

# Alcohol consumption in Polish middle and high school pupils – has this rapidly increased during 2009–11?

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## Abstract

**Introduction.** The dynamic rise of alcohol consumption in adolescents is a matter of serious concern, requiring frequently updated monitoring. By such means, it is possible to optimise preventative measures for dealing with this problem.

**Objective.** To estimate the magnitude/amount and frequency of alcohol consumed by middle and high school pupils in Poland, including the circumstances when alcohol was first drunk.

**Materials and Methods.** A randomised survey was performed throughout Poland on middle school (junior high school) pupils, (n=9360) in 2009, followed by both middle and high school pupils in 2011 (n=7971). The questionnaire was devised by the Polish Chief Sanitary Inspectorate (GIS).

**Results.** A strikingly sharp increase in alcohol consumption (29%) was observed in subjects between 2009 – 2011. In the latter year, 1 month prior to survey, respectively, 50% and 71% of middle school and high school pupils drank alcohol, and correspondingly, 36% and 63% of these pupils ever became intoxicated/drank.

**Conclusions.** 1) Adolescent alcohol consumption increases with age and is highest in girls. Monitoring as well as in-depth analysis thus becomes necessary. 2) Systematic monitoring and analysis of changing healthy lifestyle behaviour should be used for taking the necessary corrective action. This should happen concurrently and consist of planned health education programmes, including health promotion.

## Key words

alcohol consumption, adolescents/pupils, middle school, high school

## INTRODUCTION

The abuse of psychoactive substances, including alcohol, is one of the factors that greatly reduce public health status. Health problems linked to alcohol consumption, not only arise in those dependent/addicts but also in occasional or regular drinkers. Such behaviour has led to a constant increase in alcohol consumption in EU adults of currently 11 litres of pure ethanol per annum. When accounting for un-recorded alcohol consumption, it is estimated that this figure approaches in fact 15 litres. In Poland, 10% of the population abuse drinking alcoholic spirits (representing 4 million persons), and those abstaining from alcohol are 1/5th of the population, whereas around 1 million people show alcohol addiction (2.5%). European estimates show that alcohol contributes to 25% of sudden deaths in people in the age group 15–29 years [1]. In adults, becoming intoxicated is a social problem, and during adolescence increases. It is seen

that adolescents ever more frequently and at increasingly younger ages start drinking, ie. at ages 15–19 years, which thus adversely affects their development.

It has been shown that alcohol consumption is linked to many diseases and pathologies. According to the WHO (World Health Organisation), alcohol is the cause of 20–30% of all illnesses in the world, due to cancer of the oesophagus and liver, liver cirrhosis, seizures, as well as homicide and road accidents [2]. Furthermore, alcoholic beverages are classified by the International Agency for Research on Cancer (IARC) as carcinogens, where the risk of developing cancer in the buccal cavity, oesophagus, stomach, colon, rectum and breast becomes increased. The alcohol-dependent risk of developing malignancies is 7.6 per 10,000 [3]. Chronic consumption of alcoholic spirits may lead to conditions such as Korsakoff's psychosis, alcoholic dementia, delirium or alcoholic delusions [4].

Alcohol toxicity is gender dependent where men and women are differently affected. Women are more susceptible to alcohol toxicity as their bodies contain more adipose tissue but less bodily fluid than men, which leads to greater concentrations of alcohol within the circulation. Moreover,

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women possess 70–80% less alcohol dehydrogenase than men; an enzyme responsible for metabolising alcohol. Even though alcoholic spirit consumption in women is relatively much lower when compared to men; in recent years there has been a steep increase in the numbers of women and girls drinking, where the amounts drunk approach those in men [5]. This female group are aged mainly 18–29 years and consist of single women, undergoing education or higher studies, or are unemployed. It is estimated that 80% of young women drink alcohol and 1/10th drink 7.5 litres of ethanol per annum, thus constituting a serious risk of damaging their health.

