

Decrease in Adolescent Cannabis Use From 2002 to 2006 and Links to Evenings Out With Friends in 31 European and North American Countries and Regions

Emmanuel Kuntsche, PhD; Bruce Simons-Morton, EdD; Anastasios Fotiou, MA; Tom ter Bogt, PhD; Anna Kokkevi, PhD; for the Health Behavior in School-Aged Children Study

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

Design: The Health Behavior in School-Aged Children study, an international study carried out in collaboration with the World Health Organization/Europe.

Setting: A total of 31 mostly European and North American countries and regions.

Participants: A total of 93 297 students aged 15 years.

Outcome Measure: Cannabis use in the last 12 months 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 En-

gland, 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.

Conclusions: 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.

Arch Pediatr Adolesc Med. 2009;163(2):119-125

Author Affiliations: Research Department, Swiss Institute for the Prevention of Alcohol and Drug Problems, Lausanne, Switzerland (Dr Kuntsche); Prevention Research Branch, National Institute of Child Health and Human Development, National Institutes of Health, Bethesda, Maryland (Dr Simons-Morton); University Mental Health Research Institute, Athens, Greece (Mr Fotiou and Dr Kokkevi); Netherlands Institute of Mental Health and Addiction, Utrecht University, Utrecht, the Netherlands (Dr ter Bogt); Department of Psychiatry, Athens University Medical School, Athens, Greece (Dr Kokkevi).

Group Information: The Health Behavior in School-Aged Children Study Investigators are listed at the end of this article.

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 in susceptible youth.¹ In addition, longitudinal studies have demonstrated that cannabis use has detrimental effects on school-related variables such as academic performance and completion of schooling,^{2,3} 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.^{4,5} Ennett et al⁶ 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.⁷ 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,^{8,9} probably because it reflects both opportunities to use and social influences on use.

*For editorial comment
see page 183*

The prevalence of adolescent cannabis use increased from 1991 to 1997 in the United States¹⁰ and from 1995 to 2003 in most European countries.^{11,12} Recent evidence suggests, however, that there has been a decrease in cannabis prevalence from 2002 to 2006 in some Western European countries and in the

Table 1. Final Sample Sizes According to Country, Sex, and Survey Year

Country	Sample Size, No.			
	Boys		Girls	
	2002	2006	2002	2006
Austria	583	629	585	763
Flemish-speaking Belgium	973	774	967	739
French-speaking Belgium	618	683	726	649
Canada	475	1013	636	1134
Czech Republic	783	792	846	789
Denmark	634	662	689	712
England	733	651	903	666
Estonia	615	766	645	754
Finland	811	665	841	779
France	1240	1086	1262	1034
Germany	770	1139	837	1181
Greece	620	583	675	705
Hungary	489	488	801	600
Ireland	327	780	557	679
Israel	627	633	777	1097
Italy	535	615	675	618
Lithuania	967	869	918	895
Former Yugoslav Republic of Macedonia	652	914	709	925
Malta	273	173	314	159
The Netherlands	612	650	621	669
Poland	1001	1062	1094	1178
Portugal	356	562	395	732
Russia	978	1048	1239	1318
Scotland	559	1011	561	1025
Slovenia	523	724	502	754
Spain	786	1417	885	1480
Sweden	591	702	593	730
Switzerland	720	663	687	711
Ukraine	698	724	854	917
United States	665	624	801	615
Wales	571	635	539	634
Total	20 785	23 737	23 134	25 641

United States.^{10,12,13} 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 the fact that cannabis use among adolescents is generally higher in highly developed countries.⁵ Unfortunately, a broad international overview of cannabis use trends and possible explanations across countries is lacking.

The aim of this study is to compare the prevalence of 12-month cannabis use between 2002 and 2006 in 15-year-old individuals from 31 European and North American countries and regions. In line with the exposure opportunity framework⁷ and recent evidence,^{8,9} we expect that cannabis use across countries is related to the number of evenings out with friends.

