is still significant (from 30% to 50%) [15, 16]. According to expert evaluations

nowadays virtual alcohol consumption per capita amounts to about 18 liters a year (if we take all illegal alcohol drinks and domestically produced strong drinks) [1, 11].

Scientists have proved that the stronger alcohol drinks are the worse consequences of alcohol use we observe. Therefore when we analyze alcohol consumption per capita we should always take not only the quantity but also the consumption structure into account [1, 3, 12, 16, 18]. In Russia the share of strong drinks in alcohol consumption has been decreasing gradually from 54.5% in 2010 to 43.9% in 2014. The same trend is also observed in Irkutsk region, where it has decreased from 52.4% in 2010 to 40.7% in 2014 (picture 5).



Picture 5. Alcohol sales structure in the Russian Federation and Irkutsk region in 2010-2014 (in absolute alcohol, as % of the total, 1 is for strong drinks, such as vodka, liquors, cognacs and brandies; 2 is for beer including beer-based drinks; 3 is for wines including champagne and sparkling wines; 4 is for low alcohol drinks)

Nowadays there is a lot of worrying about great popularity of beer, low culture of beer consumption and spread of so called “beer alcoholism”. In 2014 the share of beer in the overall alcohol consumption rose to 40.1% (it was 30.6% in 2010). In Irkutsk region it went up to 47.4% (it was 35.6% in 2010). We should note that for the first time in 2014 beer had the biggest share in the absolute alcohol consumption in Irkutsk region (47.4%) while strong drinks such as vodka, liquors, cognacs and brandies had only 40.7%. As for wines consumption it remained steady at about 10.9% on average. According to interviews conducted among adult population in Irkutsk region the most frequently consumed drink for men is beer (66.2%), then (in decreasing order) strong drinks (18.3%), wines (13.4%) and low alcohol drinks (2.1%). As for women they drank wines more frequently than any other drinks (56.6%), then beer (31.1%), and strong drinks and low alcohol drinks were the least popular (6.1% both). So we can conclude that the structure of alcohol consumption in Irkutsk region has changed significantly.

Easy access to alcohol is one of the factors contributing to alcoholization of population. There are 4936 economic entities registered in Irkutsk region which have permission to sell alcohol. So each such entity “provides” alcohol for 380 adults while in some countries this ration can be 1:5000 [21]. And as experts insist it is the measures aimed at making access to alcohol more difficult that are the most effective and economically feasible among all the alcoholism prevention activities. These are restriction of alcohol sales time period, decrease in number of alcohol sales points, increasing alcohol prices, and alcohol advertising limitation. Besides, we should not forget about drastic decrease in strong drinks consumption as it should become an integral part of anti-alcohol state policy [12].

Retail alcohol trade changed in 2012 when Federal Law 171 came to force and according to it beer and beer-based drinks started to be treated like other alcohol drinks. That is, from that year all the restrictions imposed on alcohol applied to beer also (before 2012 small stalls could sell such drinks if their strength did not exceed 5%). Since July 1<sup>st</sup>, 2012 it's been prohibited to sell beer and beer-based drinks at public transport stops and since January 1<sup>st</sup>, 2013, it's been prohibited to sell such drinks in street stalls too. [1].

In order to prevent socially negative events in Irkutsk region the officials have issued a number of regulatory law acts and target anti-alcohol programs. For example, “A set of measures aimed at

drugs and psychotropic substances abuse prevention for 2014-2018” sub-program was approved by Irkutsk region governmental regulation on October 14, 2013 No. 447 as an integral part of “Youth policy” Irkutsk region State program for 2014-2018. According to Irkutsk region Governmental Regulation No. 313-pp from October 14, 2011 “On setting requirements and restrictions in retail alcohol trade on Irkutsk region territory” all retail alcohol trade was prohibited from 22.00 till 09.00. Another Irkutsk region Governmental Regulation No. 577-pp from December 16, 2013 “On Amendments into Irkutsk region Governmental Regulation No. 313-pp from October 14, 2011” set additional restrictions to retail alcohol trade. Thus, since January 5, 2014 retail alcohol trade in housing facilities (excluding built-on premises) for the period of time from 22.00 till 09.00 has been prohibited. All legal restrictions imposed on alcohol trade resulted in trade volumes decrease and, consequently, in alcohol consumption fall in Irkutsk region [1, 3, 19].

Lower level of alcohol mortality is also related to efficient and positive results of work accomplished by all responsible regional government departments. They have completed a set of measures aimed at increasing efficiency of alcohol trade regulation and fighting illegal ethanol and alcohol production and sales in full conformity with “Concept of Governmental Policy Implementation aimed at decreasing alcohol abuse scales...” (2009 г.) [11]. Quarterly interdepartmental commissions on regional and municipal level discuss how to ensure safety and quality of alcohol products sold on the territory of Irkutsk region.