A particularly harmful effect of alcohol for women is during pregnancy, where it is estimated that the incidence varies between 25% to almost 50%. This adversely impacts foetal development and increases both premature birth and miscarriage. Another serious consequence is in acquiring Fetal Alcohol Syndrome (FAS) which is diagnosed in 10% of neonates, although this figure may be higher due to difficulties in diagnosis and inadequate/unclear definition. FAS develops slowly *in-utero* but after birth, craniofacial defects and mental retardation become apparent [6]. Furthermore, drinking alcohol during pregnancy affects foetal brain development, which in the individual's later life increases the likelihood of acquiring drinking habits [7]. Studies on adolescents have shown that at 14 years they are more likely to have already drunk alcohol if their mothers had been drinking during pregnancy. In addition, 83% of this group, when aged 21 years considered themselves as frequent drinkers, of whom 10% were even now dependent on/addicted to alcohol.

#### Objectives:

- 1) To estimate the amount and frequency of consuming alcohol by middle and high school pupils in Poland;
- 2) Determine the ages and most common circumstances when alcohol is first drunk by middle and high school pupils;
- 3) To compare the questionnaire responses obtained regarding alcohol consumption between pupil subjects and their parents.

## MATERIALS AND METHOD

In 2009, a pilot survey was conducted by State Sanitary Inspectorate staff, from educational departments, on middle-school pupils and their parents within a local district of Poland. Subjects were randomly selected from 1,100 middle school pupils and parents, of whom 999 pupils and 667 parents correctly completed the questionnaire which were used for subsequent statistical analysis. An incorrect questionnaire was defined as inadequate replies to >50% of the questions posed. The pupils were 679 girls and 320 boys. The questionnaire was designed by GIS and directed both at pupils and their parents; this being based on a questionnaire used earlier in the Global School-base Student Health Survey (GSHS). The idea was to obtain more reliable responses through comparing the answers provided by pupil subjects and their parents, especially on questions concerning pro-healthy and unhealthy behaviour. This pilot study served as the guideline for undertaking an all-Poland survey, also on middle school pupils and their parents, in the same year (2009), that included 12,005 pupils and parents. Results qualifying for statistical analyses were 9,360 pupils and

6,951 parents. Of the pupils, this consisted of 4,961 girls and 4,399 boys.

The survey was compared to another all-Poland survey from 2011 to determine the extent of adolescent alcohol consumption between these years in the various age groups. Similar to the previous survey, the 2011 survey took a randomised sample of 10,083 middle and high school pupils of whom 7,971 qualified for statistical analysis with correctly completed questionnaires (79%); these consisted of 3,548 pupils from middle school (1,742 girls and 1,806 boys) and 4,423 from high school (2,275 girls and 2,148 boys). In contrast to 2009, parents were not included as the previous survey showed a low correlation between pupil-parent answers. The 2011 survey was additionally extended to include questions on designer drugs, which has now become an important issue for adolescents. Also, questions on alcohol consumption were altered to be more specific.

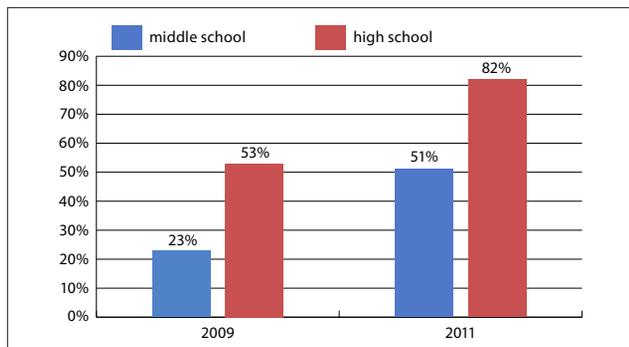
A two-step randomisation was used where the school was selected by tiered randomisation followed by the class. Samples taken were clustered, in that the pupils selected had filled in the questionnaire anonymously. The choice of schools were according to class, local district and municipality. Pupil samples were selected from the schools and institutions database held by the Ministry of National Education (30 September 2008) that constituted the sampling framework. In the first stage selection, choices were limited to 4 types of schools, i.e. middle school, comprehensive high (secondary) school, specialised high (secondary) school and technical institutes. This was followed by a randomised selection performed by Statistica and SPSS computer software. Questionnaire responses were entered into a central database using an integrated data gathering/acquisition system ready for statistical analysis by the STATISTICA programme. The statistical test used was the Pearson  $\chi^2$  which tested the independence of  $m \geq 2$  variable classes expressed in a nominal scale. The test was verified by calculating the  $\chi^2$  function and comparing it with those postulated by the Null Hypothesis, taking the probabilities of error at  $p=0.05$ ,  $p=0.02$ ,  $p=0.01$  or  $p=0.001$ .

