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# Alcohol Consumption Among Adolescents in Estonia 1994 – 2010

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## 1. Introduction

Estonia is the smallest of the three Baltic countries on the east coast of the Baltic Sea with an area of approximately 45 215 square kilometres and a population of 1.34 million (01.01.2011) (Statistics Estonia, 2011) which was an independent state in 1918–1940. Estonia regained its independence in August 1991 after the collapse of the Soviet Union. This had enormous implications for health and for the political and economic transition during the succeeding years. In 2004, Estonia became a member of the European Union associated with introduction to the common European market and general pressure towards convergence in many policy areas.

The years 1991–1994 represented the period of transition. In terms of economic development, the year 1994 was characterized by significant unemployment (7.6%) and the relatively low gross domestic product (GDP) at current prices (1370 Euros per person) (Statistics Estonia, 2011). In the period of economic growth unemployment was the lowest (4.7% in 2006) and GDP the highest (12 161 Euros per person in 2008). During the following economic downturn unemployment increased to 16.9% and GDP decreased to 10 674 Euros in 2010 (Statistics Estonia, 2011).

It is estimated that alcohol consumption is responsible for about 4% of the total disease burden in the world (WHO, 2007). While regular light to moderate alcohol intake is associated with some reduction in total mortality (Di Castenuovo et al., 2006; Rehm et al., 2009), heavy drinking has been regarded as an important contributor to the high premature mortality rates in central and eastern Europe, particularly in the countries of the former Soviet Union (Chenet et al., 1998; Leinsalu, 2002; Leon et al., 1997; McKee et al., 2000; Popova et al., 2007).

Alcohol consumption per capita (based on legal sale) increased from 5.6 litres of pure alcohol in 1994 to 15.2 in 2007 and thereafter decreased to 12.8 in 2009 in Estonia (Estonian Institute of Economic Research, 2008, 2010). Since 2006, the estimations were made about the quantity of alcohol beverages that tourists consume in Estonia and export from Estonia. Hence, the consumption of alcohol by Estonian inhabitants was 12.6 in 2007 and 10.2 in 2009 (Estonian Institute of Economic Research, 2010). In 1996–2006, alcohol consumption increased especially among men in Estonia. The proportion of men drinking more than

280 g pure alcohol per week increased from 7.4% to 16.2%, and the proportion of women drinking more than 140 g pure alcohol per week increased from 2.7% to 4.7% between 1996 and 2006 (Pärna et al., 2010). In 2006, prevalence rate of non-beverage alcohol consumption was 2.3% among men (Pärna & Leon, 2011). In Estonia alcohol-related mortality was the lowest in 1988–1991 (3.5% of all deaths) and increased to 9.1% in 2002–2005 (Rahu & Pärna, 2009). At the same time, in Estonia age-standardized mortality rates of alcoholic liver cirrhosis increased from 9.7 to 37.5 per 100 000 men and from 2.2 to 16.1 per 100 000 women aged 25–64 in 1996–2006 (Pärna & Rahu, 2010).

Although the vast majority of alcohol-related deaths occur in middle-aged and elderly people, alcohol consumption behaviour is undeniably established in adolescence. Early adolescence is a critical time, where behavioural habits (including alcohol consumption) are developing (Lintonen et al., 2000). Moreover, individuals who begin alcohol consumption at a younger age have an increased risk of becoming regular alcohol drinkers in adulthood. According to schoolchildren's self-estimation, they consume alcohol due to boredom, stress and desire to fit in the group (Milgram, 2001). The use of alcohol may become a means of escaping from situations that youth feel powerless to change (United Nations, 2005). As among adults, alcohol consumption among adolescents is associated with road accidents, suicides, depression, memory problems, fighting, rape and unprotected sexual intercourse which could increase the risk of getting infected with HIV and other sexually transmitted diseases (Williams & Knox, 1987). Alcohol consumption may cause decrease of learning ability, which in turn causes learning difficulties due to which adolescent might fall out of school (Scheier et al., 2000). In addition, the existing evidence about the relationship between adolescent drinking behaviour and family related factors are inconsistent and even contradictory. While some studies have identified a higher risk of excessive adolescent drinking behaviour among lower socio-economic groups (Geckova et al., 2002; Lintonen et al., 2000; Lowry et al., 1996), others have found no or even inverse social gradients in schoolchildren's alcohol consumption (Shucksmith et al., 1997). Living in non-intact families and bad family relationships have been risk factors for alcohol drinking among adolescents (Challier et al., 2000; Shucksmith et al., 1997).

The aim of this chapter is to describe trends in the prevalence of alcohol consumption and episodes of drunkenness and to analyze associations between alcohol consumption, episodes of drunkenness and demographic and family related factors among schoolchildren in Estonia in 1994–2010.

## **2. Material and methods**

### **2.1 Setting and sampling**

This study was based on international survey of health behavior among school-aged children (HBSC survey) conducted among 11-, 13- and 15-year-old schoolchildren in 1993/1994, 1997/1998, 2001/2002, 2005/2006 and 2009/2010 academic year in Estonia. To ensure the clarity of work results, hereafter the end year of the study (1994, 1998, 2002, 2006, 2010) was used while referring to the academic year.

