



European Monitoring Centre  
for Drugs and Drug Addiction

**ESPAD**

The European School Survey Project on Alcohol  
and Other Drugs

# ESPAD 2019 Methodology

Methodology of the 2019  
European School Survey  
Project on Alcohol and other  
Drugs

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# Contents

<b>Introduction</b> .....	<b>4</b>
Countries participating in the 1995–2019 ESPAD data collection .....	4
<b>ESPAD 2019 reporting</b> .....	<b>7</b>
Indicators used .....	7
Testing of statistical significance .....	7
<b>Methodological considerations in relation to ESPAD 2019</b> .....	<b>8</b>
Use of school surveys .....	8
Cultural context .....	8
Questionnaire changes .....	9
Ethical aspects .....	9
Data cleaning .....	12
Fieldwork .....	15
Representativeness .....	16
Geographical coverage .....	16
Sampling strategies .....	16
Birth cohort representativeness .....	17
Student representativeness .....	17
School cooperation .....	19
Student response rates .....	20
Number of participating students .....	20
Reliability .....	21
Validity .....	23
Translation of the questionnaire .....	23
Student cooperation .....	23
Student answering time and comprehension .....	25
Anonymity .....	26
Data entry and rates of missing data .....	26
Logical consistency .....	26
Under-reporting .....	28
Over-reporting .....	28
Some methodological issues to be addressed in future .....	28
Country-specific methodology remarks .....	29
<b>References</b> .....	<b>31</b>
<b>Acknowledgements</b> .....	<b>32</b>

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# Introduction

The European School Survey Project on Alcohol and Other Drugs (ESPAD) has been collecting comparable data on risk behaviours and substance use among adolescent students for almost 25 years, in order to monitor trends in and between countries.

The study is conducted in each participating country as a school survey for students reaching the age of 16 years during the year of the data collection, and following a common methodology. A handbook describing the methodology and reporting procedures drives the implementation of the study in the participating countries, thus facilitating the collection of comprehensive and comparable data.

ESPAD surveys have been performed every 4 years since 1995. The seventh round of data collection was performed in 2019, and therefore results covering a 24-year period are now available. In the past 4 years, thanks to huge efforts on the part of both the coordination team and ESPAD principal investigators (PIs), all ESPAD data for 1995–2019 have been collated and are now available in an integrated data set called the ESPAD Trend Database.

Until 2011, the results and methodological information of each round of ESPAD data collection were presented in an extensive report. Following the example of 2015, in 2019 the main findings were presented in a shorter report (ESPAD Group, 2020a). A comprehensive set of additional result tables was presented separately, in both pdf (ESPAD Group, 2020b) and editable formats. Furthermore, this report provided all the relevant methodological information concerning the survey wave. All these materials are available on the ESPAD website ([www.espad.org](http://www.espad.org)), together with the ESPAD master questionnaires for all years.

## Countries participating in the 1995–2019 ESPAD data collection

In the seventh study wave, conducted in 2019, a total of 35 countries took part (Austria, Bulgaria, Croatia, Cyprus, Czechia, Denmark, Estonia, the Faroes, Finland, France, Georgia, Germany, Greece, Hungary, Iceland, Ireland, Italy, Kosovo (under United Nations Security Council Resolution 1244), Latvia, Lithuania, Malta, Monaco, Montenegro, the Netherlands, North Macedonia, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden and Ukraine). Spain participated in the project for the first time in 2019. National research teams, as well as funding agencies and organisations that provide support for ESPAD 2019, are listed in the acknowledgements in the annex. The 1995 ESPAD data collection covered 23 countries, and 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), and five additional countries collected ESPAD data in 2008. The number of countries that contributed results to the 2011 report was 36 (Hibell et al., 2012), and three more countries collected data in the autumn of 2011; these data were presented in a digital supplement (Hibell and Guttormsson, 2013). The 2015 data collection covered 35 countries, and the report also included data from two non-ESPAD countries (ESPAD Group, 2016a).

In total, 49 countries (or entities) have participated in at least one of the data collection waves (see Table 1). Twenty-one countries have collected data in all seven consecutive waves.

**Table 1.** Countries participating in the 1995–2019 ESPAD data collection

Country	PI / associate researcher	1995	1999	2003	2007	2011	2015	2019
<b>Albania</b>	Ervin Toci	—	—	—	—	Yes	Yes	—
<b>Armenia</b>	Vacant	—	—	—	Yes	—	—	—
<b>Austria</b>	Julian Strizek	—	—	Yes	Yes	—	Yes	Yes
<b>Belgium (Flanders)</b>	Vacant	—	—	Yes	Yes <sup>(a)</sup>	Yes <sup>(b)</sup>	Yes <sup>(b)</sup>	—
<b>Belgium (Wallonia)</b>	Vacant	—	—	Yes	—	—	—	—
<b>Bosnia and Herzegovina (FBiH)</b>	Aida Pilav	—	—	—	Yes <sup>(c)</sup>	Yes <sup>(a)</sup>	—	—
<b>Bosnia and Herzegovina (RS)</b>	Sladjana Siljak	—	—	—	Yes <sup>(c)</sup>	Yes	—	—
<b>Bulgaria</b>	Anina Chileva	—	Yes	Yes	Yes	Yes	Yes	Yes
<b>Croatia</b>	Martina Markelić	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<b>Cyprus</b>	Kyriakos Veresies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<b>Czechia</b>	Pavla Chomynová	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<b>Denmark</b>	Ola Ekholm	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<b>Estonia</b>	Sigrid Vorobjov	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<b>Faroese</b>	Pál Weihe	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<b>Finland</b>	Kirsimarja Raitasalo	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<b>France</b>	Stanislas Spilka	—	Yes	Yes	Yes	Yes	Yes	Yes <sup>(d)</sup>
<b>Georgia</b>	Lela Sturua	—	—	—	—	—	Yes <sup>(e)</sup>	Yes
<b>Germany</b>	Ludwig Kraus	—	—	6 federal states	7 federal states	5 federal states	1 federal state	1 federal state
<b>Greece</b>	Anna Kokkevi	—	Yes	Yes	Yes	Yes	Yes	Yes
<b>Greenland</b>	Vacant	—	Yes	Yes	—	—	—	—
<b>Hungary</b>	Zsuzsanna Elekes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<b>Iceland</b>	Ársæll Már Arnarsson	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<b>Ireland</b>	Luke Clancy	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<b>Isle of Man</b>	Vacant	—	—	Yes	Yes	Yes <sup>(e)</sup>	—	—
<b>Italy</b>	Sabrina Molinaro	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<b>Kosovo</b>	Kaltrina Kelmendi	—	—	—	—	Yes <sup>(a)</sup>	—	Yes
<b>Latvia</b>	Diana Vanaga	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<b>Liechtenstein</b>	Esther Kocsis	—	—	—	—	Yes	Yes	—
<b>Lithuania</b>	Liudmila Rupšienė	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<b>Malta</b>	Sharon Arpa	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<b>Moldova</b>	Igor Conrad	—	—	—	Yes <sup>(c)</sup>	Yes	Yes	—
<b>Monaco</b>	Stanislas Spilka	—	—	—	Yes	Yes	Yes	Yes
<b>Montenegro</b>	Tatijana Djuriscic	—	—	—	Yes <sup>(c)</sup>	Yes	Yes	Yes
<b>Netherlands</b>	Karin Monshouwer	—	Yes	Yes	Yes	Yes <sup>(a)</sup>	Yes <sup>(a)</sup>	Yes <sup>(a)</sup>
<b>North Macedonia</b>	Elena Kjosevska	—	Yes	—	Yes <sup>(c)</sup>	—	Yes	Yes
<b>Norway</b>	Elin K. Bye	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<b>Poland</b>	Janusz Sieroslawski	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<b>Portugal</b>	Elsa Lavado	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<b>Romania</b>	Silvia Florescu	—	Yes	Yes	Yes	Yes	Yes	Yes
<b>Russia</b>	Eugenia Koshkina	—	Moscow	Moscow	Yes	Moscow	—	—

Country	PI / associate researcher	1995	1999	2003	2007	2011	2015	2019
<b>Serbia</b>	Biljana Kilibarda	—	—	—	Yes <sup>(c)</sup>	Yes	—	Yes
<b>Slovakia</b>	Alojz Nociar	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<b>Slovenia</b>	Tanja Urdih Lazar	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<b>Spain</b>	Begoña Brime Beteta	—	—	—	—	—	—	Yes
<b>Sweden</b>	Johan Svensson	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<b>Switzerland</b>	Vacant	—	—	Yes	Yes	—	—	—
<b>Turkey</b>	Nesrin Dilbaz	Istanbul	—	6 cities	—	—	—	—
<b>Ukraine</b>	Olga Balakireva	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<b>United Kingdom</b>	Vacant	Yes	Yes	Yes	Yes	Yes	—	—

<sup>(a)</sup> Data collected in the autumn.    <sup>(b)</sup> Data collected in the previous autumn.    <sup>(c)</sup> Data collected in spring 2008.

<sup>(d)</sup> Data collected in spring 2018.    <sup>(e)</sup> Data collected but not delivered.

NB: FBiH, Federation of Bosnia and Herzegovina; RS, Republika Srpska.



# ESPAD 2019 reporting

## Indicators used

In the 2019 ESPAD report, all percentages were calculated on the basis of valid responses for each variable. Therefore, non-responses were deducted from the denominator. Internal non-response rates (for each individual question) were given separately in the results tables.

