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## Decrease in adolescent cannabis use from 2002 to 2006 and links to evenings out with friends in 31 European and North America countries and regions

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### Abstract

**Objective:** To compare adolescent cannabis use between 2002 and 2006 and to investigate links to the frequency of evenings spent out with friends.

**Design and setting:** National representative samples of 31 mostly European and North American countries and regions as part of the Health Behaviour in School-Aged Children (HBSC) study were analyzed by means of  $\chi^2$ -tests, t-test, and logistic regression analysis.

**Participants:** 93,297 15-year old students.

**Outcome measure:** Cannabis use in the last 12 month in relation to the mean frequency of evenings out with friends per week.

**Results:** A decrease in the prevalence of cannabis use was found in most of the 31 participating countries and regions. The most marked decreases were found in England, Portugal, Switzerland, Slovenia, and Canada. Increases occurred only in Estonia, Lithuania, Malta, and among Russian girls. The more frequently adolescents reported going out with their friends in the evenings the more likely they were to report using cannabis. This link was consistent for boys and girls and across survey years. Across countries, changes in the mean frequency of evenings spent out were strongly linked to changes in cannabis use prevalence.

**Conclusion:** The findings are consistent with the hypothesis that by going out less frequently in the evenings with friends adolescents had fewer opportunities to obtain and use cannabis. Future research is needed to learn more about the nature of evenings out with friends and related factors that might explain changes in adolescent cannabis use over time.

### Keywords

Cannabis use; adolescents; time trends; cross-cultural study

Cannabis use among young people is a serious public health concern. Recent evidence suggests that cannabis use may contribute to motor vehicle and other injuries, chronic inflammatory and cancerous changes in the airways, and depression and other mental health problems, particularly among susceptible youth<sup>1</sup>. In addition, longitudinal studies have demonstrated that cannabis use has detrimental effects on school-related variables, such as academic performance and completion of schooling<sup>2, 3</sup>, thus, impeding adolescent development and future career opportunities.

One factor that may help explain why adolescents engage in cannabis use is association with cannabis-using peers, which can increase the availability of cannabis and socially influence use<sup>4, 5</sup>. Ennett et al.<sup>6</sup> concluded that both social interactions and environmental factors are important determinants of adolescent cannabis use. Taken together, it appears that the likelihood of cannabis use increases if in their various social and physical environments adolescents are exposed to cannabis use or have the opportunity to use it<sup>7</sup>. For example, the frequency of evenings out with friends was repeatedly shown to be a particularly strong predictor of adolescent cannabis use in various countries<sup>8, 9</sup>, probably because it reflects both opportunities to use and social influences on use.

The prevalence of adolescent cannabis use increased from 1991 to 1997 in the United States<sup>10</sup> and from 1995 to 2003 in most European countries<sup>11, 12</sup>. Recent evidence suggests, however, that there has been a decrease in cannabis prevalence from 2002 to 2006 in some Western European countries and the US<sup>10, 12, 13</sup>. Researchers expected, in contrast, an increase in cannabis use particularly in the central and eastern European regions due to the rapid development of market-orientated economies in these countries and fact that cannabis use among adolescents is generally higher in highly developed countries<sup>5</sup>. Unfortunately, a broad international overview of cannabis use trends and possible explanations across countries is lacking.

The aim of the present study is to compare the prevalence of 12-month cannabis use between 2002 and 2006 among 15-year olds from 31 European and North American countries and regions. In line with the exposure opportunity framework<sup>7</sup> and recent evidence<sup>8, 9</sup>, we expect that across countries cannabis use is related to the number of evenings out with friends.

In addition, we aim to determine if changes in cannabis use from 2002 to 2006 are associated with changes in evenings out with friends. There are two possible explanations for such a relationship. One possibility could be that the association between evenings out and cannabis use was greater in 2002 than in 2006. This would mean that adolescents went out in 2006 to the same extent but they are less at risk to take cannabis when they go out. However, previous research among adolescents in the US demonstrated that the frequency of evenings out per week was linked to cannabis use to the same extent in each survey year from 1976 to 1997<sup>8</sup>. Therefore, the alternate possibility, all other things being equal, is that changes in cannabis use occur in parallel with changes in the mean frequency of evenings out with friends rather than changes in the associations of these two variables over time.

