

**ASSESSING THE IMPACT OF BEHAVIORAL RISK FACTORS<sup>1</sup>****R. Buzinov, T. Unguryanu**

Arkhangelsk Region Department of the Federal Service on Customers' Rights Protection and Human Well-Being Surveillance, Russia, 163000, Arkhangelsk, Arkhangelsk Region, 24 Gaidara st.

**Abstract.** We have studied the prevalence of smoking and alcohol consumption in the urban population of the Arkhangelsk Region and have assessed the associated risk of ischemic heart disease (IHD). A total of 697 individuals aged 18 or over participated in the survey. The share of the smoking urban population in the Arkhangelsk region was 37.4 % whereas the percentage of individuals consuming alcohol once a month or more often was 35.5 %. The total risk of the impact of smoking and alcohol consumption for the urban population in the age groups 40 to 49, 50 to 59, 60 and over, was  $7.0 \times 10^{-3}$ ,  $2.2 \times 10^{-2}$ ,  $5.2 \times 10^{-1}$ , respectively, and was considered to be unacceptable. The main contribution to the overall risk of IHD is smoking (91.5 %).

**Keywords:** smoking, alcohol consumption, health risk.

Lifestyle is a key factor that determines people's health. Tobacco consumption is the leading cause of premature death in the world. Almost 6 million people die every year as a result of immediate smoking as well as passive smoking. By 2030, this number will reach 7.5 million, or 10 % of all death cases. It has been estimated that smoking is responsible for 71 % of lung cancer cases, 42 % of chronic respiratory disease cases, and close to 10 % of cardiovascular diseases [1].

According to a global survey, the prevalence of current smokers in Russia in 2009 was 39.1 %, among them 60.2 % were men, and 21.7 % – women [2]. Every year, 300 000 Russians die from the diseases caused by the consequences of smoking [3]. It has been proved that smoking causes a series of chronic diseases (cardiovascular, lung, cancer-related diseases, ulcer) resulting in premature incapacitability and death.

Today one can be exposed to several (two-three or more) risk factors at the same time. They can have a combined effect or a potentiating effect that results in an aggravated impact on the development, advance, and unfavorable outcome of chronic noninfectious diseases. Five leading risk factors contributing to the development of chronic noninfectious diseases (arterial hypertension, excessive drinking, smoking, hypercholesterolemia, and obesity) are responsible for 67.2 % of lost years of healthy life [4].

Today we shall assess individual, group, and population health and mortality risks associated with chronic noninfectious diseases with the account for several risk factors.

**The purpose of this research** is to study the prevalence of smoking and drinking in the urban population of Arkhangelsk Region and associated incidence of ischemic heart disease (IHD).

**Materials and methods.** To examine prevalence of smoking and alcohol consumption in urban population, a questionnaire-based cross-sectional study was conducted in Arkhangelsk Region. The sample totaled 697 people aged 18 and over stratified on the basis of gender and age. The mean average age of the sample was 43 (Q1 = 30; Q3 = 55 years old).

The assessment of health risks associated with tobacco and alcohol consumption was conducted on the basis of methodic guidelines for Assessing Public Health Risks Associated

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with Lifestyle Factors (MR 2.1.10.0033–11). To assess the ‘factor-effect’ dependency in terms of the effect of active smoking and excessive alcohol consumption of public health, we used the numbers indicating a daily intake of nicotine and pure alcohol. We calculated the daily intake of nicotine as the amount of nicotine in cigarettes equal to 0.5 mg.

Individual IHD risk under exposure to tobacco smoking is calculated for each respondent who smokes every day taking into account the age when the respondent started smoking and the number of cigarettes smoked per day. To measure the IHD risk associated with alcohol consumption we used the amount of pure consumed alcohol for each respondent and considered 18 as the starting age for drinking. We calculated the individual and population IHD risks under isolated exposure to nicotine and alcohol as well as the total risk that includes the combined exposure to both factors. The level of individual risk ranging from  $1 \cdot 10^{-4}$  to  $1 \cdot 10^{-3}$  and higher than  $1 \cdot 10^{-3}$  was consider impermissible, and ranging from  $1 \cdot 10^{-6}$  to  $1 \cdot 10^{-4}$  - as permissible.

**Results and discussion.** Seventy-three percent of the population of Arkhangelsk Region lives in five cities. The survey showed that smokers constituted 37.4 % of the urban population of Arkhangelsk Region (95 % CI: 33.8–41.0). Men’s prevalence rates were three times higher than women’s (Table 1). Most cigarette consumers were daily smokers. The distribution of smoking respondents showed that almost 40 % had been smoking for over 20 years. At the same time, a significant number of respondents confessed they wanted to quit (65.4 %). The average number of cigarettes per day in the studied age groups totaled 15, and in the group of respondents aged 50–59 – 20 cigarettes per day.

Table 1

Characteristics of Smokers in Arkhangelsk Region

Variables	Absolute Number	%	95 % CI
Gender:			
– male	166	61.9	56.0–67.5
– female	94	22.0	18.3–26.1
Frequency of smoking:			
– daily	160	61.8	55.7–67.4
– irregular smoking	36	13.9	10.2–18.6
Years of smoking:			
– 10 or less	54	32.9	26.2–40.4
– from 10 to 20	45	27.4	21.2–34.7
– 20 and more	65	39.6	32.5–47.3
Want to quit:			
– yes	102	65.4	57.6–72.4
– no	54	34.6	27.6–42.3

Over half of the respondents (60.5 %) living in the urban areas of Arkhangelsk Region consume alcohol with various frequency. The distribution of the respondents in terms of alcohol consumption frequency has shown that 1.1 % of the urban population consume alcohol daily (95 % CI: 0.5–2.3), 8.6 % (95 % CI: 6.5–11.3) – weely, 13.2 % (95 % CI: 10.5–16.3) – 2–3 times per month, 12.6 % - once a month, 25.0 % (95 % CI: 21.5–28.8) – less than once a month.

