

Health Behavior among Lithuania's Adolescents in Context of European Union

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Aim To compare health behavior patterns of adolescents in Lithuania with health behavior of adolescents in European Union (EU) in 2001/2002.

Methods The study was carried out in conformity with the methodology of Health Behavior in School-aged Children: a World Health Organization cross-national study. Three country representative samples of schoolchildren, aged 11, 13, and 15, were surveyed in 25 EU countries and regions in 2001/2002 school year. The study instrument was a standardized questionnaire that included questions on alcohol consumption, smoking, illegal drugs use, physical activity, and other patterns of health behavior. The rate or mean values of the targeted health behavior of Lithuanian students were assessed and compared to those calculated as an average for the EU countries and regions.

Results We found an early onset of alcohol consumption among Lithuanian boys. Lithuanian boys and girls across all age groups reported being drunk two and more times more often than their peers from other EU member states. Lithuanian 15-year-old boys smoked more often than did their European peers, while girls smoke more rarely. The prevalence of drugs (marihuana group) use among Lithuanian students is relatively low: the prevalence of drug use among 15-year-olds in Lithuania is two times lower than the prevalence in other EU countries and regions (11.2% vs 24.5% for boys and 4.5% vs 18.3% for girls, respectively). Physical activity of Lithuanian adolescents is rather high in comparison with their EU peers, although many students watch television for ≥ 4 hours a day. Lithuanian students did not eat sweets often, or drank soft drinks (Coca Cola and other), and they ate fruits and had breakfast every school day. With respect to hygienic habits, approximately only one in 3 boys and every second girl brushed their teeth more than once a day.

Conclusions There are health behavior differences between adolescents in Lithuania and those in other EU countries. The disparities among health behavior of young people in EU countries and regions require Lithuanian and EU health policy to develop initiatives aimed at decreasing health behavior inequalities.

Lithuania's joining the European Union (EU) was the most significant event for the country in 2004 and one of the most important steps in the integration of Lithuania into the international community. In this context, a critical and objective assessment of population health is needed to determine the level of health in Lithuania within the EU context (1).

Good health implies longer, healthier, and more productive life, higher quality of life, and better basis for steady economic growth and sustainable development of the country (2). Therefore, investment in the health of youth is doubtlessly a key priority in all EU countries. Early investments in health typically pay off later in life (3).

Over the last decades, dramatic social, political, and economic shifts, along with medical and public health interventions, have radically altered the profile of adolescent health around the world. Presently dominant negative social, behavioral, and environmental factors, such as smoking, alcohol consumption, and drugs use, affect young people's health and are the triggers for chronic non-communicable diseases in the future (4).

The Health Behavior in School-aged Children (HBSC) study carried out in Europe and North America showed an early onset of smoking and alcohol use, high consumption of sweets and soft drinks, low consumption of fruits and vegetables, and frequent skipping of breakfast among the adolescents (5). It also showed that most young people did not meet the recommended physical activity guidelines and that many reported spending long hours on doing homework, watching television, and on a computer. The European School Survey Project on Alcohol and Drugs (ESPAD) study showed that cannabis use among youth in most countries was increasing and that the differences in the cannabis use rates between the western European countries and North America were diminishing (6).

Many European countries have undergone social and political changes as well as economic transition. Health has suffered most where econ-

omies were unable to ensure an adequate income for all, where social systems have collapsed, and where natural resources have been poorly managed, as evidenced by a health gap between the western and eastern parts of the EU region. Reduction in health inequalities, including disparities in health behavior, between the countries and regions is the first target of the "Health for All" initiative (3).

Our aim was to compare health behavior patterns of adolescents in Lithuania and those in other EU countries.

Methods

The study was based on the data obtained through the World Health Organization collaborative cross-national study carried out in 32 European countries or regions, Israel, Canada, and USA in 2001/2002 (7).

Participants

Three age groups of 11-, 13-, and 15-year-old students were surveyed. The students were representative of the population of school-aged children from each country or region with respect to demographic characteristics (age, sex, and nationality). Approximately 1500 respondents were targeted in each age group. The groups of respondents were selected randomly in a two-stage process. First, schools were randomly selected from the list of schools in a country or region, then classes were randomly selected from these schools. In Lithuania, the sample consisted of the 5th-, 7th-, and 9th-grade students from 105 schools. An analogous sampling process was used in other countries or regions.