HBSC survey is a World Health Organization collaborative study, in 2010 43 countries participated in the survey. The main objective of HBSC survey is to collect high-quality

internationally comparable data on schoolchildren's health behavior, health and well-being in their social context (Roberts et al., 2007). The target groups of the survey are 11-, 13- and 15-year-old adolescents, in Estonia respectively schoolchildren from grades 5, 7 and 9.

Schoolchildren fill an anonymous questionnaire in classroom during one school hour. A person outside from school is present, schoolchildren who miss the class are left out from the survey. The questionnaires are sealed in envelopes in front of schoolchildren to ensure the confidentiality of data (Aasvee et al., 2007; Maser, 2004).

Methods used in this survey are the same in all participating countries and this gives a chance to monitor the changes in schoolchildren health, health behavior and social environment over years in different countries (Aasvee et al., 2007). HBSC survey has been conducted in Estonia in the following periods: February 1994 (King et al., 1996), February–March 1998 (Currie et al., 2000), November–December 2001 (Maser, 2004), February–March 2006 (Currie et al., 2008), February–April 2010.

## 2.2 Participants

Databases from Statistics Estonia were used to compile the sample. Estonian counties were divided into 12 strata according to language of instruction and urbanization. Sample sizes were calculated according to the number of children in grades 5, 7 and 9 in 12 strata (Aasvee et al., 2007).

In HBSC survey it is required that the number of schoolchildren in each age group is approximately 1500 (Roberts et al., 2007). To ensure equal inclusion probabilities the selection was made in two phases. In the first phase schools were selected. Inclusion probabilities were equal to the total number of grades 5, 7 and 9 in the selected school. This means that schools having more classes of these grades had higher probability to get into the sample. In second phase one class from each parallel was randomly chosen. While compiling the age groups, 90% of schoolchildren had to be within  $\pm 6$  months of the mean age for each age group and remaining 10% no more than 12 months from the mean age. In chosen schools the school board decided whether they wanted to participate in the survey or not. Schoolchildren had the right to refuse filling the questionnaire if they themselves or their parents wanted that way. Over years the non-participation rate has been below 0.5% of the whole sample.

Data files from countries that have participated in the survey have been checked and cleaned in Norwegian Social Science Data Services, where international database was created and is preserved (Aasvee et al., 2007).

This chapter focuses on 13- and 15-year-old adolescents self-assessed alcohol consumption and episodes of drunkenness in 1994–2010.

## 2.3 Measures

### 2.3.1 Alcohol consumption

Frequency of alcohol consumption variable was based on different alcoholic drinks (beer, wine, strong alcohol, liqueur, cider, light alcoholic beverages, alcopops) consumption

question. Possible answers were 'yes, every day', 'yes, every week', 'yes, every month', 'yes, less than once a month' and 'no, never'. For the purposes of analysis, schoolchildren were categorised as drinking at least weekly (weekly alcohol consumption) or less often.

### 2.3.2 Drunkenness

Frequency of drunkenness was assessed by asking whether schoolchildren had ever had so much alcohol that they were really drunk. Possible answers were 'no, never', 'yes, once', 'yes, 2–3 times', 'yes, 4–10 times', and 'yes, more than 10 times'. Responses to this question were grouped into two categories: drunkenness never or only once in life and at least two episodes of drunkenness.

### 2.3.3 Demographic factors

Sex, age and nationality were used as demographic factors. In accordance with *age groups*, schoolchildren were either 13- or 15-year-old, from grades 7 and 9 respectively. According to *ethnicity* two groups were formed: Estonians and non-Estonians (mainly Russians).

### 2.3.4 Family related factors

Family structure, family wealth, family affluence scale and family relationships were used as family related factors, that influence health and health behaviour of schoolchildren.

Based on *family structure*, schoolchildren were divided into four groups: 1) two biological parents; 2) one parent; 3) one parent and one step-parent; 4) other combinations (i.e. parent and grandparent, foster home etc.).

Based on *family wealth*, schoolchildren responses were distributed into three groups: 1) bad (very bad and bad); 2) average; 3) good (very good and good).

*Family affluence scale (FAS)* was calculated on the basis of four items 1) does your family own a car (0, 1, 2 or more), 2) how many times did you travel away on holiday with your family during the past 12 months (0, 1, 2, 3 or more), 3) do you have your own bedroom for yourself (0, 1) and 4) how many computers does your family own (0, 1, 2, 3 or more). A composite FAS score was calculated by summing the responses to these four items ranging from 0 to 9 (Richter et al., 2006). The scores were subsequently recoded into tertiles and respondents were divided into three groups respectively. In 2010 the FAS tertiles were as follows: low (0–4 points); middle (5–6 points); high (7–9 points) (Currie et al., 2008).

*Family relationships* were evaluated on an 11 item scale, where 0 meant very bad relationships and 10 very good ones. Based on the scale, schoolchildren were divided into three groups: bad relationships (0–3); 2) average relationships (4–6); 3) good relationships (7–10).

## 2.4 Statistical analysis

Prevalence of alcohol consumption and episodes of drunkenness were calculated separately for 13- and 15-year-old boys and girls. Logistic regression analysis was applied to assess the

associations between weekly alcohol consumption, at least two episodes of drunkenness and demographic and family related factors among 13- and 15-year-old schoolchildren. Weekly alcohol consumption (I model) and at least two episodes of drunkenness (II model) were used as binary variables and demographic and family related factors were used as independent variables in logistic regression analysis models. Odds ratios (OR) and corresponding 95% confidence intervals (CI) were computed for both models. OR that equals 1 refers to the base comparison group. OR's of weekly alcohol consumption and at least two episodes of drunkenness were adjusted to all demographic and family related factors in logistic regression analysis.

