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Secular trends in legal and illegal substance use among 16–20-year-old adolescents in Switzerland

Trends in substance use among Swiss adolescents

P. A. Michaud, A. Berchtold, A. Jeannin, I. Chossis, J. C. Suris

Institut universitaire de médecine sociale et préventive, Lausanne, Switzerland

Summary

Background: Data targeting trends in legal and illegal substance use by adolescents are scarce. Using the data from two similar large national surveys run in 1993 and 2002, this paper assesses secular trends in rates of substance use among 16–20-year-old Swiss adolescents.

Methods: Self-reported regular use of tobacco, alcohol misuse, regular cannabis use (≥1 occasion over last 30 days) and lifetime use of psychoactive medication, LSD, ecstasy, cocaine and heroine were assessed through identical questions using an anonymous self-administered questionnaire. 9268 (1993) and 7428 (2002) high school students and apprentices were included in the analyses.

Results: There is a higher proportion of regular smokers among apprentices than among students ($p < 0.001$). Between 1993 and 2002 the increase in regular tobacco consumption was significant among both female and male apprentices ($p < 0.001$) but not among students. Between 1993 and 2002 alcohol misuse significantly increased in all four groups ($p < 0.001$). It is more prevalent among males than among females ($p < 0.001$) and higher among apprentices than among students ($p < 0.001$). Regular use of cannabis has increased in the four groups ($p < 0.0001$). It is higher among males than among females ($p < 0.001$), while it is largely the same among students and apprentices. While the increase in ecstasy use is highly significant in all four groups ($p < 0.001$), the increase in LSD and cocaine use is significant among apprentices only ($p < 0.001$). Use of LSD, ecstasy and cocaine is more prevalent among males than among females (<0.001) and higher among apprentices than among students ($p < 0.001$).

Conclusion: The secular increase in psychoactive substance use among older Swiss adolescents calls for the implementation of effective strategies both from individual and public health viewpoints.

Key words: adolescent; substance use; substance misuse; secular trend; epidemiology; tobacco; alcohol; cannabis; LSD; ecstasy; cocaine

Introduction

In most industrialised countries the use of legal and illegal psychoactive substances by adolescents has become a major public health challenge. The use of individual substances has various short and long term implications. The major short term harmful effects of alcohol use relate to ingestion of large amounts of alcoholic beverages in a short period of time (usually referred to as binge drinking) as well as drunken driving. These behaviours, especially if they are recurrent, are usually defined as misuse (i.e. problematic use) and, in the short term, are linked to higher risk of injuries, self-harm and female sexual abuse [1]. In the long term, alcohol misuse may lead to alcohol abuse and/or dependence, especially among mentally vulnerable adolescents and those who start consuming at a lower age. Heavy use of cannabis is also linked to short term consequences such as attention deficit leading to school problems or traffic injuries [2, 3]. Although most adolescents do not face major health problems arising from cannabis consumption in the long term, heavy use may induce insidious psychoneurological disorders [4], mental health problems [5] and a higher risk of psychosis [6]. Finally, the use of other illegal drugs such as ecstasy and cocaine is related to short and long-term consequences including harmful somatic effects as well as negative psychosocial outcomes, including substance use disorders [7].

Few studies have been published on secular trends in substance use by young people [8]. Data from the US National Institute of Drug Abuse [9], the CDC Youth Risk Behavior Surveillance [10] and other sources [11] have shown an overall

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increase in use of legal and illegal drugs during the eighties ands nineties, but currently this trend seems to have peaked. Recently a similar rising trend has been identified in several European countries such as Greece, Belgium and the Czech Republic [12–14], use being apparently lower in Mediterranean countries [15–17]. Two papers have recently pointed out an increase in the use of legal and illegal substances in the Swiss population, both the general population [18] and young adolescents aged 11–15 years [19]. These papers do not however provide detailed data on trends in substance use among older adolescents, who represent an important target for preventive activities: it is often during this period of life that substance misuse, abuse and dependence originate. Using the data from two similar national surveys (the so called SMASH surveys: Swiss Multicenter Adolescent Survey on Health) run ten years apart in Switzerland among a representative sample of 16–20-year-old adolescents, the aim of this paper is to show trends in regular smoking, alcohol misuse and lifetime use of psychoactive medication and illegal substances. In Switzerland, from the age of 16, which marks the end of compulsory schooling, some two thirds of adolescents take up an apprenticeship, a dual training system in which they spend one day a week on theoretical studies in professional schools and the rest of the time do manual and office jobs. The SMASH surveys are run in high schools as well as professional centres and thus make it possible to assess differences in perceptions and behaviours between students and apprentices.