A total of 115 980 respondents were surveyed in 22 EU Member States (Table 1). Cyprus, Luxemburg, and Slovakia did not participate in HBSC study in 2001/2002.

Data collection

A set of indicators covered by the standardized questionnaires (7) included alcohol consump-

Table 1. European Union (EU) countries and regions participating in Health Behavior in School-aged Children study (5) in 2001/2002 and number of respondents

EU country	No. of respondents
Austria	4472
Belgium (region):	
Flemish speaking	6289
French speaking	4323
Czech Republic	5012
Denmark	4672
Estonia	3979
Finland	5388
France	8185
Germany	5650
Greece	3807
Hungary	4164
Ireland	2875
Italy	4386
Latvia	3481
Lithuania	5645
Malta	1980
Poland	6383
Portugal	2940
Slovenia	3956
Spain	5827
Sweden	3926
The Netherlands	4269
United Kingdom (region):	
England	6081
Scotland	4404
Wales	3887
Total:	115 980

tion, smoking, illegal drugs use, physical activity, sedentary behavior, eating habits, and oral hygienic habits (Table 2) (5). The survey was anonymous and questionnaires were administered in the classes. In each country, the data collection had to be performed strictly according to the international protocol (7). In Lithuania, the survey was performed over March and April 2002. The response rate was 95%, which was as high as in other countries. The files from 35 countries and regions were prepared and exported to the HBSC International Data Bank at the Norwegian Social Science Data Services, University of Bergen. The data were checked according to strict criteria. The questionnaires that met quality criteria and were filled out by the respondents within the desired age range were included in further analysis.

Statistical analysis

The rate and mean values of the targeted health behavior were assessed. The 95% confidence in-

Table 2. Patterns and indicators of health behavior of adolescents in European Union countries (5)

Patterns of behavior	Indicators
Alcohol consumption	The onset of experimentation with alcohol The proportion of students who reported drinking beer, wine or/and hard liquor at least once a week The proportion of students who reported being drunk at least two or more times in their life
Smoking	The onset of experimentation with tobacco The proportion of students who reported have ever had tried smoking The proportion of students who reported being a current smoker
Illegal drug use	The proportion of students who reported having used cannabis (marijuana, dope, grass, ganja, or joints) at least once in their life and in the last 12 months
Physical activity	The mean number of days per week when students are physically active for at least one hour per day The proportion of students who have inadequate physical activity (<5 physically active days per week)*
Sedentary behavior	The proportions of students who spend ≥3 h a day on homework; watch television ≥4 h a day; use computers ≥3 h a day (assessed separately on weekdays and on weekends)
Eating habits	The proportion of students who reported eating fruit daily; eating vegetables daily; eating sweets daily; drinking soft drinks (Coca-Cola, Sprite or other) daily The proportion of students who reported eating breakfast every school day
Oral hygienic habits	The proportion of students who reported brushing their teeth more than once a day

*According to the current guidelines (8).

terval (CI) limits for estimations of Lithuanian population were calculated by use of StatCalc 1.1 program (9). Direct method for age standardization was used to calculate the indicators for the combined samples of adolescents aged 11, 13, and 15 years. Average values of health behavior indicators for EU countries were calculated as means of country-level data. All 25 countries or regions were equally represented in the data set without implication of different numbers of observations from each country. The difference between the estimated values for Lithuania and those for EU populations was considered statistically significant at $P < 0.05$ if the EU average was outside the confidence interval of the estimation for the Lithuanian population. The statistical analysis was performed with the application of Statistical Package for the Social Sciences (SPSS, version 11.5; SPSS Inc., Chicago, IL, USA).

Results

Alcohol consumption

Lithuanian boys were the second youngest by the age of onset of alcohol consumption in the surveyed student population of EU countries and regions (Table 3). The onset of alcohol consumption among Lithuanian girls was at a later age, not different from the EU average. Beer was the most popular alcoholic drink among the children in EU countries. The proportion of regular beer users (once a week or more frequently) among 15-year-old boys varied from 10.1% in Ireland to 47.7% in Denmark and among girls of the same age from 3.6% in Spain to 31.5% in Denmark. The frequency of beer consumption among Lithuanian students was close to the average of surveyed EU countries. The prevalence of wine and liquor consumption among Lithuanian boys and girls was lower than the average prevalence in EU adolescent population.

