ESPAD 2015 methodology

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Contents

Introduction to the ESPAD 2015 reporting

The main purpose of the ESPAD project is to collect comparable data on substance use among students of the same age in as many European countries as possible. The studies are conducted as school surveys among students turning 16 during the year of the data collection, and following a common methodology. A handbook describing methodology and reporting procedures facilitates the collection of comprehensive and comparable data.

ESPAD surveys have been performed every fourth year since 1995. This means that the sixth data collection was performed in 2015 and that results for a 20-year period are available. Each of the five previous ESPAD data collections were presented in extensive printed reports. The presentation for 2015 is, however, done differently. The main findings are presented in a shorter printed report (EMCDDA and ESPAD, 2016), while additional material is made available online.

Apart from this methodological section, the online material includes a presentation of the 2015 results country by country, further graphics that are not included in the printed report, a comprehensive result tables section and the ESPAD master questionnaire. As in previous reports and when possible, comparable data from the two non-ESPAD countries of Spain and the United States have been included in tables and graphs.

Countries participating in ESPAD 1995-2015

In total, 35 countries took part in the sixth study wave in 2015 (Albania, Austria, Belgium (Flanders), Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, the Faroes, Finland, the former Yugoslav Republic of Macedonia, France, Georgia, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Liechtenstein, Lithuania, Malta, Moldova, Monaco, Montenegro, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Sweden and Ukraine). Georgia was new to the project in 2015. National research teams, as well as funding agencies and supportive organisations for 2015, are listed in the acknowledgements in Appendix 3.

The 1995 ESPAD data collection covered 23 countries, while the report also included data from three more European countries with similar data (Hibell et al., 1997). In 1999 data were collected in 30 countries (Hibell et al., 2000), and in 2003 the number had increased to 35 (Hibell et al., 2004). The 2007 report also included 35 countries (Hibell et al., 2009), while five additional countries collected ESPAD data in 2008. In 2011 the number of countries contributing with results in the 2011 report was 36 (Hibell et al., 2012), while three more countries collected data in the autumn of 2011, and were presented in a digital supplement (Hibell and Guttormsson, 2013).

In total 48 countries (or entities) have participated in at least one of the data-collection waves (see Table A). Twenty-one countries have collected data in all six consecutive waves.

Table A.   Countries participating in ESPAD data collections. 1995-2015

Country	Responsible researcher	1995	1999	2003	2007	2011	2015
Albania	Ervin Toci	.	.	.	.	Yes	Yes
Armenia	Artak Musheghyan	.	.	.	Yes	.	.
Austria	Julian Strizek; Alfred Uhl	.	.	Yes	Yes	.	Yes
Belgium (Flanders)	Patrick Lambrecht	.	.	Yes	Yes [a]	Yes [b]	Yes [b]
Belgium (Wallonia)	Danielle Piette	.	.	Yes	.	.	.
Bosnia and Herzegovina (FBiH)	Aida Pilav	.	.	.	Yes [c]	Yes [a]	.
Bosnia and Herzegovina (RS)	Sladjana Siljak	.	.	.	Yes [c]	Yes	.
Bulgaria	Anina Chileva	.	Yes	Yes	Yes	Yes	Yes
Croatia	Iva Pejnović Franelić	Yes	Yes	Yes	Yes	Yes	Yes
Cyprus	Kyriakos Veresies	Yes	Yes	Yes	Yes	Yes	Yes
Czech Republic	Ladislav Csémy	Yes	Yes	Yes	Yes	Yes	Yes
Denmark	Mette Vinther Skriver	Yes	Yes	Yes	Yes	Yes	Yes
Estonia	Sigrid Vorobjov	Yes	Yes	Yes	Yes	Yes	Yes
Faroes	Pál Weihe	Yes	Yes	Yes	Yes	Yes	Yes
Finland	Kirsimarja Raitasalo	Yes	Yes	Yes	Yes	Yes	Yes
Former Yugoslav Republic of Macedonia	Silvana Oncheva	.	Yes	.	Yes [c]	.	Yes
France	Stanislas Spilka	.	Yes	Yes	Yes	Yes	Yes
Georgia	Lela Sturua	.	.	.	.	.	Yes [a]
Germany	Ludwig Kraus	.	.	6 Bundesl.	7 Bundesl.	5 Bundesl.	.
Greece	Anna Kokkevi	.	Yes	Yes	Yes	Yes	Yes
Greenland	Vacant	.	Yes	Yes	.	.	.
Hungary	Zsuzsanna Elekes	Yes	Yes	Yes	Yes	Yes	Yes
Iceland	Ársæll Már Arnarsson	Yes	Yes	Yes	Yes	Yes	Yes
Ireland	Luke Clancy	Yes	Yes	Yes	Yes	Yes	Yes
Isle of Man	Andreea Steriu	.	.	Yes	Yes	Yes [d]	.
Italy	Sabrina Molinaro	Yes	Yes	Yes	Yes	Yes	Yes
Kosovo (under UNSCR 1244)	Mytaher Haskuka	.	.	.	.	Yes [a]	.
Latvia	Marcis Trapencieris	Yes	Yes	Yes	Yes	Yes	Yes
Liechtenstein	Esther Kocsis	.	.	.	.	Yes	Yes
Lithuania	Liudmila Rupšienė	Yes	Yes	Yes	Yes	Yes	Yes
Malta	Sharon Arpa	Yes	Yes	Yes	Yes	Yes	Yes
Moldova	Mihai Ciocanu	.	.	.	Yes [c]	Yes	Yes
Monaco	Stanislas Spilka	.	.	.	Yes	Yes	Yes
Montenegro	Tatijana Djurisic	.	.	.	Yes [c]	Yes	Yes
Netherlands	Karin Monshouwer	.	Yes	Yes	Yes	Yes [a]	Yes [a]
Norway	Elin K. Bye	Yes	Yes	Yes	Yes	Yes	Yes
Poland	Janusz Sieroslawski	Yes	Yes	Yes	Yes	Yes	Yes
Portugal	Fernanda Feijão	Yes	Yes	Yes	Yes	Yes	Yes
Romania	Silvia Florescu	.	Yes	Yes	Yes	Yes	Yes
Russia	Eugenia Koshkina	.	Moscow	Moscow	Yes	Moscow	.
Serbia	Spomenka Ciric-Jankovic	.	.	.	Yes [c]	Yes	.
Slovakia	Alojz Nociar	Yes	Yes	Yes	Yes	Yes	Yes
Slovenia	Tanja Urdih Lazar	Yes	Yes	Yes	Yes	Yes	Yes
Sweden	Håkan Leifman	Yes	Yes	Yes	Yes	Yes	Yes
Switzerland	Gerhard Gmel	.	.	Yes	Yes	.	.
Turkey	Nesrin Dilbaz	Istanbul	.	6 cities	.	.	.
Ukraine	Olga Balakireva	Yes	Yes	Yes	Yes	Yes	Yes
United Kingdom	Mark Bellis	Yes	Yes	Yes	Yes	Yes	.

[a]   Data collected in autumn.

[b]   Data collected in previous autumn.

[c]   Data collected in spring 2008.

[d]   Data collected but not delivered.

ESPAD average

The result tables and graphs make it possible to compare countries not only with each other but also with an ESPAD average. There are different ways of calculating the average for the participating countries. It could take account of the size of the target population in each participating country or it could be computed as a simple 'average of averages', which in practice involves assigning each country the same weighting of one. The latter means that each country influences the average to the same extent, regardless of whether it is a small or large country. Such country averages have been used in all previous ESPAD reports, and this practice has been retained also for the 2015 presentation. Country averages presented in the tables do not include Latvia, Spain and the United States (explained later).

Tables

In this methodological section references are made to tables of a methodological nature, identified by letters, while the result tables are numbered and published separately. The following symbols are used in the tables:

0   A percentage below 0.5.
.   No such data exist.
..   Data exist but have either been considered non-comparable or are inaccessible.

All percentages are calculated on the basis of valid responses for each variable. Hence, non-responses are deducted from the denominator. Internal non-response rates are given separately in the result tables.

Statistical significance

In all countries, classes (groups of students as an organisational unit) were sampled using a more or less complex procedure. Since the final sampling unit was the class, not the student, and since all students in sampled classes were supposed to take part, it is important to consider the cluster effects in any statistical calculations. This is because a group of students who make up a class (cluster) are more likely to have similar habits than a group containing the same number of students but spread across classes and schools. This affects the precision of the estimates in each country but — provided that the ESPAD guidelines are followed — in principle it should not bias the point estimate itself.

It is also important to note that a certain absolute difference in a particular variable between two surveys may be statistically significant in one country but not in another. Differences have to be tested separately from each country´s result to make it possible to decide whether a difference is significant or not. However, to be able to calculate confidence intervals and assess the statistical significance of differences, it is necessary to have access to the data, including a class variable, for all students. This was not the case in ESPAD surveys previous to 2007, which is why the figures in earlier ESPAD reports were compared between countries and over time in terms of substantive rather than statistical significance. To avoid considering too-small differences, a standardised procedure was used where a difference smaller than ± 3 percentage points was not considered as a 'real difference'.

Since databases from the past three data collections are available, differences between countries in the trend graphs have been statistically tested to identify any significant differences from 2007 onwards. Gender differences are tested for possible statistically significant differences within countries in the graphs presenting the 2015 results. Since these calculations require inclusion in the ESPAD databases, no such tests have been carried out for the two non-ESPAD countries (Spain and the United States).

A bivariate logistic regression model was used to test whether the differences observed are significant or not. The gender differences were tested using a bivariate model with gender as the only independent variable. Differences over time were tested using the same procedure, with year as the only independent variable. When testing differences between years, the whole sample was used, i.e. boys and girls together. In the logistic regressions, school class was modelled as a cluster, thus taking into consideration that the respondents were not individually sampled. Significance was tested at the 95 % level. The average alcohol consumption during the last alcohol drinking day was tested using a regression with robust standard errors. Rather than using a t-test, this method allows adjustment for the possible effect that the cluster sampling of the students might have on the results, even though this variable is continuous.

Some countries did not perform a sample but instead included all students in the survey. Although it can be argued that testing for significance in such a case is unnecessary, for conformity reasons it was decided to do so anyway.

Methodological considerations in relation to ESPAD 2015

The major strategy of the ESPAD project is to standardise procedures as much as possible, including the target population, the questionnaire, the sampling procedure and the way in which data are collected. The 2015 ESPAD results are based on 35 national surveys using the common methodological guidelines presented in the ESPAD handbook.

This text provides an overview of different methodological aspects related to the 2015 data collections and ends with a short summary of the most important methodological findings to be taken into consideration in relation to the data quality. Apart from the results from the student questionnaire, information used in this text is based on the classroom reports filled in by the survey leaders and the standardised country reports provided by each national team. For discussions about ESPAD in relation to general survey methodology, please refer to the previous ESPAD report (Hibell et al., 2012).

Use of school surveys

Knowledge about levels of alcohol and drug use can be obtained in different ways, depending on the part of the phenomenon that is of main interest. In many countries, household surveys are conducted to measure substance use habits in the general population. School surveys are also often performed, either as a complement to other investigations or as the only investigative measure.

One problem with surveys is that they usually fail to reach some segments of the population, such as problematic users, homeless persons or dropouts from school. The latter is a group of young people vulnerable to substance use.

The main rationale for carrying out school surveys is that students are at an age when onset of the use of different substances is likely to occur and its monitoring is therefore important. Another reason is ease of access: students, by definition, are to be found within the school system, which reduces the cost of locating and reaching them. Yet another advantage is that the response rates normally are high. It is unusual for students who are present in the classroom to refuse to take part in surveys.

When students are the target group of a survey, it is a well-accepted method to use group-administered questionnaires in a classroom setting where data are collected under the same conditions as a written test. While it is true that experiences from using school surveys to collect information on substance use may differ across countries, there is usually no other realistic way of collecting data from students than to do so by administering questionnaires to a group in the school, usually in the classroom.

Cultural context

The standardisation of survey methodology is the cornerstone of the ESPAD project. However, it should be stressed that standardisation alone does not ensure that data are directly comparable between countries. It is not possible to control for everything, and indeed some influences are not even possible to pinpoint. The cultural contexts in which the students have responded vary, and formally identical measures may have different meanings in different contexts.

As part of the preparations for the ESPAD 1999 data-collection exercise, a methodological study was conducted to better ascertain the role of cultural context in different countries (Hibell et al., 2000). Data were collected in countries in different parts of Europe: two northern European countries (Denmark and Sweden), two Mediterranean countries (Cyprus and Malta) and three in central and eastern Europe (Lithuania, Slovakia and Ukraine). The study showed that both reliability and validity were high in all seven countries, even though there were some minor differences. This indicates that the influence of the cultural context seemed to be rather limited in these seven countries, but even so it is important to keep this aspect in mind when comparing results from a large number of countries.

One of the important long-term goals of the ESPAD project is to track changes in adolescent substance use over time. While cultural context may affect the validity of responses to formally standardised measures, changes in such responses over time may be relatively less affected by the cultural context (which can be expected to be reasonably stable over time in a given country). In other words, even if the proportions using a particular substance are not fully comparable between two countries, it is still possible to compare those countries with regard to the extent of increases or decreases over time in those proportions.

Questionnaire changes in 2015

Methodological improvements over time are inevitable. For each data collection some changes have been made to the master questionnaire. It may be necessary to make amendments due to realities that did not exist in the past, for example the introduction of new substances on the market. In 2015, questions regarding harm from other people's drinking, use of new psychoactive substances, money gambling and internet use was added in the core section of the questionnaire. To make room, questions related to alcohol purchases, drinking locations and expected consequences of alcohol consumption were removed. Another change was that the questions on use of amphetamines, cocaine and crack were lifted from the list of various illicit substances used and introduced as separate questions. In addition, a separate question on methamphetamines was introduced.

In 2007, several structural changes were made to the questionnaire, and for some of the substance use measures the specific questions were altered. In order to evaluate the comparability of estimates based on the old and the new versions of the questionnaire, a methodological study based on a split-half methodology was conducted in 2006 in eight countries (Hibell and Bjarnason, 2008). Overall, it was found that the changes to the instrument did not affect the key indicators used to track changes in adolescent substance use over time. The estimates that turned out to have been significantly affected by the changes were primarily those that were based on problematic measures and had therefore been purposely changed in order to obtain better estimates. They included measures of the availability of different substances, the frequency of intoxication, the amount of alcohol consumed during the most recent drinking day and spirit consumption during the past 30 days. For these

variables, comparisons thus cannot be made with data from 1995-2003, which is indicated in the relevant tables. Please refer to the previous ESPAD reports to find out more about historical questionnaire changes.

There was no such split-half study performed in relation to the changes to the 2015 questionnaire. This was not considered necessary since none of the questions related to substance use were rephrased and most of the new questions were located towards the end of the questionnaire. It could however be mentioned that the changes made in the master questionnaire led to an increase in the number of core items, from 173 in 2011 to 213 in 2015. All master ESPAD questionnaires from 1995-2015 are available online (http://www.espad.org).