In addition to providing country estimates, all the results tables and graphs provide an ESPAD average, which makes it possible to compare countries not only with each other but also with an average European value. The ESPAD average, based on all the participating countries, is computed as a simple 'average of averages', which in practice involves assigning each country the same weighting of 1. This means that each country influences the average to the same extent, regardless of whether it is a small or a large country. There are other methods that could be used that are currently being discussed, for example taking account of the size of the target population in each participating country (weighted averages).

Since ESPAD averages calculated as a simple 'average of averages' have been used in all previous ESPAD reports, this practice has been followed in presenting the 2019 data. However, in the near future, a methodology working group will analyse the different options available and choose the most effective one.

## Testing of statistical significance

In the 2019 ESPAD report, gender differences in selected indicators were tested using either simple linear regression for quasi-continuous frequency measures or logistic regression for prevalence, with gender as the only predictor. A 95 % confidence level was used to test statistical significance.

Trends for selected indicators were calculated using the 1995–2019 ESPAD Trend Database, which includes data from all of the national survey waves since the inception of ESPAD. Country-specific temporal trends were estimated based on the 1995–2019 ESPAD Trend Database using analysis of variance to test for significant changes, with the survey year as the independent variable in the model. The test was carried out only for countries with at least three valid data points for 1995–2019. Post hoc tests (Tukey or Games-Howell, depending on whether or not the variances were homogeneous) were used to assess which years were responsible for changes in prevalence. In the 2019 ESPAD report, national trends were illustrated graphically, with statistically significant decreases between successive surveys indicated in green, statistically significant increases in red and unchanged situations in yellow.

Some countries did not use 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 that it would be done anyway.

# Methodological considerations in relation to ESPAD 2019

Since its inception, the major objective of ESPAD has been to create a cross-sectional survey that, taking account of the specificities of the national contexts, uses a common methodology in order to make the data comparable between countries and across years. This mainly means basing the implementation of the survey in each country on standardised procedures, including with regard to the target population, the questionnaire, the sampling procedure, the way in which data are collected and data cleaning methods of national databases (e.g. missing values, imputation). The common methodological guidelines for each survey wave are provided in the ESPAD handbook for all participating countries. Besides providing an overview of different methodological aspects related to the data collection, the ESPAD methodology reports, produced to describe the 2015 and 2019 data collections, end with a short summary of the most important methodological considerations in relation to the data quality in each country. Therefore, the 2019 survey wave took into account and tried to address the methodological challenges faced by each country in the 2015 data collection (ESPAD Group, 2016b) in order to increase the quality of the study. The information provided in this text is based on the results of the student questionnaire, classroom reports filled in by the survey leaders and the standardised country reports provided by each national team.

## Use of school surveys

Knowledge of levels of alcohol and drug use can be obtained in different ways, depending on the main point of interest. In many countries, household surveys are conducted to measure substance use habits among 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 people or school dropouts. School dropouts are a group of young people who are 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 in the school system, which reduces the cost of locating and reaching them. Yet another advantage is that the response rates are usually 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, using group-administered anonymous questionnaires in a classroom setting, in which data are collected under the same conditions as a test, is a well-accepted method. Although it is true that experiences of 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 by administering questionnaires to a group in a school, usually in a classroom.

## Cultural context

The standardisation of survey methodology is the cornerstone of ESPAD. 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 responded vary, and formally identical measures may have different meanings in different contexts. As part of the preparations for the 1999 ESPAD 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 countries in central and eastern Europe (Lithuania, Slovakia and Ukraine). The study showed that both the level of reliability and the level of validity were high in all seven countries, even though there were some minor differences. This indicated 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 ESPAD is to track changes in adolescent substance use over time. Although 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 of adolescents using a particular substance might not be 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 (trends).

## Questionnaire changes

To keep up with the emergence of new risk behaviours among young people throughout Europe, the ESPAD questionnaire is constantly adapted to include new topics while maintaining a set of core questions to track key long-term trends. For each round of data collection, some changes were made to the master questionnaire to take account of realities that did not exist in the past.

In 2019, new core sections were added on the use of electronic nicotine delivery systems, social media and gaming, and some other sections were expanded to investigate specific topics more thoroughly. Specifically, following the emergence of non-controlled drugs on the European drugs market, the questionnaire included new specific questions to investigate the use of new psychoactive substances (NPS). Moreover, new questions about gambling for money were added. Finally, screening instruments were included to assess the riskier patterns of cannabis use and money gambling, as well as self-perceived problems with the use of social media and gaming, based on the recognition that students who engage in these behaviours have different levels of risk.

Questions about problems experienced during the past 12 months that occurred because of the student's or someone else's drinking were partly excluded and partly changed to optional questions.

Lastly, the number of answer options for questions on the frequency of use of illegal substances other than cannabis was reduced to 3 (0, 1–2, 3 or more occasions).

In 2015, questions about harm from other people's drinking, use of NPS, money gambling and internet use were added to 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 that occurred was that the questions on use of amphetamines, cocaine and crack were removed 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 specific questions were altered. In order to evaluate the comparability of estimates based on the old and 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 and 2019 questionnaires. It could, however, be stated that the changes made in the master questionnaire led to changes in the numbers of core items, from 173 in 2011 to 213 in 2015 and 179 in 2019. All master ESPAD questionnaires from 1995 to 2019 are available online (<http://www.espad.org>).

## Ethical aspects

In recent years, at both European and country level, new regulations have been approved introducing new and more restrictive ethical rules to protect personal data, and some of them apply to research activities. Differences still exist at national level, thus requiring some ESPAD PIs to obtain the approval of an ethics committee or the consent of parents for the implementation of the study, whereas in some other countries this is not the case. Moreover, some countries that were interested in ESPAD could not participate because of several constraints related to the lack of support from policymakers (e.g. Albania and Russia).

According to Table 2, the approval of an ethics committee was asked for and obtained in 22 countries in 2019.

The ESPAD guidelines emphasise that ESPAD surveys should be confidential and anonymous. It is also important for students to be aware 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 2, all countries stated that they followed their data protection legislation when collecting the data.

In 24 countries, it was necessary to obtain some form of parental consent. Passive consent was usually sufficient, but for six countries active parental consent was required, for one country active consent was used in some schools, and for three countries both active and passive consent were needed, depending on the schools' requirements. According to Table 3, 1.4 % (range: 0.0–4.7 %) of the students could not take part in the study because of parental refusal in countries where only passive consent was needed.

In Cyprus, Georgia, Germany, Greece, Portugal and Romania, active parental consent was demanded, which on average seemed to be correlated with refusal rates. On average, 1.6 % (0.0–12 %) of the students present in the classrooms refused to take part in the survey.

**Table 2.** Ethical aspects (ESPAD 2019)

Country	Ethical review	Parental consent needed	Data protection legislation respected
Austria	No	No	Yes
Bulgaria	No	In some schools (active)	Yes
Croatia	Yes	Yes, passive	Yes
Cyprus	Yes	Yes, active	Yes
Czechia	Yes	No	Yes
Denmark	No	No	Yes
Estonia	Yes	Yes, passive	Yes
Faroese	No	No	Yes
Finland	Yes	Yes, both active and passive	Yes
France	Yes	Yes, passive	Yes
Georgia	Yes	Yes, active	Yes
Germany	Yes	Yes, active	Yes
Greece	Yes	Yes, active	Yes
Hungary	Yes	No	Yes
Iceland	Yes	Yes, passive	Yes
Ireland	Yes	Yes, passive	Yes
Italy	Yes	Yes passive	Yes
Kosovo	Yes	Yes, passive	Yes
Latvia	Yes	Yes, both active and passive	Yes
Lithuania	No	Yes, passive	Yes
Malta	Yes	No	Yes
Monaco	No	Yes, passive	Yes
Montenegro	Yes	Yes, passive	Yes
Netherlands	Yes	Yes, passive	Yes
North Macedonia	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
Serbia	Yes	Yes, both active and passive	Yes
Slovakia	No	No	Yes
Slovenia	No	No	Yes
Spain	No	No	Yes
Sweden	No	No	Yes
Ukraine	Yes	No	Yes

**Table 3.** Refusals, discarded questionnaires and number of valid questionnaires for students born in 2003 (ESPAD 2019)

