

Ten year trends in chronic disease risk factors in the Republic of Karelia, Russia

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Background: In Russia, non-communicable diseases are leading cause of death. The aim of this article is to describe changes in chronic disease risk factors (RFs) in Pitkäranta district in Russia during ten year period of time from 1992 to 2002. **Methods:** Study areas were Pitkäranta and Aunus districts in the Republic of Karelia, North-West Russia. The RF surveys were carried out in Pitkäranta every fifth year since 1992 and in Aunus in 2003. Independent random samples, age 25–64, were taken from the population registers. Blood pressure, weight and height were measured. Serum cholesterol, HDL-cholesterol, triglyceride and GGT values were determined from serum samples. Smoking and alcohol consumption were asked. The total number of respondents was 2766. **Results:** Systolic and diastolic blood pressure decreased in Pitkäranta from 1992 to 2002. Total serum cholesterol increased slightly. There was no significant change in BMI or in physical activity. Smoking did not change in males but increased among females. Self-reported alcohol use increased, as also mean GGT. **Conclusions:** The study gives valuable information on developments of RFs in Russia. Some alarming tendencies in lifestyle were seen and chronic disease RF situation has generally worsened. The results also show how big is the challenge to change lifestyles deep in culture—and in the situation where preventive work and policies do not receive strong support. A reliable monitoring of RFs and behaviours is obviously a back bone for drawing necessary attention and to steer intervention.

Keywords: health behaviour, monitoring, risk factors, Russia

Introduction

Premature mortality has increased rapidly in Russia in the immediate period after the break up of the Soviet Union in 1990 and again after the Russian economic crisis in 1998.¹ The life expectancy at birth among men has decreased between 1987 and 2003 from 64.9 years to 58.8 years.^{2,3} In 2003, women lived there 13 years longer than men.² In Russia, high excess of NCD mortality is much explained by cardiovascular diseases (CVD), cancer, and injuries among young and middle-aged adults.^{1,4,5}

The major well-established medical risk factors (RFs) for CVD are high blood pressure, high serum cholesterol and smoking.^{6–9} Many studies have shown that high alcohol intake, obesity and physical inactivity also contribute to CVDs.^{10–13} Heavy alcohol drinking is so prevalent in Russia that even if its overall effect on cardiovascular mortality is usually considered to be small, it has been shown to contribute to CVD mortality rates in Russia.^{14,15}

In Russia, a few RF studies have been conducted in different areas in connection with the WHO MONICA project, the WHO/EURO CINDI programme and some other projects.^{16,17} However, standardized data on RF trends are very limited. In Pitkäranta, in the Republic of Karelia, a RF monitoring system was established in collaboration with Finnish researchers in

early 1990s.¹⁸ Three cross-sectional population RF surveys have been carried out in 1992, 1997 and 2002. The RF monitoring system was established to be able to assess trends and to contribute to evaluation of the health promotion that was launched in this area after initial survey in 1992.¹⁹ To compare the situation with neighbouring area, a similar RF survey was carried out in the neighbouring district, Aunus, in 2003.

The aim of this article is to describe chronic disease RF changes in Pitkäranta during ten-year period and compare RF levels between Pitkäranta and Aunus districts.

Material and methods

The Republic of Karelia is an autonomous republic of the Russian Federation. Geographically it is the north-western region of Russia and is bordered in the west by Finland. In 2002, there were 756 406 inhabitants in the Republic of Karelia. In ten years from 1995 to 2004 the population in the Republic Karelia decreased 10% due to high mortality and low birth rate.²⁰

In early 1990s a collaborative project was launched to reduce chronic disease burden in the Republic of Karelia. The project was based on a request of the health authorities of the Russian Republic of Karelia to implement the North Karelia Project type of preventive programme there. Pitkäranta was chosen as the pilot area for the Republic mainly because its population was well-representative of the whole population in the Republic of Karelia.^{18,20} A major component of the project has been the establishment of standardized health monitoring system in the area.