Ethical aspects

More and more countries are introducing different kinds of ethical rules to protect the integrity of their citizens. Many of those rules relate to the recording of personal data, and some of them apply to research activities. From an ESPAD perspective, ethical rules may, for example, entail a requirement to obtain the approval of an ethics committee or the consent of parents. According to Table B, the approval of an ethics committee was asked for and obtained in 13 countries in 2015.

The ESPAD guidelines emphasise that ESPAD surveys should be confidential and anonymous. It is also important for students to be informed that answering the questionnaire is voluntary. In addition, it is the responsibility of each research team to comply with all national laws, regulations and guidelines concerning research ethics. According to Table B, all countries stated that they followed their national ethical rules when collecting the data.

It was necessary to obtain some form of parental consent in roughly three quarters of the countries. Normally, passive consent was sufficient, but for three countries active parental consent was required. According to Table C, 0.5 % (0.0-1.5 %) of the students could not take part in the study due to parental refusal in countries where only passive consent was needed. In Georgia, Portugal and Romania active parental consent was demanded, which resulted in higher refusal rates. According to the standard instructions, the students are informed that the study is voluntary. On average, 0.5 % (0.0-1.5 %) of the students present in the classrooms refused to take part in the survey.

Table B.   Ethical aspects. ESPAD 2015

Country	Ethical review needed	Parental consent needed	National ethical rules followed
Albania	No	No	Yes
Austria	No	In some schools	Yes
Belgium (Flanders)	No	In some schools	Yes
Bulgaria	No	In some schools (active)	Yes
Croatia	Yes	Yes, passive	Yes
Cyprus	Yes	Yes, passive	Yes
Czech Republic	No	No	Yes
Denmark	No	No	Yes
Estonia	Yes	Yes, passive	Yes
Faroes	No	No	Yes
Finland	Yes	Yes, passive	Yes
Former Yugoslav Republic of Macedonia	No	No	Yes
France	Yes	Yes, passive	Yes
Georgia	Yes	Yes, active	Yes
Greece	Yes	Yes, mainly passive	Yes
Hungary	No	In some schools	Yes
Iceland	No	Yes, passive	Yes
Ireland	Yes	Yes, passive	Yes
Italy	Yes	Yes, passive	Yes
Latvia	Yes	Yes, passive	Yes
Liechtenstein	No	Yes, passive	Yes
Lithuania	No	In a third of the schools (passive)	Yes
Malta	No	No	Yes
Moldova	No	No	Yes
Monaco	No	Yes, passive	Yes
Montenegro	No	Yes, passive	Yes
Netherlands	No	Yes, passive	Yes
Norway	No	Yes, passive	Yes
Poland	No	In some schools	Yes
Portugal	Yes	Yes, active	Yes
Romania	Yes	Yes, active	Yes
Slovakia	No	In some schools	Yes
Slovenia	No	In some schools (active)	Yes
Sweden	No	No	Yes
Ukraine	Yes	No	Yes

Table C. Refusals, discarded questionnaires and number of valid questionnaires. Students born in 1999. ESPAD 2015

Country	Refusals [a]		Discarded questionnaires (%)	Reduction of invalid due to discarding (%)	Reduction in 'relevin' due to discarding (%)	Valid questionnaires (n)		
	Parental refusal (%)	Student refusal (%)				Boys	Girls	All
Albania	.	0.0	2.2	.	18.2	1 217	1 336	2 553
Austria [c]	0.3	0.4	4.2	.	46.0	1 756	1 928	3 684
Belgium (Flanders)	0.1	0.0	2.3	100.0	0.0	918	853	1 771
Bulgaria	1.5	1.0	2.1	100.0	28.8	1 453	1 469	2 922
Croatia	1.7	0.0	2.3	71.4	49.0	1 337	1 221	2 558
Cyprus	..	..	3.8	.	43.9	1 008	1 090	2 098
Czech Republic	.	0.1	2.3	.	34.7	1 278	1 460	2 738
Denmark	0.0	0.2	1.3	.	55.0	796	874	1 670
Estonia	0.7	0.5	0.5	.	28.2	1 224	1 228	2 452
Faroes	.	0.0	0.2	.	0.0	257	254	511
Finland	0.5	0.5	0.7	60.0	39.6	1 958	2 091	4 049
Former Yugoslav Republic of Macedonia	0.0	0.0	3.0	58.3	32.0	1 179	1 249	2 428
France [c]	0.6	0.5	0.9	.	27.6	1 334	1 380	2 714
Georgia	2.0	0.1	1.1	100.0	21.4	1 047	919	1 966
Greece	1.4	0.6	0.5	40.0	42.6	1 576	1 626	3 202
Hungary	0.3	0.4	0.8	15.4	34.4	1 372	1 363	2 735
Iceland	0.1	0.8	0.9	.	40.5	1 312	1 351	2 663
Ireland	0.0	1.2	1.5	66.7	45.5	749	721	1 470
Italy	0.1	0.2	2.6	92.9	39.8	2 093	1 966	4 059
Latvia	1.4	1.3	7.6	.	59.5	558	561	1 119
Liechtenstein	0.0	0.9	0.0	.	0.0	143	173	316
Lithuania	0.7	0.4	0.6	0.0	31.6	1 303	1 270	2 573
Malta	.	0.0	0.8	14.3	34.4	1 665	1 661	3 326
Moldova	.	0.2	1.6	100.0	43.3	1 325	1 261	2 586
Monaco	0.1	0.0	1.7	.	61.8	202	195	397
Montenegro	.	0.1	1.9	31.3	53.5	1 957	1 887	3 844
Netherlands	0.1	0.1	1.5	100.0	52.6	853	831	1 684
Norway	0.0	0.4	4.2	.	48.6	1 354	1 231	2 585
Poland	0.6	0.5	2.5	.	25.4	5 658	6 164	11 822
Portugal	6.0	1.2	1.0	0.0	18.2	1 568	1 888	3 456
Romania	6.9	1.1	0.5	66.7	24.8	1 711	1 789	3 500
Slovakia	0.2	0.0	0.7	.	43.4	1 108	1 100	2 208
Slovenia	0.8	1.2	0.7	25.0	23.0	1 675	1 809	3 484
Sweden [b]	.	1.5	3.0	.	50.8	1 265	1 289	2 554
Ukraine	.	0.1	0.6	.	35.4	1 126	1 223	2 349
AVERAGE (%) / TOTAL (n)	1.0	0.5	1.8	57.9	35.2	47 335	48 711	96 046

[a] Regardless of birth year. Percentages calculated from classroom reports.

[b] Sweden included a third option to the question on gender (not able to specify gender belonging). Discarded questionnaires also includes students stating this option.

[c] Reduction in 'relevin': results for Austria and France refer to all students born in 1999, not only the ESPAD sample since further cases are removed when new weightings are introduced in the final data.

Data cleaning

In the first three data-collection waves, the research team in each country was responsible for cleaning the national data sets according to the ESPAD guidelines. Beginning with 2007, a central cleaning process was introduced, with raw national data delivered and merged into a joint database and thereafter centrally cleaned. The major advantage with this arrangement is that all questionnaires from all countries are treated in the same way, which improves comparability. However, national research teams still have the possibility to highlight, but not to discard, any questionnaires that they consider questionable. Those questionnaires are assigned a special code and are included in the national data sets sent for centralised data cleaning.

It has previously been concluded that the shift to a standardised common cleaning approach did not result in any major problems with comparability of data from previous ESPAD surveys, even though there might conceivably have been a minor effect on low-prevalence (about 1 %) behaviours (Hibell et al., 2012).

The standard cleaning procedure involved two phases: the logical substitution of missing values and the deletion of unusable cases. Only students born in 1999 (or equivalent) have been considered in this process. Initially, all cases where information was missing about gender were excluded from the database. The other major reason for questionnaire exclusion was poor data quality. All questionnaires with responses to less than half of the core items were discarded, as were all questionnaires where the respondent appeared to have followed patterns involving repetitive marking of extreme values.

Across all ESPAD countries, an average of 1.8 % (0.0-7.6 %) of the questionnaires were excluded because of poor data quality or missing information on gender (Table C). Relatively large proportions of the questionnaires from Cyprus, Norway and Austria were excluded (3.8-4.2 %), and a particularly large proportion was removed from the Latvian data (7.6 %). This indicates that the quality of the collected data in those countries tended to be not as good as compared to the average ESPAD country, especially for Latvia. If the ESPAD average is calculated without Latvia, it drops from 1.8 % to 1.6 %.

Roughly half of the countries used the opportunity to flag questionnaires considered to be of questionable quality.

On average, 58 % of those questionnaires were later removed in the central cleaning process. Table D shows the impact on the results due to the discarding of questionnaires for eight different measures of lifetime substance use. For all eight measures the prevalence rates were reduced. This reduction was however very limited, and ranged between 0.1 % and 0.4 % at the all-countries level. The three countries where the discarding of questionnaires had the most visible impact in terms of percentage points were Bulgaria, Cyprus and Latvia. In relative terms, at the all-countries level, the reduction was most obvious for the fake drug 'relevin'. According to Table C, reported lifetime relevin use drops by more than a third when discarding bad data. The above indicates that the standardised syntax deleting questionnaires targets students with less trustworthy responses relatively well.

Another part of the data-cleaning process relates to the logical substitution of missing values, which is carried out in a conservative fashion. In cases where students had indicated that they had never used a specific substance and subsequently did not respond to further questions about such use, any missing values were substituted with no use for that particular substance. However, no substitutions were made if any counter indications of use were at hand.

Table E presents information about the non-response rates before the logical substitution of missing values and the substitution impact on the non-response rates. For the seven substance use variables shown in the table, the average reduction of the non-response rates was rather small, ranging from 0.1 % to 0.5 %. With a few exceptions, the reduction was relatively limited for all seven variables in most countries. The single highest figure is found for Norway, where the non-response rate for lifetime inhalants use was reduced by 2.7 percentage points. Norway, the former Yugoslav Republic of Macedonia and Latvia were countries where the logical substitution of missing values had the biggest impact. However, such low reductions of the non-response rates hardly has any effect at all on the final prevalence estimates.

On the whole, the standardised data-cleaning process did not greatly influence the lifetime-prevalence figures. The single largest decrease in relative terms (a drop by one third) was related to students claiming to have used the dummy drug relevin, and it was accounted for by the discarding of questionnaires with repetitive extreme response patterns.

Table D. Changes in lifetime prevalence (LTP) of different substances due to deletion of bad data [a] in students born in 1999 [b]. Percentages. ESPAD 2015

Country	Cigarettes LTP		Alcohol LTP		Been intoxicated LTP		Cannabis LTP		Inhalants LTP		Ecstasy LTP		Tranquillisers or sedatives (non-medical use) LTP		Relevin LTP	
	Before deletion	Final data	Before deletion	Final data	Before deletion	Final data	Before deletion	Final data	Before deletion	Final data	Before deletion	Final data	Before deletion	Final data	Before deletion	Final data
Albania	37.7	37.3	60.5	60.2	22.4	21.7	7.6	7.1	4.0	3.6	2.9	2.6	8.0	7.6	1.6	1.3
Austria [c]	53.7	53.2	88.6	88.6	49.7	49.2	20.0	19.5	9.8	9.5	2.2	2.0	4.4	4.1	0.5	0.3
Belgium (Flanders)	31.1	31.2	79.5	79.5	29.7	29.7	17.4	17.4	2.8	2.8	3.2	3.2	6.1	6.1	0.4	0.4
Bulgaria	56.0	55.5	86.4	86.4	45.6	44.7	27.9	26.9	4.1	3.0	6.5	5.2	4.8	3.6	3.6	2.6
Croatia	62.5	62.1	92.3	92.3	47.6	46.9	22.4	21.5	25.9	25.3	3.3	2.4	5.1	4.2	1.5	0.8
Cyprus	36.0	35.3	88.6	88.4	33.0	31.9	8.5	7.2	9.3	8.1	3.6	2.5	5.8	4.6	3.3	1.9
Czech Republic	63.7	63.5	96.2	96.1	51.8	51.4	36.9	36.5	5.7	5.5	2.8	2.7	16.0	15.8	0.5	0.3
Denmark	39.3	38.9	92.3	92.4	60.2	60.0	12.7	12.4	3.8	3.6	0.8	0.5	2.6	2.3	0.5	0.2
Estonia	59.9	59.8	86.4	86.4	37.9	37.7	25.8	25.5	13.1	12.9	2.8	2.5	9.1	8.9	0.6	0.4
Faroes	49.3	49.2	80.8	80.8	34.3	34.2	5.9	5.9	2.3	2.3	0.4	0.4	1.8	1.8	0.2	0.2
Finland	47.4	47.2	73.8	73.7	37.2	37.1	8.6	8.5	8.0	7.8	1.3	1.1	5.9	5.8	0.4	0.2
Former Yugoslav Republic of Macedonia	38.8	38.4	57.2	57.0	22.8	22.0	5.6	5.0	2.3	1.9	2.6	2.1	11.4	11.1	1.1	0.8
France [c]	57.0	56.7	87.9	87.9	40.3	39.9	33.8	33.4	6.5	6.3	2.6	2.3	9.6	9.3	0.8	0.6
Georgia	43.2	42.9	84.9	84.7	43.5	43.2	12.1	11.5	12.4	12.1	4.7	4.4	11.9	11.3	2.1	1.7
Greece	38.7	38.5	93.9	93.9	34.4	34.2	8.5	8.3	12.4	12.2	1.5	1.2	4.4	4.1	0.7	0.4
Hungary	55.4	55.2	92.7	92.7	53.6	53.4	13.3	13.0	6.9	6.6	2.3	2.0	7.5	7.2	0.8	0.5
Iceland	16.6	16.3	35.1	34.8	10.3	10.0	7.7	7.4	3.3	3.0	2.1	1.7	5.8	5.5	0.8	0.5
Ireland	32.8	32.1	73.9	73.6	34.3	33.7	19.7	18.9	11.3	10.5	4.5	3.7	4.4	3.4	1.8	1.0
Italy	58.0	57.6	84.4	84.4	34.6	33.9	28.2	27.4	4.3	3.4	3.6	2.6	6.3	5.4	2.3	1.4
Latvia	66.0	65.4	89.6	89.6	46.8	46.3	18.0	16.3	15.5	14.6	3.5	2.3	5.5	4.3	2.5	1.0
Liechtenstein	57.1	57.1	89.2	89.2	41.9	41.9	29.8	29.8	8.3	8.3	1.6	1.6	3.2	3.2	0.0	0.0
Lithuania	64.9	64.8	87.0	87.0	46.4	46.2	17.9	17.7	8.2	8.0	2.1	1.8	9.2	8.9	1.0	0.7
Malta	29.4	29.1	86.2	86.2	38.3	38.1	13.0	12.6	8.6	8.3	2.2	2.0	3.2	2.9	0.7	0.5
Moldova	33.4	33.2	82.2	82.3	25.2	24.8	4.8	4.5	1.7	1.4	1.8	1.5	1.5	1.2	0.6	0.3
Monaco	56.4	55.9	89.0	88.8	42.4	41.7	32.3	31.3	8.2	8.1	2.7	2.0	10.7	10.1	2.0	0.8
Montenegro	34.8	34.1	78.0	77.6	23.0	21.9	9.1	8.0	7.7	7.1	4.3	3.4	11.0	10.3	0.9	0.4
Netherlands	39.8	39.4	73.7	73.5	33.2	32.7	23.1	22.5	5.4	4.9	3.6	3.1	8.8	8.4	0.9	0.4
Norway	29.0	28.7	59.1	58.8	26.5	26.3	6.4	6.1	5.7	5.5	1.1	0.8	6.1	5.8	0.4	0.2
Poland	54.8	54.5	83.8	83.7	35.7	35.3	24.4	23.9	10.7	10.2	3.6	3.1	17.0	16.6	2.0	1.5
Portugal	37.0	36.9	71.4	71.4	26.4	26.2	15.4	15.3	4.5	4.5	2.0	1.9	5.2	5.1	0.6	0.5
Romania	51.7	51.6	77.9	77.9	32.4	32.2	8.3	8.1	3.8	3.6	2.3	2.1	2.1	2.0	0.7	0.5
Slovakia	61.8	61.6	90.7	90.7	44.6	44.4	26.5	26.3	8.4	8.1	3.6	3.3	7.0	6.8	0.7	0.4
Slovenia	47.5	47.3	89.0	89.0	43.2	42.8	25.1	24.8	14.1	14.0	2.3	2.2	3.2	3.1	0.5	0.4
Sweden	33.7	33.4	65.3	65.0	28.1	27.6	7.1	6.6	8.2	7.4	1.7	1.2	7.5	6.9	1.0	0.5
Ukraine	50.0	49.8	82.7	82.6	39.7	39.5	9.1	8.7	4.8	4.5	1.5	1.1	1.8	1.5	0.6	0.4
AVERAGE	46.4	46.1	80.9	80.8	37.1	36.7	16.9	16.5	7.8	7.4	2.7	2.2	6.7	6.3	1.1	0.7

[a] Cases are deleted due to missing gender, more than 50 % missing and repeated extreme responses.