The present analysis is based on 13- and 15-year-olds (N=12244), 5861 boys and 6383 girls through the study waves (Table 1). Questionnaires, where the correspondents hadn't answered about their age (10 questionnaires) and alcohol consumption (99 questionnaires) were left out from the analysis. Questionnaires that lacked information about episodes of drunkenness were left out from the drunkenness analysis (62 questionnaires). Additional questionnaires that lacked information about questions related to demographic and family related factors were excluded from logistic regression analysis.

Statistical analysis was conducted with Stata 10 (Hills & Stravola, 2007).

Age group	1994		1998		2002		2006		2010	
	N	%	N	%	N	%	N	%	N	%
Boys										
13-year old	523	49.0	367	59.4	689	52.7	721	47.4	688	51.1
15-year old	545	51.0	251	40.6	619	47.3	799	52.6	659	48.9
Total	1068	100	618	100	1308	100	1520	100	1347	100
Girls										
13-year old	622	49.8	444	57.1	734	53.1	738	48.5	718	49.3
15-year old	626	49.2	333	42.9	648	46.9	783	51.5	737	50.7
Total	1248	100	777	100	1382	100	1521	100	1455	100
Total	2316	100	1395	100	2690	100	3041	100	2802	100

Table 1. Number of respondents by gender, age and study year, HBSC Survey, Estonia 1994–2010

3. Results

3.1 Demographic and family related characteristics of respondents

In 2010, the number of 13- and 15-year-old adolescents studied was almost equal (Table 2). There was about 77% of Estonian and nearly one fourth non-Estonian schoolchildren. About 63% of adolescents were living with both biological parents, approximately 20% with one parent, 15% with parent and a step-parent, and 2% had some other family structure. Almost half of the schoolchildren evaluated their family wealth to be good, 46% found it was average and about 4% said it was bad. Approximately 38% of schoolchildren had high, one third middle and 27% low FAS. About 77% of adolescents evaluated their family relationships good, 19% average and 3% bad.



Variables	Boys	Girls	Total
	(n=1347)	(n=1455)	(n=2802)
	%	%	%
Age			
13-year old	51.1	49.4	50.2
15- year old	48.9	50.7	49.8
Ethnicity			
Estonian	76.8	77.6	77.2
non-Estonian	22.5	22.1	22.3
missing	0.7	0.4	0.5
Family structure			
two parents	65.8	60.6	63.1
one parent	18.6	21.0	19.8
parent and step-parent	13.1	15.8	14.5
other	2.2	2.1	2.1
missing	0.4	0.5	0.4
Family wealth			
good	51.8	47.4	49.5
average	44.0	47.6	45.9
bad	3.1	4.5	3.8
missing	1.1	0.6	0.8
Family affluence scale			
low	24.4	29.5	27.1
middle	32.6	33.4	33.0
high	40.2	35.7	37.9
missing	2.8	1.4	2.0
Family relationships			
good	80.5	73.8	77.0
average	16.6	21.9	19.4
bad	2.4	4.1	3.3
missing	0.5	0.2	0.4

Table 2. Distribution of demographic and family related factors among 13- and 15-year-old schoolchildren by gender, HBSC Survey, Estonia, 2010

3.2 Alcohol consumption

Prevalence rate of alcohol consumption has been quite high among Estonian adolescents over study years. After 2006 the prevalence rate decreased in all age groups.

Among 13-year-old boys the alcohol drinking in 2010 (54.8%) was almost on the same level as in 1994, when it was 52.4% (Table 3). Compared to year 2006 the prevalence rate decreased 22.5%.

Although alcohol consumption rate among 13-year-old girls decreased 10.5% after 2006, it was more than 20% higher in year 2010 than in 1994. Also for the first time, alcohol consumption of girls was higher compared to boys in 2010 (64.3% and 54.8%, respectively).

Alcohol consumption	1994		1998		2002		2006		2010	
	N	%	N	%	N	%	N	%	N	%
Boys										
Yes	274	52.4	266	72.5	520	75.5	557	77.3	377	54.8
every day	2	0.4	5	1.4	19	2.8	19	2.6	15	2.2
every week	35	6.7	21	5.7	82	11.9	66	9.2	39	5.7
every month	54	10.3	47	12.8	116	16.8	131	18.2	84	12.2
seldom	183	35.0	193	52.6	303	44.0	341	47.3	239	34.7
No	249	47.6	101	27.5	169	24.5	164	22.8	311	45.2
Total	523	100	367	100	689	100	721	100	688	100
Girls										
Yes	260	41.8	279	62.8	482	65.7	552	74.8	462	64.3
every day	1	0.2	4	0.9	5	0.7	9	1.2	4	0.6
every week	8	1.3	10	2.3	50	6.8	47	6.4	53	7.4
every month	38	6.1	38	8.6	83	11.3	103	14.0	107	14.9
seldom	213	34.2	227	51.1	344	46.9	393	53.3	298	41.5
No	362	58.2	165	37.2	252	34.3	186	25.2	256	35.7
Total	622	100	444	100	734	100	738	100	718	100