The Pitkäranta district, with population of 23 844 in 2002, is one of the 17 districts in the Republic of Karelia. Of the Pitkäranta population, 60% live in the town by Lake Ladoga. The Aunus district is South of Pitkäranta and geographically almost equal in size. In 2002, there were 27 034 inhabitants.²⁰

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Table 1 Survey samples and participation rates

| | Pitkäranta | | | | | | Aunus | |
|------------------------|------------|-------|------|-------|------|-------|-------|-------|
| | 1992 | | 1997 | | 2002 | | 2003 | |
| | Men | Women | Men | Women | Men | Women | Men | Women |
| Original sample (n) | 500 | 500 | 499 | 501 | 500 | 500 | 500 | 500 |
| Final sample (n) | 495 | 497 | 486 | 500 | 472 | 481 | 480 | 491 |
| Participation by age | | | | | | | | |
| 25–34 | 90 | 114 | 69 | 113 | 62 | 71 | 45 | 71 |
| 35–44 | 94 | 117 | 77 | 112 | 68 | 84 | 52 | 89 |
| 45–54 | 91 | 110 | 78 | 111 | 67 | 99 | 61 | 92 |
| 55–64 | 105 | 114 | 85 | 104 | 66 | 88 | 78 | 89 |
| Total (N) | 380 | 455 | 309 | 440 | 263 | 342 | 236 | 341 |
| Participation rate (%) | 77 | 92 | 64 | 88 | 56 | 71 | 49 | 69 |

Subjects

The population RF surveys have been carried out in Pitkäranta every fifth year since 1992. In Aunus, first RF survey was conducted in 2003 to get a comparison points for RFs observed in Pitkäranta. The surveys were carried out in April in both areas. Independent random samples from age group 25 to 64 years were taken from the population registers. The sample size was 1000 in each survey in both areas. The samples and number of participants by area, sex and age group are presented in Table 1.

Measurements

The surveys included a self-administered questionnaire, physical measurements and laboratory analyses of blood samples. The surveys were carried out by trained nurses in local health centres and polyclinics. The survey method followed the WHO MONICA protocol²¹ and in most recent surveys also the later recommendations of the European Health Risk Monitoring project.²² The questionnaire included questions on socioeconomic factors, health behaviour, medical history and psychosocial factors. The survey methodology is described earlier in detail.¹⁷

Blood pressure (BP) was measured after 5 min rest in a sitting position from the right arm of the subject using a standard mercury sphygmomanometer. Appearance of Korotkoff sounds was recorded as systolic blood pressure (SBP) and the fifth-phase of Korotkoff sounds was recorded as the diastolic blood pressure (DBP). Blood pressure was measured twice and the mean of these two measurements was used in the analysis.

A venous blood specimen was taken to determine serum total cholesterol, high-density lipoprotein (HDL) cholesterol, triglyceride (TG) and gamma glutamyl-transferase (GGT) levels. Serum cholesterol and HDL cholesterol were determined using an enzymatic method (CHOD-PAP, Boehringer Mannheim, Monotest). Before analyses HDL-cholesterol was precipitated from samples by the PTA-precipitation method. All laboratory analyses were made from fresh serum samples at the Laboratory of Biochemistry of the National Public Health Institute of Finland in Helsinki. The laboratory is accredited and standardized against national and international reference laboratories.

Smoking was assessed by using a standard set of questions in each survey. Those who had regularly smoked cigarettes, cigars or pipe for at least one year and had been smoking during the preceding month were regarded as smokers.

Alcohol consumption patterns were assessed by a set of questions about drinking habits. The variable *Alc1* represents the self-reported amount of alcohol in grams per week (g/wk) consumed during the week previous to the survey date,

assessed by the last week's recall. Estimated alcohol content per portion was 12.5 g for beer and 12.0 g for wine and spirits. GGT was measured from serum samples. GGT values of more than 80 U/l among men and 50 U/l among women were regarded as elevated values according to the European Committee for Clinical Laboratory Standards (ECCLS).²³

Weight was measured using a beam balance scale to an accuracy of 0.1 kg and height was measured using a stadiometer to an accuracy of 0.1 cm. Body Mass Index was calculated as kg/m².

Leisure time physical activity was measured using a self-administered question with precoded answers. Participants were asked how many times a week they have had at the least 30 min leisure time physical activity so that they were short out of breath and perspired. Those reporting activity two times or more per week were recorded as moderately physically active.

Statistical methods

The statistical analyses were carried out using SAS (Statistical Analysis System, version 8.2). The differences in cardiovascular RFs between survey years in Pitkäranta were tested analysing *P*-values for trends using regression model, *T*-test was used to test the differences in continuous variables between two study areas, Pitkäranta and Aunus. Differences in prevalence were tested using a chi-square test.