[b] Results are based on cleaned unweighted data with only students born in 1999.

[c] Results refer to all students born in 1999, not only the ESPAD sample since further cases are removed when new weightings are introduced in the final data.

Table E. Non-response rates before logical substitution of missing values and the substitution impact (reduction) for seven prevalence measures [a]. Only students born in 1999 (−2 treated as −1) [b]. ESPAD 2015

Country	Cigarettes LTP		Alcohol LTP		Been intoxicated LTP		Cannabis LTP		Ecstasy LTP		Inhalants LTP		Tranquillisers or sedatives (non-medical use) LTP	
	Before log. subst.	Reduction	Before log. subst.	Reduction	Before log. subst.	Reduction	Before log. subst.	Reduction	Before log. subst.	Reduction	Before log. subst.	Reduction	Before log. subst.	Reduction
Albania	0.8	0.6	2.6	0.1	2.2	0.5	1.4	0.4	1.5	1.1	0.7	0.3	1.1	0.6
Austria [c]	0.2	0.1	1.4	0.1	1.2	0.1	1.1	0.3	1.2	0.8	0.9	0.5	0.8	0.5
Belgium (Flanders)	0.3	0.0	0.9	0.0	0.8	0.0	0.3	0.1	0.2	0.2	0.2	0.1	0.3	0.2
Bulgaria	0.5	0.2	2.2	0.1	2.4	0.2	1.1	0.4	0.3	0.3	0.8	0.3	0.8	0.4
Croatia	0.5	0.1	1.3	0.1	1.0	0.0	0.4	0.2	0.3	0.3	0.6	0.2	0.5	0.1
Cyprus	0.5	0.2	1.4	0.0	1.1	0.0	0.4	0.2	0.5	0.3	0.9	0.6	0.4	0.2
Czech Republic	0.1	0.0	0.5	0.0	0.5	0.0	0.2	0.0	0.1	0.1	0.1	0.1	0.1	0.1
Denmark	0.4	0.0	2.0	0.1	1.1	0.1	0.5	0.1	0.7	0.1	0.7	0.0	0.7	0.0
Estonia	0.1	0.0	1.2	0.0	0.7	0.0	0.2	0.0	0.1	0.0	0.2	0.1	0.2	0.1
Faroes	0.6	0.0	1.4	0.2	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Finland	0.3	0.1	0.6	0.1	0.8	0.1	0.2	0.1	0.5	0.5	0.6	0.5	0.6	0.5
Former Yugoslav Republic of Macedonia	1.6	1.0	3.6	0.4	2.4	1.1	1.7	1.1	1.3	0.9	1.1	0.5	1.2	0.8
France [c]	0.4	0.1	1.0	0.1	0.3	0.1	0.8	0.1	0.7	0.6	1.5	1.3	0.4	0.1
Georgia	0.5	0.3	3.2	0.0	4.9	0.4	2.0	1.1	1.6	0.8	1.1	0.4	1.3	0.6
Greece	0.0	− 0.0	0.4	0.0	0.2	− 0.0	0.2	− 0.0	0.3	0.3	0.2	0.2	0.2	0.1
Hungary	0.4	0.1	1.5	0.1	0.7	0.1	0.7	0.3	0.3	0.2	0.3	0.2	0.2	0.1
Iceland	0.2	0.2	0.7	0.1	0.3	0.1	0.5	0.1	0.3	0.2	0.4	0.2	0.3	0.2
Ireland	0.5	0.2	2.6	− 0.0	2.4	0.2	1.3	0.3	0.4	0.3	0.5	0.1	0.3	0.1
Italy	0.7	0.2	1.5	0.1	1.1	0.3	1.0	0.3	1.2	0.9	1.4	0.8	1.2	0.8
Latvia [c]	0.4	0.2	1.5	0.1	2.0	0.4	1.1	0.9	1.6	1.4	2.7	2.1	2.5	1.6
Liechtenstein	0.3	0.0	0.3	0.0	0.3	0.0	0.3	0.0	0.9	0.6	0.3	0.0	0.9	0.6
Lithuania	0.6	0.2	1.2	0.0	0.7	− 0.0	0.9	0.2	0.5	0.5	0.3	0.2	0.3	0.1
Malta	0.9	0.2	2.6	0.1	1.1	0.1	1.8	0.9	1.8	1.1	0.9	0.6	0.8	0.5
Moldova	1.1	0.4	0.4	0.1	0.6	0.1	0.6	0.3	0.5	0.4	0.5	0.4	0.4	0.3
Monaco	0.0	0.0	1.0	0.0	0.3	0.0	0.3	0.0	0.0	0.0	1.0	1.0	0.8	0.5
Montenegro	0.4	0.2	0.8	0.1	0.8	0.2	0.5	0.4	0.4	0.4	0.4	0.3	0.5	0.3
Netherlands	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.0
Norway	1.8	0.8	2.5	0.6	3.7	1.8	2.1	1.2	2.9	1.7	3.9	2.7	2.7	1.5
Poland	0.3	0.1	1.2	0.1	0.7	0.1	0.7	0.1	0.6	0.5	0.3	0.1	0.2	0.1
Portugal	4.7	0.1	4.1	0.1	1.7	0.2	0.9	0.1	0.4	0.3	0.7	0.4	0.4	0.3
Romania	0.3	0.1	2.2	0.0	1.8	0.2	0.8	0.1	0.5	0.4	0.9	0.7	0.4	0.3
Slovakia	0.5	0.1	0.7	0.0	0.7	0.1	0.3	0.1	0.1	0.1	0.4	0.4	0.2	0.1
Slovenia	0.2	− 0.0	1.7	0.1	0.8	0.1	0.6	0.1	0.2	0.1	0.2	0.1	0.1	0.0
Sweden	0.4	0.1	1.4	0.2	1.3	0.3	1.1	0.4	0.8	0.5	1.4	1.0	0.9	0.4
Ukraine	0.6	0.2	0.8	0.1	2.0	0.4	1.4	0.4	1.4	1.1	0.3	0.0	0.3	0.1
AVERAGE	**0.6**	**0.2**	**1.5**	**0.1**	**1.2**	**0.2**	**0.8**	**0.3**	**0.7**	**0.5**	**0.8**	**0.5**	**0.6**	**0.3**

[a]   The results are based on unweighted raw data, first without logical substitution of missing values and then where logical substitution has been made. Cases have been deleted due to missing gender, 50 % missing and repeated extreme responses.

[b]   When multiple responses are given on a single choice question, some countries code this −2 instead of −1 (no response). For comparability reasons all −2 are treated as −1.

[c]   Frequencies differ from the final 1999 data since further cases are removed after weighting has been introduced.

Fieldwork

According to the ESPAD handbook, data collection should be performed during spring. With the exception of three countries, data were collected between February and June 2015, with a majority of data-collection exercises conducted in the March-May period (Table G). For pragmatic reasons, the Belgian survey was carried out half a year in advance, in October-December 2014, while Georgia and the Netherlands collected data during the late autumn of 2015.

The ESPAD guidelines contain no rules as to whether teachers or research assistants should be responsible for data collection in the classrooms. Instead, the recommendation was to use the category of survey leaders whom the students trusted the most. In about half of the countries, teachers or other school staff administered the data collection, while research assistants did so in the other half (Table G).

Table G.   Characteristics of the data collection. ESPAD 2015

Country	Data collection period	Data collection mode	Survey leader	Anonymity preserver	Data entry
Albania	16 April-29 May	Pen and paper	Research assistant	Joint envelope	Manual
Austria	March-June	Web survey	Teacher	Anonymous passwords	CASI
Belgium (Flanders)	October-December 2014 (February 2015)	Pen and paper [a]	School staff	Individual envelopes	Manual [a]
Bulgaria	5-26 June	Pen and paper	Research assistant	Individual envelopes	Manual
Croatia	3-27 March	Pen and paper	School staff	Individual envelopes	Manual
Cyprus	20-24 April	Pen and paper	Teacher	Joint envelope	Manual
Czech Republic	1-29 June	Pen and paper	Research assistant	Individual envelopes	Optical scanner
Denmark	17 March-27 May	Pen and paper	Teacher	Individual envelopes	Manual
Estonia	February-April	Pen and paper	Research assistant	Individual envelopes	Manual
Faroes	2 March-17 April	Pen and paper	Research assistant	Joint box	Manual
Finland	16 March-3 April	Pen and paper	Teacher	Individual envelopes	Optical scanner
Former Yugoslav Republic of Macedonia	March-May	Pen and paper	Research assistant	Joint envelope	Manual
France	April-May	Pen and paper	Research assistant	Stickers/joint envelope	Optical scanner
Georgia	26 October-25 November	Pen and paper	Research assistant	Individual envelopes	Manual
Greece	March-April	Pen and paper	Research assistant	Joint envelope	Optical scanner
Hungary	1-31 March	Pen and paper	Research assistant	Joint envelope	Manual
Iceland	February-May	Pen and paper	Teacher	Individual envelopes	Optical scanner
Ireland	May	Pen and paper	Teacher	Individual envelopes	Manual
Italy	March-April	Pen and paper	Teacher	Individual envelopes	Optical scanner
Latvia	7 April-31 May	Web survey	Teacher/school staff	Not applicable	CASI
Liechtenstein	March-April	Web survey	Research assistant	Not applicable	CASI
Lithuania	16-25 March	Pen and paper	School staff	Individual envelopes	Manual
Malta	23 February-4 March	Pen and paper	Teacher (mainly)	Individual envelopes	Optical scanner
Moldova	21 April-19 May	Pen and paper	Research assistant	Joint envelope	Manual
Monaco	24 March	Pen and paper	Teacher	Individual envelopes	Optical scanner
Montenegro	17 April-15 May	Pen and paper	Research assistant	Individual envelopes	Manual
Norway	February-May	Pen and paper	Teacher	Individual envelopes	Optical scanner
Netherlands	1 October-7 December	Web survey	Research assistant	Not applicable	CASI
Poland	May-June	Pen and paper	Research assistant	Individual envelopes	Manual
Portugal	27 April-15 May	Pen and paper	Teacher	Individual envelopes	Optical scanner
Romania	11-29 May	Pen and paper	Research assistant	Individual envelopes	Manual
Slovakia	23 March-10 April	Pen and paper	Research assistant	Individual envelopes	Manual
Slovenia	30 March-3 April	Pen and paper	School staff	Individual envelopes	Manual
Sweden	9 March-27 April	Pen and paper	Teacher	Individual envelopes	Optical scanner
Ukraine	15 May-15 June	Pen and paper	Research assistant	Individual envelopes	Manual

[a]   Mainly, though a few classes in the ESPAD sample did an online version.

To stress the anonymity and confidentiality of the survey, the handbook recommended the use of individual envelopes for each student to put his/her questionnaire in and then seal. Individual envelopes were used in about three quarters of the countries (Table G). In the remaining countries, other measures were taken which were judged to fulfil the same purpose. Examples include the use of large class envelopes, which were sealed in front of the students, or a closed box into which the students put their forms.

In Austria, Latvia, Liechtenstein and the Netherlands no such precautionary measures were needed since the traditional data-collection mode of pen and paper had been abandoned. Instead, web surveys were performed in those four countries. This differs in relation to prior ESPAD data collections in those countries, and also differs in relation to the other countries collecting data in the traditional way in 2015. There are of course several advantages to online surveys, such as cost-effectiveness and more rapid data collection. From the ESPAD perspective, one general disadvantage could however be that the changed data-collection mode may give rise to questions of comparability.

For Latvia, the online data collection seem to have not functioned so well. Technical problems resulted in a large proportion of uncompleted questionnaires. Since students were not assigned unique individual codes, it appears that some had entered the survey several times and there were also instances noted of students that had accessed the questionnaire outside school hours. Although efforts were made to identify and remove such invalid cases, this still leaves doubts regarding the implementation of the Latvian fieldwork.

Representativity

The target population of the ESPAD study is defined as the national population of students who turn 16 during the calendar year of the survey, excluding those who were enrolled in either special schools or special classes for students with learning disorders or severe physical disabilities.

As a matter of principle, data can never be representative of any groups other than those included in the sampling frame. In ESPAD, the issue of representativeness is linked to several aspects, including geographic coverage, sampling, the exclusion of grades or school categories and the level of interest shown by schools and students in participating in the data collection.

Geographic coverage

The objective of including all geographic regions in the sampling frame was reached to a very large degree in most countries. Four countries (Finland, France, Portugal and Ukraine) had some minor limitations in the geographic coverage, but in all those countries at least 95 % of the population was covered (see Table F). Except for Ukraine, these geographical limitations have been at hand in previous surveys and are not considered to be of any major importance. In Ukraine, the Crimea area was not included in the 2015 sample (circa 5 % of the population).

Three countries had a geographical coverage below 95 %. For Moldova the study covered approximately 85 % of the population since the Transnitria region was not included. For Cyprus approximately 80 % of the population was covered by the survey due to the fact that only government-controlled areas were covered by the sampling frame. The lowest geographical coverage (61 %) can be noted for Belgium, since only the Dutch-speaking part (Flanders), as well as Dutch-speaking schools in the Brussels Capital Region, participated in the data collection. Apart from 2003, when Belgium took part in whole, the abovementioned geographical limitations were at hand also in previous data collections.

It is important to keep in mind that the results for Cyprus, Moldova and Belgium are representative only for the populations from which the samples were drawn, according to the geographical limitations mentioned above.

