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Author(s)	Nic Gabhainn, Saoirse
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Dr Emmanuelle Godeau<sup>\*,\*\*,\*</sup>, Mrs. Céline Vignes<sup>\*,\*\*,\*</sup>, M. Tom ter Bogt<sup>\*\*\*\*,\*</sup>, Dr Saoirse Nic Gabhainn<sup>\*\*\*\*,\*</sup>, Dr Félix Navarro<sup>\*,\*\*,\*</sup>

\* Service médical du rectorat de Toulouse, 12, rue Mondran, F-31400 Toulouse. E-mail: emmanuelle.godeau@toulouse.fr

\*\* INSERM U558, Toulouse, France

\*\*\* Association pour le développement de HBSC, Toulouse, France

\*\*\*\* Trimbos Institute (Netherlands Institute of Mental Health and Addiction), Utrecht, Netherlands

\*\*\*\*\* Department of Health Promotion, National University of Ireland, Galway, Ireland

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# Cannabis use by 15-year-old schoolchildren

Data from the HBSC/WHO international survey  
in 32 western countries

## Résumé

**Consommation de cannabis par les élèves de 15 ans. Données issues de l'enquête internationale HBSC/OMS dans 32 pays occidentaux**

Dans les 32 pays occidentaux ayant participé à l'enquête *Health behaviour in school-aged children* (HBSC-2002), menée en milieu scolaire par autoquestionnaire anonyme auprès de 45 848 élèves, de l'ordre de 20 % des jeunes de 15 ans déclarent avoir déjà pris du cannabis, qui est ainsi le troisième psychotrope consommé derrière l'alcool et le tabac. Partout, les garçons consomment plus que les filles. La France se situe parmi les dix pays ayant les plus forts taux à 15 ans (29,8 %). La majorité des usagers enquêtés appartient aux groupes de l'usage expérimental (1-2 fois dans l'année précédente : 7,9 % des jeunes) ou moyen (3-39 fois: 7,3 %) ; ces groupes étant moins représentés en Europe de l'Est, du Nord et du Sud, au profit de la discontinuation (ont essayé, mais pas de consommation dans l'année précédente). L'usage fréquent est plus rare (2,7 %). Après ajustement sur le niveau économique et l'âge, être un garçon, fumer du tabac (surtout fréquemment), boire de l'alcool (surtout fréquemment) et avoir été ivre (surtout plus de deux fois) augmentent significativement et indépendamment la probabilité d'avoir fumé du cannabis au moins une fois dans la vie. Enfin, il existe un lien entre consommation quotidienne de tabac et d'alcool, ivresses fréquentes et passage d'un usage expérimental à un usage plus fréquent. Ainsi, chez les jeunes, les consommations de psychotropes sont rarement isolées, et il semble exister des sous-groupes plus particulièrement à risque qui méritent toute l'attention de la recherche et la prévention.

## Mots-clés

Adolescent – Cannabis – Substance psychoactive – Enquête épidémiologique – Comparaison internationale.

## Summary

In the 32 western countries that participated in the Health Behaviour in School-aged Children (HBSC-2002) survey conducted in schools by means of an anonymous self-administered questionnaire among 45,848 schoolchildren, about 20% of 15-year-olds declared that they had already used cannabis, which is consequently the third most frequently consumed psychoactive substance after alcohol and tobacco. Boys are heavier consumers than girls in every country. France is one of the ten countries with the highest cannabis use rates among 15-year-olds (29.8%). The majority of users surveyed belonged to groups of experimental use (once or twice during the previous year: 7.9% of children) or moderate use (3-39 times: 7.3%); these groups were less frequently represented in Eastern, Northern and Southern Europe, in favour of "discontinuation" (have tried cannabis, but no cannabis use during the previous year). Frequent use is rarer (2.7%). After adjustment for economic level and age, being a boy, smoking tobacco (especially frequently), drinking alcohol (especially frequently) and having been drunk (especially more than twice) significantly and independently increased the probability of having smoked cannabis at least once during the subject's life. Finally, a correlation was observed between daily tobacco and alcohol consumption, frequent drunkenness and passage from experimental use to more frequent use. Psychoactive substance use is therefore rarely isolated among young people, and certain subgroups appear to be at greater risk and therefore warrant further research and prevention.