## Methods

### Study design

The data used for the analyses were part of the “Health Behaviour in School-Aged Children (HBSC)” study<sup>14, 15</sup>. HBSC surveys have been conducted every four years since 1983 in several (mostly European) countries and regions, in collaboration with the World Health Organization (WHO). In the 2001-2002 study, 35 countries and regions took part and in the 2005-2006 study, there were 41 countries. One of the 35 countries participating in 2002 one did not participate in 2006; another did not ask questions on cannabis use in 2006. Two other

countries had a high number of missing values (i.e., more than 20%) on the variables used in this study. Consequently, 31 countries could be included for cross-survey comparisons.

Data were collected on the basis of anonymous self-report questionnaires distributed in the classroom. Students were selected using a clustered sampling design, where either single classes or entire grades from schools served as the sampling units. In each country, every effort was taken to ensure that the international research protocol was followed to ensure consistency in survey instruments, data collection and processing procedures. At the student participant level, known response rates varied from 64.5% to 91.2% across countries<sup>16</sup>. Each participating country obtained approval to conduct the survey from the relevant ethics review board or equivalent regulatory institution. Further information about the survey procedures can be found in Roberts et al. (2007) and online at [www.hbsc.org](http://www.hbsc.org).

## Measures

The questionnaire was developed by an interdisciplinary research group from the participating countries. Under supervision of the national research teams, a translation/back translation procedure was used to guarantee language equivalence (Roberts et al., 2007).

**Cannabis use**—Prevalence was assessed by the question “Have you ever taken cannabis (joint, shit, grass, marijuana, hashish) in the last 12 months?” Answer categories ranging from ‘never’ to ‘40 times or more’ were recoded zero for no use and one for use for one or more times.

**Frequency of evenings spent out with friends**—The question was “How many evenings per week do you usually spend out with your friends?” The values of the answer categories ranged from zero to seven evenings a week.

## Analytic Strategy

Adolescents who did not indicate their cannabis use or the number of evenings spent out (5.6% in total) were excluded from the analyses. The final sample consisted of 93,297 15-year olds (52.3% girls; see Table 1 for a detailed overview of sample sizes according to gender, country, and survey year).

To determine statistical significance of changes across the survey years in each country,  $\chi^2$ -tests were used to compare cannabis use prevalence reported in 2006 compared to 2002 and t-tests were used to compare the mean frequency of evenings out in 2006 compared to 2002. To assess the link between evenings out with friends and cannabis use, multiple logistic regression analysis were conducted in which cannabis use was the dependent variable and evenings out, survey year, and the interaction of the two variables were the independent variables. The interaction was included to investigate whether the link between evenings out and cannabis use changed over the survey years. To investigate whether changes in cannabis use occurred in parallel with changes in the average number of evenings out with friends, the change scores of both variables across the survey years in each country were correlated and plotted.

Due to known gender differences in cannabis use<sup>11, 14</sup>, all analyses were conducted for boys and girls separately. The sampling units in the present study were classes or schools and not individuals. In such a cluster sampling, standard errors are usually smaller than in simple random sampling (i.e. participants are more similar to each other since they are in the same school class in which individuals influence each other). Smaller standard errors artificially enhance test power<sup>17</sup>. To counteract the potential enhancement in test power, the sample was down-weighted before conducting statistical analysis. Roberts et al.<sup>18</sup> suggested a down-weighting factor of .0833 corresponding to a sampling design effect of 1.2.

