

## Changes in health behavior of Lithuanian adolescents and adults over 1994–2002

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**Key words:** health behavior; adolescents, adults, smoking, alcohol consumption, nutrition, physical activity.

**Summary.** The aim of the study was to investigate the time trends in health behavior during the period 1994–2002 in Lithuanian schoolchildren and adult population. The data on smoking, alcohol drinking, consumption of fresh vegetables and fruits, physical activity habits are presented in the article. The study material was collected in 1994, 1998 and 2002 within the framework of two international projects: Health Behavior in School-aged children coordinated by WHO and Finbalt Health Monitor assessing health behavior among adults in Finland and Baltic countries. The data of our study showed that since 1994 prevalence of smoking substantially increased among Lithuanian teenagers aged 11–15 years and adult women. The increase in alcohol consumption was recorded in schoolchildren as well as in adult population. The adults started eating fresh vegetables and fruits more frequently while the usage of fresh fruits among teenagers declined. In 2002 70% of schoolboys and 45% of schoolgirls were physically active. There were no changes in physical activity among teenagers over the period of the study. The proportion of physically active persons in adult population has increased since 1994.

**Conclusion.** The health behavior is unhealthy in large proportion of Lithuanian teenagers and adults. The negative trends in health behavior especially among teenagers may increase the risk of noncommunicable diseases in Lithuanian population. Therefore the elaboration and implementation of effective health promotion programs, which should start in early childhood and would be adopted to the needs of different age groups, is urgently needed.

### Introduction

There is evidence that health behavior has a decisive influence on the health of the population. A number of studies have demonstrated that smoking, high consumption of alcohol, unhealthy nutrition and low physical activity increase the risk of noncommunicable diseases (1-3). Human behavior depends on social, economic, cultural and many other circumstances. The shift to a market economy, aggressive advertisement campaigns, the penetration of western mass demeanor into culture, the glut of new foodstuffs as well as many other changes in politics and economics that were specific after the recreation of the independence of Lithuania in 1990's have reflected in citizens' lifestyle and their health behavior. The experiences in other countries show that different demographic and social groups react to such changes unequally. Youth is a group of the community that is extremely open to new tendencies that might positively or negatively affect their health. Consequently, the national monitoring of health behavior and related factors among various population groups is essential for planning, implemen-

tation and evaluation of health promotion and disease control programs in the country.

During the last decade, lifestyle of Lithuanian young and adult population groups are being monitored by regular surveys that are a part of international studies. The Health Behavior in School-aged Children (HBSC) study, established 22 years ago, is a cross-national research conducted by an international network of research teams in collaboration with the WHO Regional Office for Europe (6-10). According to the methodology of this study, three surveys of Lithuanian schoolchildren aged 11, 13 and 15 years were completed in 1994, 1998 and 2002. Furthermore, since 1994 Lithuania together with Finland, Estonia and Latvia has been participating in the international project FINBALT HEALTH MONITOR to assess health behavior in the adult (20-64-year-old) population (11). In the later study, surveys are being conducted every other year; therefore, the data of surveys in 1994, 1998 and 2002 are presented in the present article.

The aim of the study was to investigate the time trends in health behavior of Lithuanian population over the period 1994-2002 by comparing data of surveys in adoles-

cents and adults. The findings on smoking, alcohol drinking, vegetable and fruit consumption, physical activity habits are presented.

### Material and methods

The surveys of schoolchildren's health and lifestyles were carried out in accordance with the philosophy and methods of the WHO Cross-National Survey on Health Behavior in School-aged Children, the HBSC Study (7).

Three age groups – 11, 13 and 15 year – were targeted. The appropriate grade levels corresponding to the desired age ranges were 5, 7 and 9. A stratified cluster sampling design was used to draw samples of 1500 of each age group from the whole of Lithuania. There were five strata by regions of the country including cities (Vilnius, Kaunas, Klaipėda, Āiauliai and Panevėpys) and three strata by language (Lithuanian, Russian and Polish) used for education at school. In first level of sampling, the schools were randomly selected from each stratum. Then 5<sup>th</sup>, 7<sup>th</sup> and 9<sup>th</sup> grades were included into the sample. If two or more classes of the desired grade level occurred in the selected school only one classroom was randomly selected. At each survey, approximately 100 of schools or 300 of classes were selected. It was expected that approximately 6000 pupils might participate in the survey.