## Key words

Adolescent – Cannabis – Psychoactive substance – Epidemiological survey – International comparison.

Cannabis has become, over just a few decades, the third leading psychoactive substance used in the western world, behind tobacco and alcohol, despite the fact that it is illegal in the majority of countries considered. Globally, during the 1990s, cannabis use has grown in Europe, particularly among young people. This growth has continued in many countries, particularly in new Member States (1). Similar trends are observed in the USA with a downturn between 1970 and 1980, followed by an increase in the 1990s (2). However, this growth appears to be flattening off in the USA, United Kingdom and some countries with a high prevalence (1). The main comparable surveys conducted in France indicate a similar trend (3-6), as between the HBSC 1994 (7) and 1998 (8) surveys, lifetime cannabis use rates among 15-year-old French schoolchildren increased from 12.5% to 29.1% and remained stable at 29.8% in 2002 (9). Although the other illicit drugs are globally concerned by this increased consumption, their prevalence rates are much lower than those of cannabis, particularly among very young people.

Moderate cannabis use can therefore be considered to have become the norm for a majority of young people in the western world, which tends to reinforce social acceptability, consequently increasing its use. Some studies suggest that this type of moderate use may not necessarily have any harmful effects for the user, at least from a social point of view (10). This is not the case for frequent, early or intensive use, which is now generally accepted to be associated with a number of negative consequences in terms of health (somatic or mental) and behaviour (11-13). Several recent longitudinal studies also tend to show that cannabis could contribute to decompensation or emergence of psychiatric illness in predisposed subjects (14-19). Finally, there is also a risk of dependence, even among young cannabis users (20, 21), especially in those most susceptible to addictive substances (22).

The observation of variations of declared cannabis use by young people, both over time and between various countries, as well as the study of their association with the most frequently used psychotropic drugs clearly constitute central issues, particularly when setting up targeted prevention policies and evaluation of their impact. The data presented here are derived from the Health Behaviour in School-aged Children (HBSC) survey conducted every four years since 1982 by an international scientific network in partnership with the European regional office of the World Health Organization (WHO). Globally, this survey is designed to

more clearly describe the health and well-being of 11-, 13- and 15-year-old children, their health behaviours, their determinants, and their social framework, based on their own declarations. In 2002, 33 countries (inset 1) (23) participated in this survey, including France for the third consecutive time (9). It should be stressed that questions concerning the use of illicit substances were introduced into the HBSC survey for all countries (except for Norway) only in 2002, and were only posed to children of the 15-year age-group (mean age: 15 and a half years).

## Material and methods

The HBSC survey is conducted according to a common research protocol in all countries, especially in order to standardize the modalities of sampling and data collection (23). Random sampling was performed in each country by cluster sampling, in which the class (or the school, in the absence of a list of classes as the sampling database) was the primary sampling unit. Most countries also chose to perform stratification, essentially designed to improve the representativity of the sample.

The HBSC survey is based on a strictly anonymous self-administered questionnaire completed in the classroom during the 2001-2002 school year, under the responsibility of a trained investigator (depending on the country, usually teachers not responsible for the class, research workers, nurses or more rarely school doctors, etc.). The questions on which the analyses presented in this article were based concerned the frequencies of cannabis use during the previous year and in the subject's lifetime. They were completed by questions on current tobacco and alcohol use, as well as drunkenness at any time during the subject's life. The study population was composed of 45,848 schoolchildren of the 15-year-old age group, 21,589 boys and 24,259 girls; 4,446 schoolchildren did not answer all of the questions analysed in this article and were therefore excluded from this sample, together with 316 children who declared a cannabis use during the previous year that was greater than their lifetime consumption (*i.e.* a total of 9.4% of subjects were excluded).