## Results

As shown in Table 2, the prevalence of cannabis use ranged considerably from country to country in both 2002 and 2006. Prevalence was higher among boys than girls in every country, in some cases by a factor of 2 or even 3, but in some cases only marginally. Between 2002 and 2006, there was a decrease in the prevalence of cannabis use in almost all participating countries and regions among both boys and girls. The most marked decreases were found in countries with initially high prevalence such as England, Switzerland, Canada, and the United States, but decreases greater than 10% also occurred in Portugal, Slovenia, and Czech Republic. Despite decreases, Canada, Switzerland, and the US remain the countries with the highest prevalence of cannabis use among 15-year olds. Declines occurred among both boys and girls, but the magnitude of these changes varied from country to country and in 2006 the prevalence among girls was higher than among boys in Wales and within one percentage point in Spain and Scotland. Despite declines over time in most countries, more than one out of five boys and one out of six girls had taken cannabis in the last 12 months in over one third of the participating countries. In four countries (i.e., Estonia, Lithuania, Russia, and Malta), increases were found and in each case these increases were particularly pronounced among girls.

The average number of evenings out with friends ranged considerably in both survey years, from about one evening per week among Portuguese girls to over 3 evenings per week among boys and girls in the Ukraine, Russia, Scotland, Estonia, and Spain. From 2002 to 2006, there was a decrease in the mean number of evenings out with friends per week in a majority of participating countries (Table 3). The most marked decreases were found in United States, Israel, the Netherlands, Finland, Germany, and Slovenia. However, increases were found in Malta, FYRO Macedonia, Austria, Portugal, Estonia, and other countries.

Table 4 provides the results of logistic regression analyses to determine cannabis prevalence based on survey year, the frequency of evenings out with friends per week, and the interaction of both variables. For countries in which cannabis use decreased from 2002 to 2006, the declines were significant among both boys and girls. Among countries in which cannabis use increased from 2002 to 2006, average increases occurred among both boys and girls, but this was only significant among girls, i.e., the higher number of evenings out with friends the higher the likelihood of having taken cannabis in the last 12 months. In both decreasing and increasing countries, prevalence among both boys and girls was associated with evenings out with friends. Interactions between survey year and evenings out were not significant, i.e., in both survey years, the relationship between evenings out and cannabis use was similar.

To investigate whether changes in cannabis use occur in parallel with changes in the evenings out with friends, the change scores of both variables across the survey years in each country were plotted in Graph 1. Countries with a high decrease in cannabis use prevalence, such as England (ENG), are located at the bottom of the graph and those with a high increase, such as Estonia (EE), are located at the top. Countries with a high decrease in the mean frequency of evenings out, such as the United States (US), are located toward the left side of the graphs and those with a high increase, such as Malta (MT), are toward the right side of the graphs. In both scatter plots, the general tendency emerges that countries which had a high (positive or negative) difference across the survey years in the mean frequency of evenings out with friends also had a high (positive or negative) difference in cannabis use prevalence. This was confirmed by the regression line in Graph 1 and by the high correlation of both difference scores across countries ( $N = 31$ ;  $r_{\text{boys}} = .43$ ,  $p < .05$ ;  $r_{\text{girls}} = .53$ ,  $p < .01$ ). The differences in prevalence and evenings out with friends had a shared variance ( $R^2$ ) of 19 and 28 percent among boys and girls, respectively. There was, however, one exception. Among boys in Portugal, a significant decrease in cannabis use occurred while there was a slight increase in the mean frequency of evenings spent out. Excluding Portuguese boys resulted in an even higher correlation in the

difference scores ( $N = 30$ ;  $r_{\text{boys}} = .54$ ,  $p < .01$ ) and an increased in the shared variance to 29 percent.

## Discussion

Cannabis use in the past 12 months among 15-year olds was found to vary considerably across the 31 countries, ranging from less than 5% in Sweden and FYRO Macedonia to over 30% in Canada, Switzerland, and the United States. However, the findings indicate a decrease in prevalence among both boys and girls from 2002 to 2006 in most of the 31 participating countries and regions. Only in Lithuania, Malta, and among Russian girls, where 2002 prevalence was relatively low, and in Estonia, where 2002 prevalence relatively high, were increases in cannabis use found.

These results are consistent with evidence that adolescent cannabis use has declined since the late 1990's in the US<sup>10</sup> and that the increase in prevalence reported in most Western European countries until 2002/03<sup>11, 12</sup> may have reversed<sup>12, 13</sup>. The data also indicated that in some, mostly Eastern European, countries there was an increase in prevalence, which might be due to the rapid development of market-orientated economies in these countries<sup>5</sup>.