Although Lithuanian students consumed alcohol less frequently, the amounts of alcohol they consumed were rather high in comparison with those consumed by the students from other EU countries and regions. The proportion of Lithuanian boys in all age groups who reported having even been drunk twice or more was significantly higher than the average (Table 3). The proportion of 13- and 15-year-old girls ever getting drunk was also comparatively high.

Smoking and illegal drugs use

Lithuanian adolescents we characterized by early onset and high prevalence of smoking in comparison with their peers in other EU countries (Table 4). The mean age of onset of smoking (at least one cigarette) among boys was 10.7 years, ie, the lowest in the surveyed EU countries. The girls started smoking at the mean age of 12.3 years, ie, at the younger age than EU average. In Lithuania, the percentage of adolescents who tried to smoke was among the highest in the surveyed EU countries for both the boys and girls of all age groups. Lithuanian 15-year-old boys were the most frequent smokers: 46.9% were current smokers and 34.9% smoked at least every week. Lithuanian girls smoked less often than their peers from other EU countries.

The prevalence of drug (marihuana group) use among Lithuanian students was relatively low (Table 4). On average, the prevalence of drugs use among 15-year-olds in Lithuania was two times prevalent than in other EU countries or regions.

Physical activity and sedentary behavior

One of the measures of physical activity is whether or not students meet the recommended 60 minutes of physical activity per day on 5 or more days a week. The application of this sufficiently high criteria proved that the level of physical activity of Lithuanian students, as compared with

Table 3. Alcohol use behavior of Lithuanian students aged 11-15 y in comparison with average of 25 European Union (EU) countries or regions in 2001/2002 school-year

Alcohol use in students (%)	Mean (95% CI)*			
	boys		girls	
	Lithuania	EU average	Lithuania	EU average
15-y-olds:				
age of drinking alcohol for the first time (years)	11.6 (11.4-11.8) [†]	12.3	12.6 (12.4-12.8)	12.9
age of being drunk for the first time (years)	13.2 (13.0-13.4)	13.6	14.0 (13.9-14.1)	13.9
drink beer at least once a week	26.7 (23.9-29.6)	27.2	10.2 (8.4-12.4)	11.6
drink wine at least once a week	3.1 (2.1-4.4)	9.3	3.3 (2.2-4.6)	7.1
drink hard liquor at least once a week	5.1 (3.8-6.7)	14.1	1.6 (0.9-2.7)	11.9
drink some alcoholic drink at least once a week	27.6 (24.8-30.5)	33.3	13.0 (10.9-15.4)	22.2
got drunk two or more times	56.7 (53.6-59.8)	40.5	42.2 (39.0-45.4)	33.2
13-y-old who got drunk two or more times	24.6 (21.9-27.5)	14.9	14.4 (12.2-16.9)	10.2
11-y-olds who got drunk two or more times	8.0 (6.4-9.9)	4.2	2.1 (1.3-3.2)	1.6

*95% confidence interval.

Table 4. Smoking cigarettes and drug use behavior of Lithuanian students aged 11-15 y in comparison with average of 25 European Union (EU) countries or regions in 2001/2002 school-year

Smoking and drug use in students (%)	Mean (95% CI)*			
	boys		girls	
	Lithuania	EU average	Lithuania	EU average
Reporting ever having smoked:				
11-y-olds	42.0 (38.8-45.2)	18.8	24.9 (22.1-27.9)	10.9
13-y-olds	73.9 (71.0-76.7)	43.5	50.3 (47.0-53.6)	39.2
15-y-olds	88.7 (86.5-90.6)	62.4	72.7 (69.7-75.5)	62.8
Currently smoke some:				
11-y-olds	5.3 (3.9-6.9)	4.6	2.1 (1.3-3.2)	2.3
13-y-olds	18.0 (15.6-20.6)	14.9	11.5 (9.5-13.7)	14.4
15-y-olds	46.9 (43.7-50.0)	30.3	30.3 (27.3-33.3)	32.8
15-y-olds:				
age of first-time smoking (years)	10.7 (10.5-10.9) [†]	12.0	12.3 (12.1-12.5)	12.6
currently smoke at least once a week	34.9 (31.9-38.0)	23.2	17.9 (15.5-20.5)	24.6
have ever used cannabis or marihuana	11.2 (9.3-13.3)	24.5	4.5 (3.2-6.0)	18.3
have ever used cannabis or marihuana in the previous 12 mo	8.8 (7.1-10.8)	20.9	3.1 (2.1-4.5)	15.6

*95% confidence interval.

the average estimations for EU countries and regions, was rather high (Table 5).