This article reports bivariate analyses ( $\chi^2$  test of independence) performed with SPSS version 12.0 software and multivariate analyses performed with SAS version 8.2. software. Multivariate analyses consisted of two logistic regression models. The first model tried to determine factors associated with cannabis use in the subject's lifetime (dependent variable) and the second model tried to determine factors associated with moderate or frequent cannabis use (dependent variable) among cannabis users during the previous 12 months. The independent variables considered – common to the two models – are current tobacco and alcohol use and drunkenness at any time during the subject's life. The results of multivariate analysis were adjusted for gender, the subject's real age and the family's economic level (which is known to interfere with substance use, and which varies considerably between the various countries participating in the HBSC survey), evaluated by the FAS II scale (23).

### Inset 1. – The 33 countries of the HBSC 2002 survey

Germany, Austria, Belgium (Flemish and French-speaking), Canada, Croatia, Denmark, Spain, Estonia, Finland, France, Greece, Greenland, Holland, Hungary, Ireland, Israel, Italy, Latvia, Lithuania, Macedonia, Malta, Norway, Poland, Portugal, Czech Republic, United Kingdom (England, Scotland, Wales), Russia, Slovakia, Slovenia, Sweden, Switzerland, Ukraine, USA.

## Results

### *Frequency of cannabis use*

#### **In the subject's lifetime**

In 32 countries considered, an average of 18.5% of 15-year-old girls and 25.1% of 15-year-old boys ( $p < 0.001$ ) reported having used cannabis during their life. These rates mask very marked disparities between countries: about 3% of young people in Macedonia to almost 50% of young people in Switzerland and Canada. Although more than 40% of 15-year-olds in Switzerland, Canada and Greenland declared that they had already used cannabis, less than 10% of children reported cannabis use in Finland, Lithuania, Sweden, Israel, Greece, Macedonia or Malta. With 29.8% of self-reported cannabis users (33.8% of boys and 25.8% of girls;  $p < 0.001$ ), France is in eighth position, *i.e.* among the top third of countries with the highest reported cannabis use rates. In all countries (except Greenland), boys are more frequently users than girls, with more marked differences in Eastern and Southern Europe. For example, Greek boys reported cannabis use almost three times more frequently than Greek girls, while boys in Lithuania, Ukraine or Poland reported cannabis use more than twice as frequently as girls. In contrast, in Sweden, the United Kingdom or Finland, reported cannabis use rates were almost identical for boys and girls.

#### **Over the last 12 months**

Cannabis use rates for the previous year were obviously lower than lifetime rates, but were fairly similar (15.3% for girls and 20.8% for boys all countries combined;  $p < 0.001$ ), which is not surprising in view of the young age of this population. Differences between countries remained marked, ranging from 2.1% in Macedonia to 39.1% in Canada. The patterns of use observed for the subject's lifetime were also observed for the previous 12 months: in Canada, Switzerland, Greenland and the United Kingdom, more than 30% of school-aged children reported that they had used cannabis during this period. As for lifetime use, self-reported use for the previous 12 months was more frequent in boys and gender differences were more pronounced in Eastern and Southern Europe (except for Spain). In France, self-reported use for the previous 12 months was 27.0% (30.6% of boys and 23.5% of girls;  $p < 0.001$ ), placing France in seventh position.

### *Cannabis use groups*

To analyse the various modes of cannabis use and to describe cannabis users, schoolchildren who reported cannabis use at some time during their life were divided into four groups: the discontinuation group (those who had used cannabis sometime during their life, but not during the previous year); the experimentation group (those who had used cannabis once or twice during the previous year); the moderate use group (those who

used cannabis between three and 39 times during the previous year); and the frequent use group (those who used cannabis 40 or more times during the previous year). Note that this classification, used in the HBSC international report (24), is only valid for a population of very young users, the great majority of whom are still in the initiation phase, which is why subjects of the first group are not considered to be former users, as lifetime use and use during the previous year are situated too close together in this population. What we describe as "frequent use" can be considered to be simply "repeated use" in the case of older subjects (3, 25). Finally, this description, taking these limits into account, is obviously not valid for substances that are used more frequently, such as alcohol and tobacco.