The data were collected by means of a standardized questionnaire approved by an international protocol of the study. The questioning of schoolchildren was performed anonymously in the classroom. Altogether, three surveys were completed during springtime (March-May) of 1994, 1998 and 2002. The response rate was approximately 95%. The data were filtered out at the international databank in the University of Bergen (Norway). The questionnaires that met desired age ranges of the respondents and quality criteria were selected for the further analysis (in 1994 – 5428, in 1998 – 4513 and in 2002 – 5645 questionnaires). The studied samples were representative to the population of school-aged children from the whole of Lithuania in respect to demographic and social values. Distribution of adolescents by age category, gender and year of the study is presented in Table 1.

In the study of adult population, for each survey a national random sample of 3000 inhabitants of Lithuania aged 20-64 was taken out of National Population Register. The surveys in adults were completed simultaneously with the

surveys in schoolchildren (during springtime of 1994, 1998 and 2002). A standardized questionnaire was used. In April, the questionnaires were mailed out. Those addressees, who did not respond within a month, received a second questionnaire. The questionnaire included questions on smoking, alcohol consumption, dietary habits, physical activity and other components of health behavior.

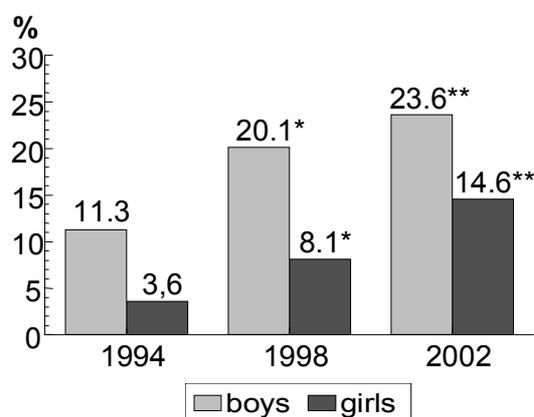
In 1994 the questionnaires were filled by 1864 persons; in 1998 – by 1874 persons; and in 2002 – by 1883 persons (Table 1). Taking into account incorrect addresses, the response rates were 64.3%, 63.8% and 63.4% correspondingly to the study years. The respondents represented the adult population of the whole Lithuania by gender, age, nationality, and the proportion of urban and rural inhabitants.

Schoolchildren were asked how often they smoke tobacco at present. Those who responded “every day”, “at least once a week, but not every day” or “less than once a week” were admitted into the group of smokers. Among adults, the proportion of daily smokers was calculated. The daily and weekly drinking of anything alcoholic, such as beer, wine or spirits, was considered as regular consumption of alcoholic beverages among adolescents. In addition, they were asked if they had ever had so much alcohol that they were feeling drunk. This item provides a measure of excessive alcohol use. Similarly, in adults the frequencies of intake of beer, wine and spirits were estimated and the proportion of persons who use these beverages at least weekly was calculated. The consumption of fruits and vegetables (both cooked and raw) was measured by asking respondents about the frequency of eating of these foodstuffs. Physical activity of schoolchildren was considered as adequate if they reported that outside of class time at least 2 times a week they exercised so much that they get out of breath or start to sweat. For the same reason, adults were asked about their physical activity during their leisure time (e. g. exercising, running, cycling, working in the garden) that continued at least 30 minutes and that get out of breath or start to sweat.

The Statistical Package for the Social Sciences (SPSS, version 11.5) was applied in statistical analysis of the data. Statistical significance in change of lifestyle indicators over the study period was measured by the Z test with the significance level 0.05.