Table 3. Distribution of alcohol consumption among 13-year-old schoolchildren by gender, HBSC Survey, Estonia, 1994–2010

Alcohol consumption	1994		1998		2002		2006		2010	
	N	%	N	%	N	%	N	%	N	%
Boys										
Yes	428	78.5	213	84.9	541	87.4	716	89.6	535	81.2
every day	6	1.1	10	4.0	19	3.1	1	2.4	12	1.8
every week	68	12.5	44	17.5	177	28.6	195	24.4	121	18.4
every month	108	19.8	66	27.0	136	22.0	202	25.3	164	24.9
seldom	246	45.1	93	37.1	209	33.8	300	37.6	238	36.1
No	117	21.5	38	15.1	78	12.6	83	10.4	124	18.8
Total	545	100	251	100	619	100	799	100	659	100
Girls										
Yes	468	74.8	281	84.4	569	87.8	700	89.4	627	85.1
every day	5	0.8	3	0.9	7	1.1	7	0.9	4	0.5
every week	25	4.0	32	9.6	122	18.8	130	16.6	95	12.9
every month	85	13.6	78	23.4	163	25.2	231	29.5	213	28.9
seldom	353	56.4	168	50.5	277	42.8	332	42.4	315	42.7
No	158	25.2	52	15.6	79	12.2	83	10.6	110	14.9
Total	626	100	333	100	648	100	783	100	737	100

Table 4. Alcohol consumption distribution among 15-year-old schoolchildren by gender, HBSC Survey, Estonia, 1994–2010



Alcohol consumption among 15-year-old boys in 2010 (81.2%) was quite similar compared to 1994 (78.5%) (Table 4). The prevalence rate increased until 2006 and then dropped by 8.4% from 89.6% to 81.2% in 2010. Alcohol consumption among 15-year-old girls increased from 1994 to 2006, when it reached 89.4% and then dropped by 4.3%. For the second time during the study period the prevalence rate of alcohol consumption was higher among girls compared to boys: first in 2002, when difference was 0.4% and then in 2010, when difference was 3.9%.

Prevalence rate of weekly alcohol consumption mostly decreased since 2002, except among 13-year-old girls (Figure 1). The prevalence rate among 13-year-old girls increased from 1.5% in 1994 to 7.9% in 2010. Among 13-year-old boys weekly alcohol consumption prevalence rate decreased from 14.7% in 2002 to 7.9% as among 13-year-old girls in 2010. In 2002 31.7% of 15-year-old boys and 20.0% of the same aged girls consumed alcohol weekly. The prevalence rate decreased from 2002 to 2010, 11.5% among 15-year-old boys and 6.6% among 15-year-old girls.

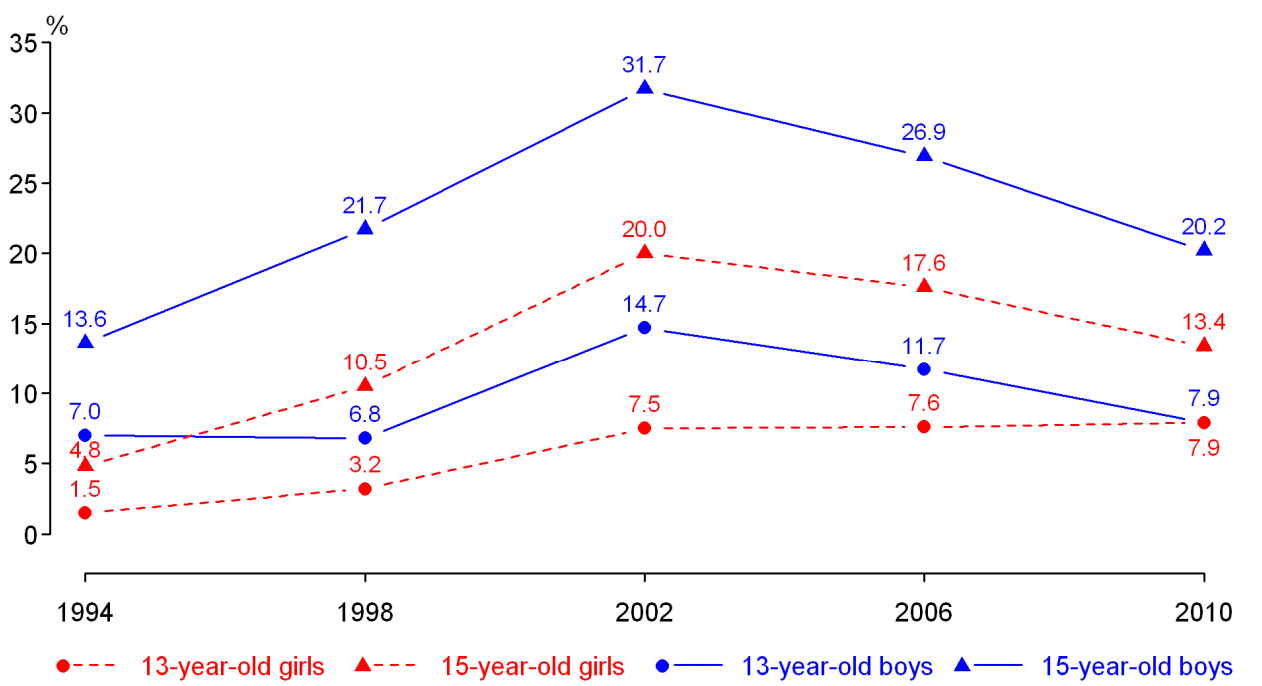


Fig. 1. Prevalence rates of weekly alcohol consumption among 13- and 15-year-old school-children by gender, HBSC Survey, Estonia, 1994–2010