Earlier publications [20, 21] have shown marked differences in the rates of substance use between these two groups and also between females and males. The data have thus been broken down by gender and academic track.

Methods

In 1993 and 2002 two national surveys on the health and lifestyles of 16–20-year-old adolescents were conducted in Switzerland with the support of the Swiss Federal Office for Public Health. A detailed description of the methods used was published earlier [20, 22]. Both covered a representative sample of adolescents in post-compulsory schooling. On both occasions all 26 Swiss cantons were offered the opportunity to take part in the study for a moderate fee. The participating cantons (23 in 1993 and 19 in 2002) provided the investigators with a comprehensive list of schools and classes in the secondary, post-compulsory education system. On the basis of this aggregated list a random cluster sample of classes was drawn using a two stage cluster procedure.

The questionnaires (available on request in French, German and Italian) were on both occasions a self-administered anonymous form using closed, pre-coded items to provide self-reported information covering health determinants, perceived health status, health behaviour and health care utilisation. The questionnaires were first developed in French and then translated into German and Italian. The two surveys were conducted over the same four-month period (April–June) during school hours, by trained health professionals external to the school/training centre systems in the absence of the teachers. The rates of refusal were extremely low (<0.5 percent). The data set retained for the analyses was drawn from the respondents aged 16–20 years who had less than 20% non-responses and for whom full information was available regarding age, gender and track. On both occasions the survey protocol was reviewed by the Lausanne Faculty of Medicine Ethical Commission.

The formulation of questionnaire items assessing the use of substances was identical in 1993 and 2002. Subjects were asked whether they were currently non-smokers, ex-smokers, irregular or regular smokers. The current use of beer, wine and hard liquors was assessed using a six point scale from never to several times a day. In 2002, two new types of alcoholic beverages were added to the previous list, the so-called "alcopops" and cocktails. This paper focuses on alcohol misusers (i.e. problematic users) who were defined as those who had been drunk more than twice in their lives and had driven while drunk more than twice [23, 24]. Those whose frequency of alcohol use extended beyond once a day were also defined as misusers even if they had not reported driving while drunk. The lifetime use of medication was assessed in a dichotomised manner (yes/no). Regular use of cannabis was defined as having consumed it at least once over the previous 30 days. Since in the 1993 survey we did not have a figure for the use of cannabis over the previous 30 days, we computed as a proxy of this measure the percentages of those having consumed cannabis more than 10 times in their lives. The lifetime use of other illegal substances was also assessed. Illegal substances such as LSD, ecstasy and cocaine are referred to as synthetic substances (by opposition to cannabis and alcohol). As the rates of respondents reporting using any synthetic substances ≥1 times over the last 30 days were low, we abandoned the idea of measuring trends in current use of these drugs. The subjects reporting using any illegal substance were asked at what age they had done so for the first time.

Since the present contribution focuses on secular trends, we had to ensure that both samples were comparable. Although we had full information on the sampling design of the 2002 survey this was not the case for the 1993 survey. To avoid bias due to differences in the composition of the two samples, we relied on the techniques of data fusion and statistical matching [25] and replaced the 1993 observations with imputed data corresponding to what the 2002 subjects would have responded if they had been interviewed in 1993 rather than 2002. Six variables were selected which we considered might potentially bias the results, namely sex, academic track (high school versus apprenticeship), residence (rural versus urban), age (16–20), parental status (living together versus not), and socioeconomic status of parents (measured by the type of education the parents had received). This process led to the creation of 320 possible combinations of these factors, defining 320 different groups of subjects. The variables of interest were then independently matched for each group of subjects, applying the 1993 distribution to 2002 subjects. At the group level this procedure leaves the variables mean and variance unchanged[1]. The whole imputation process was

1 On the other hand, the variance of the mean is generally different between the original 1993 data and the imputed data, because the of subjects in each group is different in the two surveys. This difference has an impact on confidence intervals. For the same reason, the mean and variance of imputed variables computed at the whole sample level are also different from their 1993 counterparts.

repeated independently 100 times to obtain reliable results [26]. The results are presented by age and academic track. The statistical significance in rates of use between males and females and between apprentices and students are provided in the text. We have also computed to what extent the trends between these groups were different, that is, whether the slope of the increase was the same or not: these results are shown in Table 2. Bivariate analyses were performed using STATA(27) and p values are derived from chi square calculations for all the comparisons between 1993 and 2002. As far as continuous variables are concerned (i.e. age of first consumption), p values are obtained with Student-t-tests.