**Table 1. Distribution of participants, by age category, gender and year of the study**

Year	Adolescents			Adults		
	boys	girls	all	males	females	all
1994	2429	2999	5428	787	1077	1864
1998	2150	2363	4513	823	1051	1874
2002	2887	2758	5645	836	1047	1883



**Fig. 1. Smoking prevalence among adolescents, by gender and year of the study**

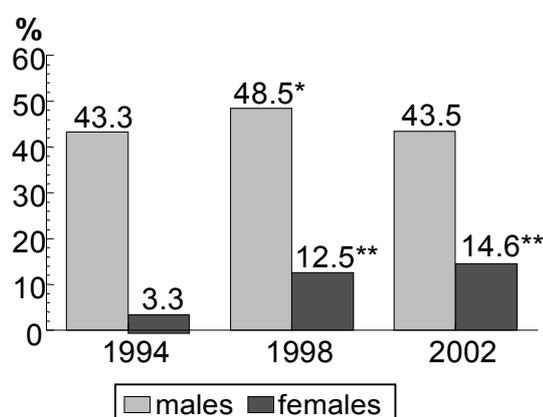
\*  $p < 0.05$  compared with 1994; \*\*  $p < 0.05$  compared with 1998.

## Results

### Smoking

Over the period 1994 – 2002, the percentage of adolescents reporting that they have smoked at least once in the previous month increased significantly: among boys – from 11.3% up to 23.6%, among girls – from 3.6% up to 14.6% (Fig. 1). There was a particularly sharp increase of the prevalence of smoking in the group of fifteen-year-old adolescents: among boys – from 23.0% up to 46.8%, among girls – from 7.7% up to 30.3%.

The prevalence of smoking among adult females increased as well significantly as among adolescents. Over eight years of the study, the percentage of daily smoking females increased twice – from 6.3% up to 12.8% (Fig. 2). Particularly high prevalence of smoking arose in the group of young (20-24-year-old) females: in 1994, there were 4.3% of smokers in females of that age while, in 2002, this figure increased more than three times (up to 14.3%). The highest smoking



**Fig. 2. Smoking prevalence among adults, by gender and year of the study**

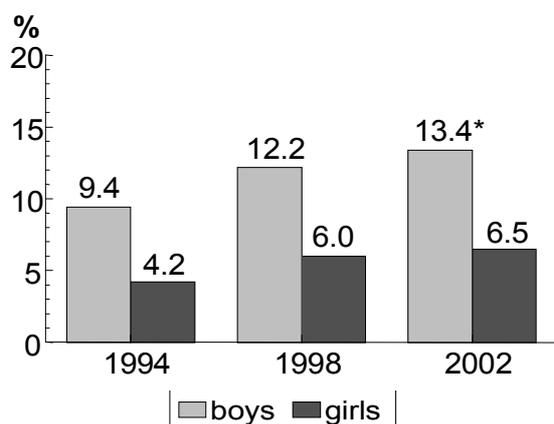
\*  $p < 0.05$  compared with 1994 and 2002; \*\*  $p < 0.05$  compared with 1998.

prevalence (48,5%) among adult males was detected in 1998.

### Consumption of alcohol

Over the study period, the proportion of schoolchildren who consume alcoholic drinks, increased (Fig. 3). In 2002, 13.4% of the boys and 6.5% ( $p < 0.001$ ) of the girls owned that they consume alcoholic beverages regularly (at least once per week). The rates of consumption of alcohol increase rapidly across adolescence. In their fifteen-year age, 27.3% of the boys and 12.9% of the girls used alcoholic beverages at least once per week. Overall, only 12.1% of the 15-year-old boys and 11.4% ( $p > 0.05$ ) of the girls of the same age stated that they did not use alcoholic beverages.