Sampling strategies

Sampling in the ESPAD project is based on school classes as the final sampling unit (i.e. organisational units of students). This is vastly more economical than sampling individual students, and it also has some desirable methodological properties. In particular, the sampling of entire classes can be expected to increase students' confidence in their anonymity. Sampling individual students and asking them to fill in a questionnaire individually, by contrast, could affect the truthfulness of their answers and therefore bias the results of the study.

An overview of the sampling procedure in each country is provided in Table F. The number of students born in 1999 in the Faroes, Iceland, Liechtenstein, Malta and Monaco was close to, or below, the number of students to be sampled according to the ESPAD guidelines (1 200 per gender). In these countries, therefore, all students were surveyed.

Table F.   Characteristics of the national samples. ESPAD 2015

Country	Sampling frame geographic coverage	Proportion of ESPAD birth cohort in regular school [a] (%)	Approx. mean age [b]	Sample type	Sampling unit(s)	Number of grades covered	Data weighted	Student representa-tiveness [c] (%)
Albania	National	85-95	15.9	Stratified random	School/class	2	No	95
Austria	National	97	15.9	Proportionate random	School/class	2	Yes	90
Belgium (Flanders)	Flanders [d]	92	15.8	Stratified random	School/class	6	Yes	94
Bulgaria	National	87	16.0	Simple random	Class	2	No	99
Croatia	National	97	15.7	Stratified simple random	School/class	2	No	94
Cyprus	National [e]	85	15.8	Stratified random	Class	1	No	>90
Czech Republic	National	97	16.0	Stratified random	School/class	2	Yes	>95
Denmark	National	94	15.8	Stratified simple random	School/class	1	No	78 [f]
Estonia	National	95	15.7	Stratified random	School/class	2	No	97 [g]
Faroes	National	92	15.7	Total	No sample	1	No	88
Finland	National [h]	95	15.8	Stratified/cluster/systematic simple random	School/class	1	No	93
Former Yugoslav Republic of Macedonia	National	79	15.8	Systematic random	Class	2	No	92 [i]
France	National [j]	94	15.9	Stratified random	School/class	4	Yes	94
Georgia	National	88	16.4	Proportionate simple random	School/class	1	No	73
Greece	National	98	15.8	Stratified random	Class	1	Yes	91
Hungary	National	98	15.7	Stratified random	Class	2	Yes	97
Iceland	National	98	15.8	Total	No sample	1	No	96
Ireland	National	88	15.9	Stratified systematic random	School/class	3	No	98
Italy	National	93	15.7	Stratified proportionate random	Class	3	No	99
Latvia	National	86	15.9	Stratified random cluster sampling	Class	3	Yes	95 [k]
Liechtenstein	National	92	15.7	Total	No sample	4	No	~99
Lithuania	National	94	15.7	Stratified random	School/class	1	No	85
Malta	National	99	15.7	Total	No sample	1	No	93
Moldova	National [l]	96	15.9	Simple random	Class	2	No	90
Monaco	National	~99	15.8	Total	No sample	4	No	~99
Montenegro	National	90	15.9	Proportinate simple random	Student	2	No	94
Netherlands	National	87	15.9	Stratified simple random	School/class	2	Yes	94
Norway	National	99 [m]	15.8	Stratified random	School/class	1	Yes	98 [m]
Poland	National	97	16.0	Stratified random	School/class	1	Yes	95
Portugal	National [n]	95	15.9	Stratified systematic random	Class	5	No	86
Romania	National	85-88 [m]	15.9	Systematic random	School/class	2	No	91
Slovakia	National	93	15.8	Stratified proportional random	School/class	3	No	98
Slovenia	National	95	15.8	Stratified random	Class	1	No	94
Sweden	National	95	15.7	Simple random	School/class	1	No	95
Ukraine	National [p]	94	16.0	Stratified systematic random	School/class	3	Yes	92
AVERAGE	.	93	15.8	.	.	2	.	93

[a]   Proportion of the ESPAD birth cohort still enrolled in regular school (not in schools/classes for students with special needs, etc.).

[b]   Based on the data collection period.

[c]   Proportion of ESPAD target students covered by the sampling frame.

[d]   Geographic population coverage 61 %: only Flanders and Dutch-speaking schools in the Brussels Capital region are covered by the sampling frame.

[e]   Geographic population coverage approx. 80 %: only government-controlled areas are covered by the sampling frame.

[f]   Boarding schools not included in the sample.

[g]   Vocational schools not included (less than 2 % of students born in 1999).

[h]   Geographic population coverage 99 %: the Åland Islands are not covered by the sampling frame.

[i]   Private and religious schools are not included in the sample.

[j]   Geographic population coverage 96.5 %: DOM-TOM territories (overseas departments and territories such as French Guiana, Réunion and those in the Caribbean) are not covered by the sampling frame.

[k]   Vocational schools not included (1.7 % of students born in 1999).

[l]   Geographic population coverage 85 %: the Transnistria region is not covered by the sampling frame.

[m]   Estimations by principal investigator.

[n]   Geographic population coverage 95 %: the islands of the Azores and Madeira are not covered by the sampling frame.

[o]   Private schools are not included in the sample.

[p]   Geographic population coverage 95 %: AR Crimea is not covered by the sampling frame.

In most countries a two-stage sample was performed, with the school as the primary unit and the class as the final sampling unit. In some countries, the class was the only sampling unit, i.e. samples of classes were drawn from comprehensive lists of classes, while in Montenegro actual students were sampled, 'pulling' their respective class.

Some countries have not considered what might be called the 'problem of small and large schools and classes'. In some countries, all schools/classes had the same probability of being sampled, regardless of the size of each class and school. In practice, this means that students belonging to small classes or attending small schools are over-represented in the samples. If students in these classes or schools have different substance use habits from students in large classes or schools, the data are not entirely representative of the population. In many countries where this problem might have occurred, however, a stratified sample was used, and it seems reasonable to assume that the sizes of schools and classes are rather similar within each stratum. Further, class size is fairly standard in many countries, and the classes within a school usually do not vary greatly in size. On the whole, the 'problem of small and large schools and classes' is not considered to be a major problem in the context of the overall ESPAD project.

In countries where non-proportionate stratification was used for sampling, the data was weighted (weightings are used in 11 countries). Lack of data about school (and class) size has complicated the sampling procedure for some countries. Despite this there is reason to assume that sampling was carried out in the best possible way and that sampling problems have not affected the outcome of any survey in such a negative way that the possibility to make comparisons with other countries is jeopardised.

Birth cohort representativity

There are differences between countries in to what extent the 1999 birth cohort is attending regular school. In some countries, schooling is compulsory until the age of 16 years. In others, this is the age when students either enrol in upper-secondary school, start other training or enter the labour market. On average, 93 % of the 1999 birth cohort was enrolled in regular school at the time of data collection (students with special needs who attend special schools/classes are not a part of the defined ESPAD population) (Table F). For seven countries the proportion was below 90 %, and for the former Yugoslav Republic of Macedonia the lowest proportion was noted (79 %).

Such differences may have an impact on the results, since it could be the case that persons who have already left school may have a different substance use pattern compared to their peers in school. On the other hand, one should not forget that the ESPAD study is actually only intended to be representative for students, not for entire birth cohorts.

Student representativity

The target population of the ESPAD project is students who turn 16 years old during the year of data collection. For the 2015 study, this means students born in 1999. In some countries, the vast majority of students born in 1999 were enrolled in a single grade. In others, large proportions of them were to be found in two or more grades. The recommendation given for the latter case, subject to the availability of the necessary resources, was to include as many grades as possible where 1999-born students were to be found, or at least the grades where 10 % or more of the target population was located. If not all grades with students in the target age group are included in the data-collection exercise, the sample is representative only of 1999-born students in the grade(s) chosen.

In about three quarters of the countries, not more than two grades were surveyed. Four or more grades were covered in Belgium (Flanders), Portugal, Monaco, France and Liechtenstein. For 30 of the 35 countries, the sampling frames covered 90 % or more of the students born in 1999. In addition, the proportion was also rather high (85-88 %) in another three countries (Faroes, Lithuania and Portugal). However, the corresponding figures were lower in Georgia and Denmark (73 % and 78 %, respectively).

In the case of Denmark the lower representativity was partly explained by the fact that 8 % of the target population was found in grades either above or below the one being surveyed. Another explanation was that boarding schools were not included in the sampling frame, where roughly 12 % of the target population could be found. In Georgia the lower representativity is solely explained by the fact that the target population was distributed among several grades but only the main one was sampled.

To sum up, there are differences between countries in how well the samples represent students born in 1999, and also in to what extent the birth cohort is enrolled in regular schooling. It is not possible to establish how the results may have been affected by a somewhat lower representativity, even though this uncertainty is important to acknowledge.

Average age

Based on the time of data collection, an approximate average age of the students has been estimated for each country (Table F). The average ESPAD age was 15.8 years. Due to the fact that the Belgian and Dutch data collections took place during autumn, the target populations were redefined to give an average age in line with other participating countries. This was, however, not the case for Georgia, which resulted in a slightly older population than average (16.4 years). This should be considered in relation to the results, since older students may have had more opportunities to experience use of different substances.

School cooperation

The proportions of participating schools and classes are shown in Table H. On average, about 84 % of the sampled schools (and classes) took part in the survey. The proportions of schools that refused to participate differ substantially among the countries. In half of them, all or nearly all sampled schools took part in the survey (95 % or more). In most

other countries the proportions were relatively high as well (between 83 and 95 %). Reasons given for not taking part were usually lack of time, examinations or other factors related to schoolwork, and sometimes a general perception of being over-surveyed.

In five countries less than half of the sampled schools took part in the study. Ordered by falling participation rates,

Table H.   Participating schools and classes and students' presence rates. Percentages. ESPAD 2015

Country	Participant rates [a] (%)		Students' presence rate [b] (%)		
	School level	Class level	Boys	Girls	All
Albania	100	100	91	97	94
Austria	21	17 [c]	90	90	90
Belgium (Flanders)	56	.. [d]	94	93	94
Bulgaria	99	98	85	84	84
Croatia	98	98	90	88	89
Cyprus	87	85	..	..	..
Czech Republic	96	.. [d]	82	84	83
Denmark	26	.. [d]	89	88	88
Estonia	90	90	84	82	83
Faroes	100	100	94	90	92
Finland	85	85	89	89	89
Former Yugoslav Republic of Macedonia	98	98	86	91	88
France	94	93	86	89	87
Georgia	98	98	86	85	86
Greece	95	95	92	93	92
Hungary	92	93	85	86	85
Iceland	88	79	86	85	86
Ireland	21	18 [c]	90	83	86
Italy	85	85	86	90	88
Latvia	49	42	85	85	85
Liechtenstein	100	100	90	95	93
Lithuania	99	99	88	88	88
Malta	93	98	83	83	83
Moldova	100	100	86	88	87
Monaco	100	100	..	..	91
Montenegro	100	100	86	88	87
Netherlands	43	.. [d]	94	92	93
Norway	53	53	89	91	90
Poland	94	94	83	83	83
Portugal	97	96	92	94	93
Romania	100	100	83	86	84
Slovakia	100	100	89	87	89
Slovenia	99	99	87	88	88
Sweden	83	83	85	86	86
Ukraine	98	98	79	81	80
AVERAGE	**84**	**87**	**87**	**88**	**88**

[a]   Participant rates for schools and classes respectively are independent of each other.

[b]   All students in participating classes regardless of birth year.

[c]   Estimated from the maximum number of classes that could participate.

[d]   Class-level participant rate is not known but similar or somewhat lower than observed at the school level.

those countries were Latvia (49 %), the Netherlands (43 %), Denmark (26 %), Ireland and Austria (both 21 %). Apart from Latvia, those countries have also previously belonged to the group with low school participation.

In Austria, weightings were introduced in order to adjust for a selection bias due to school non-participation. The weighting adjusts for education level and type of region. In Denmark the high non-response rate was related to a relatively late decision on the funding and to the implementation of a school reform parallel to the data collection. There were no indications of bias noted for the net sample though, and the Danish team found the collected data representative for Danish students.

Due to a tendering process in Ireland the data collection was delayed, and it proved difficult to enter the schools at the end of the semester. In spite of the high level of non-participating schools, the Irish team found no important signs that the achieved sample should not be representative for young people in Ireland (gender, geographic location, school type and socioeconomic background were checked). In the Netherlands, school refusals have been a growing problem throughout the country. School characteristics such as size and type of education were controlled for. The Dutch team found no reason to believe that non-participation was selective. However, school type was considered, among demographic aspects, when the weightings were computed.

Apart from the 1995 data collection, Latvia has not previously experienced any particular problems in relation to school participation. In 2015 a new procedure for collecting data was introduced. In previous data collections paper questionnaires and research assistants were used and the first contact with schools was made via a telephone call. This time the first contact and reminder was made via email, and teachers were responsible for conducting online data collection. The emphasis on communication through the internet did not fully succeed, however. The obtained net sample was skewed, with a higher number of non-participating schools in larger cities, which was taken into account when the weighting variable was computed.

To sum up, high drop-out rates for schools call the representativeness of the data into question. Refusals by schools were a relatively limited problem in the majority of the countries. However, in Austria, Denmark, Ireland, Latvia and the Netherlands the school participation rates were below 50 %. Apart from the uncertainty about representativeness this creates, it sometimes resulted in a low number of participating students, especially so for Latvia (see 'Number of participating students').

Student response rates

Table H shows the proportion of students present in the classroom during the data collection. The proportions have been calculated on the basis of the classroom reports, where the fieldworkers indicated (a) the total number of students belonging to a participating class and (b) the number of students who were present when the survey was performed.

The proportion of students present in participating classes was high in most countries. The average was 88 %, and in 27 of the 35 countries 85 % or more of the students were present in class. Ukraine reported the lowest proportion of students present (80 %). This is not considered to be any major deviation though. No country reported any major methodological problems in connection with absent students. However, Cyprus failed to collect the requested information since non-standard classroom questionnaires were used. This means that student presence rates in Cyprus remains unknown, which definitely is a disadvantage, even though there is no information available indicating it should have been particularly low.

According to the standard instructions, the students are informed that the study is voluntary. Refusal by students to participate was rare in nearly all countries. On average, 0.5 % (0.0-1.5 %) of the students present in the classrooms refused to take part in the survey (Table C). In Ireland, Latvia, Portugal, Romania and Sweden these rates were above 1 %.

Some form of parental consent was asked for in roughly three quarters of the countries. For three countries, active parental consent was requested. According to Table C, 0.5 % (0.0-1.7 %) of the students were refused permission by their parents to take part in the study in countries where only passive consent was needed. In the three countries where active consent was requested, refusal rates were higher: Georgia 2.0 %, Portugal 6.0 %, Romania 6.9 %. Hence, parental refusal rates were rather high in the latter two countries. Even though it cannot be decided whether this had any influence on the substance use estimates, this ought to be kept in mind when interpreting the results.

Higher rates of sampled students not taking part in the study increases the risk that the net sample is biased. The response rates are however deemed to be satisfactory overall, even when the refusal rates are taken into account. It should however be noted that parental refusal for their children to take part in the survey was more common in Portugal and Romania. It should also be noted that Cyprus was lacking information not only on the number of students present but also on refusals among students as well as parents.