Based on the exposure opportunity framework<sup>7</sup>, we explored the possibility that the changes in cannabis use over the survey years were associated with changes in the frequency of evenings spent out with friends. The results showed significant associations between the number of evenings adolescents go out with their friends and the likelihood of using cannabis in the last 12 month<sup>8, 9</sup>. This was the case whether prevalence decreased or increased from 2002 to 2006. Frequently going out in the evenings with friends might expose adolescents to cannabis use in their social and physical environments and provide them with opportunity and social influence to use cannabis.

Consistent with previous research among adolescents in the US<sup>8</sup>, the link between evenings out and cannabis use was found to be the same in both survey years and independent of whether cannabis use prevalence decreased or increased in a country. Therefore, we investigated whether, across the participating 31 countries, changes in cannabis use occurred in parallel with changes in the mean frequency of evenings out. With the exception of boys in Portugal, the results were very consistent, demonstrating that, at the country level, the change in cannabis use over time occurred in parallel with changes in the mean frequency of evenings out with friends (i.e., decrease or increase). Correlations of greater than .5 and shared variance of nearly one third, as found in these analyses, are large effect sizes that are exceptional in social science<sup>19</sup>. Taken together, the results indicate that in most countries adolescents went out less frequently in 2006 than in 2002 and fewer adolescent took cannabis. However, in both survey years, those who went out with friends more frequently were also more likely to use cannabis.

Besides a decline in going out in the evenings there might be a variety of other reasons for the decline in cannabis use in most of the participating countries, including prevention efforts, availability, the vicissitude of adolescent preferences, or variation in substance use secular trends. It is even less clear what might have caused the general decrease in evenings out with friends. It could be the case that new forms of communication, such as e-mail, mobile phones, and Short Message Service (SMS), may have partly replace face-to-face contacts, leading to fewer social contacts in the evenings. It is further possible that the high cannabis use prevalence in 2002 increased parent and public concerns about substance use which might in turn have made evenings out with friends and cannabis use less easy or less attractive for adolescents. Consistent with this argument is the result that the decrease in cannabis use was particular prominent among countries with high prevalence in 2002 and an increase was found among countries with low prevalence in 2002. However, it could also be that the the decline in

adolescent cannabis use (and other drugs) during this period lead to a reduction in evenings out with friends. As always in cross-sectional research, it could also be that a third variable not measured in this study was associated with the trends in both cannabis use and evenings out with friends.

Another limitation of the study is that we had no information about where and in what contexts adolescents spent their evenings out with friends, what they are doing during this time, the extent to which evenings out were unsupervised, and which aspects of peer sociability might possibly be responsible for the decrease in the mean frequency of evenings spent out with friends or with cannabis use. Future research is needed to investigate the precise nature of the effects of evenings spent with friends on cannabis use within the context of other factors that could also be responsible for changes in cannabis use over time.

## Conclusion

This overview of trends in 31 countries and regions provides policy makers with important information on the prevalence and amount of change in cannabis use among boys and girls in their countries. To conclude, a general decrease in cannabis use prevalence from 2002 to 2006 among 15-year olds was found in most of the 31 participating countries and regions. This decrease occurred mostly in parallel with a decrease in the mean number of evenings out with friends, consistent with the exposure opportunity framework. There is a great need to learn more about the nature of evenings out with friends and related factors that might explain changes in adolescent cannabis use over time. Because there are many benefits to adolescent social interaction, it is important to determine how best to foster it without unduly increasing exposure opportunities for cannabis use.