## RESULTS

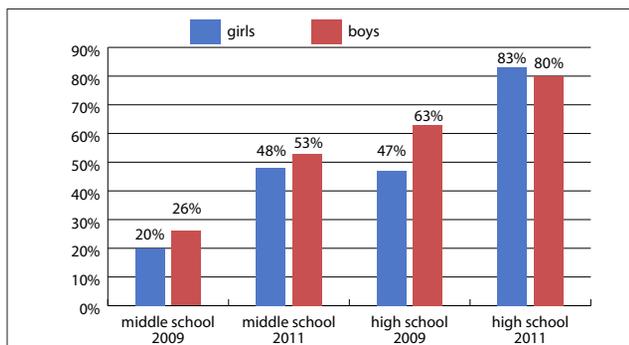
Overall, the numbers of pupils consuming alcohol rose by almost 29% between 2009 – 2011 in middle school and high school subjects for the all-Poland surveys. It is difficult to be completely sure if this outcome is reproducible, and thus whether such large differences in adolescent alcohol consumption actually reflect reality. It should be noted that there were much fewer boys than girls sampled in 2009, but who at that time drank more. Thus, the overall alcohol consumption may be skewed somewhat lower. Undoubtedly, alcohol drinking rises with adolescent age, with increasingly more drinking at high school from year to year (Fig. 1).

The proportion of girls drinking alcohol from middle school was less than boys. In high school (2009), a decidedly greater percentage of boys (16%) drank alcohol than girls. The studies from 2011 showed that the number of girls drinking increased which, by percentage, exceeded those of boys, i.e. 83% vs. 80% (Fig. 2).

As mentioned, the 2011 survey posed more specific questions (than from 2009) in which the frequency of current alcohol consumption, and over the last 30 days prior to survey, was directly addressed. This showed that 50% and

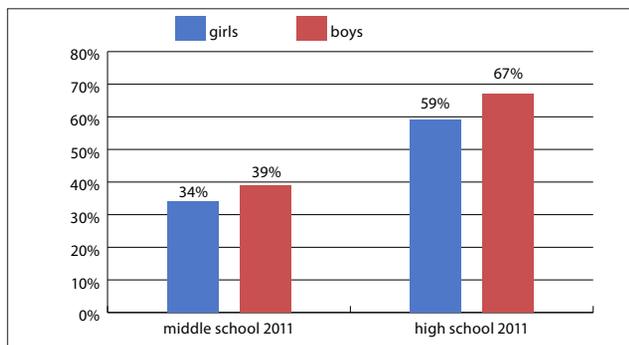


**Figure 1.** Proportions/percentages of pupils who ever drank alcohol in their lives according to study year



**Figure 2.** Percentages of pupils consuming alcohol in studied years according to gender

71% of middle and high school pupils, respectively, drank in the month before being surveyed; those that ever got drunk in their lives (intoxicated) were correspondingly 36% and 63%. It is worrying that equal numbers of girls and boys got drunk (Fig. 3).



**Figure 3.** Percentages of pupils experiencing intoxication/being drunk in 2011 according to gender

Looking at the frequency of drinking alcohol, then those pupils who were older more often drank alcohol once or several times weekly, compared to the younger pupils. In 2011, there was a 5% rise in both age groups of drinking once weekly, whilst the numbers of pupils drinking less than once weekly decreased, particularly for those attending high school (Tab. 1).