3.3 Drunkenness

The prevalence rate of at least one episode of drunkenness mostly increased from 1994 to 2006 and then decreased. Compared to boys, prevalence rate among girls was only slightly lower in 2010 (Table 5). Among 13-year-old boys the prevalence rate of at least one episode of drunkenness more than doubled in the period of 1994–2006 and after that decreased 11.5% from 45.9% to 34.4%. Among 15-year-old girls the prevalence rate increased since 1994, the difference between years 1994 and 2010 was five-fold (6.9% in 1994 and 31.1% in 2010).

Episodes of drunkenness	1994		1998		2002		2006		2010	
	N	%	N	%	N	%	N	%	N	%
Boys										
Yes	96	18.5	122	33.3	309	44.8	329	45.9	234	34.4
>10 times	5	1.0	3	0.8	37	5.4	40	5.6	28	4.1
4–10 times	6	1.2	11	3.0	33	4.8	43	6.0	29	4.3
2–3 times	24	4.6	41	11.2	100	14.5	102	14.3	66	9.7
once	61	11.8	67	18.3	139	20.2	144	20.1	111	16.3
No	423	81.5	244	66.7	380	55.2	387	54.1	446	65.6
Total	519	100	366	100	689	100	716	100	680	100
Girls										
Yes	43	6.9	66	14.9	209	28.5	219	29.7	221	31.1
>10 times	2	0.3	2	0.5	16	2.2	15	2.0	24	3.4
4–10 times	2	0.3	2	0.5	17	2.3	28	3.8	29	4.1
2–3 times	8	1.3	13	2.9	60	8.2	72	9.8	69	9.7
once	31	5.0	49	11.1	116	15.8	104	14.1	99	13.9
No	577	93.1	377	85.1	525	71.5	519	70.3	490	68.9
Total	620	100	443	100	734	100	738	100	711	100

Tabel 5. Distribution of episodes of drunkenness among 13-year-old schoolchildren by gender, HBSC Survey, Estonia, 1994–2010

Episodes of drunkenness	1994		1998		2002		2006		2010	
	N	%	N	%	N	%	N	%	N	%
Boys										
Yes	256	47.0	150	60.2	460	74.3	566	71.1	445	67.6
>10 times	30	5.5	31	12.5	152	24.6	164	20.6	99	15.1
4–10 times	29	5.3	31	12.5	76	12.3	110	13.8	97	14.7
2–3 times	81	14.9	48	19.3	123	19.9	181	22.7	119	18.1
once	116	21.3	40	16.1	109	17.6	111	13.9	130	19.8
No	289	53.0	99	39.8	159	25.7	230	28.9	213	32.4
Total	545	100	249	100	619	100	796	100	658	100
Girls										
Yes	160	25.6	132	39.6	387	59.8	487	62.4	428	58.2
>10 times	4	0.6	12	3.6	55	8.5	60	7.7	66	9.0
4–10 times	7	1.1	16	4.8	64	9.9	77	9.9	76	10.3
2–3 times	50	8.0	49	14.7	153	23.7	192	24.6	167	22.7
once	99	15.8	55	16.5	115	17.8	158	20.2	119	16.2
No	465	74.4	201	60.4	260	40.2	294	37.6	307	41.8
Total	625	100	333	100	647	100	781	100	735	100

Table 6. Distribution of episodes of drunkenness among 15-year-old schoolchildren by gender, HBSC Survey, Estonia, 1994–2010

Among 15-year-old boys the prevalence rate of at least one episode of drunkenness increased from 1994 (47.0%) to 2002 (74.3%) and then decreased (Table 6). Compared to year 1994, in 2010 the rate was higher by 20.6%. Among 15-year-old girls the prevalence rate increased from 1994 (25.6%) to 2006 (62.4%) and then decreased by 4.2%. The prevalence rate has more than doubled over the whole period.

The prevalence rate of at least two episodes of drunkenness decreased after 2006 among 13- and 15-year-old boys (Figure 2). The prevalence rate among 13-year-old boys in 2006 was 25.8% and in 2010 18.1%. Among 15-year-old boys the rate decreased from 57.2% in 2006 to 47.9% in 2010. Among 13-year-old girls the rate increased since 1994, when it was 1.9%, to 17.2% in 2010. Among 15-year-old girls the rate was stable since 2002, when it was 42.0%. However, compared to year 1994 the rate increased approximately 4 times from 9.8% to 42.0% in 2010.