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**Table 1**

Final sample sizes according to country, gender, and survey year

|   | Boys   |        | Girls  |        |
|---|--------|--------|--------|--------|
|   | 2002   | 2006   | 2002   | 2006   |
| Austria (AT)                                  | 583    | 629    | 585    | 763    |
| Flemish-speaking Belgium (BE-FI)              | 973    | 774    | 967    | 739    |
| French-speaking Belgium (BE-Fr)               | 618    | 683    | 726    | 649    |
| Canada (CA)                                   | 475    | 1,013  | 636    | 1,134  |
| Czech Republic (CZ)                           | 783    | 792    | 846    | 789    |
| Denmark (DK)                                  | 634    | 662    | 689    | 712    |
| England (ENG)                                 | 733    | 651    | 903    | 666    |
| Estonia (EE)                                  | 615    | 766    | 645    | 754    |
| Finland (FI)                                  | 811    | 665    | 841    | 779    |
| France (FR)                                   | 1,240  | 1,086  | 1,262  | 1,034  |
| Germany (DE)                                  | 770    | 1,139  | 837    | 1,181  |
| Greece (GR)                                   | 620    | 583    | 675    | 705    |
| Hungary (HU)                                  | 489    | 488    | 801    | 600    |
| Ireland (IE)                                  | 327    | 780    | 557    | 679    |
| Israel (IL)                                   | 627    | 633    | 777    | 1,097  |
| Italy (IT)                                    | 535    | 615    | 675    | 618    |
| Lithuania (LT)                                | 967    | 869    | 918    | 895    |
| Former Yugoslav Republic Of<br>Macedonia (MK) | 652    | 914    | 709    | 925    |
| Malta (MT)                                    | 273    | 173    | 314    | 159    |
| The Netherlands (NL)                          | 612    | 650    | 621    | 669    |
| Poland (PL)                                   | 1,001  | 1,062  | 1,094  | 1,178  |
| Portugal (PT)                                 | 356    | 562    | 395    | 732    |
| Russia (RU)                                   | 978    | 1,048  | 1,239  | 1,318  |
| Scotland (SCT)                                | 559    | 1,011  | 561    | 1,025  |
| Slovenia (SI)                                 | 523    | 724    | 502    | 754    |
| Spain (ES)                                    | 786    | 1,417  | 885    | 1,480  |
| Sweden (SE)                                   | 591    | 702    | 593    | 730    |
| Switzerland (CH)                              | 720    | 663    | 687    | 711    |
| Ukraine (UA)                                  | 698    | 724    | 854    | 917    |
| United States (US)                            | 665    | 624    | 801    | 615    |
| Wales (WLS)                                   | 571    | 635    | 539    | 634    |
| Total   | 20,785 | 23,737 | 23,134 | 25,641 |



**Table 2**  
Prevalence of cannabis use in the last 12 month in 2002 and 2006 (in percent) according to gender and country

|                   | Boys |      |          | Girls |      |          |
|-------------------|------|------|----------|-------|------|----------|
|                   | 2002 | 2006 | Change   | 2002  | 2006 | Change   |
| Canada            | 43.2 | 30.2 | -13.0*** | 37.4  | 27.6 | -9.8***  |
| Switzerland       | 39.8 | 26.8 | -13.0*** | 35.4  | 23.1 | -12.3*** |
| United States     | 36.3 | 24.4 | -11.9*** | 26.2  | 24.2 | -2.0     |
| Estonia           | 18.1 | 24.0 | +5.9**   | 10.8  | 14.3 | +3.5*    |
| Spain             | 31.6 | 23.9 | -7.7***  | 29.9  | 23.9 | -6.0**   |
| France            | 31.0 | 23.0 | -8.0***  | 23.6  | 20.7 | -2.9     |
| Wales             | 26.3 | 22.7 | -3.6     | 24.3  | 24.4 | +0.1     |
| Scotland          | 31.3 | 22.5 | -8.8***  | 29.6  | 21.4 | -8.2***  |
| The Netherlands   | 24.3 | 21.6 | -2.7     | 19.3  | 18.0 | -1.3     |
| England           | 37.4 | 21.2 | -16.2*** | 32.4  | 18.6 | -13.8*** |
| Italy             | 23.5 | 20.7 | -2.8     | 16.7  | 15.1 | -1.6     |
| Ireland           | 25.6 | 20.6 | -5.0     | 14.4  | 15.4 | +1.0     |
| Czech Republic    | 30.9 | 20.3 | -10.6*** | 23.1  | 18.3 | -4.8*    |
| Belgium (French)  | 28.5 | 20.2 | -8.3**   | 19.8  | 14.8 | -5.0*    |
| Belgium (Flemish) | 22.8 | 19.2 | -3.6     | 20.7  | 12.7 | -8.0***  |
| Poland            | 20.7 | 18.5 | -2.2     | 9.4   | 8.8  | -0.6     |
| Slovenia          | 27.1 | 15.1 | -12.0*** | 21.5  | 10.0 | -11.5*** |
| Denmark           | 24.1 | 14.3 | -9.8***  | 18.8  | 9.4  | -9.4***  |
| Ukraine           | 21.0 | 14.1 | -6.9***  | 7.7   | 5.2  | -2.5*    |
| Germany           | 22.3 | 12.8 | -9.5***  | 14.9  | 10.2 | -4.7**   |
| Russia            | 13.3 | 12.8 | -0.5     | 5.1   | 8.6  | +3.5**   |
| Lithuania         | 8.7  | 10.6 | +1.9     | 3.0   | 6.0  | +3.0**   |
| Austria           | 12.3 | 10.3 | -2.0     | 10.5  | 8.3  | -2.2     |
| Hungary           | 15.2 | 10.3 | -4.9*    | 9.7   | 7.8  | -1.9     |
| Portugal          | 24.9 | 9.8  | -15.1*** | 14.5  | 5.9  | -8.6***  |
| Malta             | 7.0  | 9.7  | +2.7     | 4.2   | 9.8  | +5.6*    |