The number of hours students spend on doing homework limits their time available for active leisure pursuits. The proportions of Lithuanian boys who spend ≥ 3 hours a day doing homework on weekdays and at weekends were 12.5% and 8.7%, respectively, less than the average estimations for the EU countries (Table 5). The girls were busier with their homework than boys. Lithuanian girls were also doing homework on weekdays more than their peers from the EU countries, while their time spent on homework on weekends was close to the EU average.

Watching television at leisure time may reduce adolescents' physical activity. The study showed that majority of Lithuanian students watched television at least half an hour a day.

More than a third of adolescents spent ≥ 4 hours watching television on weekdays (38.4% boys and 29.3% girls) and more than a half on weekends (61.3% boys and 55.0% girls), which was high above the EU average.

With respect to use of computers, mainly for playing computer games, Lithuanian students did not differ from their peers from other EU countries: the percentage of Lithuanian students who used computers ≥ 3 hours a day was little lower than the average estimate for the EU.

Eating habits

According to their nutrition habits, Lithuanian students took various positions on the rating scale when compared with their peers from other EU countries and regions (Table 6). Lithuanian students ate fruit relatively rarely: 20.3% boys

Table 5. Physical activity and sedentary behavior of Lithuanian students aged 11-15 y in comparison with average of 25 European Union (EU) countries or regions in 2001/2002 school-year

Physical activity of students (%)	Mean (95% CI)*			
	boys		girls	
	Lithuania	EU average	Lithuania	EU average
Physically active per week (days) [†]	4.6 (4.5-4.7) [†]	4.2	3.9 (3.8-4.0)	3.6
Inadequate physical activity [‡]	50.4 (48.6-52.3)	41.2	64.4 (62.6-66.2)	27.8
Spend ≥ 3 h a day on homework on weekdays	12.5 (11.3-13.8)	14.4	35.7 (33.9-37.5)	24.2
Spend ≥ 3 h a day on homework at weekends	8.7 (7.7-9.8)	15.4	23.6 (22.0-25.2)	24.6
Watch television ≥ 4 h a day on weekdays	38.4 (36.7-40.3)	26.5	29.3 (27.6-31.1)	22.5
Watch television ≥ 4 h a day at weekends	61.3 (59.6-63.1)	46.7	55.0 (53.2-56.9)	41.8
Use computers ≥ 3 h a day on weekdays	18.4 (17.0-19.9)	20.5	5.4 (4.5-6.3)	6.5
Use computers ≥ 3 h a day at weekends	28.0 (26.3-29.7)	34.9	10.9 (9.7-12.1)	13.3

*95% confidence interval.

[†]General physical activity not < 1 h a day.[‡] < 5 physically active days per week.

Table 6. Eating and oral hygienic habits of Lithuanian students aged 11-15 y in comparison to average of 25 European Union (EU) countries or regions in 2001/2002 school-year

Eating and oral hygienic habits of students (%)	Mean (95% CI)*			
	boys		girls	
	Lithuania	EU average	Lithuania	EU average
Eat fruit daily	20.3 (18.8-21.8) [†]	30.2	24.7 (22.6-25.8)	36.6
Eat vegetables daily	29.3 (27.6-30.9)	25.4	31.0 (29.3-32.8)	31.1
Eat sweets daily	17.2 (15.8-18.6)	29.1	20.7 (19.2-22.3)	29.1
Drink soft drinks (Coca-Cola, Sprite or other) daily	12.1 (10.9-13.3)	31.5	8.1 (7.2-9.3)	24.5
Eat breakfast every school day	77.0 (75.4-78.5)	69.8	66.9 (65.1-68.7)	60.8
Brush their teeth more than once a day	32.0 (30.3-33.7)	51.8	47.7 (45.8-49.5)	67.5

*95% confidence interval.

and 24.7% girls had daily intake of fruits, which was significantly lower than the average EU rate. The Lithuanian boys reported eating vegetables daily relatively more often than boys in other EU countries and regions, while girls were close to the EU average. Lithuanian students rarely consumed sweets and soft drinks (Coca-Cola, Sprite or other) on daily basis in comparison with their EU peers.