Results

Blood pressure

From 1992 to 2002, the mean values of systolic blood pressure (SBP) decreased significantly both among men and women in Pitkäranta. Also the mean diastolic blood pressure (DBP) decreased in both genders, but significantly only in women. In men, SBP and DBP levels were higher in Aunus than in Pitkäranta (table 2).

The prevalence of elevated SBP (>140 mm Hg) decreased in Pitkäranta from 1992 to 2002 among men from 54% to 40% (*p* = 0.001) and among women from 51% to 39% (*p* = 0.001), respectively. The prevalence of elevated DBP (>90 mm Hg) did not change significantly between 1992 and 2002 either in men or women (table 2).

Serum lipids

Despite of slight increase in mean total serum cholesterol, it did not change statistically significantly from 1992 to 2002 in Pitkäranta. The prevalence of clearly elevated total serum cholesterol values (≥ 6.5 mmol/l) increased among both genders from 1992 to 2002, but not statistically significantly. There was no significant difference in mean total serum cholesterol levels between Aunus and Pitkäranta (table 2).

Table 2 Ten-years changes in blood pressure and serum lipids, by gender

| | Value | Men (%) | | | | | Women (%) | | | | |
|----------------------------------|----------|-----------------|-----------------|-----------------|-----------------|-------|-----------------|-----------------|-----------------|---------------------------------------|--|
| | | Pitkäranta | | Aunus | | | Pitkäranta | | Aunus | | |
| | | 1992 n = 380 | 1997 n = 309 | 2002 n = 258 | 2003 n = 235 | | 1992 n = 455 | 1997 n = 439 | 2002 n = 342 | 2003 n = 341 | |
| Systolic blood pressure (mm Hg) | <120 | 8 | 17 | 20 | 10 | 15 | 27 | 30 | 27 | <i>P</i> < 0.001*, <i>P</i> = 0.065** | |
| | 120–139 | 38 | 36 | 40 | 37 | 35 | 33 | 32 | 31 | | |
| | 140–159 | 33 | 24 | 24 | 28 | 20 | 17 | 20 | 20 | | |
| | ≥160 | 21 | 22 | 16 | 25 | 31 | 23 | 19 | 22 | | |
| | Mean | 145.4 | 143.2 | 139.5 | 145.7 | 147.5 | 140.2 | 136.0 | 139.7 | | |
| | SD | 23.5 | 26.9 | 25.2 | 25.4 | 29.6 | 29.8 | 25.1 | 27.0 | | |
| Diastolic blood pressure (mm Hg) | <80 | 39 | 35 | 50 | 40 | 42 | 43 | 54 | 55 | <i>P</i> = 0.124*, <i>P</i> = 0.035** | |
| | 80–90 | 31 | 27 | 24 | 26 | 29 | 27 | 27 | 27 | | |
| | 90–99 | 18 | 19 | 14 | 19 | 16 | 17 | 11 | 13 | | |
| | ≥100 | 11 | 19 | 12 | 15 | 13 | 13 | 7 | 5 | | |
| | Mean | 83.7 | 86.1 | 81.6 | 84.4 | 83.0 | 83.3 | 77.6 | 78.7 | | |
| | SD | 13.0 | 14.1 | 15.2 | 14.5 | 13.6 | 13.8 | 14.3 | 12.1 | | |
| Total serum cholesterol (mmol/l) | <5.0 | 43 | 51 | 38 | 41 | 43 | 48 | 37 | 39 | <i>P</i> = 0.111*, <i>P</i> = 0.803** | |
| | 5–6.49 | 48 | 38 | 49 | 45 | 42 | 42 | 45 | 44 | | |
| | 6.5–7.99 | 8 | 9 | 12 | 12 | 13 | 8 | 15 | 15 | | |
| | ≥8.0 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | | |
| | Mean | 5.19 | 5.09 | 5.34 | 5.31 | 5.32 | 5.11 | 5.48 | 5.41 | | |
| | SD | 0.93 | 1.09 | 1.02 | 1.09 | 1.14 | 1.05 | 1.15 | 1.14 | | |
| HDL (mmol/l) | <1 | 11 | 22 | 26 | 17 | 8 | 11 | 16 | 6 | <i>P</i> = 0.334*, <i>P</i> = 0.416** | |
| | Mean | 1.38 | 1.29 | 1.33 | 1.52 | 1.44 | 1.35 | 1.34 | 1.54 | | |
| | SD | 0.36 | 0.37 | 0.50 | 0.59 | 0.34 | 0.31 | 0.34 | 0.42 | | |
| Triglyceride (mmol/l) | ≥2 | 9 | 15 | 17 | 12 | 11 | 12 | 15 | 7 | <i>P</i> < 0.001*, <i>P</i> < 0.001** | |
| | Mean | 1.20 | 1.35 | 1.46 | 1.28 | 1.21 | 1.26 | 1.39 | 1.15 | | |
| | SD | 0.72 | 0.75 | 1.04 | 0.86 | 0.72 | 0.68 | 1.15 | 0.54 | | |