The most frequently consumed alcoholic beverage for all subjects was beer. Wine and vodka were also often drunk by high school pupils. Table 2 demonstrates that over the years, the trends in alcohol consumption are being maintained at similar levels.

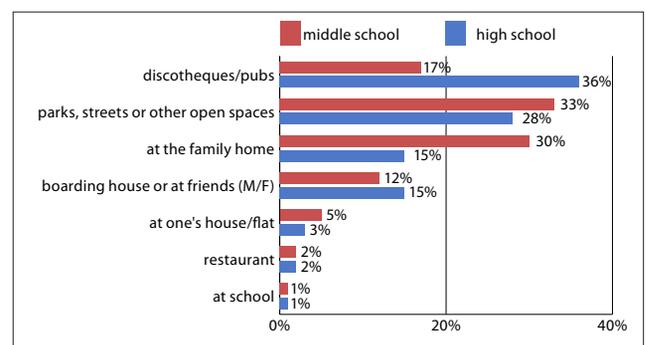
**Table 1.** Frequency of alcohol consumption in pupils according to school and study year (%)

Frequency of consuming alcohol	middle school 2009	middle school 2011	high school 2009	high school 2011
less than once weekly	73%	71%	69%	59%
once weekly	17%	21%	26%	31%
several times weekly	7%	3%	4%	6%
daily	3%	5%	1%	4%
p; (chi <sup>2</sup> )	0.003	0.001	<0.001	0.001

**Table 2.** Types of alcoholic beverages consumed by pupils according to school and study year, expressed as percentages

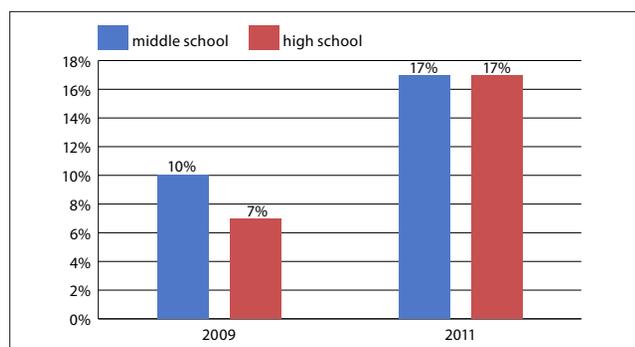
Type of alcoholic beverage	middle school 2009	middle school 2011	high school 2009	high school 2011
beer	89%	84%	89%	92%
vodka	48%	48%	72%	75%
wine	40%	49%	55%	64%
other	17%	25%	6%	27%
p; (chi <sup>2</sup> )	0.001	<0.001	<0.001	<0.001

The 2001 study shows that the places where alcohol is drunk depends on age. Those at high school, most usually occasionally drink weekly at discotheques or pubs. Other popular places include parks and open spaces. It is of concern that 15% admit to drinking at home or at friends. Their younger counterparts report that they most often drink in outside places (eg. parks). It is surprising that 30% of middle school pupils say they drink at home (Fig. 4); however, this can be explained that 40% and 48% parents of, respectively, middle and high school pupils allow them to do so at home. This happens when parties are held in the home. Children observe how other family members behave and quite frequently claim that they drink excessively (Fig. 5).



**Figure 4.** Places where alcohol is most frequently drunk (%) by middle and high school pupils

The 2009 study was also directed at parents, from which two separate questionnaires arose that were designed to check the accuracy of replies from pupils with those by their parents. Questions on psychoactive substances, including alcohol, showed little agreement. Only 2% and 17% of middle and high school parents answered that their children drank alcohol (Tab. 3). No doubt this is a sensitive subject for adults, and demonstrates their high level of ignorance about the scale of the problem and, perhaps even worse, may reflect a deliberate dismissal of this issue.