Having breakfast every school day is also an important indicator of eating habits. Lithuanian students reported eating breakfast every school day (55.3% boys, 51.5% girls) significantly more often than the students from other EU countries.

Oral hygienic habits

In comparison with EU average, the low rate of regular teeth brushing might be considered a serious oral hygiene problem among the Lithuanian adolescents. In Lithuania, only one in 3 boys (32.0%) and every second girl (47.7%) brushed their teeth more than once a day. In Sweden, Denmark, UK, the Netherlands, and many other EU countries and regions, >75% of the surveyed adolescents brushed their teeth regularly (Table 6).

Discussion

This study is the first attempt to describe health behavior of the Lithuanian adolescents within the context of EU. It highlights the lifestyle in-

equalities between the young people in Lithuania and in other EU countries.

A large prevalence of alcohol use among adolescents is leading to a global problem (10-12). Our results have shown that Lithuanian students start drinking at a relatively early age. Drinking habits of Lithuanian students were similar to those of their peers from West European and Nordic countries (Denmark, UK, and Finland), where alcohol consumption among the students is high (5). Lithuanian boys, particularly 15-year-olds, consumed alcohol more often than girls, whereas no differences were found between the boys and girls in the Western and North Western European in terms of the quantity of consumed alcohol (5,13).

Young people show a clear preference for certain types of beverage (14). Beer is by large the most popular drink among Lithuania students. According to the ESPAD report, adolescents (especially boys) in Poland, Denmark, and Czech Republic mostly consume beer (6). Lithuanian students were less likely to drink wine and hard liquor, unlike boys and girls in Denmark, Malta, or Greece. Even in the Northern European countries, girls drink hard liquor more than boys (5,6,12). It seems that the pattern of alcohol consumption among young people varies considerably among countries, reflecting different drinking cultures (5).

Self-reports on getting drunk provide a measure of excessive alcohol use (14). In our study, Lithuanian boys and girls aged 11-15 years re-

ported having been drunk two or more times in their life more frequently than their EU peers. High prevalence of excessive alcohol use was also observed in Denmark, Estonia, Czech Republic, Austria, Ireland, and UK (5,6). Both the HBSC and the ESPAD studies identified Denmark as the country where the proportion of students who reported having been drunk was the highest (5,6).

Our results showed that smoking among Lithuanian 15-year-old boys was quite common. However, girls smoked rarely in comparison with their EU peers, although the prevalence of smoking among Lithuanian girls is increasing and the onset of experimentation with tobacco occurs at earlier age (15). Other surveys in UK, Germany, and Finland found that girls smoked more than boys (5). These findings show newly arising gender differences in the EU region (4).

There is an increasing concern about rising prevalence of illegal drugs use among youth (10,16,17). The use of drugs (marihuana group) among Lithuanian students was not as frequent as among their EU peers. According to the ESPAD survey, Lithuania belongs to the group of countries (Poland, Portugal, and Croatia) with a low prevalence of cannabis use (6).

The current guidelines on physical activity advise that all young people should do physical exercise of at least moderate intensity each day for one hour (8). However, the youth mostly do not meet these recommended standards (18-20). The level of physical activity of Lithuanian students in our study was sufficiently high in comparison with other EU adolescents. According to the HBSC study, Lithuania is one of the countries (Austria, England, Ireland, and Czech Republic) where more than half of young people report being physically active at the recommended level (5). During the last decades, adolescents report long hours spent on watching TV, computer use, and doing homework (21). In our study, Lithuanian students also reported large amount

of TV time and long hours spent on homework, but computer use was not as common.

In most EU countries and regions, adolescent's nutrition is imbalanced and irregular (22-27). Students tend to skip breakfast, whereas the consumption of sugar, fat, sweets, and soft drinks is common. The consumption of fruits and vegetables is low. However, our findings showed low consumption of sweets and soft drinks among Lithuanian students in comparison with EU average. Lithuanian students consumed more vegetables, but less fruits, and commonly had breakfast more often than their EU peers.

The most common oral health problems include dental caries and periodontal diseases, which may be prevented by maintaining good oral hygiene (5). The proportion of children who reported brushing their teeth more often than once a day is considered a common indicator of oral hygiene. According to this indicator, Lithuanian students have poor oral hygiene. In comparison with EU average, the low rate of regular teeth brushing might be considered a serious oral hygiene problem for the Lithuanian adolescents.