**P* for trend for change in mean during 1992 to 2002

***t*-test for independent samples testing the difference in means in Pitkäranta 2002 and Aunus 2003

Body mass index (BMI)

Body mass index (BMI) did not change statistically significantly in Pitkäranta either in men or in women from 1992 to 2002. The proportion of women who were obese (BMI ≥ 30 kg/m²) was 32% in Pitkäranta and 35% in Aunus. In both survey areas, the proportion of obese women was much greater compared to men (table 3).

Smoking

The proportion of daily smokers among men did not change statistically significantly in Pitkäranta from 1992 to 2002 and was 66% in Pitkäranta 2002 and in Aunus 2003. In Pitkäranta among women, the proportion of daily smokers was significantly higher in 2002 than in 1992. In both areas, daily smoking was more common among men than among women (table 3).

Physical activity

In Pitkäranta there was no change in moderate physical activity between the survey years either among men or women. Only 19% of men and 12% of women reported having at least moderate physical activity in 2002. In Pitkäranta, among men the proportion of participants having at least moderate activity was significantly higher than in Aunus. Only 11% of men and 10% women in Aunus reported to be at least moderately physically active (table 3).

Self reported alcohol use and serum gamma-glutamyltransferase (GGT) levels

From 1992 to 2002, the self-reported alcohol consumption increased significantly in men and in women in Pitkäranta. Among men, the mean alcohol consumption was similar in Pitkäranta and in Aunus. Among women, alcohol use was higher in Aunus than in Pitkäranta (table 4).

The mean GGT increased statistically significantly between survey years in Pitkäranta among both genders. The prevalence of elevated GGT (≥ 80 U/l) increased from 3% to 10% among men. There were no differences in the mean GGT between Pitkäranta and Aunus (table 4).

Dietary habits

The use of butter on bread decreased significantly from 1992 to 2002 among both genders in Pitkäranta. In men 71% and in women 80% reported using mainly butter on bread in 1992, while ten years later 43% of men and 39% of women reported butter use. In Aunus, both men and women used statistically significantly more butter on bread than in Pitkäranta (table 3).

The use of vegetable oil in cooking increased significantly in both genders in Pitkäranta from 1992 to 2002. In 2002, 78% of men and 84% of women reported to use mainly vegetable oil in cooking. In both areas men used more butter in cooking than women. Among both genders, the use of vegetable oil in cooking in Aunus was similar to that in Pitkäranta (table 3).

Discussion

This study describes the ten year trends of RFs of chronic diseases, and especially of CVDs in Pitkäranta region in the Republic of Karelia, Russia. Recently more population studies providing point data on chronic disease RFs and health behaviour have been carried out in Russia,^{24,25} but even currently little standardized data on RF or health behaviour trends have been published. The Russian Longitudinal Monitoring Survey includes self-reported health data from

thirteen survey rounds since year 1992.²⁶ The WHO MONICA project is the only survey that has measured and reported cardiovascular RF data by collecting material repeatedly in some areas in Russia. However, the data are already old and includes only two observation points.²⁷ The current health monitoring system of Pitkäranta allows us to analyse longer trends in RFs and health behaviours in the region. Even if the survey area is restricted to one region of the Republic of Karelia and mainly represents 'peripheral Russia', the study gives very valuable information on ongoing risk factor developments in the country. As the RF changes observed in Pitkäranta area have been quite modest over time, the survey was also carried out in Aunus district to get a comparison point for current RF levels. It could be possible that while the RF levels in Pitkäranta have remained quite stable much bigger deterioration has happened in neighbouring areas.