Figure 1 shows the distribution of cannabis users according to their level of use in each country. Globally, moderate use is the most frequent mode (7.8% of all 15-year-old children, *i.e.* 35.9% of users), close to experimentation (7.4%, *i.e.* 34.3% of users), while discontinuation and frequent use were less frequent (3.7% and 2.7%, *i.e.* 17.1% and 12.7% of users, respectively). The distribution of use groups in France followed this same order, but with different proportions in favour of moderate use (moderate use: 44.0% of consumers, experimentation: 32.0%, frequent use: 14.8%, discontinuation: 9.2%). In the USA, Switzerland, Ireland, Canada, United Kingdom and Slovenia, more than 15% of users belonged to the frequent use group. In contrast, in Macedonia, Ukraine, Estonia, Russia, Lithuania and Latvia, this group represented less than 5% of all users. The frequent use group represented between 10% and 15% of users in eight countries, including France, and between 5% and 10% of users in another ten countries. In all countries (except Greenland and Italy), the frequent use group comprised more boys than girls.

### *Use of cannabis and other substances*

In order to characterize cannabis use by 15-year-old schoolchildren according to their levels of tobacco and alcohol use and the frequency of drunkenness (NB: the prevalences of use of these substances are shown in Table I), logistic regression was performed for the 32 countries. By taking into account the family's economic level and age, four factors significantly and independently increased the probability of having used cannabis at least once during the subject's life: being a boy; smoking, especially frequent smoking; drinking alcohol, especially frequent drinking; and having been drunk, especially more than twice (Table II).

### *Groups of cannabis and other substance users*

In order to more clearly define the difference between the group of experimental users and heavier users (moderate or frequent), another logistic regression was performed in the same countries