Our study had several limitations. Although a lot of effort was spent on the standardization of methods in the research, the comparison of the data eventually raised the methodological issues. Some countries had problems with translation of the questionnaire into the national language. Small variations between the countries should be regarded and interpreted with some reservations. Therefore, a sufficiently large number of the surveyed adolescents and the selection of applied methods allow reliable assessment of higher than a few per cent variations among the countries with different social and cultural environment.

Our study was not designed to analyze the impact of social and environmental factors on health behavior of adolescents in the EU countries. We are aware that the health of youth is being influenced by social changes, political and economic reforms, new technologies, and globalization. Our findings indicate the need for pro-

grams to improve the health behavior of adolescents in Lithuania. The development of effective strategies requires an assessment of adolescent health behavior and the factors that influence it. Young people should receive consistent messages on healthy behavior in multiple settings and from a variety of sources, including home, schools, health care settings, community organizations, the mass media, and government agencies. Considering the fact that healthy young people become healthy adults, it is in the community's best interests to make young people's health a priority in the public health policy (2,28).

In conclusion, there are many health behavior differences between adolescents in Lithuania and in the EU. A number of factors can play a role in these differences, such as cultural habits and norms, availability, pricing, advertising, and national policies. The disparities in health behavior of young people in EU countries and regions demand Lithuanian and EU health policy to develop initiatives aimed at decreasing health behavior inequalities. The EU health policy makers should take these inequalities into consideration.

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References

- 1 Pundzius J, Zekas R, Veckiene I, editors. Annual report of the National Health Council 2004. Health program

implementation in Lithuania: achievements and problems [in Lithuanian]. Vilnius: Baltijos kopija; 2005. Available from: http://www3.lrs.lt/bome/ivairus/ataskaitos/Ataskaita_2004_NST.pdf. Accessed: March 30, 2006.

- 2 Byrne D. Enabling good health for all: a reflection process for a new EU health strategy. European Commission; 2004. Available at: http://europa.eu.int/comm/health/ph_overview/Documents/pub_good_health_en.pdf. Accessed: March 30, 2006.
- 3 Health 21: an introduction to the health for all policy framework for the WHO European Union Region. European Union Health for All Series; No. 5. Copenhagen: WHO Regional Office for European Union; 1998. Available at: <http://www.euro.who.int/document/ehfa5-e.pdf>. Accessed: March 30, 2006.
- 4 Blum RW, Nelson-Mmari K. The health of young people in a global context. *J Adolesc Health*. 2004;35:402-18. [Medline:15488435](#)
- 5 Currie C, Roberts C, Morgan A, Smith R, Settertobulte W, Samdal O, et al, editors. Young people's health in context. Health Behaviour in School-aged Children (HBSC) study: international report from the 2001/2002 survey. Health Policy for Children and Adolescents, No. 4. Copenhagen: WHO Regional Office for Europe; 2004.
- 6 Hibell B, Andersson B, Bjarnasson T, Ahlström S, Balakireva O, Kokkevi A, et al, editors. The ESPAD Report 2003. Alcohol and other drug use among students in 35 European countries. Stockholm: The Swedish Council for Information on Alcohol and Other Drugs and the Pompidou Group at the Council of Europe; 2004.
- 7 Currie C, Samdal O, Boyce W, Smith R, editors. Health Behaviour in School-aged Children: a World Health Organization cross-national study (HBSC). Research protocol for the 2001/2002 survey. Edinburgh: Child and Adolescent Health Research Unit, University of Edinburgh; 2001.
- 8 Prochaska JJ, Sallis JF, Long B. A physical activity screening measure for use with adolescents in primary care. *Arch Pediatr Adolesc Med*. 2001;155:554-9. [Medline:11343497](#)
- 9 Krishnamoorthy K. StatCalc. Available at: <http://www.ucs.louisiana.edu/~kxk4695/StatCalc.htm>. Accessed: March 30, 2006.
- 10 Duhig AM, Cavallo DA, McKee SA, George TP, Krishnan-Sarin S. Daily patterns of alcohol, cigarette, and marijuana use in adolescent smokers and non-smokers. *Addict Behav*. 2005;30:271-83. [Medline:15621398](#)
- 11 Foxcroft DR, Ireland D, Lister-Sharp DJ, Lowe G, Breen R. Primary prevention for alcohol misuse in young people. The Cochrane Database of Systematic Reviews 2002, Issue 3. Art. No.: CD003024. doi:10.1002/14651858.CD003024.
- 12 Schmid H, Ter Bogt T, Godeau E, Hublet A, Ferreira Dias S, Fotiou A. Drunkenness among young people: a cross-national comparison. *J Stud Alcohol*. 2003;64:650-61. [Medline:14572187](#)
- 13 Currie C, Hurrelmann K, Settertobulte W, Smith R, Todd J, editors. Health and health behaviour among young people. Copenhagen: WHO Regional Office for Europe; 2000.
- 14 Sumskas L, Zaborskis A. Alcohol consumption in Lithuanian school-aged children during 1994-2002. *Medicina (Kaunas)*. 2004;40:1117-23. [Medline:15547314](#)
- 15 Grabauskas V, Zaborskis A, Klumbiene J, Petkeviciene J, Zemaitiene N. Changes in health behavior of Lithuanian adolescents and adults over 1994-2002. *Medicina (Kaunas)*. 2004;40:884-90. [Medline:15456976](#)