Country	Refusals <sup>(a)</sup>		Discarded questionnaires (%)	Reduction in invalid questionnaires because of discarding (%)	Reduction in 'relewin' because of discarding (%)	Valid questionnaires (n)		
	Parental refusal (%)	Student refusal (%)				Boys	Girls	All <sup>(b)</sup>
Austria	0.7	0.4	1.6	0.0	33	1 850	2 513	4 363
Bulgaria	0.7	0.4	2.4	100	55	1 407	1 457	2 864
Croatia	2.3	0.8	1.5	0.0	40	1 436	1 336	2 772
Cyprus	12	12	4.2	—	29	527	697	1 224
Czechia	—	0.3	0.5	100	33	1 400	1 378	2 778
Denmark	—	0.1	2.2	79	33	1 185	1 303	2 488
Estonia	0.8	0.9	0.2	—	0	1 208	1 312	2 520
Faroese	—	0.0	1.5	—	67	251	260	511
Finland	1.4	0.7	0.6	0.0	50	2 279	2 315	4 594
France	0.8	0.3	1.0	0.0	100	1 224	1 364	2 588
Georgia	0.3	6.7	1.2	0.0	11	1 431	1 661	3 092
Germany	0.0	6.2	0.5	0.0	0	710	749	1 459
Greece	5.7	1.5	0.7	71	33	2 925	3 063	5 988
Hungary	1.0	0.5	0.8	—	38	1 243	1 180	2 423
Iceland	—	—	1.5	—	33	1 235	1 299	2 534
Ireland	1.4	1.2	1.4	89	29	939	1 001	1 940
Italy	0.3	0.4	2.0	—	22	1 331	1 211	2 542
Kosovo	4.7	6.3	1.7	—	25	813	943	1 756
Latvia	5.7	2.2	0.1	0.0	0	1 389	1 354	2 743
Lithuania	2.9	2.6	0.3	84	20	1 186	1 207	2 393
Malta	—	0.3	0.1	92	20	1 551	1 492	3 043
Monaco	0.0	0.0	0.5	0.0	60	208	220	428
Montenegro	0.0	0.0	1.8	93	50	2 855	2 845	5 700
Netherlands	—	—	0.6	100	50	609	679	1 288
North Macedonia	0.5	0.6	1.6	52	.	1 424	1 506	2 930
Norway	—	—	0.4	100	40	2 160	2 153	4 313
Poland	0.5	1.0	1.0	0.0	36	2 389	2 658	5 047
Portugal	11	2.6	1.4	100	25	1 994	2 371	4 365
Romania	4.8	0.6	0.8	—	25	1 888	1 876	3 764
Serbia	1.9	0.0	2.6	—	20	1 715	1 814	3 529
Slovakia	0.1	0.2	0.7	—	25	1 109	1 149	2 258
Slovenia	0.5	1.1	1.1	—	40	1 648	1 765	3 413
Spain	0.0	0.5	0.4	—	20	1 706	1 851	3 557
Sweden <sup>(c)</sup>	—	0.5	4.3	0.0	43	1 278	1 268	2 546
Ukraine	—	1.1	0.7	0.0	60	1 335	1 396	2 731
<b>Average (%) / total (n)</b>	<b>2.3</b>	<b>1.6</b>	<b>1.3</b>	<b>46</b>	<b>34</b>	<b>49 838</b>	<b>52 646</b>	<b>102 484</b>

## Data cleaning

Since 2007, the ESPAD national databases have been subject to a central cleaning process, with raw national data delivered and merged into a joint database and thereafter cleaned by the ESPAD coordination team. This improves the comparability of data. Before the central cleaning, national research teams have the opportunity to highlight, but not to discard, any questionnaires that they consider of bad quality. 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). Only students reaching the age of 16 years during the year of data collection are considered for inclusion in the ESPAD data set (those cases in which the year of birth is missing are excluded). The standard cleaning procedure performed on the ESPAD data set involves two phases: the logical substitution of missing values and the deletion of unusable cases. In 2019, as in previous years, logical substitution of missing values was performed in a rather conservative way. In cases in which students indicated that they had never used a specific substance and did not respond to other questions about such use, any missing values were substituted with no use for that particular substance. However, no substitutions were made if any contradictory indications of use were reported. All cases in which information about gender was missing were then 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 in which the respondent appeared to have followed patterns involving repeated marking of extreme values.

Across all ESPAD countries, an average of 1.3 % (0.1–4.3 %) of the questionnaires were excluded because of poor data quality or missing information on gender (Table 3). Relatively large proportions of the questionnaires from Cyprus and Sweden were excluded (4.2 % and 4.3 %, respectively). In the case of Sweden, this was primarily due to the question of gender, as Sweden had a third option: 'Other gender identity'.

Just over half of the countries used this opportunity to indicate questionnaires considered of low quality. On average, 46 % of those questionnaires were later removed in the central cleaning process.

Table 4 shows the impact on the results due to the discarding of low-quality questionnaires for eight different measures of lifetime substance use, including the fake drug 'relewin' (countries may use another name, instead of relewin, for the dummy drug if there is a risk that the students may confuse it with a national drug street name for any existing substance). For seven measures, the prevalence rates were reduced. This reduction was, however, very limited and ranged between 0.0 % and 1.1 %. Greece, Monaco and Bulgaria are the three countries where the discarding of questionnaires had the most visible impact in terms of percentage points. According to Table 3, reported lifetime relewin use dropped by more than one third when bad data were discarded. This means that the standardised syntax deleting questionnaires targeted students with less trustworthy responses relatively well. Table 5 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 Table 5, the average reduction in the non-response rates was rather small, ranging from 0.1 % to 0.3 %. The reduction was relatively limited for all seven variables in most countries. Kosovo was the country where the logical substitution of missing values had the biggest impact. However, such low reductions in the non-response rates hardly had 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.

**Table 4.** Changes in lifetime prevalence of different substances due to deletion of bad data <sup>(a)</sup> for students born in 2003 <sup>(b)</sup> (%) (ESPAD 2019)

Country	Cigarettes LTP		Alcohol LTP		Been drunk LTP		Cannabis LTP		Inhalants LTP		Ecstasy LTP		Tranquilisers 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
Austria	48	48	84	84	47	48	22	21	13	12	3.3	2.6	6.5	5.6	0.6	0.4
Bulgaria	54	50	83	82	47	43	21	17	2.8	2.3	3.9	2.6	2.8	2.0	1.9	1.1
Croatia	54	54	90	90	44	43	21	21	15	15	2.7	2.1	2.7	2.3	1.0	0.6
Cyprus	30	28	83	83	30	30	9.3	8.4	7.3	6.6	3.7	2.9	7.1	6.6	2.4	1.7
Czechia	58	54	95	95	51	47	31	28	5.0	4.9	4.2	3.6	7.6	6.5	0.3	0.2
Denmark	43	42	92	92	66	66	17	17	5.5	5.3	1.9	1.6	4.8	4.6	0.6	0.4
Estonia	48	48	81	82	34	34	21	20	13	13	5.0	5.2	14	15	0.4	0.4
Faroese	46	46	79	80	34	33	10	9.4	6.7	6.3	1.9	1.4	3.5	2.7	0.9	0.2
Finland	40	39	68	69	35	36	12	11	6.3	5.7	1.6	1.4	7.2	7.1	0.4	0.2
France	45	45	80	80	36	34	24	23	6.4	6.2	2.4	1.7	6.8	6.4	0.8	0.6
Georgia	34	36	85	87	44	46	12	14	4.9	4.9	2.3	2.2	3.0	3.1	0.9	0.8
Germany	44	45	89	90	48	49	24	22	—	—	2.7	1.9	8.7	7.7	0.2	0.1
Greece	43	33	93	89	44	31	13	8.2	13	13	2.0	1.2	5.1	3.5	0.9	0.6
Hungary	53	53	91	91	51	51	12	13	6.7	6.5	3.3	3.3	7.7	7.6	0.8	0.5
Iceland	15	15	37	37	11	11	6.8	6.4	2.9	2.8	1.5	1.3	7.0	6.8	0.6	0.4
Ireland	32	31	74	73	37	36	19	19	11	10	3.6	2.8	2.9	2.6	1.4	1.0
Italy	54	55	85	84	33	35	25	27	2.6	2.3	1.5	1.2	3.3	4.3	0.9	0.7
Kosovo	41	41	29	29	9	9	3.3	2.9	0.7	0.5	1.5	1.1	4.8	4.5	0.8	0.6
Latvia	58	58	89	89	44	44	26	26	16	16	5.0	5.0	21	21	0.1	0.1
Lithuania	55	55	79	79	35	34	18	18	8.5	8.4	3.2	3.0	20	20	0.5	0.4
Malta	23	22	81	82	33	32	12	12	5.8	5.3	1.6	1.1	3.5	3.1	0.6	0.4
Monaco	55	45	92	89	54	39	38	22	8.5	7.5	2.5	1.9	8.8	5.9	0.5	0.2
Montenegro	36	35	77	77	25	24	10	9.3	6.7	6.1	3.4	2.7	11	11	0.7	0.3
Netherlands	32	31	72	72	36	36	23	22	7.2	7.1	4.1	3.5	8.8	8.3	0.8	0.4
North Macedonia	38	38	67	67	25	25	6.5	6.1	2.1	1.9	1.4	1.1	4.3	4.2	—	—
Norway	26	25	54	53	23	23	8.8	8.7	4.9	4.5	1.9	1.6	6.1	5.8	1.1	0.7
Poland	49	50	82	81	34	34	21	21	8.7	8.4	2.9	2.6	15	15	1.2	0.7
Portugal	34	34	77	77	29	29	13	13	4.5	4.5	3.3	3.2	6.1	6.0	0.4	0.3
Romania	50	49	82	82	31	30	9.0	8.7	2.9	2.8	1.4	1.2	1.9	1.7	0.5	0.3
Serbia	39	38	87	87	37	37	8.1	7.3	6.5	6.1	2.6	2.1	6.4	5.8	1.1	0.8
Slovakia	58	58	90	90	46	46	25	24	8.0	8.2	4.0	3.3	10	10	0.5	0.3
Slovenia	41	38	83	84	42	41	25	23	11	11	3.8	2.9	4.3	3.8	0.7	0.3
Spain	41	41	78	78	43	43	23	23	2.6	2.5	1.0	0.9	4.1	4.0	0.5	0.4
Sweden	27	26	58	58	26	26	8.3	8.0	11	11	2.2	1.8	6.9	6.4	0.8	0.4
Ukraine	51	50	86	85	45	43	8.8	7.9	9.2	9.2	1.8	1.1	2.2	1.7	0.7	0.2
<b>Average</b>	<b>43</b>	<b>42</b>	<b>79</b>	<b>76</b>	<b>37</b>	<b>36</b>	<b>17</b>	<b>16</b>	<b>7.1</b>	<b>6.8</b>	<b>2.8</b>	<b>2.3</b>	<b>7.2</b>	<b>6.7</b>	<b>0.8</b>	<b>0.5</b>

<sup>(a)</sup> Questionnaires with missing gender information, more than 50 % of core items unanswered or repeated extreme responses were deleted.<sup>(b)</sup> Results are based on cleaned unweighted data for students born only in 2003.