In addition to alcohol consumption, schoolchildren were asked if they had ever had so much alcohol that they were 'really drunk'. This is considered to be a more risky bent of alcohol consumption. In 2002, 51.4% of the boys and 40.1% of the girls ( $p < 0.001$ ) reported having



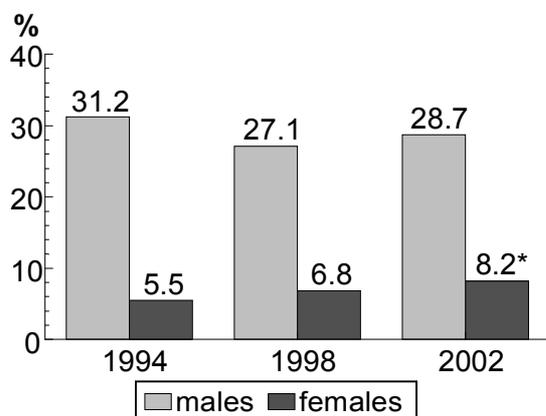
**Fig. 3. Percentage of adolescents reporting that they consume alcoholic drinks at least once per week, by gender and year of the study**

\*  $p < 0.05$  compared with 1994.



**Fig. 4. Percentage of adolescents who owned they have been 'really drunk' two or more times, by gender and year of the study**

\*  $p < 0.05$  compared with 1994; \*\*  $p < 0.05$  compared with 1998.



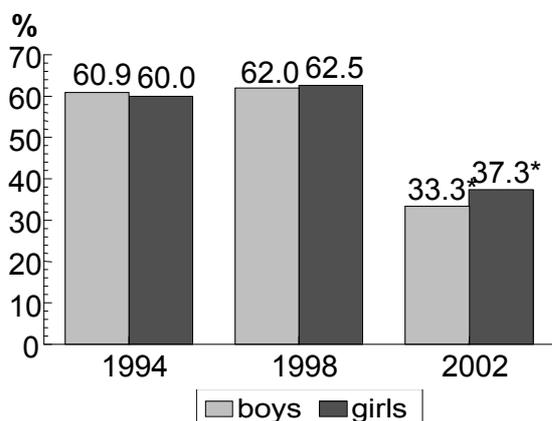
**Fig. 5. Percentage of adults who consume strong alcoholic drinks at least once per week, by gender and year of the study**

\*  $p < 0.05$  compared with 1994.

been drunk. Quite a number of adolescents (30.1% of the boys and 19.6% of the girls,  $p < 0.001$ ) confirmed having been really drunk twice or more times. As presented in Fig. 4, the number of such schoolchildren increased over eight years of the study. The most significant increment has been detected among the 13-year-old girls and the 15-year-old adolescents in both sexes.

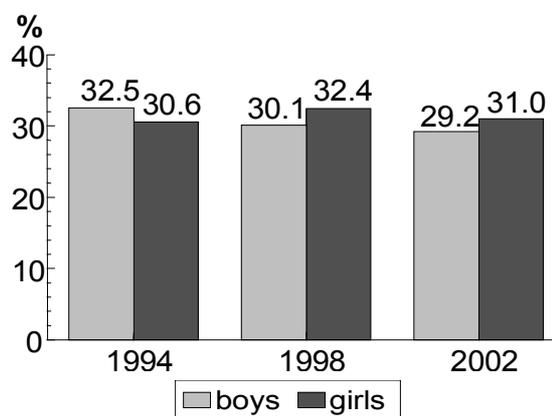
In 2002, 28.7% of the adult males indicated that they consumed strong alcoholic beverages at least weekly. This indicator has not change significantly over the last eight years. Female respondents drank significantly less frequently in the week than men, but in contrast to them the percentage of females who drink on more occasions in the week increased statistically significantly from 5.5% in 1994 up to 8.2% in 2002 (Fig. 5).

More frequently females preferred to drink wine than their male counterparts, e. g. according to the results of the recent survey, 35.8% of the females and 26.6% of the males ( $p < 0.001$ ) reported that they did drink wine at least twice in month.



**Fig. 7. Percentage of adolescents who eat fruits daily, by gender and year of the study**

\*  $p < 0.05$  compared with 1994 or 1998.