In addition, we aim to determine if the changes in cannabis use from 2002 to 2006 are associated with changes in the number of evenings out with friends. There are 2 possible explanations for such a relationship. One is 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

were less at risk to take cannabis when they went out. However, previous research among adolescents in the United States 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 1997.⁸ The alternate possibility, all other things being equal, is that changes in cannabis use occur parallel to changes in the mean frequency of evenings out with friends rather than changes in the association of these 2 variables over time.

METHODS

STUDY DESIGN

The data used for the analyses were part of the Health Behaviour in School-Aged Children (HBSC) study.^{14,15} The HBSC surveys have been conducted every 4 years since 1983/1984 in several (mostly European) countries and regions in collaboration with the World Health Organization. A total of 35 countries participated in the 2001/2002 data collection wave and 41 countries participated 2005/2006 survey. One of the 35 countries participating in 2002 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 (ie, more than 20%) for the variables used in this study. Consequently, 31 countries were 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 in which 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.¹⁶ 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 al¹⁷ and online at www.lbhc.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.¹⁷ The prevalence of cannabis use 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 as 0 for no use and 1 for use 1 or more times. To assess the frequency of evenings spent out with friends, the question asked was, "How many evenings per week do you usually spend out with your friends?" The values of the answer categories ranged from 0 to 7 evenings per week.

STATISTICAL ANALYSIS

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

To determine the statistical significance of changes across the survey years in each country, χ^2 tests were used to compare cannabis use prevalence reported in 2006 compared with 2002 and

Table 2. Prevalence of Cannabis Use Over 12 Months in 2002 and 2006 by Sex and Country

Country ^a	Percentage					
	Boys			Girls		
	2002	2006	Change	2002	2006	Change
Canada	43.2	30.2	-13.0 ^b	37.4	27.6	-9.8 ^b
Switzerland	39.8	26.8	-13.0 ^b	35.4	23.1	-12.3 ^b
United States	36.3	24.4	-11.9 ^b	26.2	24.2	-2.0
Estonia	18.1	24.0	+5.9 ^d	10.8	14.3	+3.5 ^c
Spain	31.6	23.9	-7.7 ^b	29.9	23.9	-6.0 ^d
France	31.0	23.0	-8.0 ^b	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 ^b	29.6	21.4	-8.2 ^b
The Netherlands	24.3	21.6	-2.7	19.3	18.0	-1.3
England	37.4	21.2	-16.2 ^b	32.4	18.6	-13.8 ^b
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 ^b	23.1	18.3	-4.8 ^c
French-speaking Belgium	28.5	20.2	-8.3 ^d	19.8	14.8	-5.0 ^c
Flemish-speaking Belgium	22.8	19.2	-3.6	20.7	12.7	-8.0 ^b
Poland	20.7	18.5	-2.2	9.4	8.8	-0.6
Slovenia	27.1	15.1	-12.0 ^b	21.5	10.0	-11.5 ^b
Denmark	24.1	14.3	-9.8 ^b	18.8	9.4	-9.4 ^b
Ukraine	21.0	14.1	-6.9 ^b	7.7	5.2	-2.5 ^c
Germany	22.3	12.8	-9.5 ^b	14.9	10.2	-4.7 ^d
Russia	13.3	12.8	-0.5	5.1	8.6	+3.5 ^d
Lithuania	8.7	10.6	+1.9	3.0	6.0	+3.0 ^d
Austria	12.3	10.3	-2.0	10.5	8.3	-2.2
Hungary	15.2	10.3	-4.9 ^c	9.7	7.8	-1.9
Portugal	24.9	9.8	-15.1 ^b	14.5	5.9	-8.6 ^b
Malta	7.0	9.7	+2.7	4.2	9.8	+5.6 ^c
Finland	7.8	7.0	-0.8	6.8	4.3	-2.5 ^c
Israel	9.0	6.8	-2.2	4.2	2.2	-2.0 ^c
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
Former Yugoslav Republic of Macedonia	3.9	3.7	-0.2	2.2	2.2	0.0

^aCountries are in order by prevalence in 2006 among boys; χ^2 tests.

^b $P < .001$.

^c $P < .05$.