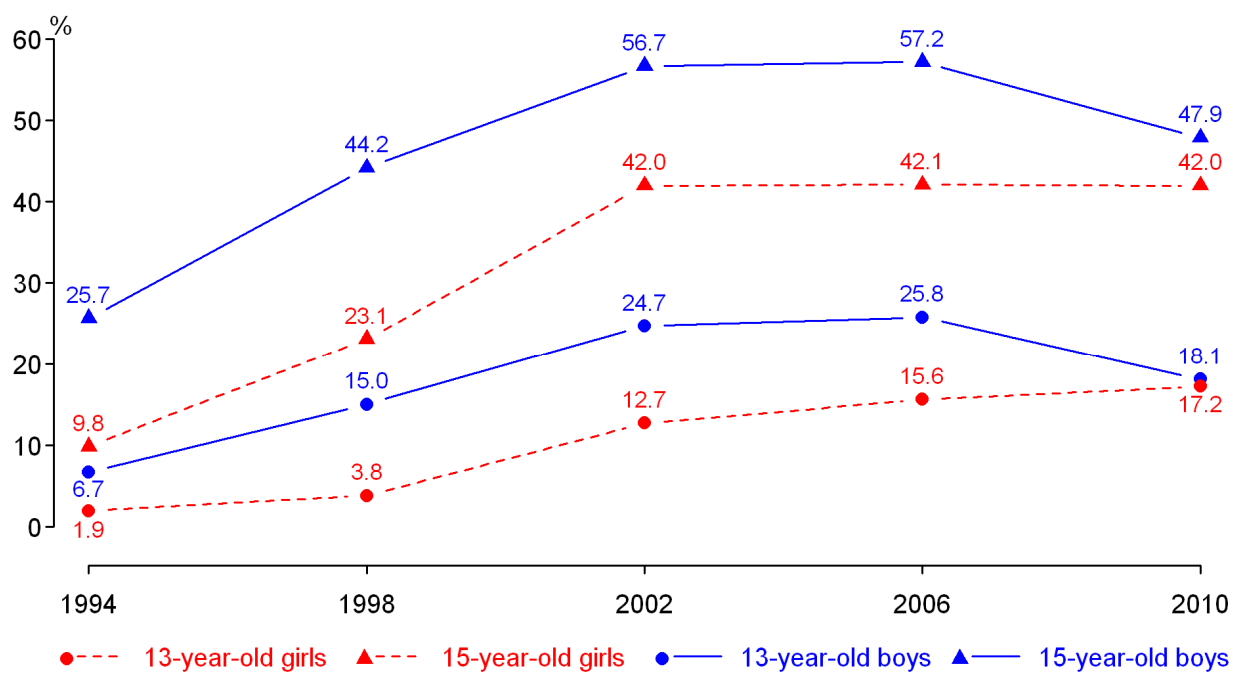


Fig. 2. Prevalence rates of at least two episodes of drunkenness among 13- and 15-year-old schoolchildren by gender, HBSC Survey, Estonia, 1994–2010

3.4 Alcohol consumption and drunkenness by demographic and family related factors

In 2010, weekly alcohol consumption and repeated drunkenness were higher among 15-year-olds (*versus* 13-year-olds) and among Estonian (*versus* non-Estonian) boys and girls (Table 7). Family structure was not associated with drinking alcohol weekly. Compared to schoolchildren living with both parents, odds for repeated drunkenness was higher among girls living with one parent, and among boys and girls living with parent and step-parent. Family wealth and FAS were associated with alcohol consumption and drunkenness only among girls. Odds to drink alcohol weekly and to have at least two episodes of drunkenness was higher among girls living in families with lower perceived wealth, but having higher FAS. Compared to adolescents with the good family relationships, odds to consume alcohol weekly and to have at least two episodes of drunkenness was higher among boys and girls with average and bad family relationships.

Variables	Weekly alcohol consumption (I model)		Repeated drunkenness (II model)	
	Boys	Girls	Boys	Girls
	AOR (95% CI)	AOR (95% CI)	AOR (95% CI)	AOR (95% CI)
Age				
13-year old	1	1	1	1
15- year old	2.78 (1.95–3.96)	1.62 (1.14–2.31)	4.14 (3.18–5.39)	3.47 (2.69–4.48)
Ethnicity				
non-Estonian	1	1	1	1
Estonian	2.63 (1.58–4.36)	2.23 (1.31–3.80)	2.45 (1.74–3.45)	2.03 (1.46–2.83)
Family structure				
two parents	1	1	1	1
one parent	1.21 (0.79–1.88)	1.33 (0.85–2.09)	1.32 (0.95–1.87)	1.55 (1.13–2.13)
parent and step- parent	1.05 (0.64–1.71)	1.32 (0.83–2.09)	1.72 (1.19–2.49)	1.45 (1.04–2.03)
other	1.73 (0.62–4.79)	1.20 (0.39–3.70)	2.01 (0.82–4.90)	2.65 (1.19–5.92)
Family wealth				
good	1	1	1	1
average	0.83 (0.58–1.18)	1.16 (0.80–1.69)	0.89 (0.67–1.16)	1.44 (1.10–1.87)
bad	1.13 (0.46–2.75)	2.38 (1.15–4.92)	1.12 (0.53–2.36)	1.96 (1.07–3.57)
Family affluence scale				
low	1	1	1	1
middle	0.74 (0.46–1.19)	1.35 (0.84–2.17)	1.12 (0.79–1.60)	1.29 (0.93–1.78)
high	1.41 (0.91–2.20)	2.05 (1.27–3.32)	1.35 (0.95–1.92)	1.95 (1.39–2.73)
Family relationships				
good	1	1	1	1
average	1.71 (1.14–2.58)	2.27 (1.54–3.35)	1.76 (1.26–2.46)	1.85 (1.38–2.48)
bad	3.82 (1.65–8.88)	3.30 (1.68–6.47)	3.43 (1.53–7.71)	2.47 (1.36–4.47)

Table 7. Adjusted odds ratios (AOR) and 95% confidence intervals (CI) for weekly alcohol consumption (I model) and for at least two episodes of drunkenness (II model) pending on demographic and family related factors among 13- and 15-year-old schoolchildren by gender, HBSC Survey, Estonia, 2010

4. Discussion

The present chapter focused on alcohol consumption among adolescents in Estonia in 1994–2010.