**Fig. 6. Percentage of adolescents who eat vegetables daily, by gender and year of the study**

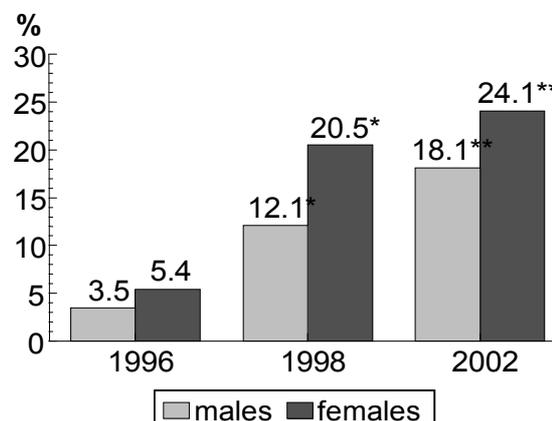
The surveys in both population of adolescents and in adult population have demonstrated that present-day Lithuanians represent a more actively drinking of beer than eight years ago. In 2002, among adolescents there were 12.7% of the boys and 5.4% of the girls, and among adults there were 58.8% of the males and 18.4% of the females who reported about drinking of beer weekly or more often while, in 1994, these figures has been 8.9% and 3.4%, 43.5% and 7.1%, correspondingly.

#### *Fruit and vegetable consumption*

The respondents were asked about the frequency of their consumption of a variety of foodstuffs. Data presented below are concerned with the fruit and vegetable (both cooked and raw) intake.

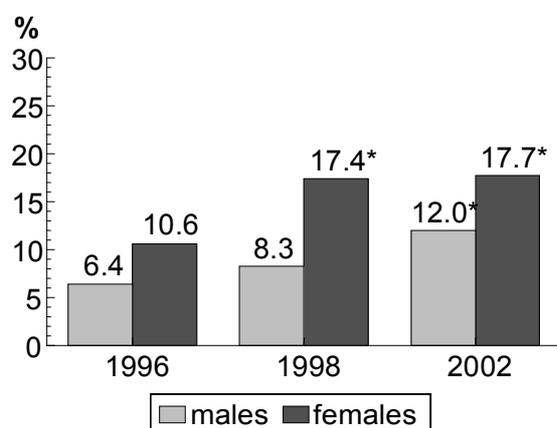
Nearly a third of schoolchildren reported eating vegetables once or several times a day. This proportion has not changed over the study period (Fig. 6).

In 1994 and in 1998, a great proportion of adolescents (approximately 60%) have reported fruit consumption



**Fig. 8. Percentage of adults who eat vegetables daily, by gender and year of the study**

\*  $p < 0.05$  compared with 1996; \*\*  $p < 0.05$  compared with 1998.

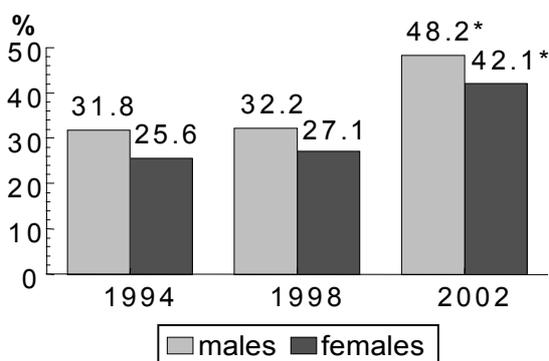


**Fig. 9. Percentage of adults who eat fruits daily, by gender and year of the study**

\*  $p < 0.05$  compared with 1996.

daily. However, in 2002, there were a remarkable fewer number of such respondents (33.3% of the boys and 37.3% of the girls) (Fig. 7).

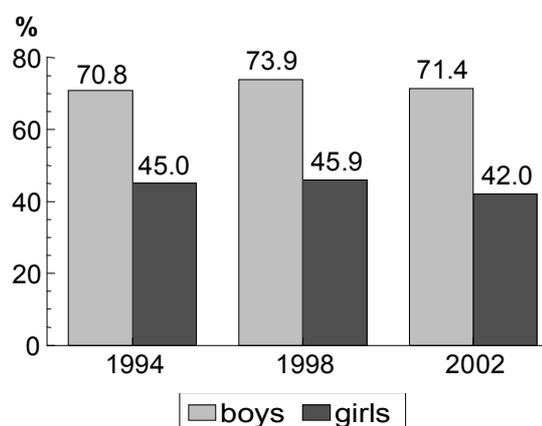
The adults' habits of fruit and vegetable eating were taken into analysis only since 1996, because questions about the intake of these foodstuffs were not included in previous surveys. The data for vegetable