Results

Table 1 presents sociodemographic characteristics of the two samples which are comparable. Figure 1 shows the prevalence of current regular smoking, of alcohol misuse and current use of cannabis (use over previous 30 days). Apprentices tend to smoke in a much higher proportion than students ($p < 0.001$). Indeed, the increase in regular tobacco consumption is significant among both female and male apprentices ($p < 0.001$) but not among students. Moreover, between 1993 and 2002 the differences in rates of use between apprentices and students tend to increase (Table 2). Alcohol misuse is much

Table 1

Main characteristics of the two samples.

Survey	1993							2002						
	Apprentices		Students		Total			Apprentices		Students		Total		
Caracteristics	Girls	Boys	Girls	Boys	Girls	Boys	Total	Girls	Boys	Girls	Boys	Girls	Boys	Total
N=	(2164)	(3780)	(1829)	(1495)	(3993)	(5275)	(9268)	(2131)	(3183)	(1252)	(861)	(3384)	(4044)	(7428)
AGE	%	%	%	%	%	%	%	%	%	%	%	%	%	%
16	16.4	18.0	31.8	28.9	23.5	21.1	22.1	9.3	11.2	12.9	15.8	10.7	12.2	11.5
17	31.6	29.8	29.7	26.8	30.7	28.9	29.7	28.0	24.1	33.1	30.1	29.8	25.4	27.4
18	29.7	28.6	22.2	27.7	26.2	28.4	27.4	34.7	29.4	28.4	28.1	32.4	29.1	30.6
19 & 20	22.3	23.6	16.3	16.7	19.6	21.6	20.8	28.0	35.3	25.6	26.1	27.1	33.3	30.5
NATIONALITY														
Swiss	75.6	76.4	78.0	75.3	76.7	76.1	76.4	83.4	82.3	89.6	89.9	85.7	83.9	84.7
Other	24.4	23.6	22.0	24.7	23.3	23.9	23.6	16.6	17.7	10.4	10.1	14.3	16.1	15.3
RESIDENCE														
Urban	41.9	40.4	46.9	52.2	44.2	43.7	44.0	39.3	40.4	46.0	53.0	41.8	42.8	42.3
Rural	58.1	59.6	53.1	47.8	55.8	56.3	56.0	59.5	58.4	53.6	45.8	57.3	55.8	56.5
PARENTAL STATUS														
Live together	79.6	81.6	83.3	83.2	81.3	82.1	81.7	73.7	76.6	77.6	80.8	75.1	77.5	76.4
Separated/ divorced	15.6	14.1	13.4	13.5	14.6	13.9	14.2	21.2	18.9	16.5	15.3	19.4	18.2	18.8
Parent(s) deceased	4.8	4.3	3.3	3.3	4.1	4.0	4.1	4.6	4.1	5.8	3.6	5.1	4.0	4.5

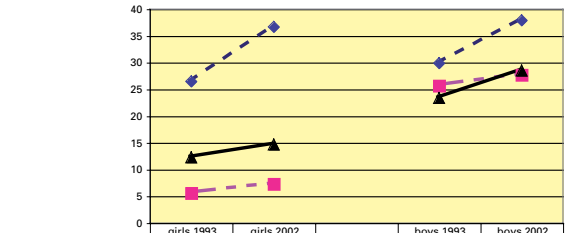
Table 2

Magnitude of differences in trends, by gender and by gender and academic track.