^d $P < .01$.

t tests were used to compare the mean frequency of evenings out in 2006 with that of 2002. To assess the link between evenings out with friends and cannabis use, multiple logistic regression analyses were conducted in which cannabis use was the dependent variable and evenings out, survey year, and the interaction of the 2 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 in scores of both variables across the survey years in each country were correlated and plotted.

Owing to known differences in cannabis use between sexes,^{11,14} all analyses were conducted for boys and girls separately. The sampling units in the present study were classes or schools, not individuals. In such a cluster sampling, standard errors are usually smaller than in simple random sampling (ie, participants are more similar to each other because they are in the same school class in which individuals influence each other). Smaller standard errors artificially enhance test power.¹⁸ To counteract the potential enhancement in test power, the sample was down-weighted before conducting statistical analysis. Roberts et al¹⁹ suggested a down-weighting factor of 0.0833 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 the Czech Republic. Despite decreases, Canada, Switzerland, and the United States remain the countries with the highest prevalence of cannabis use among 15-year-old adolescents. 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 1 percentage point in Spain and Scotland. Despite declines over time in most countries, more than 1 of

Table 3. Mean Number of Evenings Spent Out With Friends per Week and *t* Values by Sex and Country

Country ^a	Evenings Spent Out With Friends, No.					
	Boys			Girls		
	2002	2006	Change	2002	2006	Change
Ukraine	4.21	4.15	-.06	3.33	3.66	+.33 ^c
Russia	4.13	3.85	-.27 ^b	3.76	3.78	+.02
Scotland	4.14	3.77	-.37 ^c	3.62	3.21	-.42 ^d
Estonia	3.42	3.56	+.14	3.01	3.26	+.25 ^b
Spain	3.61	3.56	-.05	3.27	3.14	-.13
Wales	3.44	3.48	+.03	2.99	2.94	-.05
Former Yugoslav Republic of Macedonia	3.21	3.43	+.22 ^b	2.30	2.75	+.46 ^d
Ireland	3.10	3.41	+.31	2.93	2.91	-.02
Finland	3.84	3.40	-.44 ^d	3.51	3.01	-.50 ^d
England	3.49	3.11	-.38 ^c	2.90	2.69	-.22
Canada	3.29	2.94	-.35 ^c	2.85	2.68	-.17
Lithuania	2.87	2.87	.00	2.41	2.49	+.08
Israel	3.29	2.72	-.57 ^d	2.77	2.16	-.60 ^d
Greece	2.52	2.69	+.17	1.96	2.06	+.10
Italy	2.61	2.69	+.07	1.90	2.09	+.19
Poland	2.50	2.64	+.14	2.19	2.33	+.14
Malta	1.90	2.61	+.71 ^d	1.63	2.43	+.80 ^d
Flemish-speaking Belgium	2.56	2.57	+.01	2.17	2.18	+.01
Sweden	2.76	2.57	-.19	2.29	2.17	-.12
United States	3.14	2.49	-.64 ^d	2.80	2.13	-.67 ^d
Denmark	2.60	2.41	-.19	2.56	2.33	-.24 ^b
The Netherlands	2.98	2.39	-.59 ^d	2.64	2.29	-.34 ^c
Czech Republic	2.75	2.38	-.36 ^b	2.65	2.32	-.33 ^c
Germany	2.80	2.37	-.43 ^d	2.73	2.35	-.38 ^d
Slovenia	2.48	2.15	-.34 ^c	2.39	1.74	-.65 ^d
France	1.80	1.93	+.13	1.28	1.33	+.05
Austria	1.57	1.85	+.28 ^c	1.60	1.60	.00
Switzerland	2.15	1.73	-.42 ^d	1.93	1.56	-.37 ^d
French-speaking Belgium	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

^aCountries ordered by mean frequency in 2006 among boys; *t* tests.

^b*P* < .05.

^c*P* < .01.

^d*P* < .001.