Number of participating students

To ensure that a satisfactory level of precision can be obtained in the estimates for various subgroups of the population, the ESPAD guidelines recommend sampling enough classes to obtain 1 200 participating students of each gender.

In countries with fewer than 2 800 students in the target population, it is recommended that the total population be included. This was the case in the three countries with the smallest sample sizes: Liechtenstein (316 students with valid questionnaires), Monaco (397) and the Faroes (511) (Table C). The sampling frames also included the total population of the somewhat larger countries of Iceland (2 663 students with valid questionnaires) and Malta (3 326).

Nine countries did not fully meet the criteria of 2 400 students. In six additional countries the net samples comprised less than 2 000 students: Belgium (Flanders), Denmark, Georgia, Ireland, Latvia and the Netherlands. These were all countries with relatively high rates of non-participating schools, reflected in a lower number of students included in the net sample.

In the case of Latvia, only 1 119 students were obtained in the net sample, which must be considered a quite serious deviation from the quality criteria regarding the number of subjects to be analysed. In the five other countries mentioned above, the number of participating students ranged between 1 470 and 1 966. Even though these figures are low, the numbers of valid questionnaires have been deemed enough to enable international comparisons, however not without caution.

Reliability

Reliability, which is a necessary condition for validity, is the extent to which repeated measurements made under the same conditions produce the same results. For many substances, the ESPAD questionnaire contains questions about lifetime use and also age at first use. The latter all include the response option 'never', which makes it possible to compare rates of lifetime prevalence for each substance according to these two sets of questions. Five substances are checked for inconsistency in relation to lifetime use in Table I as an indication of reliability. In addition, reported lifetime alcohol intoxication is also checked against reported lifetime use of alcohol.

The lowest inconsistency figures were found for cannabis and ecstasy use, with averages of 1 % each. In nearly all countries, the inconsistency rates are 0 % or 1 %, meaning that 99-100 % gave consistent answers about their consumption of these substances.

For the more common use of cigarettes, the average inconsistency rate was 3 %. Most countries had relatively low figures, with only four countries at 5 % or more; the highest figure (7 %) was found for Portugal. The average inconsistency figures were also relatively low (3 %) for use of tranquillisers and sedatives without a doctor's prescription. Only just over four countries had a figure that was 5 % or higher. The highest average rate of inconsistency (4 %) is found for lifetime inhalants use. In 10 countries, 5 % or more of the students gave inconsistent answers. Inhalants are also the substance with the highest national rates of inconsistency. The top countries were Croatia (10 %), followed by Latvia and Georgia (9 % each).

With the exception of inhalant use, there are very few cases where the inconsistency rate is above 5 %. It should be recognised, however, that there are some technical discrepancies between the two types of measures of use which might contribute to inconsistency. One is the fact that the question about age at first use did not include a 'do not remember' response category. A student who has used a substance but does not remember how old he or she was the first time could conceivably decide to answer 'never' instead of guessing an age, especially if he or she has used that substance only once or a few times. Yet another factor contributing to inconsistency might be that students were ambivalent when answering the question about age at 'first use' of a substance. If a student had used a substance only once or twice and did not define himself or herself as a 'user', it may not have seemed appropriate to give an age when he or she 'first' used it (which may have come across as synonymous with the age at which he or she 'started using' it). These students may have answered 'never' since they think of their consumption as an experiment rather than the beginning of 'real' use.

Most substances controlled in Table I are probably relatively familiar to the students in the sense that they have heard about them. If a substance is familiar and mentioned in several questions, the students ought to use the same definition consistently. However, inhalants might be an exception in this respect. The concept includes a great many different agents that can be inhaled. If not all relevant agents are consistently given as examples in the questions that are compared, there is a risk that the students' frame of reference will not be the same when they answer the two questions, which in turn may explain the lower consistency rates found for inhalants.

The proportion of students reporting having been intoxicated from alcohol use without previously reporting any lifetime

Table I. Some aspects of reliability. Inconsistency between two questions in a single administration. Students reporting substance use on one question but not on another [a]. Percentages. 2015

Country	Cigarettes LTP (C06 and C08a)	Cannabis LTP (C22a and C23)	Ecstasy LTP (C26a and C33d)	Inhalants LTP (C31a and C33e)	Tranquillisers or sedatives, non-medical use LTP (C32a and C33a)	Alcohol LTP: intoxication without consumption (C15a and C10a)
Albania	6	2	2	3	5	2
Austria	2	1	0	5	2	0
Belgium (Flanders)	1	0	1	1	2	0
Bulgaria	4	2	3	2	2	1
Croatia	4	1	1	10	2	0
Cyprus	3	1	2	5	3	1
Czech Republic	2	0	1	3	9	0
Denmark	1	0	0	1	1	0
Estonia	1	0	1	4	4	0
Faroes	2	2	0	2	0	0
Finland	1	0	0	2	1	0
Former Yugoslav Republic of Macedonia	6	1	1	1	7	1
France	1	0	1	3	2	0
Georgia	3	1	2	9	9	0
Greece	1	1	1	7	2	0
Hungary	2	1	1	4	2	0
Iceland	1	0	0	1	1	0
Ireland	2	1	1	5	1	0
Italy	2	2	1	2	2	0
Latvia	4	1	2	9	3	0
Liechtenstein	2	0	0	3	2	0
Lithuania	4	1	1	4	3	1
Malta	1	0	1	3	1	0
Moldova	4	1	1	1	1	0
Monaco	2	1	1	3	1	0
Montenegro	5	1	2	3	3	0
Netherlands	2	1	1	3	3	0
Norway	2	0	0	3	1	0
Poland	1	1	2	5	4	0
Portugal	7	1	1	3	1	1
Romania	4	1	1	3	1	1
Slovakia	4	1	1	5	3	0
Slovenia	3	1	1	6	1	0
Sweden	1	0	1	3	2	0
Ukraine	3	1	1	3	1	1
AVERAGE	**3**	**1**	**1**	**4**	**3**	**0**

[a] One question could be about lifetime prevalence (LTP) while the other is about age at first use.

use of alcohol was low. The ESPAD average was 0 % and the highest inconsistency rate was only 2 %, found in Albania.

In summary, it can be said that inconsistency figures for all variables controlled are relatively low in nearly all countries, indicating good reliability. Whilst still adequate, inhalant use showed the lowest levels of consistency, which is likely related to the fact that this concept is the most difficult to define. Particularly high scores are relatively uncommon, and no country scored among the highest for all variables. Albania could be mentioned as the country that tends to display the lowest consistency throughout. On the whole, inconsistency rates are not seen as reflecting any major reliability problems.

Validity

The validity of the answers is a major concern in survey-based research, particularly in surveys of sensitive behaviours such as substance use. In ESPAD terms, validity could be said to be the degree to which the survey (including its methods of data collection) measures those aspects of students' consumption of different substances that we intend to measure. In the 2011 ESPAD report (Hibell et al., 2012) the validity of the ESPAD survey was thoroughly discussed and the conclusion was, based on relevant available research, that the validity can be considered high in (ESPAD-like) school surveys. One factor that was pointed out as particularly important was that the students trusted that their responses were anonymous when filling out the questionnaire. Below is a number of topics important for the validity presented in relation to the 2015 data collection.

Translation of the questionnaire

The comparability of the actual questionnaire across countries is of vital importance in any multinational survey project. Establishing the equivalence of the translations of questions into the various languages is therefore an important aspect of establishing validity. The ESPAD master questionnaire is presented in English. In non-English-speaking countries, the questionnaire should be translated into the local language(s) and then back-translated into English by another translator, whereupon the original version and the back-translated version are to be compared for anomalies.

However, the equivalence of questionnaires is not only a matter of literal translation equivalence. It is also a matter of equivalence of understanding, meaning that each question should be understood in the same way in all countries, irrespective of the original wording in the master questionnaire. When necessary, the questions have been culturally adjusted to suit the situation in individual countries. For instance, the slang words for different substances asked for in the questionnaire should be adjusted to the situation in each single country. If this is not done properly, comparability with other countries may be undermined.

No major problems with the translations have been reported or detected. On the whole, it seems reasonable to assume that the translation of the questionnaire was not a major methodological problem and does not jeopardise the comparability of the results between the ESPAD countries.

Student cooperation

The primary prerequisites for obtaining any data at all are that students in selected classes actually receive the questionnaire and that they are willing to fill it in. The first prerequisite is not met if the school or the teacher refuses to cooperate. If

students do receive the questionnaire, they must have enough time to complete it, they must understand the questions and they must be willing to answer the questions honestly.

Participation in the study, of course, was voluntary. However, in nearly all countries no or very few students were reported to have declined taking part (Table C). On average, 0.5 % (0.0-1.5 %) of the students present in the classrooms refused to take part in the survey. In Ireland, Latvia, Portugal, Romania and Sweden these rates were above 1 %.

Some form of parental consent was required in roughly three quarters of the countries. In three of them, active parental consent was required. According to Table C, in countries where only passive consent was requested 0.5 % (0.0-1.7 %) of the students could not take part in the study due to parental refusal. In the three countries where active consent was needed, refusal rates were higher: Georgia 2.0 %, Portugal 6.0 %, Romania 6.9 %. Hence, parental collaboration can be deemed lower in the latter two countries.

Since the reasons for parental refusal are not known, it is unknown whether this is linked to the subject of the survey, i.e. substance use. However, even though uncertainty in this context would be greater when the proportion of students who were not given permission was larger, it seems a reasonable assumption that the topic of the survey was not in most cases the main reason why parents denied their children permission to participate. Hence, parents refusing to allow their children to participate in the ESPAD study are not seen as an important methodological problem that influences comparisons between countries to any important degree. However, in the countries with the highest figures, it includes some measure of uncertainty.

As described before, all data were centrally cleaned in a standardised way. With few exceptions, only a relatively small fraction of the questionnaires were discarded during the cleaning process. On average, 1.8 % of the questionnaires were excluded (Table C). Some countries clearly displayed greater proportions, including Cyprus (3.8 %), Austria (4.2 %), Norway (4.2 %) and Latvia (7.6 %). This may be an indication of a situation that is not as good regarding student cooperation in these particular countries, although technical issues also may have contributed to these levels, at least for Latvia. However, overall, the proportions of discarded questionnaires do not indicate any significant problems relating to student cooperation.

In a standardised classroom report, the survey leaders were asked (a) to report disturbances in the classroom during the data collection, (b) the extent to which the students had worked seriously and (c) whether the students seemed to have had difficulties understanding the questions. On average, 75 % of the survey leaders reported that there were no disturbances during data collection. In four countries (Greece, Moldova, Slovakia and Ukraine) these levels were

lower (around 50 %). However, it should be noted that research assistants or survey leaders other than teachers were responsible for the data collection in all those countries from which disturbances were more frequently reported. They are likely less used to the normal level of disturbance in a classroom compared to teachers, and thus more likely to report disturbances.

In most of the countries, a majority of the survey leaders (64 %) reported that 'all' students worked seriously and an additional 34 % indicated that the majority had done so (Table J). On the other hand, 2 % of the survey leaders reported that less than the majority had been working seriously. These levels were somewhat higher (4-6 %) in Croatia, the Czech Republic, the former Yugoslav Republic

Table J.   Opinions of survey leaders. Class-level information. Percentages. ESPAD 2015

Country	Disturbances during the survey			Students working seriously			Students that found the form difficult [a]
	No disturbances at all	From a few students	More than a few students	All	Nearly all/ the majority	Half or less	
Albania	83	17	0	67	33	0	0
Austria	83	15	2	64	36	1	3
Belgium (Flanders)	67	29	5	65	32	3	22
Bulgaria	77	19	4	65	33	2	8
Croatia	64	31	5	39	57	4	2
Cyprus [b]	..	..	..	..	..	..	..
Czech Republic	63	29	8	64	30	6	11
Denmark	72	26	2	79	21	0	3
Estonia	81	17	1	74	24	2	2
Faroes	95	5	0	100	0	0	0
Finland	81	19	1	79	21	0	2
Former Yugoslav Republic of Macedonia	81	17	3	49	46	6	5
France	64	27	9	61	36	4	6
Georgia	100	0	0	100	0	0	0
Greece	54	32	14	54	43	3	3
Hungary	89	9	2	68	30	2	4
Iceland	72	28	1	69	30	1	4
Ireland	89	11	0	76	24	0	7
Italy	78	20	2	56	41	2	2
Latvia	77	20	4	43	53	4	15
Liechtenstein	78	15	7	85	15	0	0
Lithuania	73	25	2	51	46	3	12
Malta	73	22	5	68	29	3	6
Moldova	49	32	20	45	54	1	2
Monaco	62	32	6	55	45	0	1
Montenegro	88	11	1	51	47	3	2
Netherlands	66	26	9	66	32	2	1
Norway	85	13	2	84	16	0	0
Poland	78	17	5	60	36	4	7
Portugal	89	11	1	63	37	0	2
Romania	100	0	0	77	22	2	7
Slovakia	49	38	14	44	53	3	6
Slovenia	72	26	2	57	43	0	10
Sweden	65	31	4	58	41	1	8
Ukraine	51	43	7	55	42	3	6
AVERAGE	75	21	4	64	34	2	5

[a]   Proportion of survey leaders answering 'rather difficult' or 'very difficult'.

[b]   Cyprus did not use the standard class room questionnaire but reports that there were 'high ratings offered by supervisors with respect to the cooperation of the students'.

of Macedonia, France, Latvia and Poland. Even though the proportions were low, this may be an indication of a possibly less-good setting than in the average ESPAD country.

In summary, no country reported problems with many students declining participation. The proportion of discarded questionnaires was low in nearly all countries, with an average of 1.8 %. When there were disturbances during data collection, they rarely involved more than a few students. Even when fairly high levels of disturbances were reported from some countries, they seem very rarely to have had a negative effect on student cooperation. In fact, most survey leaders reported that all/the majority of students worked seriously. In the case of countries with lower rates, those responsible for data collection were non-teachers who were most probably less familiar with the normal noise level in a classroom. Hence, student cooperation seems to have been good or very good in nearly all participating countries.

Even though overall student cooperation seems to have been satisfactory, two remarks need to be made in this respect. One is the fact that a fairly large number of questionnaires were removed from the Latvian database (7.6 %), even though technical issues also may have contributed. The other remark is that the circumstances regarding the data-collection situation remains unknown for Cyprus, since standardised classroom information has not been collected.

Student comprehension

All countries asked all or nearly all of the core questions from the ESPAD master questionnaire (Table K). A majority of the countries also included the module about risky cannabis consumption (the cannabis abuse screening test (CAST)) as well as several of the optional questions. Most countries also included at least some national questions.

The total number of questions in the national questionnaires varied across countries. The average number of items (with each subquestion of a question being counted as an item) was 293, the smallest number being 234 in Estonia and the largest being 416 in Ukraine (Table K). Naturally, the length of the questionnaire has an effect on the time taken to complete it. In addition, differences in students' experience of participating in studies of this type may also affect the time for completion. For these and other reasons, it is not surprising that the time taken to respond to the questionnaire varied across countries.

The average response time was 38 minutes (Table K). The highest figure (53 minutes) was reported from Greece. A rather long average completion time was also reported in the Faroes and Moldova (52 minutes) and in the Czech Republic, Portugal and Ukraine (around 46 minutes). No country reported refusal by students to complete the questionnaire because of its length.