When examining the average daily alcohol consumption, we determined that the urban population drinks mostly beer ( $M = 667.4$  r; 95 % CI: 571.8–762.9). The consumption of

unfortified wine totaled 352.1 g (95 % CI: 571.8–762.9), fortified wine – 276.5 g (95 % CI: 235.8–317.2), vodka – 222.9 g (95 % CI: 192.9–252.9).

The average amount of pure alcohol per consumption in smokers that consume alcohol broken down into age groups constituted the following: aged 20–29 – 96.7 g, aged 30–39 – 150.3 g, aged 40–49 – 124.5 g, aged 50–59 – 70.9 g, aged 60 and up – 106.8 g.

Table 2 shows the medial values for the risk of IHD development in the five age groups of the population of Arkhangelsk Region: 20–29, 30–39, 40–49, 50–59, 60 and older. With tobacco smoking being the only exposure factor, the risk for the population aged 20–29 is permissible ( $5.2 \times 10^{-5}$ ), aged 30–39 – alarming ( $5.5 \times 10^{-4}$ ), and aged 40 and older – high and impermissible.

Alcohol consumption is considered a permissible risk of IHD development in adult population aged 20–29 and 30–39 ( $6.9 \times 10^{-6}$  and  $5.5 \times 10^{-5}$  respectively). In the group aged 40–49, the risk of IHD development associated with alcohol consumption is considered alarming ( $4.1 \times 10^{-4}$ ), and in the population aged 50 and older – high.

Total risk from exposure to tobacco smoking and alcohol consumption in the urban population aged 20–29 is at the permissible level ( $6.2 \times 10^{-5}$ ), aged 30–39 – alarming, and aged 40–49, 50–59, and 60 and older – high.

We have determined that tobacco smoking is the biggest contributor to the total risk of IHD development. The percentage of the effects to tobacco smoking among the respondents ranges from 75.0 % to 99.9 % and averages 91.5 %. The contribution of alcohol consumption to the total risk ranges from 0.1 to 25 % and averages 8.5 %.

The population risk of IHD development in the adult urban population of Arkhangelsk Region who consume tobacco and alcohol under isolated exposure to tobacco smoking and alcohol consumption totals 11 145 and 960 cases of IHD respectively.

Table 2

Individual Risk of the IHD Development in the Adult Urban Population of Arkhangelsk Region Under Exposure to Tobacco Smoking and Alcohol Consumption  
(medial risk values in each of the age groups)

Age, years old	Risk of IHD development			
	No exposure to the risk factors	Under exposure to tobacco smoking	Under exposure to alcohol	Total risk (smoking + alcohol)
20–29	$2.7 \times 10^{-6}$	$5.2 \times 10^{-5}$	$6.9 \times 10^{-6}$	$5.9 \times 10^{-5}$
30–39	$1.7 \times 10^{-5}$	$5.5 \times 10^{-4}$	$5.5 \times 10^{-5}$	$6.1 \times 10^{-4}$
40–49	$1.8 \times 10^{-4}$	$6.6 \times 10^{-3}$	$4.1 \times 10^{-4}$	$7.0 \times 10^{-3}$
50–59	$6.3 \times 10^{-4}$	$2.0 \times 10^{-2}$	$1.6 \times 10^{-3}$	$2.2 \times 10^{-2}$
60 and older	$5.7 \times 10^{-3}$	$5.1 \times 10^{-1}$	$1.5 \times 10^{-2}$	$5.2 \times 10^{-1}$

Additional risk of IHD development in the population groups aged 60 and older resulting from tobacco smoking is at the level of 0.50 in terms of relative risk. Such risk is qualified as high, and it requires giving up tobacco smoking. Our study has shown that only 8 % of smokers under 60 want to quit and have tried quitting – 3.5 % of the total number of respondents in this age group.

**Conclusion.** The risk of IHD development associated with tobacco smoking in the middle-aged and old urban population of Arkhangelsk Region is impermissible; it requires an

action program aimed at the adjustment of behavioural risk factors including decrease in the prevalence of smoking in the population.

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### A b o u t t h e a u t h o r s :

**Buzinov Roman Vyacheslavovich, PhD in Medicine** (Arkhangelsk, Russia) – Head of the Arkhangelsk Region Department of the Federal Service on Customers' Rights Protection and Human Well-Being Surveillance (24 Gaidara St, Arkhangelsk, 163000, Arkhangelsk Region, email: [arkh@29rpn.atnet.ru](mailto:arkh@29rpn.atnet.ru), tel.: 8 (8182) 200-569).

**Unguryanu Tatiana Nikolaevna, PhD in Medicine** (Arkhangelsk, Russia) – Chief Specialist-Expert of the Arkhangelsk Region Department of the Federal Service on Customers' Rights Protection and Human Well-Being Surveillance (24 Gaidara St, Arkhangelsk, 163000, Arkhangelsk Region, email: [unguryanu\\_tn@mail.ru](mailto:unguryanu_tn@mail.ru), tel.: 8 (8182) 21-04-61).