**Fig. 11. Percentage of adults engaging in exercise for at least 30 minutes twice or more times per week, by gender and year of the study**

\*  $p < 0.05$  compared with 1994 and 1998.

consumption indicate that the percentage of adult males who reported daily intake of vegetables increased significantly from 3.5% up to 18.1% over the period between 1996-2002. In adult females, this percentage increased as much as in males – from 5.4% up to 24.8% (Fig. 8). Similarly to vegetable consumption, there was an increase in the frequency of eating of raw fruits and berries. In 1996, 6.4% of the males and 10.6% of the females reported eating these foodstuffs daily. In 2002, the relevant indices increased up to 12.0% of the males and up to 17.7% of the females (Fig. 9). The presented date also shows that females consume both vegetables and fruits more frequently than males.



**Fig. 10. Percentage of adolescents participating in exercise at least twice or more times per week, by gender and year of the study**

#### Physical activity

According to the data of surveys in schoolchildren, physical activity in exercise outside of class time among adolescents did not change remarkably over the period of 1994-2002 (Fig. 10). In general, boys were more physically active than girls. Overall, 70% of the boys and 45% of the girls ( $p < 0.001$ ) exercised at least twice a week. However, there was no substantial difference by age.

In contrast to adolescents, the proportion of adult people who liked physical activity at leisure increased. According to the data of the survey in 1994, 31.9% of the males and 25.6% of the females reported that they had at least twice a week a moderate physical activity that continued for at least 30 minutes and that get them out of breath or start to sweat. In 2002, 48.2% of the males and 42.1% of the females exercised (Fig. 11). Thus, more males than females engaged in exercising at leisure.

#### Discussion

The findings on health behavior of Lithuanian population are presented in the article. The comparison between adolescents and adults of changes in smoking, alcohol drinking, vegetable and fruit consumption and physical activity habits was carried out for the first time. The surveys both in schoolchildren and in adults were conducted simultaneously (in the spring of 1994, 1998 and 2002). The studied samples of respondents represented population of appropriate age range of the whole Lithuania. The standardized questionnaires approved by international protocols included the same questions for all surveys. That allows concluding that presented data reflect real changes in changes of lifestyle among adolescents and adults during the first decade after recreation of Lithuanian independence.

The findings of the study show an increasing prevalence rate of smoking and high consumption of alcohol among adolescents in addition to the adult

population of Lithuania. Schoolchildren came to use fruits less frequently, although among adults the consumption of vegetables and fruits did not change. Physical activity of adults in leisure increased while among adolescents it remained in the same level.

Nevertheless, some indices of adults' lifestyle (nutrition and physical activity) over the study period have improved. However, the presented results show of negative tendencies in trends of lifestyle among adolescents. This fact is disturbing, taking into account that adolescents are considered to be the most vulnerable part of the population. It is difficult to expect a decline in the prevalence rate of lifestyle-related diseases in the country, if healthy lifestyle promoting programs will not be developed and implemented in the foreseeable future.

The WHO sounds the alarm that more and more of youths smoke (12, 13). A sharp increase in prevalence rate of smoking among Lithuanian adolescents has been demonstrated by comparison of data from countries that participate in the cross-national HBSC study (8). In 1994, in the rank of 24 participating countries ordered by increasing prevalence rate of smoking the Lithuanian boys were in the third position (less prevalence rate of smoking was among schoolchildren from Israel and Sweden) whereas Lithuanian girls smoked least frequently. In 1998, the Lithuanian boys took a middle position in the rank of schoolchildren from 29 countries and, in 2002, were between ten of 35 countries showing the highest prevalence rate of smoking. The prevalence of smoking among Lithuanian girls increased as well as among boys, therefore, Lithuania remained taking a position between countries where girls' smoking is not very popular. A similar change was detected for prevalence rate of alcohol consumption among adolescents (8-10).