In 2014 officials of Federal Service for surveillance on consumer rights protection and human well-being inspected 233 retail outlets and catering facilities which dealt with alcohol trade. 342 samples of alcohol products including 39 foreign ones were tested in laboratories. All the samples conformed to hygienic standards. But still after the inspections 165 administrative offences were detected and legal action were taken; 741 thousand rubles of fines were exacted, 220 thousands of them were exacted from 16 legal entities. Such inspections are also carried out by Ministry of Internal Affairs.

As control measures over alcohol trade were toughened we determined that licensing scope was very low in rural areas of Irkutsk region. Absence of legal alcohol trade and high prices on alcohol make population with low income choose cheaper products and buy alcohol from moonshiners and



bootleggers who often sell counterfeit and substitutes [1]. Toxicological monitoring carried out by Federal Service for surveillance on consumer rights protection and human well-being in 2014 registered 1928 cases of acute alcoholic intoxication; 218 cases were due to alcohol substitutes and 9 of them were fatal (total number of fatal cases of alcoholic intoxication amounted to 170). We should point out that retail alcohol trade legalization is the problem not only in Irkutsk region, but in the whole country [1].

Nowadays measures aimed at lowering alcohol consumption among children, adolescents and youth are becoming particularly important [1, 2,3,19, 21]. As we know, alcohol consumption deteriorates cerebrum functions, impairs intellectual abilities and has negative influence on school results. Young people who drink alcohol damage their health, education and all future life but they often do it unconsciously. A lot of specialists from various spheres of knowledge take part in implementation of effective policy aimed at forming motivation for healthy lifestyle; the whole society is deeply interested in it. RF Ministry of Education and Science started to work out sample programs for skills development and professional retraining of teachers. These programs cover issues of alcoholism prevention among young people and are going to be used in all regions of Russia [14].

Raising the level of minimum age requirement for buying and drinking alcohol from 18 to 21 is considered to be the most efficient measure in anti-alcoholic activities aimed at young people. 7 regions of the Russian Federation approved this minimum age requirement of 21 in 2015 [3].

We should pay special attention to the problem of low alcohol energetic drinks. Such drinks are made with various flavoring and tonic additives; they usually have a well-designed and colorful package with attractive brands, names and symbols. Such products appeal to children, adolescents and youth. Data on ethanol content in such drinks are not always clearly provided. And any combination of ethanol and tonics (for example, caffeine) speeds up alcohol addiction formation and leads to physiological need of daily drinking [1].

Sales of low alcohol energetic drinks are now prohibited by regional laws in approximately 30 regions of the Russian Federation and they are also restricted in Moscow, Moscow region, Krasnodar and Magadan regions, in the Far East (Evreiskaya autonomous region, Kamchatka, Chukotka, Khabarovsk region). On December 4<sup>th</sup>, 2015 Irkutsk region legislative assembly held a round-table

discussion on the theme "Prevention of alcohol consumption among adolescents. Problems and solutions". The participants passed on some recommendations to Irkutsk region government: 1) to prohibit sales of low alcohol energetic drinks on Irkutsk region territory by regional law; 2) increase administrative fines rates for officials and legal entities who breaches the rules set for retail trade in alcohol products as well as violates the restrictions imposed on retail alcohol trade [21].

In spite of all the results we achieved Irkutsk region according to Russian regions sobriety rating is included into a group of 43 regions where "anti-alcohol campaign cannot be considered satisfactory" and alcohol use impacts "endanger people health and safety" [6].

Health care organizations services cannot be overestimated when we speak about efficiency of measures aimed at detection, treatment, and rehabilitation of alcohol addicts and people suffering from chronic alcoholism. But as Nemtsov A.V. points out [15], the possibilities of health care in the sphere of alcohol use prevention are limited. He gives some reasons for the fact; for example low anti-alcohol potential of the population; poverty of a considerable part of the country population, and these poor citizens tend to drink more alcohol than people with middle incomes; one more reason is that most drinking people usually have low level of education and culture. According to the expert, "health care should pay attention to hard drinking which exceeds alcoholism in dozens times. Drunkards, not alcoholics, have the biggest share in alcohol mortality rates. Therefore, general practitioners must not ignore the diseases that hard drinkers usually have, but they should prove the relation between somatic pathology and alcohol abuse to their patients. It is also necessary to change medical workers' attitude towards drunkards as they tend to consider such people to be "wasted". Unfortunately, such attitude is deeply enrooted in our population's psychology as human life is thought to be very cheap. Health care can and should reeducate people..." [15].