|                | Boys |      |        | Girls |      |        |
|----------------|------|------|--------|-------|------|--------|
|                | 2002 | 2006 | Change | 2002  | 2006 | Change |
| Finland        | 7.8  | 7.0  | -0.8   | 6.8   | 4.3  | -2.5*  |
| Israel         | 9.0  | 6.8  | -2.2   | 4.2   | 2.2  | -2.0*  |
| Greece         | 6.4  | 4.1  | -2.3   | 2.1   | 1.9  | -0.2   |
| Sweden         | 4.9  | 3.9  | -1.0   | 4.5   | 2.5  | -2.0   |
| FYRO Macedonia | 3.9  | 3.7  | -0.2   | 2.2   | 2.2  | 0.0    |

Note. Countries ordered by prevalence in 2006 among boys;  $\chi^2$ -tests (df=1):

\* p < .05

\*\* p < .01

\*\*\* p < .001

**Table 3**  
Mean number of evenings spent out with friends per week and t-values according to gender and country

|                   | Boys |      |          | Girls |      |          |
|-------------------|------|------|----------|-------|------|----------|
|                   | 2002 | 2006 | Change   | 2002  | 2006 | Change   |
| Ukraine           | 4.21 | 4.15 | -0.06    | 3.33  | 3.06 | +0.33**  |
| Russia            | 4.13 | 3.85 | -0.27*   | 3.76  | 3.78 | +0.02    |
| Scotland          | 4.14 | 3.77 | -0.37*** | 3.62  | 3.21 | -0.42*** |
| Estonia           | 3.42 | 3.56 | +0.14    | 3.01  | 3.26 | +0.25*   |
| Spain             | 3.61 | 3.56 | -0.05    | 3.27  | 3.14 | -0.13    |
| Wales             | 3.44 | 3.48 | +0.03    | 2.99  | 2.94 | -0.05    |
| FYRO Macedonia    | 3.21 | 3.43 | +0.22*   | 2.30  | 2.75 | +0.46*** |
| Ireland           | 3.10 | 3.41 | +0.31    | 2.93  | 2.91 | -0.02    |
| Finland           | 3.84 | 3.40 | -0.44*** | 3.51  | 3.01 | -0.50*** |
| England           | 3.49 | 3.11 | -0.38**  | 2.90  | 2.69 | -0.22    |
| Canada            | 3.29 | 2.94 | -0.35**  | 2.85  | 2.68 | -0.17    |
| Lithuania         | 2.87 | 2.87 | .00      | 2.41  | 2.49 | +0.08    |
| Israel            | 3.29 | 2.72 | -0.57*** | 2.77  | 2.16 | -0.60*** |
| Greece            | 2.52 | 2.69 | +0.17    | 1.96  | 2.06 | +0.10    |
| Italy             | 2.61 | 2.69 | +0.07    | 1.90  | 2.09 | +0.19    |
| Poland            | 2.50 | 2.64 | +0.14    | 2.19  | 2.33 | +0.14    |
| Malta             | 1.90 | 2.61 | +0.71*** | 1.63  | 2.43 | +0.80*** |
| Belgium (Flemish) | 2.56 | 2.57 | +0.01    | 2.17  | 2.18 | +0.01    |
| Sweden            | 2.76 | 2.57 | -0.19    | 2.29  | 2.17 | -0.12    |
| United States     | 3.14 | 2.49 | -0.64*** | 2.80  | 2.13 | -0.67*** |
| Denmark           | 2.60 | 2.41 | -0.19    | 2.56  | 2.33 | -0.24*   |
| The Netherlands   | 2.98 | 2.39 | -0.59*** | 2.64  | 2.29 | -0.34**  |
| Czech Republic    | 2.75 | 2.38 | -0.36*   | 2.65  | 2.32 | -0.33**  |
| Germany           | 2.80 | 2.37 | -0.43*** | 2.73  | 2.35 | -0.38*** |
| Slovenia          | 2.48 | 2.15 | -0.34**  | 2.39  | 1.74 | -0.65*** |
| France            | 1.80 | 1.93 | +0.13    | 1.28  | 1.33 | +0.05    |