The response rate in the surveys has decreased during the time. This might cause some bias in prevalence of especially unfavourable behaviours such as alcohol consumption and smoking meaning that the prevalence might actually be higher than observed. Also in this study we were not able to achieve data on use of samogon and surrogate alcohols that partly further increase the underreporting of alcohol consumption. However, the use of these products is most common among alcoholics and other disadvantaged who are also the ones who drop out from population surveys. The small samples restrict the possibility to analyse data in subgroups and thus only gender specific analyses were possible. Considering behaviours especially it would be also important to get more frequent, even annual, data to get better understanding on related fluctuations in morbidity and mortality especially seen in Russia. However, conducting RF surveys is expensive and labour consuming and thus not feasible more frequently.

According to the results of the RF studies in 1992, 1997 and 2002 in Pitkäranta region, the RF situation has generally not improved either among men or women. The level of serum cholesterol has slightly increased both among men and women. Daily smoking is still very common among men and has not changed during the last 10 years. During the same period of time smoking of women has increased remarkably. From 1992 to 2002, blood pressure levels have developed positively both among men and women. Especially women's blood pressure has decreased significantly.

Also in health behaviours some alarming tendencies were seen. The use of alcohol has increased both among men and women. Especially men's alcohol use has considerably increased from 1992 to 2002. Leisure time physical activity has not increased and still remains at very low level. Also, the share of overweight of men and women has been same during the study period.

In Pitkäranta region, the overall level of cholesterol did not decrease rather increase a little even though vegetable oil is commonly used in cooking and the use of butter on bread is decreasing. The phenomenon can be explained by several factors. In post-Soviet Russia, wide social changes have brought lots of new products into the grocery market and—significantly—availability of different foodstuff has increased. According to health behaviour survey among adults, the use of cheeses has increased substantially both among men and women.²⁸ Likely, the availability of meat products has increased as well. The use of such sources of saturated fat contributes negatively to the overall level of cholesterol. In Finland, over 20-years it has been seen how the sources of saturated fats in diet have changed.²⁹ Although the mean level of serum cholesterol is still not very high in Pitkäranta, future research should define the sources of saturated fats in diet for the continued intervention work.

Table 3 Ten-year changes in body mass index, smoking, physical activity, fat used on bread and in cooking, by gender

| Value | Men (%) | | | | | Women (%) | | | | |
|--------------------------|-----------------------|-----------------|-----------------|-----------------|------|-----------------|-----------------|-----------------|-----------------|--|
| | Pitkäranta | | Aunus | | | Pitkäranta | | Aunus | | |
| | 1992 n = 380 | 1997 n = 309 | 2002 n = 258 | 2003 n = 235 | | 1992 n = 455 | 1997 n = 439 | 2002 n = 342 | 2003 n = 341 | |
| BMI (kg/m ²) | <25 | 54 | 57 | 52 | 57 | 37 | 33 | 36 | 34 | <i>P</i> = 0.250*, <i>P</i> = 0.273** |
| | 25–29.9 | 34 | 33 | 35 | 33 | 29 | 33 | 31 | 31 | |
| | ≥30 | 12 | 11 | 13 | 10 | 34 | 34 | 32 | 35 | |
| | Mean | 25.2 | 24.8 | 25.3 | 24.8 | 28.0 | 28.0 | 27.8 | 28.3 | |
| | SD | 4.1 | 3.8 | 4.0 | 3.6 | 5.8 | 5.8 | 6.0 | 5.8 | |
| Smoking | Smoker | 65 | 63 | 66 | 66 | 11 | 15 | 21 | 18 | <i>P</i> = 0.888*, <i>P</i> = 0.997*** <i>P</i> < 0.001*, <i>P</i> = 0.328*** |
| Physical activity | Moderate ^a | 18 | 19 | 19 | 11 | 13 | 15 | 12 | 10 | <i>P</i> = 0.731*, <i>P</i> = 0.001*** <i>P</i> = 0.710*, <i>P</i> = 0.094*** |
| | None ^b | 65 | 68 | 67 | 82 | 70 | 71 | 71 | 78 | |
| Fat used on bread | Nothing | 24 | 11 | 10 | 11 | 18 | 8 | 13 | 13 | <i>P</i> < 0.001*, <i>P</i> = 0.020*** <i>P</i> < 0.001*, <i>P</i> < 0.001*** |
| | Margarine | 5 | 50 | 47 | 36 | 3 | 54 | 48 | 32 | |
| | Butter | 71 | 39 | 43 | 53 | 79 | 38 | 39 | 55 | |
| Fat used in cooking | Vegetable oil | 32 | 74 | 78 | 81 | 36 | 84 | 84 | 88 | <i>P</i> < 0.001*, <i>P</i> = 0.214*** <i>P</i> < 0.001*, <i>P</i> = 0.192*** |
| | Margarine | 18 | 15 | 18 | 12 | 21 | 11 | 13 | 8 | |
| | Butter | 50 | 11 | 4 | 7 | 43 | 5 | 3 | 4 | |