NB: LTP, lifetime prevalence.

**Table 5.** Non-response rates before logical substitution of missing values and the substitution impact (reduction) for seven prevalence measures <sup>(a)</sup> for students born in 2003 only <sup>(b)</sup> (ESPAD 2019)

Country	Cigarettes LTP		Alcohol LTP		Been drunk LTP		Cannabis LTP		Ecstasy LTP		Inhalants LTP		Tranquillisers or sedatives (non-medical use) LTP	
	Before logical substitution	Reduction	Before logical substitution	Reduction	Before logical substitution	Reduction	Before logical substitution	Reduction	Before logical substitution	Reduction	Before logical substitution	Reduction	Before logical substitution	Reduction
Austria	0.1	0.0	1.6	0.0	1.1	0.0	0.5	0.1	0.1	0.0	0.2	0.0	0.1	0.0
Bulgaria	0.8	0.0	3.2	0.0	2.7	0.0	1.9	0.4	1.0	0.2	0.6	0.0	0.9	0.0
Croatia	0.4	0.2	3.0	0.0	1.3	0.1	0.5	0.2	0.5	0.4	0.8	0.5	0.5	0.3
Cyprus	1.1	0.9	3.0	0.1	2.8	0.4	2.0	0.4	3.3	0.0	2.9	0.0	3.0	0.0
Czechia	0.5	0.1	1.2	0.1	1.1	0.1	0.5	0.1	0.9	0.4	0.8	0.5	0.6	0.0
Denmark	0.3	0.1	0.6	0.0	1.4	0.0	1.4	0.1	1.5	0.1	1.8	0.1	2.0	0.3
Estonia	0.1	0.0	2.1	0.1	1.5	0.0	0.9	0.1	0.3	0.1	0.5	0.1	0.2	0.0
Faroese	0.8	0.4	1.3	0.0	0.8	0.0	0.6	0.4	0.4	0.2	0.2	0.0	0.2	0.0
Finland	0.3	0.1	1.3	0.2	0.9	0.1	0.5	0.0	0.7	0.3	0.6	0.1	0.6	0.2
France	0.3	0.1	1.3	0.1	1.2	0.2	0.8	0.1	1.5	0.0	1.7	0.0	1.6	0.0
Georgia	0.6	0.0	2.9	0.0	1.9	0.0	1.2	0.0	1.3	0.0	0.7	0.0	0.7	0.0
Germany	0.1	0.1	1.0	0.0	0.5	0.0	0.7	0.0	0.4	0.1	—	—	0.3	0.0
Greece	0.3	0.1	0.6	0.1	0.6	0.1	0.9	0.2	0.6	0.0	0.8	0.0	0.6	0.0
Hungary	0.5	0.2	2.3	0.0	0.9	0.2	0.8	0.1	0.5	0.2	0.7	0.4	0.4	0.1
Iceland	0.8	0.0	2.0	0.1	2.1	0.4	2.2	0.0	2.1	0.0	2.2	0.0	3.2	0.0
Ireland	0.7	0.3	3.8	0.2	1.7	0.1	0.9	0.1	0.9	0.4	1.0	0.4	0.8	0.1
Italy	0.7	0.3	2.7	0.0	1.3	0.2	1.1	0.0	1.3	0.4	1.6	0.7	1.8	1.0
Kosovo	2.1	1.2	5.1	0.7	3.9	1.8	2.4	1.1	2.0	1.0	2.0	0.9	1.7	0.6
Latvia	0.3	0.1	1.7	0.0	1.0	0.0	0.7	0.0	0.4	0.1	0.3	0.0	0.4	0.1
Lithuania	0.4	0.2	0.4	0.0	0.3	0.1	0.3	0.2	0.2	0.2	0.1	0.1	0.2	0.0
Malta	0.4	0.2	1.8	0.1	1.1	0.1	0.6	0.1	0.7	0.0	0.9	0.2	0.9	0.2
Monaco	0.0	0.0	1.4	0.0	1.4	0.0	2.8	0.0	0.5	0.3	0.5	0.5	0.5	0.3
Montenegro	0.8	0.5	1.1	0.1	0.7	0.0	0.5	0.2	0.7	0.2	0.5	0.0	0.6	0.1
Netherlands	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.3	0.0	0.3	0.0	0.3	0.0
North Macedonia	1.1	0.3	2.9	0.3	2.0	0.5	1.2	0.4	2.4	1.5	1.5	0.5	1.7	0.6
Norway	0.6	0.0	1.3	0.0	2.5	0.0	3.1	0.0	4.6	0.0	4.1	0.0	5.1	0.0
Poland	0.5	0.2	1.4	0.1	0.6	0.0	0.5	0.2	0.5	0.2	0.8	0.5	0.5	0.1
Portugal	0.5	0.2	0.7	0.0	0.5	0.2	0.2	0.0	0.7	0.3	1.6	1.1	1.5	1.0
Romania	0.2	0.0	1.8	0.0	2.1	0.2	0.5	0.1	0.6	0.2	1.1	0.7	0.5	0.1
Serbia	0.5	0.3	1.7	0.1	1.7	0.2	1.5	0.4	1.3	0.8	1.0	0.3	1.0	0.4
Slovakia	0.3	0.1	1.4	0.0	1.0	0.1	0.7	0.0	0.6	0.0	0.4	0.0	0.4	0.0
Slovenia	0.4	0.2	2.5	0.1	1.0	0.0	0.6	0.2	0.2	0.1	0.5	0.4	0.2	0.0
Spain	0.2	0.1	2.2	0.0	1.3	0.2	0.4	0.0	0.3	0.2	0.5	0.4	0.3	0.1
Sweden	0.8	0.1	1.8	0.1	2.2	0.6	1.6	0.1	2.5	0.0	2.3	0.0	1.9	0.0
Ukraine	0.3	0.0	2.9	0.0	2.7	0.4	0.9	0.1	1.0	0.5	1.0	0.3	0.9	0.3
<b>Average</b>	<b>0.5</b>	<b>0.2</b>	<b>1.9</b>	<b>0.1</b>	<b>1.4</b>	<b>0.2</b>	<b>1.0</b>	<b>0.2</b>	<b>1.1</b>	<b>0.2</b>	<b>1.1</b>	<b>0.3</b>	<b>1.0</b>	<b>0.2</b>

<sup>(a)</sup> The results are based on unweighted raw data, first without logical substitution of missing values and then with logical substitution.

<sup>(b)</sup> When multiple responses are given to a single choice question, they should be coded -2 instead of -1 (no response). For the purpose of this analysis, all -2 values have been treated as -1.

NB: LTP, lifetime prevalence.



## Fieldwork

According to the ESPAD handbook, data collection should be performed during spring. In 2019, data were mainly collected between February and June, with the majority of data collection exercises conducted from March to May (Table 6) and with the exception of two countries: the French survey was carried out 1 year in advance, between April and June 2018, and the Netherlands collected data during the autumn of 2019 (October–November).

In ESPAD, survey leaders (who can be teachers or research assistants) are responsible for data collection in the classrooms. In about half of the countries, teachers or other school staff administered the data collection, while research assistants did so in the remaining countries (Table 6).

To preserve the anonymity and confidentiality of the survey, the use of individual envelopes for each student to put his or her questionnaire in and then seal is recommended.

Individual envelopes were used in 22 countries (Table 6). In the remaining countries, other measures were taken that were judged as fulfilling the same purpose. Examples include the use of large class envelopes, which were sealed in front of the students, and a closed box in which the students put their forms. In Austria, Denmark, France, Iceland, the Netherlands and Norway, the ESPAD survey was administered online. The Faroes (in only three schools) and Italy adopted a mixed administration mode (paper and pencil and web based).

There are, of course, several advantages to carrying out online surveys, such as cost-effectiveness and more rapid data collection. Comparability between traditional paper-and-pencil and computerised administration modes was assessed in a methodological study conducted in Italy; no significant mode effect in the reporting of sensitive information was detected, and comparability was considered satisfactory (Colasante et al., 2019).