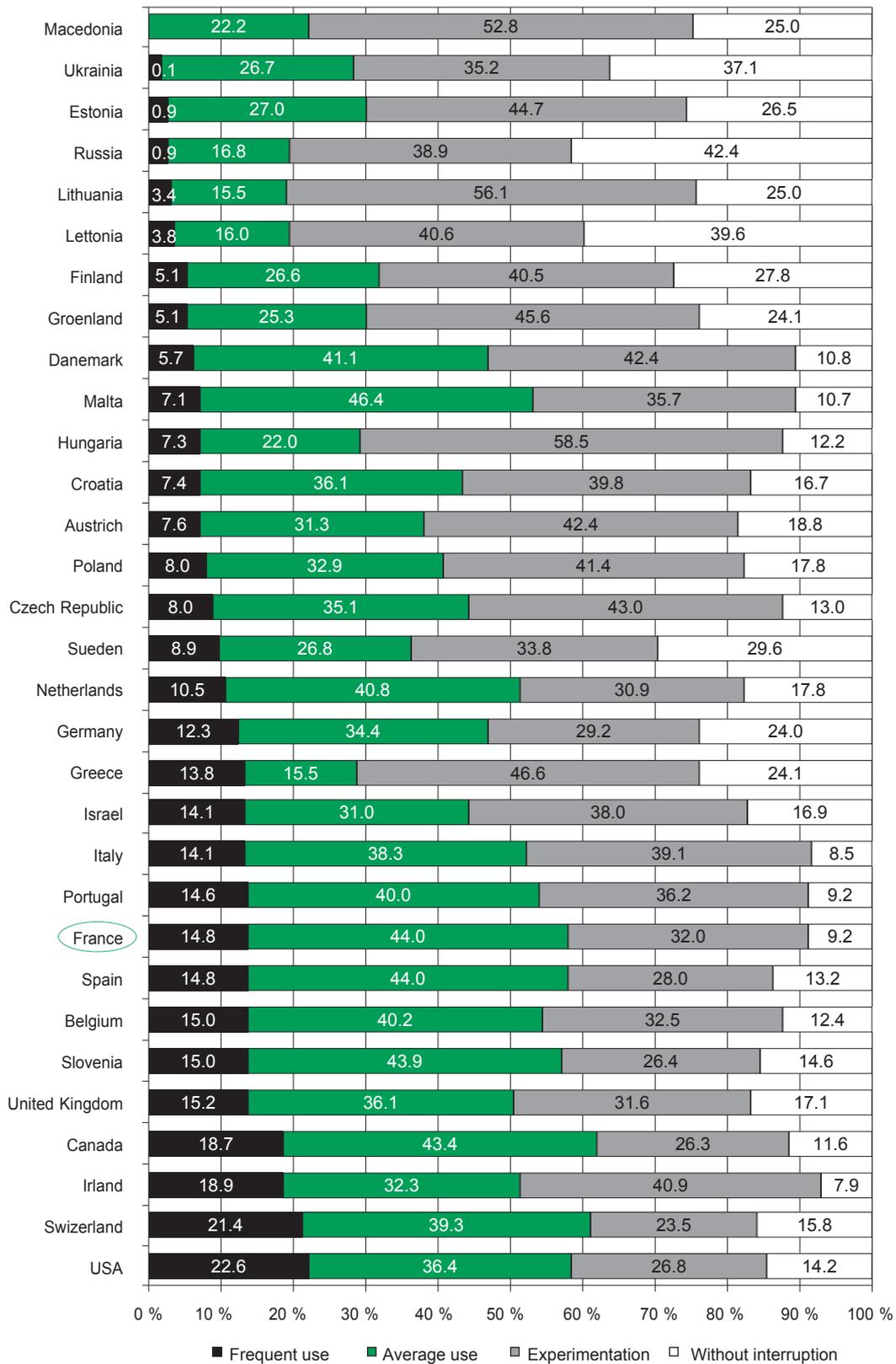


Figure 1. – Distribution of cannabis users according to their level of use by country (%).

to model the probability of being a moderate or frequent user among at least experimental cannabis users (8,016 schoolchildren: 3,320 experimental users and 4,696 moderate or frequent users). After adjustment for age and the family's economic level,

this probability was significantly and independently increased by male gender, weekly and especially daily tobacco use, weekly and especially daily alcohol use, and a history of being drunk at least twice (Table III).

**Table I:** Distribution of current tobacco and alcohol use and history of drunkenness (%)

Variables		All (%)	Boys (%)	Girls (%)
Current smoking	Never	69.7	69.8	69.5
	Occasional	7.5	7.0	8.0
	Weekly	6.0	5.7	6.2
	Daily	16.8	17.5	16.3
Current drinking	Never	39.9	35.8	43.5
	Occasional	32.1	30.6	33.3
	Weekly	25.7	29.9	22.2
	Daily	2.3	3.7	1.0
Lifetime drunkenness	Never	48.4	44.6	51.7
	Once	17.0	16.1	17.7
	Twice or more	34.6	39.3	30.6

**Table II:** Results of logistic regression of cannabis use in the subject's lifetime (yes vs no) adjusted for age and the family's economic level

Variable		Adjusted odds-ratio (95% confidence interval)	p
Gender	Girls	–	–
	Boys	1.3 (1.3-1.4)	< 0.001
Current smoking	Never	–	–
	Occasional	2.4 (2.2-2.6)	< 0.001
	Weekly	3.4 (3.1-3.8)	< 0.001
	Daily	6.6 (6.2-7.1)	< 0.001
Current drinking	Never	–	–
	Occasional	1.2 (1.1-1.3)	< 0.001
	Weekly	1.9 (1.8-2.1)	< 0.001
	Daily	2.6 (2.2-3.0)	< 0.001
History of drunkenness	Never	–	–
	Once	2.3 (2.2-2.6)	< 0.001
	Twice or more	4.5 (4.2-4.9)	< 0.001

**Table III:** Results of logistic regression of cannabis use groups (moderate or frequent vs experimentation) adjusted for age and the family's economic level

Variable		Adjusted odds-ratio (95% confidence interval)	p
Gender	Girls	–	–
	Boys	1.2 (1.1-1.3)	< 0.001
Current smoking	Never	–	–
	Occasional	1.1 (0.9-1.3)	< 0.001
	Weekly	1.5 (1.2-1.7)	ns
	Daily	2.5 (2.2-2.8)	< 0.001
Current drinking	Never	–	–
	Occasional	0.9 (0.8-1.1)	ns
	Weekly	1.2 (1.1-1.4)	0.009
	Daily	2.2 (1.7-2.9)	< 0.001
History of drunkenness	Never	–	–
	Once	1.0 (0.9-1.2)	ns
	Twice or more	1.5 (1.3-1.7)	< 0.001

ns : not significant at 1%.