4.1 Limitations and strength of the survey

Before discussing the results, one has to consider the limitations of the survey. Limitations are mainly related to questionnaire survey and its validity. Some studies have demonstrated that there is tendency to under-report when asking questions on such a sensitive risk taking behaviour like alcohol consumption (Newell et al., 1999). To deal with this potential bias of self-reporting all possible efforts to guarantee anonymity of responses were made. Despite of some limitations, this study provides basic data and several inferences can be drawn.

Strength of this survey is related to the possibility to make cross-national comparisons as standard approach was employed according to the study protocol to use the same questions in each participating country.

#### 4.2 Trends in alcohol consumption and drunkenness

Weekly alcohol consumption increased from 1994 to 2002 and thereafter decreased among boys and girls in Estonia. Only among 13-year-old girls drinking alcohol weekly increased during the whole study period. Nevertheless, compared to the year 1994, prevalence of weekly drinking was much higher in 2010. In 1994–2002, similar increasing trend of alcohol consumption was found among adolescents in neighbouring countries Latvia and Lithuania (Zaborskis et al., 2006).

Similar pattern emerged with drunkenness. Prevalence of at least two episodes of drunkenness increased from 1994 to 2006 and thereafter slightly decreased among boys and girls. Among 13-year-old girls weekly alcohol consumption increased during the whole study period. Throughout the study period prevalence of drunkenness increased more among girls. Again, compared to the year 1994, prevalence of weekly alcohol consumption was much higher in 2010.

At the same time, Simons-Morton et al. (2009) reported world-wide cross-cultural patterns in alcohol consumption. The Northern European countries showed a declining trend, but Eastern European countries (including Estonia) experienced increasing trend in alcohol consumption and drunkenness. The variability of trends by country might reflect alcohol and marketing policy differences by country. Estonia has experienced significant political and economic changes during the last two decades. A lot of effects on alcohol related issues in Estonia could be associated with economic changes of the former Soviet Union as well as with the joining the European Union in 2004.

Gender differences in alcohol consumption among adolescents were pronounced. Throughout the study period, drinking and drunkenness remained higher among boys compared to girls, but the gap between boys and girls declined and girls appeared to be catching up with boys especially among 13-year-olds. Also, gender gap was shrinking in almost all countries participating in HBSC Survey (Simons-Morton et al., 2009). The variability in trends by gender in Estonia could be due to increased effectiveness of contemporary marketing practices or relative ineffectiveness of policies and programs with girls. However, these changes in prevalence could also be due to changes in the social roles of women, allowing girls greater autonomy and wider range of social options (Rahav et al., 2006).

Prevention of alcohol consumption among adolescents is very important because it prevents problems among adults in the future (Hingson et al., 2006). It has been found that the most effective prevention measures are those that are targeted to schoolchildren and to their parents at the same time (Smit et al., 2008; Wu et al., 2003). However, it has to be taken into account that every country needs its own implementation of a specific program due to cultural differences (Koning et al., 2010). Simons-Morton et al. (2010) compared alcohol consumption of adolescents in USA, Canada and Netherlands and found that there were higher odds to consume alcohol and get drunk in the Netherlands, where minimum age to purchase alcohol is 16 compared to Canada (minimum age 19) and USA (minimum age 21).



### 4.3 Alcohol consumption and drunkenness by demographic and family related factors

Weekly alcohol consumption and repeated drunkenness were associated with demographic factors like gender and age as described above. In addition, compared to non-Estonian adolescents alcohol drinking was more pronounced among Estonians. At the same time, weekly alcohol consumption was higher, but the amount of pure alcohol consumed per week was lower among adults of ethnic majority in Estonia (Pärna et al., 2010). However, in Lithuania, in schools with Lithuanian teaching language, Polish and Russian adolescents were more exposed to alcohol consumption (Šumskas et al., 2010).

Drunkenness, but not weekly alcohol consumption was associated with family structure among boys and girls. Living in non-intact families was a risk factor for repeated drunkenness. Also, Bjarnason et al. (2003) reported that schoolchildren living with both biological parents engaged less frequently in heavy alcohol consumption than those living in other arrangements. According to world-wide literature, higher supervision in intact families and supportive family environment might be associated with lower alcohol consumption among adolescents in these families (Cookston, 1999; Shucksmith et al., 1997).