**Figure 5.** Percentage frequency of alcohol being consumed by pupils, estimated by their parents

**Table 3.** Comparing pupil and parental responses on pupils' alcohol consumption, expressed as percentages

Was alcohol drunk?	middle school		high school	
	pupils	parents	Pupils	parents
YES	23%	2%	53%	17%
NO	77%	98%	47%	83%
p; (chi <sup>2</sup> )	0.006	0.014	0.057	0.001

## DISCUSSION

For teenagers, alcohol is the most frequently used psychoactive substance. Despite the fact that it is illegal to sell alcohol to minors and that many preventative measures have been tried, the amount and frequency of adolescent alcohol drinking has not lessened [8]. In order to deal with this problem, then not only is monitoring required, but a more detailed study to determine the factors that cause and govern this type of behaviour.

The presented study shows that drinking alcohol rises with age; a trend which is increasing in the 2011 part of the study when compared to the 2009 results. A worrying sign is that this has occurred for both middle (28%) and high school (29%) pupils. A 2011 study conducted by the European School Project on Alcohol and Drugs (ESPAD) demonstrated that, respectively, 87% and 95% of middle (3rd class) and high (2nd class) school pupils had already had their first alcoholic drinks. A month prior to being surveyed, a study revealed that 58% subjects aged 15–16 years and 80% aged 17–18 admitted drinking alcohol [9]. The current study (2011) demonstrated, respectively, that 51% and 82% of middle and high school pupils had ever drunk alcohol in their lives. Similar results were also obtained by the Health Behaviour in School-Aged Children (HBSC) study from 2010, where a month before being surveyed, 51% and 77% of middle (class 3) and high (class 2) school pupils, respectively, drank alcohol [10].

Even though more at risk behaviour is attributed to boys, girls appear to be closely catching up [11]. Girl emancipation and similar gender lifestyles was observed in the 1990s, not only in Poland, but throughout Europe. The presented study shows that in 2011, high school girls drink more often than boys. The aforementioned ESPAD, conducted every 4 years in Poland and Europe since 1995, has shown that boys drink more than girls [9] in both the younger and older age groups. However, the latest ESPAD stage has shown that girls have now overtaken boys in countries such as Iceland Latvia and Sweden. Subjects most frequently drink beer,

wine followed by vodka; this has been confirmed by other studies [12]. Teenagers often don't just stop after their first alcoholic drink, but in the future continue with the habit at a rising rate. The largest increase in consuming alcohol occurs between adolescence and early adulthood [13, 14]. An American study has confirmed that the tendency to get drunk at ages 17–18 years is carried forward to higher education. Young people leaving home more frequently drink and get drunk, where such behaviour is continued on into adulthood [15]. By getting 'drunk', this is defined as consuming 5 or more drinks (equivalent to 70g ethanol) for men and 4 or more drinks for women on one occasion, while being often inebriated/intoxicated is when this behaviour is repeated. The ESPAD studies from 2011 clearly indicate that the majority of older pupils (70%) and almost half (49%) the younger ones have experienced being drunk. Polish studies (2011) have demonstrated that, respectively, 36% and 63% of middle and high school pupils got drunk [9]. The HSBC study findings, however, were that 47% and 73% of middle (class 3) and high (class 2) school pupils, respectively, had ever got drunk [10]. Boys get drunk relatively more often than girls and experience the after-effects [16], and USA studies show that this the case for 56% of males and 43% of females [17]. German studies have likewise indicated this in 16-year-olds [18], together with the presented study, where 34% of middle school boy pupils had ever got drunk, and 39% of girls. It is a worrying feature of the presented findings about the frequency of getting drunk, that in the older age group, 59% of girls and 67% boys had had experience of this.