**Table 6.** Characteristics of the data collection (ESPAD 2019)

Country	Data collection period	Data collection mode	Survey leader	Method used to preserve anonymity	Data entry
Austria	March to June 2019	Web based	School staff	Not applicable	CASI
Bulgaria	8–30 April 2019	Paper and pencil	External staff	Individual envelopes	Manual
Croatia	28 February to 17 April 2019	Paper and pencil	School staff	Individual envelopes	Manual
Cyprus	April to May 2019	Paper and pencil	School staff	Joint envelopes	Manual
Czechia	1 March to 17 April 2019 16 May to 27 June	Paper and pencil	External staff	Individual envelopes	OCR
Denmark	February to May 2019	Web based	School staff	Not applicable	CASI
Estonia	February to April 2019	Paper and pencil	External staff	Individual envelopes	Manual
Faroes	5 March to 4 April 2019	Mixed mode (*)	Other	Joint box	Manual
Finland	March to April 2019	Paper and pencil	School staff	Individual envelopes	OCR
France	April to June 2018	Web based	School staff	Not applicable	CASI
Georgia	April to May 2019	Paper and pencil	External staff	Individual envelopes	Manual
Germany	1 April to 30 April 2019	Paper and pencil	School staff	Joint envelopes	Manual
Greece	February to April 2019	Paper and pencil	External staff	Joint envelopes	OCR
Hungary	15 April to 30 May 2019	Paper and pencil	External staff	Joint envelopes	Manual
Iceland	7 March to 7 May 2019	Web based	School staff	Not applicable	CASI
Ireland	3 March to 14 May 2019	Paper and pencil	School staff	Individual envelopes	Manual
Italy	March to April 2019	Mixed mode	School staff	Individual envelopes	OCR
Kosovo	15 March and 15 June 2019	Paper and pencil	External staff and other	Joint envelopes	Manual
Latvia	26 March to 4 June 2019	Paper and pencil	External staff	Joint box	Manual
Lithuania	8–12 April 2019	Paper and pencil	School staff	Individual envelopes	Manual

Country	Data collection period	Data collection mode	Survey leader	Method used to preserve anonymity	Data entry
Malta	12 February to 4 April 2019	Paper and pencil	School staff and external staff	Individual envelopes	Manual
Monaco	4 April 2019	Paper and pencil	School staff and external staff	Individual envelopes	OCR
Montenegro	1 April to 7 May 2019	Paper and pencil	School staff and external staff	Individual envelopes	Manual
Netherlands	October to November 2019	Web based	External staff	Not applicable	CASI
North Macedonia	14 March to 13 May 2019	Paper and pencil	External staff	Individual envelopes	Manual
Norway	February to May 2019	Web based	School staff	Not applicable	CASI
Poland	May to June 2019	Paper and pencil	External staff	Individual envelopes	Manual
Portugal	11 March to 5 April 2019	Paper and pencil	School staff	Individual envelopes	OCR
Romania	9 May to 13 June 2019	Paper and pencil	External staff and other	Individual envelopes	Manual
Serbia	16 April to 18 June 2019	Paper and pencil	External staff	Individual envelopes	Manual
Slovakia	6 May to 11 June 2019	Paper and pencil	External staff	Individual envelopes	Manual
Slovenia	March to April 2019	Paper and pencil	School staff	Individual envelopes	Manual
Spain	March 2019	Paper and pencil	External staff	Individual envelopes	Manual
Sweden	18 March to 26 April 2019	Paper and pencil	School staff	Individual envelopes	OCR
Ukraine	20 February to 29 May 2019	Paper and pencil	External staff	Individual envelopes	Manual

(<sup>a</sup>) Web-based administration was used in three schools.

NB: CASI, computer-assisted self-interviewing; OCR, optical character recognition.

## Representativeness

The ESPAD target population is defined as students who reach the age of 16 years in the calendar year of the survey and who are present in the classroom on the day of the survey. Students who were enrolled in regular, vocational, general or academic studies were included; those who were enrolled in either special schools or special classes for students with learning disorders or severe physical disabilities were excluded. As a matter of principle, data can be representative only of those groups that are included in the sampling frame.

In ESPAD, the representativeness of the national surveys is assessed against several indicators, including geographical 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.

## Geographical coverage

All samples had national geographical coverage, except for those from Cyprus (only government-controlled areas were included), Georgia (the occupied territories of Abkhazia and

South Ossetia were excluded), Germany (only the federal state of Bavaria was included) and Kosovo (less than 4 % of the target population enrolled in schools in Northern Kosovo under the parallel structures and working with the plans of the Ministry of Education of Serbia was excluded). Moreover, in Finland the Åland Islands were not covered by the sampling frame, and in Ukraine the Autonomous Republic of Crimea was not included in the survey, nor were the territories of Donetsk and Luhansk, which are not controlled by the Ukrainian government. It is important to keep in mind that the results for these countries are representative only of the populations from which the samples were drawn, according to the geographical limitations mentioned above.

## Sampling strategies

Sampling in ESPAD is based on school classes being the final sampling unit. 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 7. The study was carried out on a representative sample of the target population in all participating countries except the Faroes, Iceland, Malta, Monaco and Montenegro, where all 2003-born target students were included. The number of students born in 2003 in the Faroes, Iceland, Malta and Monaco was close to, or below, the number of students to be sampled according to the ESPAD guidelines (1 200 per gender). Therefore, in these countries all students were surveyed.

In most countries, a two-stage sample was performed, with the class being the final sampling unit.

Some countries did not consider 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 will not be 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. Furthermore, class size is fairly standard in many countries, and the classes in 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 ESPAD as a whole. In countries where non-proportionate stratification was used for sampling, the data were weighted (in 2019 weights were used in 11 countries and included in the database).

Weights were usually calculated to account for gender (two countries) and geographical distribution of the target population (six countries), type and size of schools (seven countries) and immigrant background (Finland collected data in schools in which at least 30 % of students had an immigrant background; therefore, a sampling weight was applied to balance the final sample).

## Birth cohort representativeness

Differences in the extent to which the 2003 birth cohort is attending regular school exist between ESPAD countries. In some countries, schooling is compulsory until the age of 16 years. In other countries, this is the age when students enrol in upper secondary school, start vocational training or enter the labour market. On average, 87 % of the 2003 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 ESPAD target population) (Table 7). For 12 countries, the proportion was below 90 %. Such differences may have a certain impact on the results, since it could be the case that individuals who have already left school may have different substance use patterns from their peers in school. However, one should not forget that the ESPAD study is actually intended to be representative only of students, not of entire birth cohorts.

## Student representativeness

The ESPAD target population is students who reach the age of 16 years during the year of data collection. For the 2019 study, this means students born in 2003. In some countries, the vast majority of students born in 2003 were enrolled in a single grade. In other countries, large proportions of them were to be found in two or more grades. The recommendation given for the second scenario, subject to the availability of the necessary resources, was to include as many grades as possible in which 2003-born students were to be found, or at least all grades in which 10 % or more of the target population was enrolled. If all grades with students in the target age group are not included in the data collection exercise, the sample is representative only of 2003-born students in the grade(s) chosen. In 30 countries, no more than two grades were surveyed. Three or more grades were covered in Italy, Kosovo, Latvia, Monaco and Portugal.

The proportion of ESPAD target students covered by the sampling frame was high on average (96 %), with 32 countries reaching 90 % or more of the students born in 2003. The lowest rates, however, which were rather high in general, were reported in Serbia (86 %) and Germany (88 %).

**Table 7.** Characteristics of the national samples (ESPAD 2019)

Country	Sampling frame geographical coverage	Proportion of ESPAD birth cohort in regular school <sup>(a)</sup>	Sample type	Sampling unit(s)	Number of grades covered	Data weighted	Weight type	Student representativeness <sup>(b)</sup> (%)
<b>Austria</b>	National	92	Multistage stratified random	Class	2	Yes	School type and gender	95
<b>Bulgaria</b>	National	76	Multistage stratified random	Class	2	No	—	95
<b>Croatia</b>	National	93	Stratified random	Class	2	No	—	98
<b>Cyprus</b>	National <sup>(c)</sup>	—	Multistage random	School	1	Yes	Geographical area and school type	100
<b>Czechia</b>	National	90	Multistage stratified random	Class	2	Yes	School type	>95 <sup>(d)</sup>
<b>Denmark</b>	National	74	Stratified random	School	1	Yes	Geographical area	100
<b>Estonia</b>	National	91	Stratified random	Class	2	No	—	100
<b>Faroese</b>	National	89	Total	No sample	1	No	—	95
<b>Finland</b>	National <sup>(e)</sup>	95	Multistage stratified random	Class	1	Yes	Immigrant background	100
<b>France <sup>(f)</sup></b>	National	98	Multistage stratified random	Class	1	No	—	97
<b>Georgia</b>	National <sup>(g)</sup>	86	Multistage random	Class	2	No	—	100
<b>Germany</b>	1 federal state <sup>(h)</sup>	96	Systematic random	Class	2	Yes	School type and grade	88
<b>Greece</b>	National	86	Stratified clustered random	Class	1	Yes	Geographical area	92
<b>Hungary</b>	National	90	Stratified random	Class	2	Yes	Geographical area, school type and grade	99
<b>Iceland</b>	National	98	Total	No sample	1	No	—	96
<b>Ireland</b>	National	98	Stratified systematic random	Class	2	No	—	98
<b>Italy</b>	National	95	Multistage stratified random	Class	3	No	—	99
<b>Kosovo</b>	National <sup>(i)</sup>	—	Multistage random	Class	4	No	—	—
<b>Latvia</b>	National	84	Stratified random	Class	3	No	—	98
<b>Lithuania</b>	National	81	Simple random	Class	2	No	—	100
<b>Malta</b>	National	98	Total	No sample	1	No	—	95
<b>Monaco</b>	National	57	Total	No sample	4	No	—	100
<b>Montenegro</b>	National	87	Total	No sample	1	No	—	94
<b>Netherlands <sup>(j)</sup></b>	National	94	Multistage random	Class	2	Yes	School type and gender	98
<b>North Macedonia</b>	National	66	Systematic random	Class	2	No	—	95

Country	Sampling frame geographical coverage	Proportion of ESPAD birth cohort in regular school <sup>(a)</sup>	Sample type	Sampling unit(s)	Number of grades covered	Data weighted	Weight type	Student representativeness <sup>(b)</sup> (%)
Norway	National	—	Multistage stratified random	Class	1	Yes	Geographical area and school type	98 <sup>(d)</sup>
Poland	National	99	Stratified random	Class	1	Yes	Geographical area	98
Portugal	National	86	Stratified random	Class	6	No	—	100
Romania	National	—	Multistage random	Class	2	No	—	90 <sup>(d)</sup>
Serbia	National	—	Multistage stratified random	Class	1	No	—	86
Slovakia	National	—	Stratified random	School <sup>(k)</sup>	2	No	—	94 <sup>(d)</sup>
Slovenia	National	92	Stratified random	Class	1	No	—	91
Spain	National	92	Multistage stratified random	Class	2	No	—	100
Sweden	National	—	Multistage random	Class	1	No	—	94
Ukraine	National <sup>(l)</sup>	85	Multistage stratified random	Class	2	No	—	98 <sup>(d)</sup>
<b>Average</b>	—	<b>87</b>	—	—	<b>2</b>	—	—	<b>96</b>

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

<sup>(b)</sup> Proportion of ESPAD target students covered by the sampling frame.