Similar association was found between alcohol consumption, repeated drunkenness and family wealth among girls. Lower family wealth was a risk factor for heavy alcohol use among girls in Estonia. Zaborskis et al. (2006) found inverse relationship between alcohol consumption and the perceived family wealth in all three Baltic countries. In 1994–2002, girls in Estonia, but boys in Latvia and Lithuania from the families perceived by them as wealthy were more likely to drink weekly as compared to adolescents from the families perceived by them as not wealthy. This inconsistency in these findings might be explained by time difference in these studies (they were conducted in different years).

Weekly alcohol consumption as well as repeated drunkenness was associated with family affluence scale among girls, but not among boys. At the same time, there was not found any relationship between repeated drunkenness and FAS among 11–15-year-olds in Estonia in 2002 (Richter et al., 2006). Again, this inconsistency in these results might be explained with different age groups and study years used in these studies. Moreover, Richter et al. (2006) found very limited evidence for a close consistent relationship between episodes of drunkenness and parental FAS in almost all other participating countries (27) in the same study. Kuntsche et al. (2004) have pointed out that while adults problem drinking seems to be more common in less affluent groups, this direction might be reversed for adolescents, where accessibility to financial resources is more limited. Also, higher FAS as well as family wealth might be not directly associated with higher education. Inconsistency in association of alcohol drinking with family wealth and FAS could be explained by the fact, that distribution of perceived family wealth among adolescents is quite different as compared to FAS. Adolescents who estimated the family wealth 'not so well-off' or 'not at all well-off' was in 2010 survey 3.2%, by FAS tertiles low economic situation was in 27% of students. Evidently, FAS shows more objectively the financial situation of the family.

In addition, there might be other factors during adolescence, which may have a greater impact on drinking behaviour than family related factors and parental socioeconomic status. For instances, the specific character of adolescence as a stage of experimenting with behaviours associated with adult status (Richter et al., 2006) or situations that youth feel powerless to change (United Nations, 2005).



Weekly alcohol consumption and repeated drunkenness were associated with worse family relationships among boys and girls in this study. According to world-wide literature, a supportive family environment (Shucksmith et al., 1997) and parent-child communication is associated with lowered prevalence of alcohol consumption (Luk et al., 2010).

#### 4.4 Alcohol policy in Estonia

During 1996–2006 alcohol policy was virtually nonexistent in Estonia. There was a national alcoholism and drug abuse prevention programme for 1997–2007, which was continued since 2004 under national drug abuse prevention strategy (1994–2012). This programme mainly focused on the creation of a nationwide information system to evaluate the damage caused by alcohol and drug abuse.

In 1996–2006 the prices of alcoholic beverages increased in Estonia (1.3 times for domestically produced beer and 1.4 times for vodka). However, the average price increase has been slower than the increase in the consumer price index, as well as slower than the income increase of inhabitants, which most likely has also contributed to the increase of alcohol consumption (Estonian Institute of Economic Research, 2008).

Compared to the 2004 level, excise tax increased 45% by the beginning of 2010. The highest tax increases (30% altogether) occurred in 2008 when the economic crisis started to affect the Estonian economy (Lai & Habicht, 2011). This was the first time when affordability of alcoholic beverages decreased after many years.

A nation-wide restriction on the time of off-premise sales of alcoholic beverages was introduced in the summer of 2008. Currently, off-premise sale of alcoholic beverages is prohibited from 10 p.m. to 10 a.m. throughout Estonia.

There is still wide availability of alcohol sales outlets: 198 alcohol retail shops per 100 000 inhabitants in Estonia in 2010, while 6.5 in Finland and 4.5 in Sweden (Estonian Institute of Economic Research, 2010).

Since 2008 advertising of alcoholic beverages on television and radio has been prohibited from 7 a.m. to 9 p.m. in Estonia. Before, prohibition of TV advertisement ended at 8 p.m. for alcoholic beverages other than spirits (Lai & Habicht, 2011).

Interventions on a personal level such as alcohol counselling have had very low focus in Estonia. A pilot study to evaluate the methods of early identification of risk drinking and counselling in the primary health care was carried out in the beginning of 2010. It was found that early identification of risk drinking and counselling are feasible. Continuous practical training, considering the specificity of primary health care, is necessary in order to promote the counselling skills of primary health care specialists (Saame et al., 2011).

In Estonia, further alcohol policy actions should include the reduction of the density of alcohol outlets, more comprehensive advertisement bans, clearer separation of alcoholic beverages from other goods in retail stores and full implementation of brief alcohol interventions in primary health care (Lai & Habicht, 2011).

In addition to previously mentioned policy actions, there should be an alcohol consumption prevention program targeted to adolescents and their parents. Higher price for light alcoholic beverages and consistently asking for ID-card while selling alcohol would lower

alcohol consumption among adolescents. Root beer (0.5% and 0.8%) and non-alcoholic cider (1.2%) should be considered as alcoholic beverages. Also raising the minimum age to purchase alcohol from 18 to 21 would be an effective preventive measure.

## 5. Conclusion

Alcohol consumption among adolescents in Estonia is a serious public health problem. Demographic and family related factors influence alcohol use of adolescents, especially among girls. The results of this study may guide the development of policy and interventions tackling alcohol consumption among adolescents in Estonia.

Additional research is needed on the nature of differences in drinking attitudes and patterns among boys and girls and their parents. Also, it might be interesting to look at the alcohol consumption within the context of other, possibly more relevant factors such as peer or school influence and other parental factors.

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