A high susceptibility to alcohol may be a factor leading to addiction in later life. The literature shows that around 30% of people who drink heavily when young, become addicted in adulthood [19]. The initial process of experimenting with alcohol leads to a loss of control over one's body, turning unconsciously into an addiction [20], the craving for which is satisfied by drinking alcohol. Many studies have stressed that substance abuse in children and adolescents arises from the desire to experience the pleasure in being intoxicated, of satisfying one's curiosity, to alleviate feelings of boredom, or as an escape from problems of the family, school, or of a personal nature [21]. A prevailing view is that the principal factor causing alcohol dependence is when a life crisis is experienced associated with painfully emotional states. A lack of emotional stability is taken to mean a low sociability, decreased self-esteem and finding life to be meaningless [22]. Becoming intoxicated becomes a way of dealing with the world and coping with oneself, a panacea without which teenagers are unable to get by. Youngsters cut themselves off from their environment and seek fulfilment/happiness within their own closed world in order to create a different and improved reality. The psychological need for starting to drink alcohol rises in teenagers who belong to a peer group which has acquired such a habit. This is reinforced by a sense of belonging and being identified in a given age group. By adopting such behaviour, teenagers seek to attract attention through which they feel important and wanted. Peer approval promotes the desire to follow a particular course of action, especially if this goes against parents' wishes. The study from 2009 shows that parents are either unaware or that they do not want to admit that their offspring drink alcohol.

The family environment plays a significant role in the drinking of alcohol. Any disruption in an appropriate/correct child-parent relationship may result in the child feeling

isolated and a decreased confidence in parental authority, thus effectively creating a barrier which may lead the child itself to start drinking. A difficult issue arises when adolescents experiment in drinking alcohol in the presence of their parents in social situations, when toasts are raised or important family occasions are celebrated. The current study demonstrates that, respectively, 40% and 48% parents of middle and high school pupils allow their offspring to drink at home. Teenagers thus have parental consent for drinking, while at the same time observing their parents and falling into the generally accepted patterns of drinking behaviour. A significant problem arises when parents or just one parent drinks excessively, which is destructive towards family life. The 2011 part of the study shows that around 17% of parents drink alcohol more than once weekly. In Poland, about 1.5 million children are brought up in families suffering from pathological problems of alcohol abuse. This is associated with aggressive and repressive behaviour of parents, incidences of violence, sexual abuse, and the neglect of family needs and matters. Furthermore, the Adult Children of Alcoholics Syndrome appears in alcoholic families, which destructively damages the child's mental and physical development, often causing emotional disorders as well as physical and health weaknesses [23, 24].

The adverse consequences of alcohol abuse can be observed in all societies and they may cause serious health and social problems [25]. Aside from the health issues, frequent alcohol abuse leads to learning impairment, where mental processes are disrupted and a memory loss [26]. Risky behaviour linked to excessive alcohol consumption includes interpersonal violence, suicide, homicide, drink-driving (causing fatal accidents), increased juvenile violence and unwanted or undesired sexual liaison [27].

In Poland, alcohol drinking is largely acceptable and tolerated. Alcoholic beverages are indeed the most popular psychoactive substance taken by adolescents. The widespread availability, advertising/promoting drinking, (especially beer) and ineffective law enforcement concerning underage sales, are frequently deliberately exploited by the liquor industry. Market research has confirmed that increasing beer consumption by those aged 15–19 years is the mainstay of profits within this sector. As a consequence, national policies are inadequate to deal with alcohol abuse leading to an increasing health service burden. A re-focusing of policies is thus indicated, where limitations on availability and price increases should be introduced. An excellent example is the USA, where the legal age-limit for alcohol drinking has been raised to 21 years. It is vital that young people are made to realise that alcohol abuse can not only ruin health but their own life (and those closest), thereby limiting their chances of functioning normally.

## CONCLUSIONS

1. Alcohol consumption in adolescents increases with age, with girls showing the greatest increase. This requires not only monitoring but more in depth analyses/study.
2. Parents are convinced their children drink less than is the actual case. It seems this has always been so; however, this area is worth tackling.
3. Healthy lifestyle behaviour in teenagers is based on appropriate parental role-modelling. Dealing with unhealthy behaviour is made more difficult when parents themselves often set bad examples.

4. The systematic monitoring and analyses of adolescent lifestyle changes in behaviour should form the basis for any current remedial action, as and when required, in planning suitable educational health programmes and health promotion.

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