<sup>(c)</sup> Only government-controlled areas were covered by the sampling frame.

<sup>(d)</sup> Estimations by the PI.

<sup>(e)</sup> The Åland Islands were not covered by the sampling frame.

<sup>(f)</sup> Data collected in spring 2018.

<sup>(g)</sup> The occupied territories of Abkhazia and South Ossetia were not covered by the sampling frame.

<sup>(h)</sup> The sampling frame covered only the federal state of Bavaria.

<sup>(i)</sup> 4 % of the target population enrolled in schools in Northern Kosovo and/or functioning under the parallel structures of the Ministry of Education of Serbia within the other Serbian municipalities were not covered by the sampling frame.

<sup>(j)</sup> Data collected in autumn instead of spring.

<sup>(k)</sup> The sampling unit was the school, and classes included in the survey were selected randomly by assistants in the last step of selection at the schools before the survey.

<sup>(l)</sup> The Autonomous Republic of Crimea was not included in the survey, nor were the territories of Donetsk and Luhansk, which are not controlled by the Ukrainian government.

## School cooperation

The school participation rate (share of selected schools taking part in the survey) and the class participation rate (share of selected classes participating in the survey) were generally high, and refusals by schools were a relatively limited problem in the majority of the countries (Table 8). On average, about 82 % of the sampled schools and 84 % of the sampled classes took part in the survey. There is great variability across countries in the proportion of schools that refused to participate. In about half of the countries, more than 90 % of all sampled schools took part in the survey. In most other countries, the proportions were also relatively

high (more than 80 %). The 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 three countries (Austria, Denmark and the Netherlands), less than half of the sampled schools took part in the study. Those countries have also previously belonged to the group of countries with a low rate of school participation.

In Austria, the percentage of school cooperation was low compared with other countries (30 %) but higher than that in the previous survey. Moreover, weightings were introduced for different school types, in order to adjust for a selection

bias due to school non-participation. In Denmark, although the participation rate was low (21 %), there was no indication that non-responses should be strongly associated with school type or gender. Furthermore, the data were weighted considering geographical area.

**Table 8.** Participating schools and classes and students' presence rates (%) (ESPAD 2019)

Country	Participant rate <sup>(a)</sup>		Students' presence rate <sup>(b)</sup>		
	School level	Class level	Boys	Girls	All
Austria	30	92	86	88	87
Bulgaria	100	100	87	88	87
Croatia	93	94	90	90	90
Cyprus	67	75	93	95	94
Czechia	69	92 <sup>(c)</sup>	87	85	86
Denmark	21	21	88	88	88
Estonia	84	80	85	83	84
Faroese	95	100	81	82	82
Finland	80	79	89	87	88
France	88	100	100	100	100
Georgia	100	51	75	81	78
Germany	51	89	91	90	90
Greece	89	89	86	88	87
Hungary	80	74	86	87	86
Iceland	75	50	—	—	—
Ireland	100	85	78	81	79
Italy	85	89	82	85	83
Kosovo	88	83	90	94	92
Latvia	83	100	84	83	83
Lithuania	100	99	83	84	84
Malta	96	99	82	75	78
Monaco	100	100	86	88	87
Montenegro	96	100	88	90	89
Netherlands	35	35 <sup>(c)</sup>	—	—	92
North Macedonia	99	86	88	93	91
Norway	58	58	—	—	89
Poland	91	91	75	71	73
Portugal	96	94	91	93	92
Romania	—	—	85	87	86
Serbia	86	86	88	89	88
Slovakia	94	95	83	84	83
Slovenia	98	99	88	87	88
Spain	90	90	89	91	90
Sweden	85	85	85	84	85
Ukraine	96	96	81	79	80
<b>Average</b>	<b>82</b>	<b>84</b>	<b>86</b>	<b>87</b>	<b>86</b>

<sup>(a)</sup> Participant rates for schools and classes are independent of each other.

<sup>(b)</sup> All students in participating classes regardless of birth year.

<sup>(c)</sup> School participation rate (class participant rate unknown).

In the Netherlands, school refusals have been a growing problem throughout the country, but the Dutch team found no reason to believe that non-participation was selective. However, school type was considered when the weightings were computed.

## Student response rates

The proportions of students present in the classroom during the data collection are shown in Table 8. The proportions have been calculated on the basis of the classroom reports, in which the fieldworkers indicated (1) the total number of students belonging to a participating class and (2) the number of students who were present when the survey was performed. The proportions of students in participating classes who were present on the day of the survey and who answered the questionnaire were high. The average was 86 %, and in 23 of the 35 countries 85 % or more of the students were present in the classroom. Poland reported the lowest proportion of students present (73 %); nevertheless, this is not considered to be a major deviation. No country reported any major methodological problems in connection with absent students. Iceland and Norway did not collect classroom questionnaires, and the student presence rates remain unknown.

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 (Table 3). On average, 1.6 % (0.0–12 %) of the students present in the classroom refused to take part in the survey. In Greece, Ireland, Latvia, Lithuania, Portugal, Slovenia and Ukraine these rates were about 1 % or slightly above, and in Georgia, Germany and Kosovo they were above 5 %. Cyprus reported the highest student refusal percentage (12 %). Some form of parental consent was asked for in more than half of the countries (Table 2). For six countries active parental consent was requested, for one country active consent was used only in some schools, and for three either active and passive consent were required. According to Table 3, 1.4 % (0.0–4.7 %) of the students were refused permission by their parents to take part in the study in countries where only passive consent was needed. In four countries where active consent was requested, refusal rates were higher: Cyprus (12 %), Portugal (11 %), Greece (5.7 %) and Romania (4.8 %). Although it cannot be decided whether such refusal had any influence on the substance use estimates, it ought to be kept in mind when interpreting the results. High rates of sampled students not taking part in the study increases the risk that the net sample might be biased. The response rates are, however, deemed to be satisfactory overall, even when the refusal rates are considered.

## 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 countries with the smallest sample sizes: the Faroes (511 students with valid questionnaires) and Monaco (428) (Table 3). The sampling frames also included the total population of the somewhat larger countries of Iceland (2 534 students with valid questionnaires), Malta (3 043) and Montenegro (5 700). Seven countries did not fully meet the target of 2 400 students, and in five of these the net samples comprised fewer than 2 000 students: Cyprus, Germany, Ireland, Kosovo and the Netherlands. Germany and the Netherlands had relatively high rates of non-participating schools, which were reflected in lower numbers of students included in the net samples. It also has to be taken into account that Germany participated in the survey with only one federal state (Bavaria). In the five countries mentioned above, the number of participating students ranged between 1 224 and 1 940. Although these figures are low, the numbers of valid questionnaires have been deemed enough to enable international comparisons, though not without caution.

## Reliability

Reliability is the extent to which repeated measurements made under the same conditions produce the same results, and it is considered a necessary condition for validity. For many substances, the ESPAD questionnaire contains questions about lifetime use and also age at first use. The questions referring to the latter indicator 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. As an indication of reliability, inconsistency in relation to lifetime use of five substances is shown in Table 9. For three of these substances (ecstasy, inhalants and tranquillisers), questions about age at first use were optional in 2019, and about 10 countries did not include them in the questionnaire. In addition, reported lifetime alcohol intoxication has also been compared with reported lifetime use of alcohol.

The lowest inconsistency figures were found for intoxication, cannabis and ecstasy use, with averages of less than 1 %, meaning that 99–100 % gave consistent answers about their consumption of these substances. The average inconsistency figures were also relatively low (1.9 %) for

use of tranquillisers and sedatives without a doctor's prescription, and for all the countries the rates were less than 5 %. For the use of cigarettes, the average inconsistency rate was 2.9 %. Most countries had relatively low figures, with only two countries exceeding 5 %: Kosovo (9.7 %) and North Macedonia (5.2 %).

Inhalants were the substance with the highest national rates of inconsistency. The average rate was 3.4 %. The top countries were Croatia (7.5 %), Latvia (7.2 %) and Ukraine (7.1 %).