## Discussion

In the Western countries that participated in the HBSC 2002 survey, with an average of one 15-year-old out of five reporting cannabis use, this study confirms that cannabis is the third leading psychoactive substance, after alcohol and tobacco. France does not escape this rule and is among the top ten countries with the highest rates of cannabis use among 15-year-old schoolchildren. These findings are in line with the main comparable surveys in Europe (26, 27) and especially in France (3-6) and the USA (2).

Data on cannabis use by young people in 1995, 1999 and 2003, derived from the ESPAD survey (27) illustrate the following phenomena: sometimes very marked increase of consumption; attenuation of differences between Western and Northern and Eastern European countries, and, finally, a reduction of the differences in prevalence between girls and boys, although they still remain marked. Note that, although prevalences can vary in the same country between HBSC 2002 survey data (24) and the most comparable ESPAD survey data (26), the global geographical patterns and orders of magnitudes are identical. These results suggest a process of homogenization of substance use behaviours in line with the North American and Western European model towards Eastern and Southern Europe, as previously observed for other psychoactive substances, such as heavy drinking (28). Cannabis use appears to occupy a larger place in so-called leisure activities in countries with a high socioeconomic level. In these countries, adolescents have more money to spend on cannabis and appear to have "learnt" cannabis use from older generations (29).

The majority of cannabis users in the countries of this survey belonged to experimental use (7.9%) or moderate use (7.3%) groups. These groups were less represented in Eastern, Northern and Southern Europe (with the marked exception of Spain), in favour of discontinuation. However, in view of the young age of the subjects interviewed, even low proportions of frequent users (globally 2.8%) should be taken into account, as there is a risk of harmful effects of this use for these young people, in terms of both health and behaviour, especially as the risk of dependence appears to be non-negligible among this type of cannabis user (20, 21), particularly when the first experimentation with cannabis occurred at a young age (30). Furthermore, the demonstration of a link between daily tobacco and alcohol use and frequent drunkenness and progression from experimental cannabis use to moderate or frequent use (the probability of progression is multiplied by more than two for smokers and drinkers and by 1.5 for drunkenness) should also be emphasized. It confirms that, in these young cannabis users, psychoactive substance use behaviours are rarely isolated, they participate in the ordinary experimentations of adolescence, are part of a broader risk-taking dynamic, and reflect, for the same adolescent, a global response mode to his/her distress ("self-treatment" use), or even a way to forget everything, with, in every case, the risk of installation of dependent behaviours for various substances.

All types of prevention policies can no longer ignore the data confirmed by this survey: throughout the Western world, cannabis use is on the increase, even among very young adolescents; it is no longer reserved to a minority and is considered by many adolescents to be equivalent to legal and socially accepted psychoactive substances (alcohol and tobacco). It is therefore particularly important for prevention programmes targeted to young people to integrate into their global approach the health and social risks associated with early and frequent cannabis use, but without totally stigmatizing experimentation: a middle road must be found between diabolization and banalization. Programmes taking these dimensions into account have been proposed in a number of European countries, especially in France (see the French government plan to fight illicit drugs, tobacco and alcohol, 2004-2008 (31)). The share granted to information of young people about the dangers of drugs, the involvement of parents and local community workers, and the development of school programmes based on social learning theories varies from country to country (1). The new version of the HBSC survey conducted in 2006 in most of these countries should be able to evaluate the impact of these programmes and campaigns, especially by determining the frequent user rates in the adolescent population. However, these quantitative analyses must also be completed by more qualitative studies in order to more clearly understand the substance use behaviours of school-age children and their significance in the various subgroups of users, to more accurately target prevention campaigns. Finally, surveys among school-age children should be completed by specific surveys among adolescents who have left school, as this population appears to be particularly susceptible to various types of high-risk behaviour, including excessive psychoactive substance use (32-35). We therefore need to be able to identify and access potential school "dropouts" while they are still at school, or even those who have dropped out of school and who, by definition, cannot be taken into account in school surveys or in school-based prevention programmes. It therefore appears essential to work in partnership with workers involved with these high-risk adolescents, without neglecting more general prevention messages for these populations. ■

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