5 boys and 1 of 6 girls had taken cannabis in the last 12 months in more than one-third of the participating countries. In 4 countries (ie, 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 1 evening per week among Portuguese girls to more than 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 most participating countries (**Table 3**). The most marked decreases were found in the United States, Israel, the Netherlands, Finland, Germany, and Slovenia. However, increases were found in Malta, the Former Yugoslav Republic of 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 between 2002 and 2006, the declines were significant among both boys and

girls. In countries in which cannabis use increased between 2002 and 2006, average increases occurred among both boys and girls, but this was only significant for girls, ie, the higher number of evenings out with friends, the higher the likelihood of having taken cannabis in the last 12 months. In both countries with a decrease and those with an increase, prevalence among both boys and girls was associated with evenings out with friends. Interactions between survey year and evenings out were not significant, ie, in both survey years the relationship between evenings out and cannabis use was similar.

To investigate whether changes in cannabis use occur parallel to changes in the number of evenings out with friends, the change in scores of both variables across the survey years in each country were plotted in the **Figure**. Countries with a large decrease in prevalence of cannabis use, such as England, are located at the bottom of the graph and those with a large increase, such as Estonia, are located at the top. Countries with a large decrease in the mean frequency of evenings out, such as the United States, are located toward the left side of the graphs and those with a large increase, such as Malta, are toward the right side of the graphs. In both scatter plots, the gen-

Table 4. Association Between the Prevalence of Cannabis Use, Survey Year, and Evenings Out With Friends for Boys and Girls and for Countries With Decreasing or Increasing Cannabis Use

	OR (95% CI)	
	Boys	Girls
Decreasing		
Survey year ^a	0.66 (0.59-0.73) ^e	0.71 (0.64-0.79) ^e
Evenings out with friends ^b	1.27 (1.27-1.29) ^e	1.32 (1.24-1.39) ^e
Interaction of survey year with evenings out ^c	1.01 (0.99-1.04)	1.01 (0.98-1.03)
$R^2_{\text{(Nagelkerke)}}$, %	7.9	8.2
Increasing ^d		
Survey year ^a	1.42 (0.98-2.10)	1.80 (1.13-2.86) ^c
Evenings out with friends ^b	1.32 (1.24-1.39) ^e	1.33 (1.23-1.44) ^e
Interaction of survey year with evenings out ^c	0.97 (0.90-1.05)	0.98 (0.89-1.08)
$R^2_{\text{(Nagelkerke)}}$, %	7.5	7.4

Abbreviations: CI, confidence interval; OR, odds ratio.

^aCoding: 0, 2002; 1, 2006.

^bAnswers range from 0 to 7 evenings per week.

^c $P < .05$.

^dEstonia, Lithuania, Malta, and Russia.

^e $P < .001$.

eral tendency emerges that countries that had a large (positive or negative) difference across the survey years in the mean frequency of evenings out with friends also had a large (positive or negative) difference in cannabis use prevalence. This was confirmed by the regression line in the Figure and by the high correlation of both difference scores across countries ($n=31$; $r_{\text{boys}}=0.43$, $P < .05$; $r_{\text{girls}}=.53$, $P < .01$). The differences in prevalence and evenings out with friends had a shared variance (R^2) of 19% and 28% 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 ($n=30$; $r_{\text{boys}}=0.54$; $P < .01$) and an increase in the shared variance to 29%.

COMMENT

Cannabis use in the 12 months surveyed among 15-year-old adolescents was found to vary considerably across the 31 countries, ranging from less than 5% in Sweden and the Former Yugoslav Republic of Macedonia to more than 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 the prevalence in 2002 was relatively low, and in Estonia, where the prevalence in 2002 was relatively high, were increases in cannabis use found.

These results are consistent with evidence that adolescent cannabis use has declined since the late 1990s in the United States¹⁰ and that the increase in prevalence reported in most Western European countries until 2002 and 2003^{11,12} may have reversed.^{12,13} The data also indicated that in some, mostly Eastern European, countries there was an increase in prevalence that might be due to

the rapid development of market-oriented economies in these countries.⁵

Based on the exposure opportunity framework,⁷ 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 over 12 months.^{8,9} 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 United States,⁸ 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 parallel to 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 parallel to changes in the mean frequency of evenings out with friends (ie, decrease or increase). Correlations of greater than 0.5 and shared variance of nearly one-third, as found in these analyses, are large effect sizes that are exceptional in social science.²⁰ Taken together, the results indicate that in most countries, adolescents went out less frequently in 2006 than in 2002 and fewer adolescents 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, includ-