Substance		Trend		
		Male-Female	F apprent. – F student	M apprent. – M student
Alcohol misuse	Difference	.012 [–.001; .035]	.006 [–.016; .029]	–.025 [–.068; .019]
	p-value	.271	.591	.263
Tobacco	Difference	–.006 [–.035; .022]	.084 [.043; .125]	.076 [031; .120]
	p-value	.670	.000	.001
Cannabis	Difference	–.059 [–.089; –.028]	.025 [–.020; .071]	–.028 [–.079; .023]
	p-value	.000	.276	.279
Medicine	Difference	.005 [–.009; .018]	.003 [–.017; .023]	.017 [–.004; .038]
	p-value	.487	.760	.115
Ecstasy	Difference	.037 [.023; .051]	.027 [011; .044]	.063 [.042; .084]
	p-value	.000	.001	.000
LSD	Difference	.028 [.012; .045]	.011 [–.009; .031]	.034 [006; .061]
	p-value	.001	.263	.015
Cocaine	Difference	.028 [.015; .040]	.012 [–.003; .027]	.064 [.045; .083]
	p-value	.000	.108	.000
Heroin	Difference	–.008 [–.016; –.000]	.000 [–.009; .010]	–.002 [–.015; .010]
	p-value	.046	.940	.733

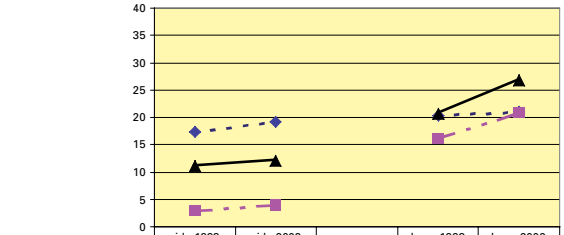
Figure 1

Prevalence of regular smoking, alcohol misuse and regular use of cannabis, by gender and academic track.



	girls 1993	girls 2002		boys 1993	boys 2002
smoking regularly	26.5	36.7		29.9	37.9
alcohol problematic	5.6	7.3		25.7	27.7
cannabis 30 days	12.3	14.7		23.4	28.5

APPRENTICES



	girls 1993	girls 2002		boys 1993	boys 2002
smoking regularly	17,4	19,2		20,4	21
alcohol problematic	2,9	3,9		16,2	20,9
cannabis 30 days	11	12,1		20,7	26,7

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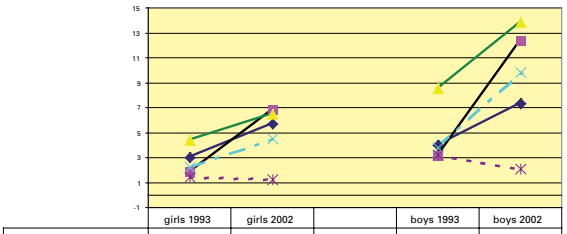
Figure 2

Prevalence of lifetime use of psychoactive medication, LSD, ecstasy and cocaine, by gender and academic track.



	girls 1993	girls 2002		boys 1993	boys 2002
medication lifetime	3	5,7		4	7,3
ecstasy lifetime	1,8	6,8		3,1	12,4
LSD lifetime	4,4	6,5		8,5	13,8
cocaïne lifetime	2,2	4,5		3,8	9,8
heroin lifetime	1,4	1,2		3,2	2,1

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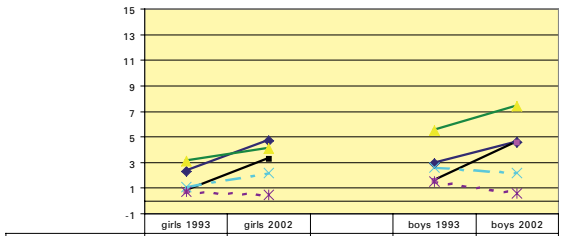

	girls 1993	girls 2002		boys 1993	boys 2002
medication lifetime	2,3	4,7		2,9	4,6
ecstasy lifetime	0,8	3,3		1,6	4,6
LSD lifetime	3,1	4,1		5,5	7,4
cocaïne lifetime	1,1	2,2		2,6	2,2
heroin lifetime	0,7	0,5		1,5	0,6

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more prevalent among males than among females (p <0.001) and much higher among apprentices than among students (p <0.001). It increased between 1993 and 2002, the differences between the two survey periods being highly significant and of the same magnitude in all four groups (p <0.001). Regular use of cannabis is much higher among males than females (p <0.001) while it is largely the same among students and apprentices. It has increased in the four groups (p <.0001), the increase being slightly steeper among males than among females.