It should be recognised, however, that there were some technical differences between the two types of measures of use (lifetime use and age at first use) that might have contributed to inconsistency. One difference was that the question about age at first use did not include a 'do not remember' response category. A student who had used a substance but did not remember how old he or she was at first use could have conceivably decided to answer 'never' instead of guessing an age, especially if he or she had used that substance only once or a few times. Another factor contributing to inconsistency might have been 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 might not have seemed appropriate to give an age at first use. These students might have answered 'never', since they thought of their consumption as an experiment rather than the beginning of 'real' use. Most controlled substances in Table 9 were probably relatively familiar to the students, in the sense that they would have heard about them. If a substance was familiar and mentioned in several questions, the students ought to have used the same definition consistently. However, inhalants might be an exception in this respect. The definition includes many different agents that can be inhaled. If all relevant agents are not consistently given as examples in the questions that are being compared, there is a risk that the students' frame of reference will not be the same when they answer the two questions, which may explain the lower consistency rates found for inhalants.

In summary, it can be said that inconsistency figures for all controlled variables are relatively low in nearly all countries, indicating good reliability. With the exception of inhalant use, there are just two cases in which the inconsistency rate is above 5 % (Kosovo and North Macedonia for cigarette use), and no country scored among the highest for all variables. On the whole, inconsistency rates are not seen as reflecting any major reliability problems.

**Table 9.** Some aspects of reliability: inconsistency between two questions in a single administration, with students reporting substance use for one question but not another <sup>(a)</sup> (%) (ESPAD 2019)

Country	Cigarettes LTP	Cannabis LTP	Ecstasy LTP	Inhalants LTP	Tranquilisers or sedatives (non-medical use) LTP	Alcohol LTP: intoxication without consumption
Austria	4.0	1.1	—	—	—	0.2
Bulgaria	4.8	0.8	1.9	1.5	1.3	1.0
Croatia	4.8	1.0	0.9	7.5	1.3	0.3
Cyprus	3.7	2.5	—	—	—	1.0
Czechia	1.3	0.1	0.7	2.3	—	0.0
Denmark	0.4	0.4	0.3	1.2	0.4	0.0
Estonia	2.9	0.8	1.2	4.8	2.5	0.0
Faroese	2.4	0.6	0.8	2.4	0.6	0.0
Finland	0.9	0.1	0.1	1.7	1.1	0.0
France	2.8	0.8	—	—	—	0.0
Georgia	4.4	1.8	1.7	4.1	1.4	1.0
Germany	1.2	0.3	0.5	5.8	2.8	0.0
Greece	1.5	0.6	—	—	—	0.3
Hungary	2.2	0.7	1.3	4.4	2.2	0.1
Iceland	3.0	0.9	—	—	—	0.1
Ireland	2.5	0.5	0.6	4.0	0.5	0.5
Italy	2.1	1.0	1.0	1.5	2.0	0.1
Kosovo	9.7	1.2	0.9	0.5	4.4	1.6
Latvia	2.1	0.7	1.2	7.2	3.6	0.2
Lithuania	3.9	0.9	0.5	4.1	2.5	0.2
Malta	1.2	0.6	0.5	2.5	1.0	0.2
Monaco	0.7	0.7	1.2	2.6	2.8	0.2
Montenegro	4.2	0.6	0.9	3.0	2.1	0.3
Netherlands	2.6	0.5	—	—	—	0.4
North Macedonia	5.2	0.9	0.8	1.9	4.0	0.2
Norway	0.0	0.0	—	—	—	0.0
Poland	2.1	0.6	1.2	3.4	3.0	0.2
Portugal	3.1	0.8	0.9	3.0	2.6	0.2
Romania	3.6	0.6	0.3	1.8	0.8	0.2
Serbia	4.1	0.8	0.7	4.1	2.0	0.3
Slovakia	4.2	0.8	—	—	—	0.3
Slovenia	2.6	0.6	0.8	4.6	1.1	0.2
Spain	2.0	1.5	0.7	1.7	1.4	0.1
Sweden	0.8	0.4	—	—	—	0.1
Ukraine	4.2	0.8	0.9	7.1	0.6	0.6
<b>Average</b>	<b>2.9</b>	<b>0.8</b>	<b>0.9</b>	<b>3.4</b>	<b>1.9</b>	<b>0.3</b>

<sup>(a)</sup> One question is about lifetime prevalence, whereas the other is about age at first use.

NB: LTP, lifetime prevalence.



## Validity

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. The validity of the answers is a major concern in survey-based research, particularly in surveys of sensitive behaviours, such as substance use. The validity of the ESPAD survey was thoroughly discussed, and the conclusion, based on relevant available research, was that the level of validity could be considered high (Hibell et al., 2012). 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 that are important to the validity presented in relation to the 2019 data collection.

## Translation of the questionnaire

The comparability of the actual questionnaire across countries is of vital importance in any multinational survey project. Establishing consistency in the translations of the questions into the various languages is therefore an important aspect of measuring validity. The ESPAD master questionnaire is presented in English. In non-English-speaking countries, the questionnaire should be translated into the national language(s) and then back-translated into English by another translator. The original version and the back-translated version should then be compared to identify possible anomalies. However, the consistency of the questionnaires is not purely a matter of literal translation. It is also a matter of understanding. 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 the different substances mentioned in the questionnaire should be adjusted to the cultural context of each country. If this is not done properly, comparability with other countries may be undermined. No major problems with the translations were reported or detected. On the whole, it seems reasonable to assume that the translation of the questionnaire was not a major methodological problem and did 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. In previous sections, it has been shown that, in nearly all countries,

very few students were reported to have declined taking part (Table 3). It has also been shown that, in the majority of the ESPAD countries, some form of parental consent was requested (Table 2), and that, in the four countries where active consent was needed, refusal rates were higher. Despite the fact that the reasons for parental refusal are not known, it seems reasonable to assume that parents refusing to allow their children to participate in the ESPAD study are not a significant methodological problem that influences comparisons between countries to a large degree. However, in the countries with the highest figures, it implies some measure of uncertainty.

As described previously, all data were centrally cleaned in a standardised way. With a few exceptions, only a relatively small fraction of the questionnaires was discarded during the cleaning process. The greater proportions displayed by a few countries, including Cyprus (4.2 %) and Sweden (4.3 %), may be an indication that the situation was not as good regarding student cooperation.

In the classroom report, the survey leaders were asked to report (1) disturbances in the classroom during the data collection, (2) the extent to which the students had worked seriously and (3) whether the students seemed to have had difficulties in understanding the questions (Table 10). On average, 74 % of the survey leaders reported that there were no disturbances during data collection. In only five countries (Slovakia, Kosovo, Germany, Ukraine and the Netherlands), the percentages were less than 60 %, and the lowest value was registered in Slovakia (31 %). However, it should be noted that research assistants or survey leaders other than school staff were responsible for the data collection in four of those countries in which disturbances were more frequently reported. These individuals were likely to be less used to the normal level of disturbance in a classroom than teachers and thus more likely to report disturbances. In most of the countries, the majority of the survey leaders (59 %) reported that 'all' students had worked seriously, and an additional 39 % indicated that 'the majority' had done so. However, 2.1 % of the survey leaders reported that less than the majority had worked seriously. These levels were somewhat higher (4.2–5.3 %) in Germany, North Macedonia, Monaco and Slovakia. In Kosovo, this rate reached 17 %. Although the proportions were relatively low, this may be an indication of a setting that is possibly not as good as that in the average ESPAD country.

In summary, most countries did not report problems with many students declining participation. The proportion of discarded questionnaires was low in nearly all countries, with an average of 1.3 %. When there were disturbances during data collection, they rarely involved more than a few students. Even when fairly high levels of disturbances were reported in some countries, they seemed to have very rarely

had a negative effect on student cooperation. In fact, most survey leaders reported that all / the majority of students had worked seriously. In the case of countries with lower rates, those responsible for data collection were almost always non-school staff who were most probably less familiar with the normal noise level in a classroom. Therefore, student cooperation seems to have been good in nearly all participating countries.

Although overall student cooperation seems to have been satisfactory, a remark that needs to be made in this respect is the fact that Iceland and Norway did not collect classroom information, so the circumstances regarding the data collection in these countries remain unknown.

**Table 10.** Opinions of survey leaders: class-level information (%) (ESPAD 2019)

Country	Disturbances during the survey			Students working seriously			Students who found the form difficult <sup>(a)</sup>
	No disturbances at all	From a few students	More than a few students	All	Nearly all / the majority	Half or less	
Austria	84	15	1.6	58	40	1.5	4.9
Bulgaria	77	20	2.8	67	32	1.2	3.1
Croatia	68	28	4.3	56	41	2.4	6.5
Cyprus	76	23	1.2	59	40	1.2	17
Czechia	67	26	7.2	63	36	1.2	10
Denmark	71	25	3.6	70	30	0.0	0.0
Estonia	87	12	0.8	74	25	0.4	2.2
Faroese	80	20	0.0	60	40	0.0	0.0
Finland	80	19	0.4	67	32	0.8	2.6
France	73	20	6.9	51	48	0.9	4.5
Georgia	97	2.6	0.2	58	39	2.2	4.1
Germany	55	29	17	30	66	4.2	1.9
Greece	63	29	9.0	61	36	3.3	3.6
Hungary	87	10	2.5	65	32	2.5	10
Iceland	—	—	—	—	—	—	—
Ireland	71	27	2.2	68	30	2.2	21
Italy	79	20	0.7	62	38	0.0	2.7
Kosovo	54	35	11	24	59	17	12
Latvia	68	25	6.3	56	43	1.7	1.7
Lithuania	80	19	1.2	72	28	0.0	7.9
Malta	72	27	1.8	62	35	2.4	4.3
Monaco	79	20	1.3	62	33	5.1	1.3
Montenegro	90	9.3	0.7	59	40	1.3	2.3
Netherlands	58	22	20	55	45	0.6	0.6
North Macedonia	78	19	2.9	51	45	4.7	1.8
Norway	—	—	—	—	—	—	—
Poland	79	18	3.5	61	36	3.0	3.0
Portugal	85	12	3.1	60	40	0.4	8.4
Romania	100	0.3	0.0	80	20	0.0	0.6
Serbia	90	10	0.0	67	33	0.6	4.0
Slovakia	31	52	17	36	59	5.3	5.7
Slovenia	69	28	3.0	51	49	0.5	10
Spain	90	8.4	2.0	71	28	1.0	1.0
Sweden	63	28	8.8	63	36	0.7	16
Ukraine	57	39	4.3	46	52	1.8	5.2
<b>Average</b>	<b>74</b>	<b>21</b>	<b>4.5</b>	<b>59</b>	<b>39</b>	<b>2.1</b>	<b>5.5</b>

<sup>(a)</sup> Proportion of survey leaders answering 'Rather difficult' or 'Very difficult'.