Another cross-national study The European School Project on Alcohol and Drugs (ESPAD) has reported on the use of alcohol and other drugs among schoolchildren aged 15-16 year in 30 European countries (14,15). Lithuanian schools participated in this project too. According to the report, 81.2% of the boys and 65.5% of the girls confirmed having been really drunk for once

A decline in consumption of fruits among schoolchildren points out the habitude of unhealthy eating. That is alarming because unhealthy lifestyle habits, which were established in childhood and adolescence, remain for adulthood and it is difficult to correct such habits by educational means. Physical activity of adolescents seems to be insufficient. Unhealthy eating in conjunction with lack of physical activity increases the risk for overweight in later ages.

According to the data of the Finbalt Health Monitor study in 2002, the highest prevalence rate of smoking was in Latvia (51%), the lowest – in Finland (26%) (17,

18). Over the last decade, in Finland the number of smoker males has decreased markedly. Lithuanian women smoked less frequently than in other participating countries (in Latvia – 19%, in Estonia – 18%, in Finland – 19%) (16–19). In comparison with other European countries, Lithuanian women do not smoke too much (e.g. in Denmark – 40%, U.K. – 28%) (20, 21). Nevertheless, the prevalence rate of smoking among females in Lithuania has been increasing continually while in other countries the smoking prevalence has stabilized; however in the group of women with high education level it has started to decrease (18,19).

Lithuanian males and females use strong alcoholic drinks as much as Latvians but less than Estonians and Finish (16-19). Over the study period, the consumption of alcoholic beverages in Finland was almost the same, in Estonia has decreased while in Lithuania has increased, especially of the beer. There is evidence that the frequent and abundant beer consumption increases the risk for sudden death (22).

A sufficient intake of vegetables and fruits help protect from a various chronic diseases (23). The proportion of persons who consume vegetables daily in Baltic countries was almost the same but in Finland it was much higher (16–19). In 2003, 26% of the Finish males and 26% of the Finish females reported eating vegetables daily. In Finland, 19% of the males and 36% of the females reported fruit intake daily that was remarkably more frequent than in Baltic countries. The increased consumption of vegetables and fruits in Finland could be explained by the implementation of the program for prevention of chronic noncommunicable diseases, which has started 20 years ago (18). It was pleasant that Lithuanian and Estonian adults during the period of the study began to use vegetables and fruits more often.

The rate of exercising during leisure time among Finish was also the highest: 58% of the males and 65% of the females exercised at least twice a week (18). After the last survey that showed an increase of the physical activity of Lithuanian adults it is not to be considered yet as sufficient.

The WHO has proposed a new strategy for health promotion and prevention of chronic noncommunicable diseases (24, 25). The main goal of this strategy is to promote a healthy lifestyle: healthy nutrition, physical activity, life without smoking and alcohol. As chronic noncommunicable diseases are highly prevalent in Lithuania, the WHO strategy plays a role of primary importance for health policy planning in Lithuania. We conclude that health behavior in a large proportion of adolescents and adults is unhealthy. Therefore, the elaboration and implementation of effective health promotion

programs, which should start in early childhood and would be adapted to the needs of different age groups, is urgently needed.

### Conclusions

1. Over the period between 1994 and 2002, the prevalence of smoking substantially increased among adolescents of both genders and among adult females, in Lithuania. An increase in alcohol consumption was recorded among adolescents as well as among adult population.

2. Adults started eating vegetables and fruits more frequently while the fruit intake among adolescents declined.

3. In 2002, 70% of the schoolboys and 45% of the schoolgirls were physically active. There were no changes in physical activity among adolescents over the period of the study. The proportion of physically active persons in the adult population has increased since 1994.

The health behavior in a large proportion of adolescents and adults is unhealthy. The negative trends in health behavior especially among adolescents may increase the risk of noncommunicable disease in Lithuanian population. Therefore the elaboration and implementation of effective health promotion programs, which should start in early childhood and would be adapted to the needs of different age groups, is urgently needed.

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