In a few countries, more than 10 % of the survey leaders thought that the students had had some difficulties responding to the questionnaire (average 5 %). The highest proportion was found for Belgium (Flanders) (22 %) (Table J). It should be noted that the Belgian figure also included information from classes in more junior grades, where very few students in the ESPAD target group were to be found. Presumably, the corresponding figure for the Belgian ESPAD target population only would be considerably lower. The levels were more than twice the average in the Czech Republic, Latvia and Lithuania (between 11 % and 15 %).

Overall, student comprehension seems to have been satisfactory in most participating countries. However, the longer the time needed to fill in the questionnaire, the greater the risk that some students may grow tired towards the end and start giving less reliable answers. Even though this might have happened in some countries, it should be kept in mind that the ESPAD core questions were at the beginning of the questionnaire and thus less affected by possible fatigue linked to the length of the questionnaire.

Anonymity

It is crucial in surveys about deviant behaviour, such as illicit drug use, that the respondents are confident that reporting such behaviour will not entail any negative consequences for them. It is therefore important that the students understand that the survey is anonymous. Several measures were taken to ensure perceived as well as actual anonymity.

The ESPAD handbook recommends that an individual envelope be distributed along with the questionnaire. This gives the students the possibility to seal the questionnaire right after completion. In 23 ESPAD countries, such individual envelopes were used (Table G). Countries that did not use individual envelopes used other methods to ensure that the students felt that their anonymity was safeguarded. These methods included individual stickers, a closed box or a joint envelope for the entire class, often sealed in front of the class before being sent off to the research institute. If the data collection was performed online, the data was stored on a central server, to which only the research team had access.

The survey leader could be either a teacher or a research assistant. The decision as to the most suitable survey leader was taken by each country. The basis for this decision should, of course, be that the person most trusted by the students is chosen. In about half of the ESPAD countries, teachers or other members of school staff functioned as survey leaders, while the other half chose research assistants or other people from outside the school (Table G). The survey leaders were asked to stress the issue of anonymity and to refrain from walking around in the classroom while the

Table K.   Number of used items and average completion time. ESPAD 2015

Country	Main		Cannabis module (9)	Optional (93)	Own	Total number of items	Average completion time
	Core (215)	Optional (16)					
Albania	215	3	9	93	0	320	33
Austria	215	5	9	81	0	310	32
Belgium (Flanders)	179	11	7	7	135	339	40 [a]
Bulgaria	215	15	9	93	1	333	40
Croatia	215	5	0	73	0	293	33
Cyprus	215	15	9	20	0	259	36
Czech Republic	215	11	9	7	14	256	46
Denmark	214	10	9	93	1	327	35
Estonia	215	10	0	6	3	234	31
Faroes	215	10	0	90	14	329	52
Finland	212	11	0	13	51	287	32
Former Yugoslav Republic of Macedonia	215	2	9	34	0	260	33
France	210	11	7	12	28	268	39
Georgia	215	8	9	51	0	283	50 [a]
Greece	215	10	0	33	58	316	53
Hungary	215	14	7	29	46	311	38
Iceland	215	11	0	0	27	253	34
Ireland	215	12	9	56	3	295	35
Italy	212	10	9	37	38	306	37
Latvia	209	13	8	50	26	306	32
Liechtenstein	215	7	9	20	13	264	32
Lithuania	215	12	0	51	4	282	35
Malta	212	13	0	23	6	254	41
Moldova	212	9	9	33	27	290	52
Monaco	211	11	7	12	18	259	60 [b]
Montenegro	215	0	0	0	73	288	35
Netherlands	214	13	9	18	4	258	26
Norway	211	11	0	0	19	241	29
Poland	215	12	9	19	65	320	33
Portugal	206	7	9	42	45	309	47
Romania	215	14	9	93	20	351	42
Slovakia	214	14	9	0	46	283	20
Slovenia	215	5	9	56	0	285	34
Sweden	208	12	0	34	0	254	25
Ukraine	215	13	9	69	110	416	46
AVERAGE	**213**	**10**	**6**	**39**	**26**	**293**	**38**

[a]   According to country report and not according to classroom data.

[b]   Maximum time allowed, not average time used.

questionnaires were being completed. The students were instructed, verbally and in writing on the first page of the questionnaire, that they should not put their names on the questionnaire or the envelope.

No country reported any serious doubts among the students regarding anonymity issues. Overall, anonymity seems to have been handled satisfactorily in all participating countries.

Data entry and rates of missing data

Twenty countries entered the data manually while 11 used optical scanning. In four countries no data entry process was necessary since online data collection was performed using a web-based questionnaire (Table G). All countries were encouraged to perform quality checks of entered data. No particular problems were reported due to such checks.

In the instructions given to the students it was stressed that it was important for them to answer each question as thoughtfully and frankly as possible. Since participation in the study was voluntary, however, students may have skipped questions they found objectionable. Rates of missing data on substance use questions may indicate the respondents' willingness to report such use.

The proportion of unanswered questions was low for all substances (Table E). After data cleaning, the average proportion of non-responses on lifetime use ranged from 0.2 % (lifetime prevalence of ecstasy use) to 1.4 % (lifetime prevalence of alcohol use). There were no alarmingly high numbers of unanswered questions on lifetime substance use in any country. The highest rates were found for cigarettes and alcohol in Portugal (around 4 %). For illicit substances, the highest non-response rates found for any country were just above 1 %. Non-response to single (sensitive) questions is thereby not judged to be an important methodological problem in the ESPAD 2015 data collection.

Logical consistency

A measure closely related to the inconsistency measures discussed in the reliability section is logical consistency. In the ESPAD questionnaire this is relevant for sets of substance use questions measuring use during three time frames: lifetime, the last 12 months and the last 30 days. Logically, the figure for prevalence in the last 12 months cannot exceed lifetime prevalence, and the 30-day prevalence cannot exceed either the 12-month prevalence or the lifetime prevalence.

Table L includes information on the proportion of inconsistent answers relating to these three time frames for three variables: alcohol use, having been intoxicated and cannabis use. For ecstasy use and use of inhalants only lifetime and 12-month use are compared. In nearly all countries and for all five variables the reported proportions of inconsistent answers were relatively low. In other words, the proportion giving logically consistent answers across the three (or two) time frames can be considered sufficient.

Fairly high proportions of inconsistent answers were found in a few countries. To a large extent, they relate to alcohol use. Inconsistent answers on alcohol use were given by roughly 12 % of the students in Albania, Georgia and Cyprus. Across the five variables, Cyprus together with Bulgaria tended to display an overall less-favourable consistency, indicating somewhat lower data quality in relation to this aspect in these countries. With the exceptions mentioned, logical consistency seemed to be relatively high in the participating countries.

Under-reporting

One important methodological problem in surveys relates to social desirability, i.e. the tendency of respondents to give answers that they believe will show them in a good light in the eyes of others. This factor becomes particularly important in surveys relating to behaviours that are not accepted in a society or are even illegal.

At the end of the core part of the questionnaire used in the 2015 ESPAD survey, students were asked about their hypothetical willingness to admit cannabis use. The wording was, 'If you had ever used marijuana or hashish, do you think that you would have said so in this questionnaire?' The response options were 'I already said that I have used it', 'Definitely yes', 'Probably yes', 'Probably not' and 'Definitely not'.

The proportions of students claiming that they would definitely not report cannabis use are shown in Table L. In two thirds of the countries, between 5 % and 10 % replied that they were definitely unwilling to admit cannabis consumption if they had used it. The highest figure, 24 %, was reported from the former Yugoslav Republic of Macedonia. In Albania, Croatia, Latvia, Lithuania, Montenegro and Romania the values ranged between 15 % and 20 %.

A higher proportion of students replying that they would not be willing to admit cannabis use might signal problems with validity, but this is not necessarily the case. In fact, students who have never used illicit drugs may tend to be rather strongly opposed to their use, and this opposition may in part be reflected in their answers to this hypothetical question. To the extent that the response to this question reflects the opinion of the population of non-cannabis users, the result will yield a too-pessimistic view of the actual willingness of the cannabis-using population to report such use. It should also be borne in mind that the question is hypothetical. If a student tried cannabis in the future, he or she might be willing to admit it in a survey even if a negative answer had been given this time. Combining these two arguments gives rise to a third reflection: if, in the future, a student decides to try an illicit substance for the first time, the very reasons that caused him or her to try the drug might also entail a changed willingness to admit its use.

The question about hypothetical willingness to report cannabis use may be most useful in a cross-cultural context. In countries where a high proportion would definitely not admit such use, many adolescents apparently consider it so shameful that they could not even hypothetically imagine reporting it. The figures for the unwillingness to admit cannabis use were rather high in some countries and much lower in others, indicating that the level of under-reporting may vary across countries.

Table L. Some aspects of validity: inconsistent answers, unwillingness to admit cannabis use and reported use of the dummy drug 'relevin'. Percentages. ESPAD 2015

Country	Inconsistent answers [a]					Unwillingness to admit cannabis use (C53) [b]	Reported 'relevin' use (C32c) [c]
	Alcohol (C10a-c)	Been intoxicated (C15a-c)	Cannabis (C21a-c)	Ecstasy (C26a-b)	Inhalants (C31a-b)		
Albania	10.7	4.4	1.5	0.8	0.6	20.0	1.3
Austria	3.0	1.6	0.5	0.1	0.1	8.5	0.3
Belgium (Flanders)	1.2	1.3	0.1	0.0	0.0	5.4	0.4
Bulgaria	8.5	6.2	2.7	1.5	1.0	10.7	2.6
Croatia	3.2	3.0	1.1	0.5	0.5	19.6	0.8
Cyprus	13.8	6.5	1.8	1.2	0.8	10.5	1.9
Czech Republic	2.8	1.4	0.6	0.0	0.0	6.5	0.4
Denmark	1.8	1.7	0.1	0.0	0.0	4.6	0.2
Estonia	1.1	0.8	0.2	0.0	0.1	4.8	0.4
Faroes	0.8	0.2	0.0	0.0	0.0	2.9	0.2
Finland	0.5	0.6	0.1	0.0	0.0	3.6	0.2
Former Yugoslav Republic of Macedonia	7.1	3.1	0.8	0.2	0.1	24.0	0.8
France	2.7	1.4	0.8	0.1	0.1	4.9	0.7
Georgia	7.5	4.7	0.4	0.2	0.7	11.4	1.7
Greece	4.9	2.4	0.7	0.1	0.4	6.7	0.4
Hungary	4.7	2.4	0.4	0.3	0.2	9.0	0.6
Iceland	0.5	0.4	0.2	0.1	0.0	9.0	0.5
Ireland	1.8	1.0	0.7	0.1	0.4	12.0	1.0
Italy	5.9	3.2	2.2	0.6	0.4	6.9	1.4
Latvia	3.6	3.5	0.5	0.0	0.3	15.6	0.8
Liechtenstein	2.2	1.3	0.3	0.0	0.0	4.8	0.0
Lithuania	3.3	1.8	0.6	0.3	0.5	20.5	0.7
Malta	4.3	2.5	0.6	0.2	0.2	11.8	0.5
Moldova	2.2	2.7	0.9	0.2	0.1	9.2	0.3
Monaco	2.3	1.3	0.3	0.3	0.3	4.2	0.8
Montenegro	5.4	3.0	0.1	0.3	0.3	17.2	0.4
Netherlands	1.8	2.0	0.7	0.3	0.1	9.7	0.4
Norway	0.6	0.6	0.2	0.1	0.0	4.9	0.2
Poland	3.1	2.0	0.8	0.3	0.4	7.0	1.7
Portugal	7.3	1.3	1.0	0.1	0.2	5.5	0.5
Romania	10.7	4.7	1.0	0.3	0.5	14.9	0.5
Slovakia	3.4	2.8	0.5	0.0	0.3	8.0	0.4
Slovenia	2.8	2.3	1.0	0.1	0.3	3.2	0.4
Sweden	0.8	0.8	0.2	0.2	0.2	8.4	0.5
Ukraine	0.0	0.1	0.0	0.0	0.0	10.9	0.4
AVERAGE	**3.9**	**2.3**	**0.7**	**0.2**	**0.3**	**9.6**	**0.7**

[a] For each substance an inconsistent response pattern is defined as one in which any of the following is found: (a) 30-day frequency is higher than annual frequency; (b) 30-day frequency is higher than lifetime frequency; or (c) annual frequency is higher than lifetime frequency. For ecstasy and inhalants only lifetime and annual frequency.

[b] Students answering 'definitely not' to the question 'If you had ever used marijuana or hashish (cannabis), do you think that you would have said so in this questionnaire?'.

[c] Instead of relevin some countries used national alternatives as a dummy drug.

It can be concluded that surveys most probably underestimate the prevalence of illicit substance use, that under-reporting probably differs somewhat across countries and that under-reporting of illicit drug use might be higher in the seven countries mentioned above. There is, however, no reason to believe that such differences would undermine the overall conclusions of the study. Hence, low-prevalence countries would most likely remained low-prevalence countries even if all students who had taken illicit drugs admitted their use.

Over-reporting

In addition to the risk of under-reporting substance use, there is also the risk of respondents exaggerating their substance use experience, which may also threaten the validity of the results. To test this, the dummy drug 'relevin' was included among a list of existing substances in the questionnaire. Countries may use another name instead of relevin for the dummy drug, if there is a risk that the students may confuse it with a national street name for any existing substance.

The average across all ESPAD countries for reported relevin use was 0.7 % (Table L). In Bulgaria, Cyprus, Georgia and Poland however, the proportion of students reporting use of the dummy drug was higher than average (around 2 %). With the exception of those four countries, few students reported any use of the dummy drug, indicating that students do not routinely exaggerate their substance use. It seems reasonable to assume that high prevalence rates for drug use are in practice nearly unaffected by a possible general tendency to exaggerate drug use. However, these findings also underline the need for caution in interpreting the prevalence of less-common drugs such as heroin and LSD. For each country, the proportion reporting use of the dummy drug could serve as a baseline for plausibility — meaning that if, say, 0.7 % of students in a country claim to have used the dummy drug, then the first 0.7 % of students reporting use of a real drug should be interpreted with caution.

Non-ESPAD countries: Spain and the United States

Apart from the results of the 35 ESPAD countries participating in 2015, data from two more countries are presented in the graphs and tables. These non-ESPAD countries are Spain and the United States. Comparisons with these countries have been performed in previous ESPAD reports as well. This is considered feasible since many of the questionnaire items are identical, or at least very similar. The reason for the many similarities is that the US 'Monitoring the future' study has strongly influenced the ESPAD questionnaire.

However, since there are differences both in the overall methodology and, sometimes, in the wording of individual items, caution is called for when results from Spain and the United States are compared with results from the ESPAD countries. To draw attention to this, data from Spain and the United States are presented separately at the bottom of the tables and with divergent patterns in the graphs.

Both Spain and the United States have provided short texts containing information similar to that presented in the ESPAD country reports and summarised in the methodological tables. These presentations are available in Appendices 1 and 2, while some main findings are summarised below.