Figure 2 shows the proportions of subjects reporting lifetime use of various substances. Male apprentices report a significantly higher rate of use of psychoactive medication than the other three groups (p <0.001). While the increase from 1993 to 2002 is not statistically significant for male students, it is highly significant for the other three groups (p <0.001). However, the magnitude of increase is similar among the four groups (Table 2). The use of synthetic substances (i.e. LSD, ecstasy and cocaine) is much more prevalent among males than among females (p <0.001), with one exception (lifetime use of cocaine, which is similar among male and female students), and is much higher among apprentices than among students (p <0.001). As far as LSD is concerned, the increase between 1993 and 2002 attains statistical significance for apprentices only (p <0.001), whereas the differences are highly significant for all four groups with regard to the use of ecstasy (p <0.0001). The magnitude of the rise in LSD and ecstasy use is higher among apprentices than among students, especially males (Table 2). The rise in lifetime use of cocaine is particularly striking among male apprentices, with a doubling of the rates over 10 years (p <0.001). Among students there is no significant increase or decrease in lifetime use of cocaine. Within the four groups there was no change whatever in lifetime use of heroin.

Table 3 shows the means of the age at which various substances were consumed for the first time. While the age of access to tobacco has not changed among male students, it has slightly decreased among female students and among apprentices of both genders, especially females. Also, females tend to start smoking at a slightly earlier age than males, and apprentices at an earlier age than students (p <0.01). The most striking data are those relating to the age at which respondents first experienced the use of cannabis, which has significantly decreased among the four groups. Males tend to experience their first cannabis use at an earlier age than females (p <0.001). Male apprentices seem to have used psychoactive medication at an earlier age in 2002 than in 1993. With two exceptions (use of LSD and ecstasy by male apprentices), the mean age at which apprentices and students of both genders begin to use synthetic substances does not differ significantly.

Discussion

This paper shows how the rates of use of legal and illegal psychoactive substances have evolved over a period of about ten years (1993–2002), using the data from two surveys run in a similar manner among a large, nationally representative sample of Swiss apprentices and students. The results are bro-

Table 3

Mean age at which various substances have been consumed for the first time, with confidence intervals and p values (t-test values).

		Apprentices				Students			
		Females		Males		Females		Males	
		1993	2002	1993	2002	1993	2002	1993	2002
tobacco	Age	15.25 [15.15; 15.35]	14.95 [14.84; 15.05]	15.19 [15.11; 15.26]	15.03 [14.94; 15.13]	15.51 [15.40; 15.62]	15.19 [15.01; 15.37]	15.40 [15.24; 15.56]	15.45 [15.26; 15.64]
	p	.000		.014		.003		.653	
cannabis	Age	15.64 [15.52; 15.75]	15.34 [15.26; 15.42]	15.72 [15.64; 15.79]	15.1 [15.06; 15.20]	15.95 [15.80; 16.11]	15.47 [15.35; 15.59]	15.79 [15.64; 15.94]	15.11 [14.99; 15.23]
	p	.000		.000		.000		.000	
medicine	Age	15.411 [15.02; 15.79]	15.77 [15.49; 16.06]	16.13 [15.90; 16.35]	15.82 [15.65; 16.00]	15.75 [15.17; 16.33]	15.90 [15.53; 16.26]	16.04 [15.29; 16.78]	15.72 [15.14; 16.30]
	p	.132		.035		.646		.488	
ecstasy	Age	16.52 [16.05; 16.99]	16.31 [16.08; 16.54]	16.73 [16.47; 16.98]	16.40 [16.27; 16.53]	16.73 [15.74; 17.72]	16.65 [16.17; 17.13]	16.99 [16.01; 17.97]	16.72 [16.33; 17.11]
	p	.429		.027		.874		.530	
LSD	Age	16.37 [16.14; 16.60]	16.52 [16.33; 16.72]	17.05 [16.89; 17.20]	16.26 [16.13; 16.38]	16.29 [15.86; 16.73]	16.20 [15.80; 16.59]	16.77 [16.36; 17.18]	16.43 [16.09; 16.77]
	p	.316		.000		.749		.204	
cocaine	Age	16.42 [16.04; 16.80]	16.72 [16.47; 16.97]	16.99 [16.71; 17.27]	16.91 [16.76; 17.06]	16.02 [15.11; 16.92]	16.82 [16.25; 17.39]	16.82 [16.24; 17.41]	17.28 [16.50; 18.05]
	p	.181		.597		.104		.323	
heroin	Age	16.35 [15.86; 16.83]	16.63 [16.27; 16.99]	16.67 [16.40; 16.93]	16.2 [16.00; 16.59]	16.21 [15.61; 16.82]	17.5 [6–18.19; 21.70]	16.92 [15.98; 17.87]	16.641 [3.94; 19.35]
	p	.338		.079		.176		.770	

ken down by gender and academic track. They show a large and significant increase in the use of tobacco by apprentices, while the rates remained stable among students. Among the four subgroups considered there is a significant increase in alcohol misuse, as defined by a combined measure of frequency of use and episodes of drunkenness and of drunken driving. There is also a considerable increase in the use of all other psychoactive substances, including medication, LSD, ecstasy and cocaine. One exception is heroin, the rates of use of which have remained stable for ten years.