|                  | Boys |      |         | Girls |      |         |
|------------------|------|------|---------|-------|------|---------|
|                  | 2002 | 2006 | Change  | 2002  | 2006 | Change  |
| Austria          | 1.57 | 1.85 | + .28** | 1.60  | 1.60 | .00     |
| Switzerland      | 2.15 | 1.73 | -.42*** | 1.93  | 1.56 | -.37*** |
| Belgium (French) | 1.74 | 1.67 | -.07    | 1.39  | 1.28 | -.11    |
| Hungary          | 1.81 | 1.66 | -.15    | 1.65  | 1.58 | -.07    |
| Portugal         | 1.33 | 1.56 | +.23    | 0.92  | 1.02 | +.10    |

Note. Countries ordered by mean frequency in 2006 among boys; t-tests:

\* p < .05

\*\* p < .01

\*\*\* p < .001

**Table 4**

Odds Ratios (95% confidence intervals) of multiple logistic regression analyses to determine the association between the prevalence of cannabis use, survey year, and evenings out with friends separately for boys and girls and for countries with decreasing or increasing cannabis use

|  | Boys                   | Girls                  |
|--|------------------------|------------------------|
| Decreasing countries                   |                        |                        |
| Survey year <sup>1</sup>               | 0.66 *** (0.59 - 0.73) | 0.71 *** (0.64 - 0.79) |
| Evenings out with friends <sup>2</sup> | 1.27 *** (1.27 - 1.29) | 1.32 *** (1.24 - 1.39) |
| Interaction survey * evenings          | 1.01 (0.99 - 1.04)     | 1.01 (0.98 - 1.03)     |
| R <sup>2</sup> <sub>(Nagelkerke)</sub> | 7.9%                   | 8.2%                   |
| Increasing countries <sup>3</sup>      |                        |                        |
| Survey year <sup>1</sup>               | 1.42 (0.98 - 2.10)     | 1.80* (1.13 - 2.86)    |
| Evenings out with friends <sup>2</sup> | 1.32 *** (1.24 - 1.39) | 1.33 *** (1.23 - 1.44) |
| Interaction survey year * evenings out | 0.97 (0.90 - 1.05)     | 0.98 (0.89 - 1.08)     |
| R <sup>2</sup> <sub>(Nagelkerke)</sub> | 7.5%                   | 7.4%                   |

Note.

<sup>1</sup> coding: 2002 = 0, 2006 = 1

<sup>2</sup> answer range from 0 to 7 evenings per week

<sup>3</sup> Estonia, Lithuania, Malta, and Russia

\* p<.05

\*\*\* p<.001