Spain

The Spanish data comes from a long-term series of biennial national school surveys conducted since 1994 by the Spanish Observatory on Drugs and Drug Addiction, which is part of the Governmental Delegation for the National Plan on Drugs (DGPNSD). The data used here were collected between November 2014 and April 2015 among 14- to 18-year-old students (Spanish Observatory on Drugs and Drug Addiction, 2016a, b). Only 15- to 16-year olds are included for ESPAD comparisons (18 280 students). The average age was 15.5 years, hence slightly lower than the ESPAD average of 15.8.

Approximately 83 % of the residents born in 1999 were enrolled in school, and the sampling frame covered almost 100 % of the students. Of the sampled schools, 13 % were replaced due to justified refusals. About 15 % of the students were absent at the time of the survey, while hardly any (0.1 %) declined to take part in the data collection. Fieldwork was performed by research assistants. The Spanish team considers the data collection to have been successful and nationally representative for 15- to 16-year-old students.

United States

The data presented for the United States come from a long-term series of annual national surveys that are part of the 'Monitoring the future' project (Johnston et al., 2016; Miech et al., 2015). Three school grades are annually surveyed, but for ESPAD comparisons only the results for grade 10 are compared. The proportion of 10th graders who were 15 years old was 42 %, 16 years old 53 % and 17 years old 5 %. This gives an estimated average age of 16.1 years, which is slightly higher than the ESPAD average of 15.8.

The sample was representative of all 10th grade students in the coterminous United States (48 states, i.e. all except Alaska and Hawaii). About 97 % of the target population were enrolled in school (grade 10) at the time of the data collection, which took place in February-June 2015. Of the sampled schools (original selection and replacement schools) 93 % took part in the study. In the sampled classes 87 % of the students were present and refusals were quite rare (less than 1 %). Fieldwork was performed by research assistants. Approximately 5.1 % of 10th-grade questionnaires were dropped in the 2015 cleaning process due to inconsistencies in sets of answers or non-credible answers. This is a larger proportion of removed questionnaires compared to the ESPAD average of 1.8 %.

Summary

The most notable methodological remarks among countries where problems have been detected are summarised below, followed by a short overall methodological summary and some final remarks.

Country-specific methodological remarks

Deviations from the common ESPAD methodology and setbacks of methodological importance which are deemed important when interpreting the results are listed for individual countries.

Albania. Inconsistency measurements related to reliability and validity indicate that the collected data may be of somewhat lower quality compared to the average ESPAD country.

Austria. The data collection was performed online (instead of using pencil and paper). The school participation rate was low (21 %). This gives rise to some uncertainty regarding the collected data, even though no serious sample bias has been detected. A relatively high proportion (4.2 %) of the questionnaires were discarded in the central data-cleaning process.

Bulgaria. Compared to other countries a relatively high level of inconsistent answers and a slightly higher level of 'relevin' use was noted, indicating a somewhat lower level of data validity than average.

Belgium (Flanders). Geographic limitations since only students in the Dutch-speaking areas took part (approximately 60 % of the population). The data collection was performed during autumn 2014 (instead of spring 2015). The target population was redefined to give an average age in line with other participating countries.

Cyprus. Only government-controlled areas were included in the sample (approximately 80 % of the population). Standard classroom report information was not available, which leaves uncertainties regarding student participation rates and the classroom situation during data collection. A relatively high proportion (3.8 %) of the questionnaires were discarded in the central data-cleaning process. A relatively high level of inconsistent answers and a relatively high level of 'relevin' use was noted, indicating a somewhat lower data quality than the ESPAD average.

Denmark. The sampling frame had a relatively low (78 %) coverage of the ESPAD target group, partly explained by the fact that only one school grade was sampled and that boarding schools were not included in the sampling frame. Low (26 %) school-participation rates, in turn leading to a relatively small net sample (1 670 students). This gives rise to some uncertainty regarding the collected data, though no serious sample bias has been detected.

Former Yugoslav Republic of Macedonia. A relatively low proportion (79 %) of the 1999 birth cohort was enrolled in school. A relatively large proportion (24 %) responded that they would be unwilling to report possible use of cannabis, indicating that under-reporting may be higher than in other countries.

Georgia. The sampling frame had a relatively low (73 %) coverage of the target population since the 1999-born students were distributed among several grades but only the main grade was sampled. The students were approximately 6 months older compared to the ESPAD average since the data collection was performed during autumn instead of spring and there was no redefinition of the target group.

Ireland. The school participation rates were low (21 %), in turn leading to a relatively small net sample (1 470). This gives rise to uncertainty regarding the collected data, though no serious sample bias has been detected.

Latvia. The data collection was performed online (instead of using pencil and paper). The school participation rate was low (49 %), in turn leading to a very low number of students in the net sample (1 119 students). The fieldwork suffered from setbacks, leading to some uncertainties regarding the quality of the data collection. A high proportion (7.6 %) of the questionnaires were discarded. As a precautionary measure related to these methodological obstacles the Latvian results are presented below a line in the results tables and no comparisons are made with previous surveys.

Liechtenstein. The data collection was performed online (instead of using pencil and paper).

Moldova. The Transnitria region was not covered by the sample (circa 20 % of the Moldovan population).

Netherlands. The data collection was performed online (instead of using pencil and paper). Low (43 %) school participation rates, which in turn lead to a relatively small net sample (1 684 students). This gives rise to uncertainty regarding the collected data, though no particular serious bias has been detected. The data collection was performed during autumn instead of spring (the target population was redefined to give an average age in line with other participating countries).

Norway. A relatively high proportion (4.2 %) of the questionnaires were discarded in the central data-cleaning process.

Portugal. A relatively high proportion (6.0 %) of parents refused to allow their children to participate in the survey. The sampling frame covered 86 % of the ESPAD target group since private schools were not included.

Romania. A relatively high proportion (6.9 %) of the parents refused permission for their child to participate in the survey.

Non-ESPAD countries

Spain and the United States. These countries do not participate in the ESPAD study but carry out similar school surveys with similar questions. Whenever data are judged to be comparable, results from these countries are reported. However, since they do not use the full ESPAD methodology, such comparisons definitely include a measure of uncertainty. This is emphasised by presenting data from Spain and the United States below a line in the results tables.

Spain. Data were largely collected between November 2014 and April 2015. Because of this, the average age of the Spanish respondents is slightly lower than the ESPAD average (15.5 and 15.8 years, respectively).

United States. The data collection in the United States was carried out between February and June 2015. The estimated average age was 16.1 years, slightly above the ESPAD average of 15.8 years. Approximately 5 % of the questionnaires were discarded in the cleaning process, which was higher than the ESPAD average of 1.8 %.

General methodological remarks

The main purpose of the ESPAD project is to collect comparable data on substance use among students of the same age in as many European countries as possible. The studies are conducted as school surveys, following a common methodology described in a handbook. The target population of the ESPAD study is defined as the national population of students who turn 16 during the calendar year of the survey, excluding those who are enrolled in either special schools or special classes for students with learning disorders or severe physical disabilities. In nearly all countries, a very large majority of those born in 1999 were enrolled in school during the 2015 data collection (93 % on average). The estimated average age of participating students across the ESPAD countries was 15.8 years.

In some countries there were limitations in the geographical coverage. In most cases they were minor. However, for three countries these limitations were bigger: Belgium, where data collection was limited to the Dutch-speaking areas (Flanders); Cyprus, where data collection was limited to government-controlled areas; and Moldova, where the Transnitria region was not included in the sampling frame.

In the vast majority of the countries, the representativeness of the sampling frames was high and usually covered at least 90 % of the target student population. In countries where not all relevant grades and school categories were included, the sample is representative only of students born in 1999 enrolled in participating grades and school categories.

No particular problems were noted regarding absent students or present students declining participation, nor were there, apart from two countries, any particular problems with parents refusing to allow their child to take part. School cooperation was satisfactory in most countries, even though some countries encountered notable problems with schools that refused to take part for various reasons. In five countries, less than 50 % of the sampled schools or classes took part in the ESPAD survey. This in turn had a negative influence on the number of participating students. Taken together, these two factors make the representativeness of the data for a few countries somewhat uncertain.

The analysis of the available information suggests that the validity of the ESPAD studies is high in most countries. The indicators analysed include student cooperation, student comprehension, anonymity, reported use of a dummy drug, rates of missing data and logical consistency. The main issues of validity relate to reported lack of willingness to answer honestly as well as to cultural context. Validity problems, however, seem to be limited in scope and to affect only a few countries to a rather limited extent.

Below follow some final general remarks.

- The overall impression is that the methodological problems in the 2015 ESPAD data collection were relatively limited.
- With one exception, no country experienced methodological problems of such a degree that the comparability of its results with data from other countries was called into question.
- The estimates for illicit drug use probably represent an underestimate, and the level of under-reporting may differ somewhat between countries. However, it is not likely that the classification of countries as either high-prevalence or low-prevalence ones could be questioned on the basis of differences in under-reporting between countries.
- Despite some differences in a cultural context, the validity of the ESPAD survey is assumed to be generally high.
- Individual countries may suffer from various methodological problems that should be taken into account when their results are analysed. These were briefly summarised before (in 'Country-specific methodological remarks').
- It is more relevant to focus on the magnitude of the estimates than on absolute figures, both when analysing data from single countries and when interpreting trends and differences between countries. Small differences between countries should be considered carefully. They may not reflect real differences.

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Appendix 1 – Spain
(Not an ESPAD country)

This description was provided by the Spanish Observatory on Drugs and Drug Addiction.

The Spanish data presented in this report come from a long-term series of biennial national school surveys conducted since 1994 by the Spanish Observatory on Drugs and Drug Addiction, which is part of the Governmental Delegation for the National Plan on Drugs (DGPNSD). 2014 survey data were collected by Análisis e Investigación, SL. Data analysis was performed by the Spanish Observatory on Drugs and Drug Addiction (Rosario Sendino, principal researcher; Aurora Ruiz, Noelia Llorens, Begoña Brime and Elena Álvarez, co-principal researchers). In all, nearly 300 000 students from approximately 7 000 schools have been surveyed over the life of the study.

Ethical procedures

The participation of students in the Spanish survey was based on passive parental consent, as parents' associations of schools, school administrations and regional educational authorities were informed about the nature, objectives and characteristics of the study.

Since the Spanish national school survey is a part of the Spanish national statistical plan, it is compulsory for schools to participate unless they have serious and justified grounds for refusing. All selected students were informed that participation in the survey was voluntary. To ensure confidentiality, all questionnaires were anonymous. Field researchers were responsible for the data collection. Teachers were invited to stay in the classrooms during the administration of the survey, but their role was limited to assisting fieldworkers in keeping the group working in silence and order.

Population, sampling and representativeness

The reference population was the 1 489 531 students aged 14-18 attending public and private schools of secondary, high-school and vocational education. Schools for students with special needs and specialised study subjects such as arts or music were excluded. The sample consisted of 37 486 students aged 14-18 who attended secondary school in all regions of Spain in 2014, including urban and rural as well as public and private schools. These students represented 70 % of all youths of this age in Spain. School is compulsory in Spain until the age of 16. Approximately 83 % of all Spanish inhabitants born in 1999 were enrolled in school during the data-collection period (2014/2015). Close to 100 % of the Spanish students born in 1999 were covered by the sampling frame.

A two-stage cluster sampling was used, by randomly selecting 941 schools in a first stage and 1 858 classes in a second stage. In order to select the schools, the sampling frame was first stratified by region (19 strata) and school type (public and private schools). Schools and classes had the same probability of being sampled, regardless of size.

Data were weighted by region, type of school (public/private) and type of studies (secondary, high school and vocational education).

For comparison with the ESPAD study, data are reported only for the 18 280 students who were 15 or 16 years old at the time the survey was performed, with a mean age of 15.49.

Field procedure

All students in the sampled classes completed the questionnaire during a regular lesson (45-60 minutes). The anonymous character of the study was stressed by the survey leader prior to asking the students to complete the questionnaire. Teachers introduced the survey leaders (two per classroom) and were asked to remain in the classroom to ensure an orderly atmosphere. Teachers remained in the classroom and were asked not to walk around the room.

Each student received an individual envelope in which to deposit the questionnaire once it was completed. Before leaving the classroom students were asked to give the envelope to the survey leader.

Data were collected from 14 November to 22 December 2014, and from 1 February to 8 April 2015. The survey was interrupted during the Christmas holidays and for a month thereafter to avoid bias in questions concerning the last-30-day period.

School and student participation

The information in this section refers to the whole sample (14 to 18-year-old students). The cooperation of the schools was excellent. The proportion of schools replaced because of a justified refusal to participate was 12.7 %.

About 15 % of registered students were not in class at the time of the survey (absent) for different reasons.

Student cooperation was very good. The proportion of students who declined to take part in the study was irrelevant (0.1 %).

Questionnaire and data processing

A standardised, anonymous questionnaire was used, which may be considered comparable with many questions used in the ESPAD questionnaire.

The questionnaire includes questions on sociodemographic characteristics, drug use, risk associated with different drug use behaviours, certain aspects related to entertainment, level of perceived availability of different psychoactive drugs, certain social and health-related problems, gathered information on drugs, drug use by friends and classmates, short cannabis abuse screening test (CAST), new psychoactive drugs (spice, ketamine, mephedrone, and salvia), students' perception of their parents' attitude regarding drug use and questions about the internet and gambling.

The linguistic particularities of the various autonomous regions were taken into account. Because of this, special versions of the questionnaire were used in the Basque, Castilian, Catalan, Galician and Valencian languages.

Data entry and the first checks for consistency were carried out by Análisis e Investigación, SL. Later on, a more detailed data check and analysis (selection of cases, recoding of variables, assignment of missing-data codes and data weighting) was carried out by the Spanish Observatory on Drugs and Drug Addiction. Due to missing information on age, gender or otherwise a high rate of non-responses, 1.5 % of all questionnaires were discarded.

Weightings were added to the data to improve the accuracy of estimates by correction for unequal probabilities of selection that arise in the multistage sampling procedures.

Reliability and validity

Results from the different surveys conducted since 1994 show tendencies that are rather consistent, suggesting that the data presented satisfy international standards of quality for school surveys. As mentioned, the reliability and validity seem to be high. It is assumed, however, that any remaining bias is in the direction of under-reporting.

It was found that self-reported drug use relates in consistent and expected ways to a number of attitudes, behaviours, beliefs and social situations; in other words, there is strong evidence of construct validity. The missing data rates for the self-reported-use questions are only slightly higher than for the preceding non-sensitive questions, in spite of the explicit instruction to respondents to leave blank those drug use questions they felt they could not answer honestly.

This is not to argue that self-reported measures of drug use are valid in all cases. The fieldworkers tried to create a situation and set of procedures in which students felt that their confidentiality was protected. They also tried to present a convincing case as to why such research is needed. Evidence suggests that a high level of validity has been obtained.

Methodological conclusions

The Spanish school surveys on drug use seem to have functioned well since their initiation in 1994. In 2014-2015 there are clearly trends of stabilisation in the prevalence rates of alcohol consumption (and also a decreasing trend in intoxication due to alcohol drinking) and significantly decreasing trends in the prevalence rates of cannabis, cocaine, tobacco, amphetamine, ecstasy and heroin consumption. There is a decrease in risk perception of occasional consumption and in perceived availability. These trends are consistent with those found in household surveys and in some of the drug-related indicators (drug-related deaths, drug-related infectious diseases, etc.).