Direct and indirect economic losses caused by population alcoholization bring significant damage to the country social and economic development. Economic losses are: 1) increased mortality level; 2) shorter period of healthy lifetime; 3) working ability loss; 4) decrease in labor productivity; 5) expenditure on treatment of diseases caused by alcohol use; 6) state social payments to disabled people and orphans; 7) damage cause by fires and road accidents; 8) state expenses on prisoners, fight

against crime rate, and homelessness control [1, 11]. Anti-alcohol measures can lead to lower mortality caused by suicides [9] and road accidents, to lower crime rates, and to longer lifetime and higher quality of life.

According to experts' judgments, the total direct losses caused by hard drinking and alcoholism and lower labor productivity which results from alcohol consumption amount to 2-5% of GDP [5]. In 2014 alcoholization of Irkutsk region population led to total economic losses of 18.4 billion rubles (2.2% of gross regional product) [19]. Prevented economic damage in Irkutsk region in 2014 calculated with taking decreased scales of alcoholization and their consequences was 1 billion rubles. Economic effect of activities implemented in the sphere of fighting against hard drinking and alcoholism in Irkutsk region in 2014 amounted to 0.4 billion rubles [3].

RF Public Health Ministry inter-departmental commission analyzed death causes in our country and discussed measures necessary to lower mortality rates. According to the discussion conclusions we should take immediate action and fight alcohol substitutes and illegal spirits trade; we should immediately start fighting domestic hard drinking, and we should actively promote and support sober lifestyle. Such activities are to be carried out and controlled by all the Russian society, religious denominations and civil activists [4]. If we wish to decrease Russian population mortality rate then we should pay special attention to working out measures aimed at fighting alcohol use, smoking, and drug addiction in public health care. We have to provide conditions for healthy lifestyle, correction and regular surveillance over behavioral and biological risk factors which can cause non-infectious diseases on population, group and individual level [10].

#### **Conclusions:**

1. Over 2010-2014 alcohol mortality in Irkutsk region decreased 1.4 times, among all the population and among working population as well. Registered figures of most alcohol mortality causes in the region were lower than average in the RF and Siberia Federal District, except for alcohol cardiomyopathy and chronic pancreatitis of alcoholic etiology.

2. Irkutsk region holds 30-59 places in various alcohol mortality ratings among all Russian regions in 2014 and it proves that the region situation with it is relatively satisfying.

3. Absolute alcohol consumption per capita in Irkutsk region decreased from 9.3 liters in 2010 to

8.4 liters in 2014. The consumption structure changed and in 2014 beer took the first place instead of strong drinks, its share being 47.4% against 40.7% share of strong drinks (they were 35.6% and 52.4% correspondingly in 2010).

3. 11 municipal areas in Irkutsk region were called "risk" territories in the terms of alcohol mortality and 7 municipal areas in the terms of accidental alcohol intoxication mortality. Mortality rates in those areas were 1.6 times higher than the average regional level. The main "risk" groups are men aged 30-79 and women aged 35-69.

4. Over the last 5 years alcohol mortality among men in Irkutsk region was 2.5 times higher than the same mortality among women; accidental alcohol intoxication mortality was 3.2 times higher among men than among women, and those rates were 16.6% higher in rural areas than in urban areas.

5. Due to demographic losses and significant economic damage caused by harmful alcohol use in Irkutsk region we consider surveillance over alcohol trade, monitoring scales of damage caused by alcohol use, and promoting healthy lifestyle to be vital activities implemented by Federal Service for Surveillance over consumer rights protection and human well-being.

Further decrease in alcohol mortality rates and alcoholization scales in Irkutsk region, as well as fighting negative medical, social and economic consequences of alcoholization, requires complex and systematic approach and can be achieved as a result of the following activities [3]:

- massive information campaign telling people about risks connected with alcohol use;
- promoting motivation and creating conditions for healthy lifestyle, especially in risk groups of population;
- implementing state and regional social programs aimed at increasing population life quality;
- further restrictions imposed on alcohol availability, including decrease in number of retail outlets selling alcohol (to minimum level of 1 per 1000 adults), restricted period of time when alcohol can be sold;
- permitting alcohol sales strictly with all necessary licenses; making all economic entities dealing with alcohol trade obtain such licenses, fighting illegal alcohol trade;
- increasing age requirement in Irkutsk region and setting a minimum age at which alcohol can be bought and drunk at 21 instead of 18.

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