a: Leisure time physical activity at least two times per week

b: Leisure time physical activity only few times a year or less

**P* for trend for change in prevalence during 1992–2002

***t*-test for independent samples testing the difference in means in Pitkäranta 2002 and Aunus 2003

***Chi-square test for independent samples testing the difference in prevalence in Pitkäranta 2002 and Aunus 2003

Table 4 Ten-year changes in alcohol consumption and serum gamma-glutamyltransferase, by gender

| Value | Men (%) | | | | Value | Women (%) | | | |
|---|-----------------|-----------------|-----------------|-----------------|-------------------|-----------------|-----------------|-----------------|-----------------|
| | Pitkäranta | | Aunus | | | Pitkäranta | | Aunus | |
| | 1992 n = 380 | 1997 n = 309 | 2002 n = 258 | 2003 n = 235 | | 1992 n = 455 | 1997 n = 439 | 2002 n = 342 | 2003 n = 341 |
| Alcohol consumption in g/week (Alc1) ^a | | | | | | | | | |
| 0 | 41 | 32 | 26 | 26 | 0 | 66 | 53 | 52 | 47 |
| 1-168 ^b | 56 | 59 | 62 | 63 | 1-84 ^c | 33 | 44 | 48 | 50 |
| ≥169 | 3 | 9 | 12 | 11 | ≥85 | 1 | 3 | 0 | 3 |
| Mean | 45.2 | 65.0 | 75.3 | 70.7 | Mean | 9.4 | 15.0 | 12.2 | 17.3 |
| SD | 59.5 | 84.0 | 105.0 | 91.7 | SD | 31.8 | 25.1 | 16.2 | 29.9 |
| <i>P</i> < 0.001*, <i>P</i> = 0.604** | | | | | | | | | |
| GGT (U/l) | | | | | | | | | |
| High ≥ 80 | 3 | 4 | 10 | 12 | High ≥ 50 | 9 | 8 | 10 | 9 |
| Mean | 27.0 | 33.6 | 43.4 | 43.6 | Mean | 22.3 | 26.6 | 29.3 | 26.0 |
| SD | 20.4 | 25.5 | 42.5 | 48.3 | SD | 23.7 | 23.5 | 43.1 | 25.5 |
| <i>P</i> < 0.001*, <i>P</i> = 0.968** | | | | | | | | | |

a: Alcohol consumption assessed by last weeks recall

b: 168 g/wk of alcohol is approximately 14 drinks/wk or 2 drinks/day

c: 84 g/wk of alcohol is approximately 7 drinks/wk or one drink/day

**P* for trend for change in mean during 1992–2002

***t*-test for independent samples testing the difference in means in Pitkäranta 2002 and Aunus 2003

In Russia, smoking is one of the central causes of premature mortality, especially among men. Men's smoking has long been very common among all age groups, both in cities and in the countryside. In contrast to that, women's smoking has increased during the last decades and is now more common among younger age groups and in urban areas.^{30,31} In Pitkäranta region, smoking is even more common than in other regions in Russia or the Baltic States both among men and women.^{32–34}

At the same time in Finland smoking among men has considerably decreased, and among women the early increase has levelled off at relatively low level.²⁹ This is a result of comprehensive programmes and policies for tobacco control to prevent and reduce smoke-related diseases.³⁵

The actions in Finland have complied much with the principles of the international Framework Convention on Tobacco Control (FCTC) of World Health Organization, that Russia has not yet ratified.³⁶ According to the FCTC both actions to prevent young people to begin smoking and supporting people to quit smoking are needed. Medical personnel are in the central position when shaping people's willingness and—significantly—attempts to quit smoking. Price policy, advertising ban and sales control also influence the demand of tobacco. Impacts of passive smoking can be reduced by restricting smoking in workplaces and public spaces.³⁷