The sample is representative of the whole country, and the number of students is large enough in relation to the 15- to 16-year-old cohort, which is the ESPAD target group. The level of cooperation shown by schools and students was very good.

There were 514 variables in the Spanish questionnaire, which is higher than in all ESPAD countries. However, since the average time to answer the questionnaire was within one lesson, it seems reasonable to assume that the length of the questionnaire has not negatively influenced the validity. About 0.1 % of the students did not participate, mostly because they simply refused to collaborate. The information provided by the survey leaders did not indicate any major problems, so there is reason to believe that student cooperation was good.

Appendix 2 – United States
(Not an ESPAD country)

This description was provided by Professor Lloyd Johnston at the University of Michigan.

The data presented here for the United States come from a long-term series of annual national surveys that are part of the 'Monitoring the future' project (Lloyd D. Johnston, principal investigator; Jerald G. Bachman, Patrick M. O'Malley, John E. Schulenberg and Richard A. Miech, co-investigators). This research series, in its 40th year in 2015, is funded under a series of investigator-initiated competing research grants from the US National Institute on Drug Abuse and conducted at the Institute for Social Research of the University of Michigan. The findings and description presented here were provided by Professor Johnston.

Surveys on nationally representative samples of 12th graders have been carried out each year since 1975. Beginning in 1991, surveys on nationally representative samples of 8th- and 10th-grade students have also been conducted annually. In all some 1 500 000 students have been surveyed over the life of the study. Follow-up surveys of each 12th-grade class have been conducted since 1977, yielding annual national samples of college students and adults, and eventually people through age 55 who were secondary-school graduates. In the United States about 85-90 % of each graduating birth cohort graduates from secondary school by completing 12th grade. Considerably more complete 10th grade, and about 97 % of the teenagers born in 1999 and in 2000 were enrolled in school at the time of the data collection.

Population

In the United States, the required age for school attendance is 16. For this report, only the data for students who were in 10th grade in the spring of 2015 are presented. Nearly all of the students in this grade are 15 or 16 years of age, thus approximating the age of the ESPAD participants. The proportion of 10th graders who were 15 years old was 42 %, 16 years old 53 % and 17 years old 5 %.

Sample and representativeness

In 2015, the 10th graders included in the study comprised 15 015 students in 120 high schools nationwide (102 public and 18 private schools), selected to provide an accurate representative cross-section of all 10th-grade students in the coterminous United States (48 states, i.e. all except Alaska and Hawaii).

A multistage random sampling procedure is used for securing the nationwide sample of 10th-grade students each year. Stage 1 is the selection of particular geographic areas across the country, Stage 2 involves the selection (with probability proportionate to size) of one or more schools in each area containing a 10th grade and Stage 3 is the selection of students within each school. Within each school, up to 350 10th graders may be included. In schools with a small number of 10th graders, the usual procedure is to include all of them in the data collection. In larger schools, a subset of 10th graders is selected either by randomly sampling entire classrooms or by some other random method judged to be unbiased. The resulting data are reweighted to correct for any differences in selection probability that may have occurred in the sampling. (See Johnston et al., 2016 and Miech et al., 2015 for details on sampling and field procedures, as well as for more detailed results.)

Field procedures

Parental notification with the opportunity for them to decline their child's participation is required prior to the administration of the survey; some individual schools require active written parental consent. Approximately 3 weeks before the administration, letters and brochures are sent to the students' parents to inform them of the study and request permission for their children to participate.

About 10 days before the administration, the students are given flyers explaining the study, telling them that their participation is voluntary and that the project has a special government grant of confidentiality that allows the investigators to protect all information gathered in the study. The actual questionnaire administration is conducted by representatives of the local Institute for Social Research and their assistants, following standardised procedures detailed in a project instruction manual. The questionnaires are administered in classrooms during a normal class period whenever possible; however, circumstances in some schools require the use of larger group administrations. Teachers introduce the interviewer and remain in the room to ensure an orderly atmosphere. They are asked not to move around the room lest students be concerned that they might see their answers. Most respondents can finish within a normal 45-minute class period; for those who cannot, an effort is made to provide a few minutes of additional time. The data-collection period was from mid February through mid June of 2015. The annual surveys are always conducted at the same time of year to avoid any unintended artefacts.

The questionnaires turned in by the 10th-grade respondents to the university-employed interviewer are anonymous. They contain no names, addresses, phone numbers or other individually identifying information.

Questionnaire and data processing

The 'Monitoring the future' questionnaires are designed to be optically scanned after they have been completed. All questions have a pre-specified set of answers; with no write-in answers. A great many of the questions in the 'Monitoring the future' questionnaires are equivalent to questions in the core segment of the ESPAD survey, but a number of the ESPAD questions are not included in 'Monitoring the future'. Similarly, many of the 'Monitoring the future' questions are not included in ESPAD.

Because many questions are needed to cover all of the topic areas in the study, much of the questionnaire content intended for 10th graders is divided into four different questionnaire forms that are distributed to participants in an ordered sequence that ensures four virtually identical random subsamples. About one third of each questionnaire form consists of key variables that are common to all forms. All demographic variables, and nearly all of the drug use variables included in this report, are contained in this common set of measures. Questions on other topics tend to be contained in fewer forms, and are thus usually based on one third or two thirds as many cases (i.e. approximately 5 000 to 10 000 cases).

After the administration of the surveys in the classrooms, the interviewers forward boxes of the completed questionnaires to a contractor, where they are optically scanned. The data are then sent to study staff where they are checked for accuracy, processed and cleaned using SAS statistical and data-management software. Processing and cleaning steps include consistency and wild-code checking, assignment of missing data codes, addition of weightings and school information, creation of permanent recoded variables and creation of a clean data disc for analysis. Approximately 5 % of the questionnaires were discarded in the cleaning process.

Weightings are added to the data to improve the accuracy of estimates by correction for unequal probabilities of selection that arise at any point in the multistage sampling procedure.

School and student cooperation

Schools are invited to participate in the study for a 2-year period. With very few exceptions, each school from the original sample participating in the first year has agreed to participate for the second. For each school refusal, a similar school (in terms of size, geographic area, community size, etc.) is recruited as a replacement. In 2015, 44 % of the sampling slots were filled with original selection schools and 49 % with replacement schools. Overall some 93 % of the sampling 'slots' were filled, including the replacement schools.

In 2015, completed questionnaires were obtained from 87 % of all sampled students in the 10th-grade sample of schools. The single most important reason that students were missed was absence from class at the time of data collection. The proportion of explicit refusals amounts to less than 1 % of students. Student comprehension is judged to be very high, based on pilot tests, questionnaire-completion rates and low rates of internal inconsistencies.

Reliability and validity

Even taking into account the clustered nature of these school-based samples, it was found that the annual drug-prevalence estimates, based on the total sample of 10th graders each year, have confidence intervals that average about ± 1 %. Confidence intervals on lifetime prevalence for 10th-graders vary from ± 0.2 % to ± 2.4 %, depending on the drug. Confidence intervals for last-12-month, last-30-day and daily use are smaller. This means that, had it been possible to invite all schools and all 10th-grade students in the 48 coterminous states to participate, the results from such a massive survey should be within about 1 percentage point of the present findings for most drugs at least 95 times out of 100. This was considered to be a high level of sampling accuracy, permitting the detection of fairly small changes from one year to the next.

The question always arises of whether sensitive behaviours like drug use are honestly reported. Like most studies dealing with sensitive behaviours, there is no direct, totally objective validation of the present measures; however, the considerable amount of inferential evidence that exists from the study of 12th graders strongly suggests that the self-report questions produce largely valid data (Johnston and O'Malley, 1985; Johnston, O'Malley, Bachman and Schulenberg, 2003; O'Malley, Bachman and Johnston, 1983. These citations are available at http://www.monitoringthefuture.org).

First, using a three-wave panel design, it was established that the various measures of self-reported drug use have a high degree of reliability, a necessary condition of validity. In essence, this means that respondents were highly consistent in their self-reported behaviours over a 3-4-year interval. Second, a high degree of consistency was found among logically related measures of use within the same questionnaire administration — evidence for convergent validity. Third, the proportion of seniors (i.e. 12th graders) reporting some illicit drug use by 12th grade has reached two thirds of all 12th-grade respondents in peak years and as high as 80 % in some follow-up years, which constitutes prima facie evidence that the extent of under-reporting must be very limited. Fourth, the seniors' reports of use by their unnamed friends, about whom they would presumably have less reason to distort, have been highly consistent with self-reported use in the aggregate in terms of both prevalence and trends in prevalence. Fifth, it was found that self-reported drug use relates in consistent and expected ways to a number of other attitudes, behaviours, beliefs and social situations; in other words, there is strong evidence of construct validity. Sixth, the missing-data rates for the self-reported use questions are only very slightly higher than for the preceding non-sensitive questions, in spite of the explicit instruction to respondents to leave blank those drug use questions they felt they could not answer honestly. And seventh, the great majority of respondents, when asked, say they would answer such questions honestly if they were users.

This is not to argue that self-reported measures of drug use are valid in all cases. The researchers tried to create a situation and set of procedures in which students feel that their confidentiality will be protected. They also tried to present a convincing case as to why such research is needed. The evidence suggests that a high level of validity has been obtained. Nevertheless, insofar as there exists any remaining reporting bias, the estimates are believed to be in the direction of under-reporting. Thus, the estimates are believed to be lower than their true values, even for the obtained samples, but not substantially so.

Methodological considerations

There is no reason to believe that the sample is biased. However, it should be noted that the population consists of students in grade 10. Most of them are 15-16 years old, which means that a large majority were born in 2000, but not all of them, which yields a very modest degree of non-comparability with the regular ESPAD countries.

Another difference, compared with most but not all other countries, was that the students in the United States knew about the study in advance. It seems reasonable to think that this fact has not created any major problems in comparison with other countries since the reliability and validity are rather high and since students in the United States are accustomed to participating in different kinds of surveys.

An advantage from the ESPAD perspective is that the most important drug use questions are the same in the United States as in Europe. As mentioned, the reliability and validity seem to be high. It is assumed, however, that any remaining bias is in the direction of under-reporting.

With the abovementioned in mind, there is reason to believe that the results from the United States are rather comparable with data from the regular ESPAD countries.

Further information http://www.monitoringthefuture.org

Appendix 3 – Acknowledgements

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Institute of Public Health; Ministry of Health; Ministry of Education and Sport

Austria

Bundesministerium für Gesundheit (BMG); Bundesministerium für Bildung und Frauen (BMBF)

Belgium (Flanders)

Department of Clinical and Lifespan Psychology (KLEP — VUB); Ministry of Welfare, Public Health and Family of the Government of Flanders; Research Council of the Free University of Brussels

Bulgaria

National Centre for Public Health and Analyses (NCPHA); National Centre for Drug Addictions (NCDA); Ministry of Education and Science (MoES)

Croatia

Croatian Institute of Public Health (CIPH); Ministry of Health; Ministry of Science, Education and Sports

Cyprus

Kenthea; Ministry of Education and Culture; CMCDDA; Cyprus Anti-drugs Council

Czech Republic

Czech National Monitoring Centre for Drugs and Addiction; National Institute of Mental Health; Office of the Government of the Czech Republic

Denmark

Department of Public Health, Aarhus University; Danish Health Authority

Estonia
National Institute for Health Development

Faroes
Ministry of Education, Research and Culture; Faroese Board of Public Health

Finland
National Institute for Health and Welfare (THL)

Former Yugoslav Republic of Macedonia
National Institute of Public Health and Centres for Public Health in Skopje; Tetovo; Kumanovo; Stip; Veles; Prilep; Bitola; Ohrid; Strumica and Kocani; Kontakt non-governmental organisation; Ministry of Health; Ministry of Education and Science

France
French Monitoring Centre on Drugs and Drug Addictions (OFDT); Ministry of Education; Ministry of Agriculture; French National Institute of Health and Medical Research (Inserm)

Georgia
National Centre for Disease Control and Public Health (NCDC); Ministry of Education and Science; European Monitoring Centre for Drugs and Drug Addiction (EMCDDA), EMCDDA-ENP technical cooperation project (ENPI/2013/325-486) funding

Greece
Greek Organisation Against Drugs (OKANA); OKANA/local authority drug prevention centres; Ministry of Education

Hungary
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Iceland
Icelandic Directorate of Health; University of Akureyri

Ireland
Department of Health; TobaccoFree Research Institute Ireland; Focas Research Institute; DIT Dublin; Seefin DM; Kerry

Italy
National Research Council (CNR), Unit of Epidemiology and Health Service Research of the Institute of Clinical Physiology

Latvia
Centre for Disease Prevention and Control

Liechtenstein
School Board

Lithuania
Lithuanian Ministry of Education and Science; Qualifications and Vocational Education and Training Development Centre; Klaipėda University

Malta
Aġenzija Sedqa (National Agency against Drug and Alcohol Abuse and Compulsive Gambling), Foundation for Social Welfare Services; Directorate for Educational Services (DES), Student Services Department, Education Psycho-Social Services; Anti-Substance Abuse Service within the Education Psycho-Social Services; Directorate for Education, Secretariat for Catholic Education, Archdioceses of Malta; ISA-Independent Schools Association and the participating independent schools

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Monaco
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Montenegro
Institute of Public Health of Montenegro; Ministry of Education of Montenegro; Ministry of Health of Montenegro

Netherlands
Dutch Ministry of Health, Welfare and Sport; Regional Health Services; Trimbos-instituut

Norway
Norwegian Institute for Alcohol and Drug Research (SIRUS)

Poland
National Bureau for Drug Prevention (KBPN); State Agency for the Prevention of Alcohol-Related Problems (PARPA); Institute of Psychiatry and Neurology (IPiN)

Portugal
General-Directorate for Intervention on Addictive Behaviours and Dependencies (SICAD), Ministry of Health; Direção-Geral de Estatísticas da Educação e Ciência and Direçao-Geral da Educação, Ministry of Education

Romania
National Anti-drug Agency; Ministry of National Education and Scientific Research; National School of Public Health, Management and Professional Development

Slovakia
Research Institute for Child Psychology and Pathopsychology; St. Elizabeth University of Health and Social Sciences; Public Health Authority of the Slovak Republic; Slovak Centre of Scientific and Technical Information; National Monitoring Centre for Drugs

Slovenia
University Medical Centre Ljubljana; Clinical Institute of Occupational, Traffic and Sports Medicine; Ministry of Education, Science and Sport

Sweden
Swedish Ministry of Health and Social Affairs; Swedish Council for Information on Alcohol and Other Drugs (CAN)

Ukraine
Ukrainian Institute for Social Research after Olexander Yaremenko (UISR); Institute for Economics and Forecasting National Academy of Science of Ukraine (IEP NASU); Social Monitoring Centre (SMC); Ministry of Education and Science of Ukraine; European Monitoring Centre for Drugs and Drug Addiction (EMCDDA), EMCDDA-ENP technical cooperation project (ENPI/2013/325-486) funding; United Nations Children's Fund (Unicef) in Ukraine

ESPAD

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