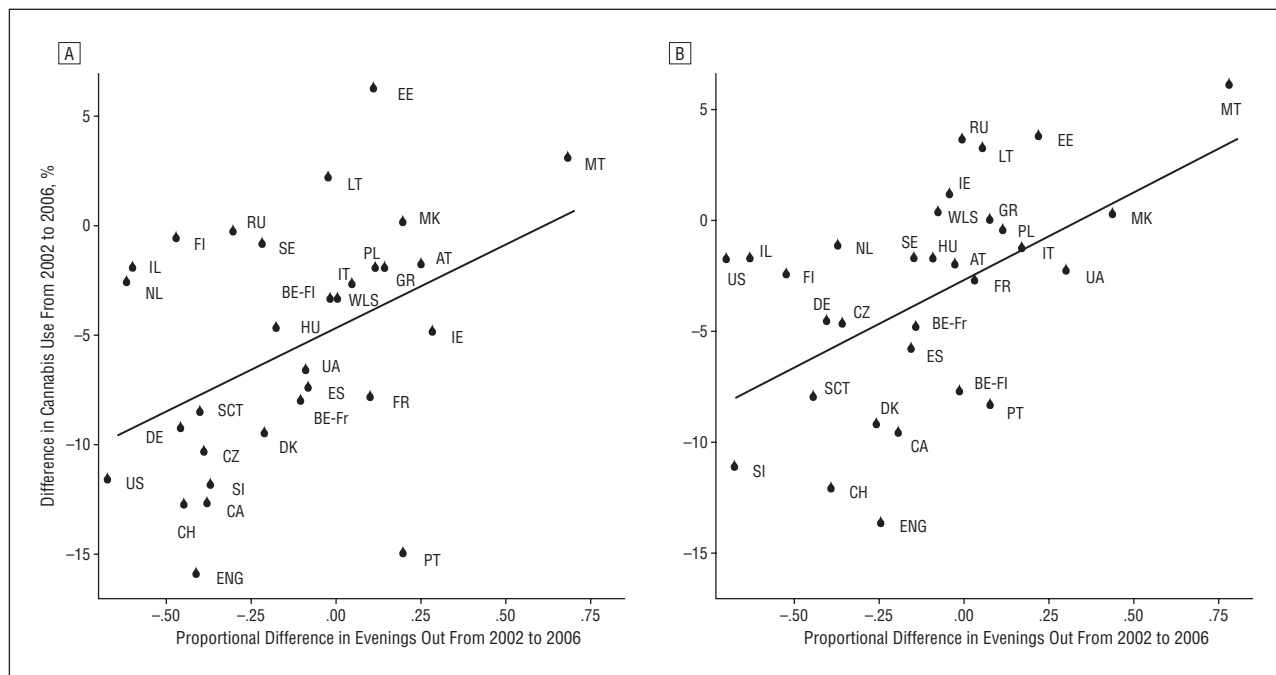


Figure. Differences in the prevalence of cannabis use from 2002 to 2006 vs the difference in the mean frequency of evenings spent out for boys (A; $R^2=0.19$) and girls (B; $R^2=0.28$) in 31 participating countries. BE-FI indicates Flemish-speaking Belgium; BE-Fr, French-speaking Belgium; CA, Canada; CZ, Czech Republic; DK, Denmark; ENG, England; EE, Estonia; FI, Finland; FR, France; DE, Germany; GR, Greece; HU, Hungary; IE, Ireland; IL, Israel; IT, Italy; LT, Lithuania; MK, Former Yugoslav Republic of Macedonia; MT, Malta; NL, the Netherlands; PL, Poland; PT, Portugal; RU, Russia; SCT, Scotland; SI, Slovenia; ES, Spain; CH, Switzerland; UA, Ukraine; US, United States; WLS, Wales.

ing prevention efforts, availability, the vicissitude of adolescent preferences, or variation in secular substance use 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, may have partly replaced face-to-face contacts, leading to fewer social contacts in the evenings. It is further possible that the high prevalence of cannabis use in 2002 increased parental 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 particularly prominent in countries with high prevalence in 2002 and an increase was found in countries with low prevalence in 2002. However, it could also be that 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.