Heavy alcohol drinking has a long tradition in Russia. In Russia, there seems to be great regional differences in the use of alcohol—being lowest in Volga and Caucasus regions and highest in Ural region.³⁸ In this comparison, the alcohol consumption in the North West Russia was comparable with Central Russia. In 2000, it was estimated that the total consumption of alcohol in pure alcohol in Russia and in other former Soviet republics was 13.9 l per capita. At the same time the alcohol consumption in West countries, although varying, is generally lower.³⁹ In Pitkäranta region, especially men have significantly increased the use of alcohol during the 10-year research period. This information is well supported both by our data on self-reported use of alcohol and by the GGT values.

The availability of alcohol, relative changes in alcohol prices and, thereby, changes in the use of alcohol have clearly an impact on mortality and life expectancy in Russia.⁵ Even

though the positive impact of moderate consumption of alcohol on CVDs is likely,⁴⁰ the profuse and long-term use of alcohol in many ways leads to higher mortality of CVDs not to speak of other causes of death. Finnish research has reported that binge drinking increases the relative risk to myocardial infarction and—furthermore—overall mortality.⁴¹ Repeated hangovers are also related to higher CVD mortality.^{42–44}

Even though the results of this study indicate that the SBP has decreased significantly in Pitkäranta both among men and women, the SBP in Pitkäranta is still high, and higher than in Moscow and Novosibirsk in 1995.¹⁶ In Pitkäranta, 40% of all respondents in 2002 had high SBP (>140 mmHg). In 1992 the corresponding figure was 52%. Blood pressure is affected by BMI, physical activity and the use of alcohol.^{10,11} In Pitkäranta, no significant change can be noticed neither in the BMI nor physical activity and the use of alcohol increased, especially among men. Thus it is likely that the decrease in blood pressure level is at least partly a consequence of the implemented blood pressure control activities, by wide screening, treatment and follow-up¹⁷ and also by possible life style-related changes of patients. Likely the use of salt in diet has decreased as the use of salt-conserved foodstuff decreases.

In Russia, the functions of health sector are regulated by over 100 federal laws. There are serious weaknesses in applying the laws in reality; they are vague declaration-like texts, legislative foundations that are usually based more on political power than scientific evidence. One example of this is Russian's Federation Law on Tobacco from 2001. At the federal level, compliance and implementation of the law is poor. In order to have a real impact on people's smoking in Russia, a greater commitment to effective policies and legislations, and their effective implementation are needed.

Russia has been involved with The Countrywide Integrated Non-communicable Disease Intervention (CINDI) Programme of WHO since mid 1980s. Pitkäranta region is currently one of the Russian CINDI regions. The CINDI programme has clearly given valuable support in Russia both on national level and in Pitkäranta. However, much greater commitment to prevention of chronic disease would be needed, both concerning policy and resources and implementation of systematic activities.

The recent report of the World Bank 'Dying too young' summarizes well the extremely unfavourable public health

situation of Russia, where CVD, cancer and violent causes have the greatest contribution.⁴⁵ As the report argues, urgent measures are needed to change the situation. The report notes how effective interventions and policies are available and makes reference of the good results in North Karelia and later on in Finland as a whole.

The project in Pitkäranta is a pioneering effort to start to change the situation, at least for the Republic of Karelia. The results and experiences give valuable lessons, and also show how big the challenge is to change the lifestyles deep in the culture—and in the situation where preventive work and policies do still not receive strong support.

A reliable monitoring of target RFs and behaviours is obviously a back bone to drawing necessary attention and to steer intervention. This has clearly been the case in Pitkäranta where the results, presented here, have contributed to gradually growing preventive work that has also been increasingly used in other parts of Russia.

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Conflicts of interest: None declared.

Key points

- The results presented in this article indicate that the average RF levels of chronic diseases are still quite high in the Republic of Karelia and the RF situation has generally worsened.
- Daily smoking is very common among men and has increased remarkably among women.
- Regarding health behaviour one of the most alarming tendencies is the increased use of alcohol on both genders.
- However, some positive development in RFs and health behaviour can be seen, such as decreased levels of elevated blood pressure and some positive changes in diet.

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