From 1993 to 2002 the proportion of regular smokers has continued to increase among 16–20-year-olds, above all among male apprentices. According to the Swiss arm of the HBSC (Health Behaviour of School Children) survey, the proportion of smokers among younger adolescents (11–15 y.) increased between 1986 and 1998 [19] but between 1998 and 2002 the rates remained stable among 15-year-old adolescents [28]. As the legislative climate in our country is currently changing, with a more stringent control of tobacco sales to minors and extension of no-smoking areas, the figures we have for the year 2002 may hopefully represent the acme of the curve. Indeed, while the United States witnessed a major increase in the proportion of smokers up the 1994, the rates have since then declined both in the general population and among young people [11, 29, 30], probably as a result of both legislative and preventive measures. The same has been observed in Canada [31].

While the amount of alcohol used remains fairly stable in the general Swiss population, it has recently been shown to be increasing among younger schoolchildren aged 11–15 years [19, 32]. A similar trend is observed in our survey of older adolescents. What is particularly disturbing is that it is not only the frequency and amount of alcohol used which are increasing [21] but that the pattern of use is changing. As suggested by Figure 1, more and more adolescents engage in alcohol misuse, defined by several episodes of drunkenness and by drunken driving. Thus, alcohol is less and less used as a recreational, dietary product and more and more consumed as a drug to modify consciousness. Added to, or as a cause of, this phenomenon is the availability of new, appealing sugared beverages such as cocktails and so-called alcopops which encourage inexperienced adolescents to ingest large amounts of alcohol in short periods of time [18, 19, 22] without measuring its potential short term consequences such as alcoholic coma, violence or unplanned sexual experiences. Indeed, several serial cross-sectional studies, including one from Finland [33], the HBSC survey [34] and the ESPAD (European School Survey Project on Alcohol and Other Drugs) [17, 35] as well as surveys from the United States [30, 36] have focused on trends in substance use among adolescents. In Finland, from 1977 to 1999 the drinking pattern among boys became more drunkenness-oriented with age, but not among girls ("Boys developed a regular pattern of drunkenness steadily increasing between ages 14–18 while among girls the increase in drunkenness started to level off between ages 16 and 18"). The HBSC [16, 34] and ESPAD surveys [17, 35] report an increase in binge drinking in many European countries. In the United States, data derived from several large-scale studies from the nineties to

the beginning of the millennium show that, while the consumption of alcohol has remained stable or has slightly decreased in both genders, the onset of drunkenness has shifted to an earlier age [30, 36].

Over the last 10–15 years the use of cannabis in our country has dramatically changed among younger and older adolescents as well as among adults, as reported by several surveys [18, 19, 37]. According to the HBSC [16, 34] and ESPAD [17, 35] surveys, Switzerland has currently one of the highest rates of cannabis use by adolescents. Similarly, from 1992 to 2002, among young adults aged 15–34 years and living in Switzerland, the lifetime prevalence of cannabis use has jumped from 10.9 to 24.4% among women and from 24.3 to 36.1% [37] among men. Our figures thus come as no surprise and are accompanied by a significant decline in the age of first consumption. This trend is alarming, since longitudinal studies among young people show that an earlier age of access to cannabis is linked to a much higher risk of abuse or dependence, as well as greater involvement in the use of other illegal substances [38, 39]. In a recently published qualitative study on the representation of cannabis among young people [40], we have been able to show that for many young people cannabis is no longer considered a drug. A comparable rise in cannabis use has also been found in other countries, such as France, Germany, Spain or even Greece, where the crude rates of cannabis use are much lower than in our country [41]. Also, a decrease in the age of first cannabis use has accompanied this trend in several countries, including those of Eastern European [42, 43]. In the United States there is apparently no such rise, since both in the general population and among young people the rates of cannabis use have remained stable over the last 10–15 years [9, 11, 30, 44]. However, according to one US study the proportion of heavy users may have increased, especially among young people [44].