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-old adolescents 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.

Accepted for Publication: June 24, 2008.

Correspondence: Emmanuel Kuntsche, PhD, Research Department, Swiss Institute for the Prevention of Alcohol and Drug Problems, PO Box 870, 1001 Lausanne, Switzerland (ekuntsche@sfa-isp.ch).

Author Contributions: *Study concept and design:* Kuntsche, Simons-Morton, and Kokkevi. *Acquisition of data:* Kuntsche and Kokkevi. *Analysis and interpretation of data:* Kuntsche, Simons-Morton, Fotiou, ter Bogt, and Kokkevi. *Drafting of the manuscript:* Kuntsche and Simons-Morton. *Critical revision of the manuscript for important intellectual content:* Kuntsche, Simons-Morton, Fotiou, ter Bogt, and Kokkevi. *Statistical analysis:* Kuntsche. *Obtained funding:* Simons-Morton and Kokkevi. *Administrative, technical, and material support:* Fotiou. *Study supervision:* Kokkevi.

Health Behavior in School-Aged Children Study Investigators: Candace Currie (international coordinator, 2001/2002 and 2005/2006 survey), University of Edinburgh, Scotland; and Oddrun Samdal (data bank manager), University of Bergen, Norway; the following principal investigators provided data for the present study: Wolfgang Dür, Austria; Carine Vereecken, Flemish-speaking Belgium; Danielle Piette, French-speaking Belgium; William Boyce, Canada; Ladislav Csémy, Czech Republic; Pernille Due, Denmark; Antony Morgan, England; Katrin Aasvee, Estonia; Jorma Tynjälä, Finland; Emmanuelle Godeau, France; Ulrike Ravens-Sieberer, Germany; Anna Kokkevi, Greece; Ágnes Németh, Hungary; Saoirse Nic Gabhainn, Ireland; Yossi Harel, Israel; Franco Cavallo, Italy; Apolinaras Zaborskis, Lithuania; Lina Kostorova Unkowska, Former Yugoslav Republic Of Macedonia; Marianne Massa, Malta; Wilma Vollebergh, the Netherlands; Joanna Mazur, Poland; Margarida Gaspar De Matos, Portugal; Alexander Komkov, Russia; Candace Currie, Scotland; Helena Jericek, Slovenia; Carmen Moreno Rodriguez, Spain; Ulla Marklund, Sweden; Emmanuel Kuntsche, Switzerland; Olga Balakireva, Ukraine; Ron Iannotti, United States; and Chris Roberts, Wales.

Funding/Support: This study was supported by the Swiss Institute for the Prevention of Alcohol and Drug Problems and grant 04.001776/2.24.02.-64 from the Swiss Federal Office of Public Health (Dr Kuntsche).

Additional Contributions: The authors would like to thank Anne Hublet, PhD, Saoirse Nic Gabhainn, PhD, and Robert Griebler, MA, for their comments on a previous version of the paper.