- 16 Johnston LD, O'Malley PM, Bachman JG. Monitoring the future national results on adolescent drug use: overview of key findings, 2002. NIH Publication No. 03-5374. Bethesda (MD): National Institute on Drug Abuse; 2003.
- 17 Petrie J, Bunn F, Byrne G. Parenting programmes for preventing tobacco, alcohol or drugs abuse in children under 18. (Protocol) The Cochrane Database of Systematic Reviews 2005, Issue 1. Art. No.: CD005065. DOI: 10.1002/14651858.CD005065.
- 18 Hillsdon M, Foster C, Thorogood M. Interventions for promoting physical activity. The Cochrane Database of Systematic Reviews 2005, Issue 1. Art. No.: CD003180. DOI: 10.1002/14651858.CD003180.pub2.
- 19 Sallis JF, Zakarian JM, Hovell MF, Hofstetter CR. Ethnic, socioeconomic, and sex differences in physical activity among adolescents. *J Clin Epidemiol.* 1996;49:125-34. [Medline:8606313](#)
- 20 Sallis JF, Prochaska JJ, Taylor WC. A review of correlates of physical activity of children and adolescents. *Med Sci Sports Exerc.* 2000;32:963-75. [Medline:10795788](#)
- 21 Aarnio M, Winter T, Kujala U, Kaprio J. Associations of health related behaviour, social relationships, and health status with persistent physical activity and inactivity: a study of Finnish adolescent twins. *Br J Sports Med.* 2002;36:360-4. [Medline:12351335](#)
- 22 Rolland-Cachera MF, Bellisle F, Deheeger M. Nutritional status and food intake in adolescents living in Western Europe. *Eur J Clin Nutr.* 2000;54 Suppl 1:S41-6. [Medline:10805037](#)
- 23 Cruz JA. Dietary habits and nutritional status in adolescents over European Union–Southern Europe. *Eur J Clin Nutr.* 2000;54 Suppl 1:S29-35. [Medline:10805035](#)
- 24 Hassapidou MN, Fotiadou E. Dietary intakes and food habits of adolescents in northern Greece. *Int J Food Sci Nutr.* 2001;52:109-16. [Medline:11303458](#)
- 25 Samuelson G. Dietary habits and nutritional status in adolescents over Europe. An overview of current studies in the Nordic countries. *Eur J Clin Nutr.* 2000;54 Suppl 1: S21-8. [Medline:10805034](#)
- 26 Paulus D, Saint-Remy A, Jeanjean M. Dietary habits during adolescence—results of the Belgian Adolux Study. *Eur J Clin Nutr.* 2001;55:130-6. [Medline:11305626](#)
- 27 Parizkova J. Dietary habits and nutritional status in adolescents in Central and Eastern Europe. *Eur J Clin Nutr.* 2000;54 Suppl 1:S36-40. [Medline:10805036](#)
- 28 Diet, nutrition and the prevention of chronic diseases. Report of a joint WHO/FAO Expert Consultation. WHO Technical Report Series, No. 916. Geneva: World Health Organization, 2003 Available at: http://whqlibdoc.who.int/trs/WHO_TRS_916.pdf. Accessed: March 30, 2006.