The increase in the use of other illegal drugs, even if lower than that of cannabis, is still impressive, since, for example, we have observed a tripling of the rates of lifetime use of ecstasy among the four subgroups. While the rate of cannabis use is largely similar among apprentices and students, this is not the case for LSD, ecstasy and cocaine: there is a major rise in the use of these three substances among apprentices and especially male apprentices. For example, one in ten male apprentices reports having used cocaine at least once in his life. Even if this use is probably often experimental, the behaviour of apprentices is a matter for concern, given the fact that this trend towards higher lifetime use is associated with a decreasing mean age of access to synthetic substances and an increase in alcohol misuse, especially among males. Interestingly, the age of access to the three different synthetic substances (ecstasy, LSD and cocaine) is much the same, possibly indicating that these substances are often found and consumed on similar occasions or even together. These figures are to some extent confirmed by observations in facilities for drug addicts, which show that while the use of heroin is steady or may have decreased, there has been a surge in the number of requests from individuals severely addicted to cocaine [18]. It should finally be mentioned that the use of medication with psychoactive properties is also on the increase.

An upsurge in the use of synthetic drugs by young adults has been observed in many European countries as well as in Australia and China [7]. We have not identified any publication dealing specifically with secular trends in the use of synthetic substances by adolescents in Europe. In the United States, the Monitoring the Future surveys allow an assessment of lifetime use of these substances by 8 to 12th graders [11, 30]. From 1991 to 2004, the decrease in lifetime LSD rates of use among 8th, 10th and 12th graders is respectively –0.4, –0.7 and –1.3, while for the use of ecstasy it is respectively –0.4, –1.1 and –0.8. In this country it also appears that the use of cocaine has remained stable over the last decade. However, it must be borne in mind that the US figures are relatively high, with numbers similar to those found recently in Switzerland. For example, the percentages of American 12th graders having used LSD, ecstasy or cocaine in 2002 was respectively 8.4%, 10.5% and 7.8%. The percentages of those who used these substances within the 30 preceding days was slightly lower than in Switzerland.

Several European surveys focusing on substance use tend to target pupils reached in the school setting, usually under-17s [17, 19, 34, 45, 46]. It is indeed more difficult to reach young people once they are no longer in compulsory schooling. One strength of the present paper is that it focuses on both students and apprentices, thus making it possible to assess to what extent earlier involvement in an adult work setting correlates with other behaviours in the area of health and substance use. To some extent our data assess the impact of the transition from school to work, since our results show that apprentices, especially among males, tend to consume a higher proportion of substances than students, and to some extent at an earlier age. Also, the slope of the increase in consumption between 1993 and 2002 is steeper among apprentices, as far as the use of tobacco, LSD and cocaine is concerned. There are several potential explanations for these differences: first, apprentices enter "adult" life at an earlier age and are confronted with adults who use both legal and illegal substances. Moreover, they are pushed at an earlier age into adult-type lifestyles, such as, for example, dating: for example, we have shown in several surveys that they engage in an active sexual life to a greater extent than students. Also, since apprentices draw a – modest but still meaningful – salary from their job (by the end of apprenticeship up to 1,000 Swiss francs a month), they enjoy more financial freedom than their student peers. They may also be less exposed to prevention programmes, since they spend only one day a week in a formal teaching setting (professional centre).

There are some limitations to our results. First,

the percentages must, as in all other similar surveys, be interpreted with caution as these are self-reported values. A discussion of potential biases in self-reporting of substance use is provided elsewhere [20, 42]. Also, we do not know how far the rise in rates of substance consumption is linked to a net increase in use or if it has also become more acceptable to report such behaviour. We assessed trends using data points, with an implicit assumption of linearity; the rates may in fact have speeded up or slowed down during the ten-year period considered. As our samples were not entirely comparable, we had to rely on a complex matching procedure which, even if done carefully, leaves some room for slight biases. One strength of these data is that they are based on identical questions and were gathered in an identical context. Another strength is that they concern a large, nationally representative sample of adolescents working either as students or as apprentices, who form about 85–90% of the population in this age range. However, it must be acknowledged that the rates we obtained may underestimate the percentages of young people using drugs: we have shown in another publication that individuals who have dropped out of the educational system (not included in the SMASH survey) have a much higher use of psychoactive substances [47].