REFERENCES

- Kalant H. Adverse effects of cannabis on health: an update of the literature since 1996. *Prog Neuropsychopharmacol Biol Psychiatry*. 2004;28(5):849-863.
- Fergusson DM, Horwood LJ, Beauvais AL. Cannabis and educational achievement. *Addiction*. 2003;98(12):1681-1692.
- Lynskey MT, Coffey C, Degenhardt L, Carlin JB, Patton GC. A longitudinal study of the effects of adolescent cannabis use on high school completion. *Addiction*. 2003;98(5):685-692.
- Kuntsche E, Delgrande Jordan M. Adolescent alcohol and cannabis use in relation to peer and school factors: results of multilevel analyses. *Drug Alcohol Depend*. 2006;84(2):167-174.
- ter Bogt T, Schmid H, Nic Gabhainn S, Fotiou A, Vollebergh W. Economic and cultural correlates of cannabis use among mid-adolescents in 31 countries. *Addiction*. 2006;101(2):241-251.
- Ennett ST, Flewelling RL, Lindrooth RC, Norton EC. School and neighborhood characteristics associated with school rates of alcohol, cigarette, and marijuana Use. *J Health Soc Behav*. 1997;38(1):55-71.
- Van Etten ML, Neumark YD, Anthony JC. Initial opportunity to use marijuana and the transition to first use: United States, 1979 to 1994. *Drug Alcohol Depend*. 1997;49(1):1-7.
- Brown TN, Schulenberg J, Bachman JG, O'Malley PM, Johnston LD. Are risk and protective factors for substance use consistent across historical time? national data from the high school classes of 1976 through 1997. *Prev Sci*. 2001;2(1):29-43.
- Kokkevi AE, Arapaki AA, Richardson C, Florescu S, Kuzman M, Stergar E. Further investigation of psychological and environmental correlates of substance use in adolescence in six European countries. *Drug Alcohol Depend*. 2007;88(2-3):308-312.
- Johnston LD, O'Malley PM, Bachman JG, Schulenberg JE. *Monitoring the Future: National Results on Adolescent Drug Use: Overview of Key Findings, 2006*. Bethesda, MD: National Institute on Drug Abuse; 2007. National Institutes of Health publication 07-6202.
- Hibell B, Andersson B, Bjarnason T, et al. *The ESPAD Report 2003: Alcohol and Other Drug Use Among Students in 35 European Countries*. Stockholm, Sweden: The Swedish Council for Information on Alcohol and Other Drugs, Council of Europe, Co-operation Group to Combat Drug Abuse and Illicit Trafficking in Drugs (Pompidou Group); 2004.
- Schmid H, Delgrande Jordan M, Kuntsche E, Kuendig H, Annaheim B. *Der Konsum psychoaktiver Substanzen von Schülerinnen und Schülern in der Schweiz: ausgewählte Ergebnisse einer Studie, durchgeführt unter der Schirmherrschaft der Weltgesundheitsorganisation (WHO) [Consumption of psychoactive substances among school students in Switzerland: selected results of a study conducted under the aegis of the World Health Organization (WHO)]*. Lausanne, Switzerland: Swiss Institute for the Prevention of Alcohol and Drug Problems; 2008. Research Report 42, revised and updated version.
- European Monitoring Center of Drugs and Drug Addiction (EMCDDA). *Annual Report 2007: the State of the Drugs Problem in Europe*. Lisbon, Portugal: EMCDDA; 2007.
- Currie C, Roberts C, Morgan A, et al, eds. *Young People's Health in Context: Health Behaviour in School-Aged Children (HBSC) Study: International Report From the 2001/2002 Survey*. Copenhagen, Denmark: World Health Organization Regional Office for Europe; 2004.
- Currie C, Godeau E, Nic Gabhainn S, et al, eds. *Inequalities in Young People's Health: HBSC International Report From the 2005/06 Survey*. Copenhagen, Denmark: World Health Organization Regional Office for Europe; 2008.
- Kuntsche E, Pickett W, Overpeck M, Craig W, Boyce WF, Gaspar de Matos M. Television viewing and forms of bullying among adolescents from eight countries. *J Adolesc Health*. 2006;39(6):908-915.
- Roberts C, Currie C, Samdal O, Currie D, Smith R, Maes L. Measuring the health and health behaviours of adolescents through cross-national survey research: recent developments in the Health Behaviour in School-aged Children (HBSC) study. *J Public Health*. 2007;15:179-186.
- Kish L. *Survey Sampling*. New York, NY, London, England, Sydney, Australia: John Wiley & Sons Inc; 1965.
- Roberts C, Tynjälä J, Currie D, King M. Annex 1: methods. In: Currie C, Roberts C, Morgan A, et al, eds. *Young People's Health in Context: Health Behaviour in School-Aged Children (HBSC) Study: International Report From the 2001/2002 Survey*. Copenhagen, Denmark: World Health Organization Regional Office for Europe; 2004:217-227.
- Cohen J. *Statistical Power Analysis for the Behavioral Sciences*. 2nd ed. Hillsdale, NJ: Lawrence Erlbaum Associates Inc Publishers; 1988.

“As a teenager you are at the last stage in your life when you will be happy to hear that the phone is for you.”

—Fran Lebowitz, *Social Studies*