These results have several implications. On the individual level, professionals – especially physicians – working with adolescents should be aware of the still large number of adolescents who smoke regularly and should attempt to address this issue systematically in their everyday work. Many young people think of quitting and should be offered appropriate motivational support [48, 49]. More and more teenagers begin to use substances at an earlier age and engage in alcohol misuse, regular use of cannabis and even in the use of substances which potentially may easily induce addiction, such as cocaine. When given assurances about confidentiality, young patients provide sincere and reliable information on their drug consumption and there are short validated tests available for such screening in everyday practice [50]. Moreover, we have evidence that brief interventions using motivational interviewing techniques can have lasting positive effects in reducing the use of alcohol and illegal drugs, at least in certain settings [51, 52]. This may apply particularly to male apprentices, who tend to use both legal and illegal substances to a larger extent than students.

On the public health level it must be recognized that, despite the fairly large number of initiatives for the prevention of substance misuse in our country [53], the situation has not yet improved. Two hypotheses can be offered to explain this: first, many preventive programmes, especially within the school setting, are run as one-shot interventions, without a long-term link to parents and the surrounding community. Successful projects in the field tend to emphasise life skills and the participation of young people and parents/communities [54]. A good example of this strategy is provided by an Australian controlled trial, which has demonstrated that a programme aimed at improving social skills and connectedness in school, and which actually involves the whole school staff as well as the community, is effective in reducing substance use by the pupils [55]. Indeed, although apprentices spend only one day a week in professional centres, it is worth implementing such policies within these settings, as recently attempted in several professional centres of French-speaking Switzerland[2]. Second, the way the legislation is applied and the content of public discourse on legal and illegal substances is often blurred and ambiguous. For instance, we have recently shown [40] that many young people no longer consider cannabis a drug. Adults and professionals should send adolescents clearer and more unequivocal messages regarding the potentially harmful consequences of any substance consumption which goes beyond occasional, recreational use. Also, young people are told not to abuse alcohol, but, until recently, they have had ready access to appealing alcoholic beverages without effective control over their sale. Policies targeting the availability of legal substances have an impact on substance use, as witness the stabilisation of smoking and alcohol use among young people in some countries including the USA [10, 56–58]. The recent trend towards the imposition of tobacco bans in Switzerland may improve the situation and, in the long term, decrease the proportion of smokers among young people. Similarly, the more stringent repression of alcohol use while driving may prove fruitful. In summary, the large proportion of adolescents who misuse psychoactive substances in this country calls for the implementation of more large scale, effective intervention strategies as well as better perception by politicians and decision makers of the seriousness of this issue.

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Correspondence:
Pierre-Andre Michaud
Groupe de recherche sur la santé des adolescents
Institut universitaire de médecine sociale et préventive
Bugnon 17
CH-1005 Lausanne
E-Mail: Pierre-Andre.Michaud@chuv.ch

2 For instance in the "Centre Professionnel du Littoral Neuchâtelois".

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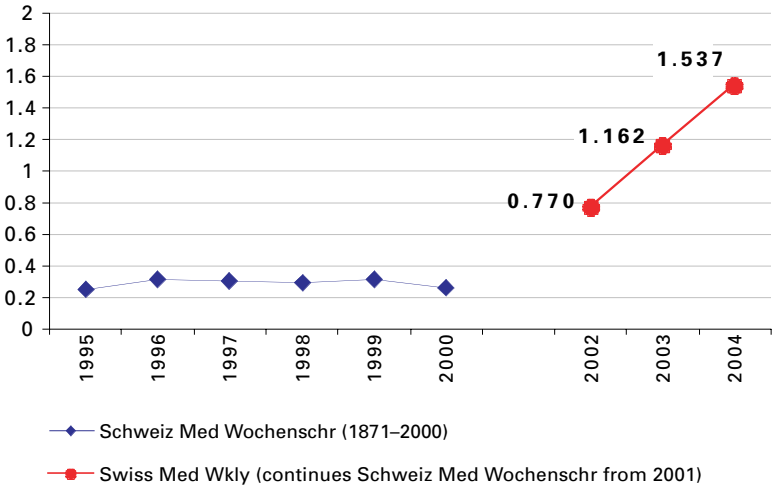

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