## Student answering time and comprehension

As shown in Table 11, all countries asked all or nearly all of the core questions from the ESPAD master questionnaire. Furthermore, the optional module about performance enhancers as well as several of the optional questions were included in 15 countries. 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 295, with the smallest number being 186 in the Netherlands and the largest being 479 in Portugal. Naturally, the length of the questionnaire has an effect on the time taken to complete it. In addition, differences in students' experiences of participating in studies of this type may also affect the completion time. For these reasons and other reasons, it is not surprising that the time taken to respond to the questionnaire varied across countries. The average response

time was 37 minutes. The highest figure (54 minutes) was reported in Greece. A rather long average completion time was also reported in Czechia (48 minutes) and in the Faroes (45 minutes).

In a few countries, more than 10 % of the survey leaders thought that the students had had some difficulties in responding to the questionnaire (average 5.5 %). The highest proportion was found in Ireland (21 %) (Table 10). Overall, student comprehension seems to have been satisfactory in most participating countries. However, the longer the questionnaire and therefore the longer the time needed to fill it in, the greater the risk that some students may become tired towards the end and start giving less reliable answers. Although 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 due to the length of the questionnaire.

**Table 11.** Number of used items and average completion time (ESPAD 2019)

Country	Core (179) (H1)	Optional (174) / own	Performance enhancers module (7)	Total number of items	Average completion time (min)
Austria	179	188	No	367	34
Bulgaria	179	157	Yes	336	36
Croatia	179	146	No	325	35
Cyprus	179	34	Yes	213	36
Czechia	166	104	No	270	48
Denmark	179	74	Yes	253	35
Estonia	179	41	No	220	32
Faroes	179	167	Yes	346	45
Finland	179	251	No	430	33
France	143	167	No	310	33
Georgia	179	155	Yes	334	43
Germany	179	34	No	213	—
Greece	179	245	Yes	424	54
Hungary	179	131	Yes	310	38
Iceland	175	51	No	226	—
Ireland	179	187	Yes	366	33
Italy	179	149	Yes	328	41
Kosovo	179	72	No	251	37
Latvia	177	97	Yes	274	35
Lithuania	179	126	No	305	35
Malta	179	63	No	242	40
Monaco	179	199	No	378	31
Montenegro	179	46	No	225	34
Netherlands	177	9	No	186	27
North Macedonia	177	110	Yes	287	37
Norway	166	21	No	187	—
Poland	179	158	Yes	337	33
Portugal	179	300	No	479	43

Country	Core (179) (H1)	Optional (174) / own	Performance enhancers module (7)	Total number of items	Average completion time (min)
Romania	179	36	No	215	40
Serbia	179	58	No	237	35
Slovakia	179	61	No	240	40
Slovenia	179	53	Yes	232	34
Spain	179	181	Yes	360	39
Sweden	179	11	No	190	25
Ukraine	179	255	Yes	434	38
<b>Average</b>	<b>177</b>	<b>118</b>	<b>—</b>	<b>295</b>	<b>37</b>

## Anonymity

In surveys on hidden behaviours, such as ESPAD, it is of the utmost importance that the students understand that the survey is anonymous and that they are confident that reporting such behaviours will not entail any negative consequences. Several measures were taken to ensure perceived and actual anonymity. The ESPAD handbook recommends that an individual envelope be distributed along with the questionnaire. This gives the students the possibility of sealing the questionnaire right after completion. In 22 ESPAD countries these individual envelopes were used (Table 6). Countries that did not use individual envelopes used other methods to ensure that the students felt that their anonymity was safeguarded. These methods included a closed box and a joint envelope for the entire class, which was often sealed in front of the class before being sent to the research institute. If the data collection was performed online, the data were 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, have been that the person most trusted by the students was chosen. In about half of the ESPAD countries, teachers or other members of school staff functioned as survey leaders, while the remaining countries chose research assistants or other people from outside the school (Table 6). The survey leaders were asked to stress the issue of anonymity and to refrain from walking around the classroom while the 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-two countries entered the data manually, while seven used optical scanning. In six countries, data collection

was performed using a web-based questionnaire; thus, no data entry process was necessary (Table 6). All countries performed quality checks of the entered data. No particular problems due to such checks were reported. 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, students might have skipped questions they found objectionable. The 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 5). There were no alarmingly high numbers of unanswered questions on lifetime substance use in any country. The highest rates were found for alcohol in Kosovo (around 5%), and for ecstasy, inhalants and tranquillisers or sedatives without a doctor's prescription (4.1–5.1%) in Norway. Non-response to single (sensitive) questions is thereby not judged as being a significant methodological problem in the 2019 ESPAD data collection.

## Logical consistency

Logical consistency is a measure closely related to the inconsistency discussed in Section 3.14. In the ESPAD questionnaire, this indicator is detectable for sets of substance use questions measuring use during three time frames: lifetime, the past 12 months and the past 30 days. Logically, the figure for prevalence in the past 12 months cannot exceed lifetime prevalence, and the 30-day prevalence cannot exceed either the 12-month prevalence or the lifetime prevalence. Table 12 presents some 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 use and 12-month use have been compared. In nearly all countries and for all five variables, the proportions of inconsistent answers were relatively low. In other words, the proportions 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 related to alcohol use. Inconsistent answers about alcohol use were given by 6.0–9.3 % of the students in Georgia, Kosovo, Bulgaria, Romania and Cyprus. Across the five variables, Cyprus, Bulgaria and Georgia tended to display

an overall lower level of consistency, indicating a somewhat lower level of data quality in relation to this aspect. Despite the exceptions mentioned, logical consistency seemed to be relatively high in the participating countries.

**Table 12.** Some aspects of validity: inconsistent answers, unwillingness to admit cannabis use and reported use of the dummy drug 'releVIN' (%) (ESPAD 2019)

Country	Inconsistent answers <sup>(a)</sup>					Unwillingness to admit cannabis use (C57) <sup>(b)</sup>	Reported 'releVIN' use (C31d) <sup>(c)</sup>
	Alcohol (C15a-c)	Been drunk (C20a-c)	Cannabis (C25a-c)	Ecstasy (C29a-b)	Inhalants (C30a-b)		
Austria	2.4	2.5	0.8	0.2	0.4	10	0.4
Bulgaria	7	5.5	1.6	0.5	0.7	12	1.1
Croatia	3.4	2.2	0.9	0.2	0.1	21	0.6
Cyprus	9	6.7	2.5	1.3	2.2	9.4	1.7
Czechia	1.5	1.3	0.4	0.0	0.0	6.6	0.2
Denmark	2.5	8.0	0.3	0.0	0.0	5.3	0.4
Estonia	1.2	1.1	0.2	0.2	0.2	5.9	0.4
Faroese	0.6	1.8	0.6	0.2	0.0	3.7	0.2
Finland	0.6	0.6	0.1	0.0	0.1	3.5	0.2
France	2.2	1.7	0.7	0.2	0.3	7.7	0.6
Georgia	6.0	7.5	6.1	0.4	0.4	15	0.8
Germany	1.7	1.0	0.3	0.0	0.2	3.0	0.1
Greece	4.8	2.2	0.9	0.3	0.6	8.8	0.6
Hungary	2.9	2.6	0.6	0.2	0.3	7.3	0.5
Iceland	0.9	0.6	0.3	0.0	0.1	15	0.4
Ireland	1.7	1.7	0.6	0.2	0.2	11	1.0
Italy	4.2	2.2	1.1	0.1	0.1	6.1	0.7
Kosovo	7	2.7	0.5	0.7	0.3	18	0.6
Latvia	1.1	1.3	0.2	0.0	0.0	10	0.1
Lithuania	2.0	1.2	0.4	0.1	0.3	15	0.4
Malta	3.4	2.1	0.5	0.2	0.2	14	0.4
Monaco	3.6	1.4	0.5	0.0	0.2	4.7	0.2
Montenegro	2.7	1.3	0.1	0.2	0.2	12	0.3
Netherlands	1.4	1.2	0.6	0.1	0.0	9.3	0.4
North Macedonia	4.6	1.8	0.4	0.1	0.1	19	—
Norway	0.8	0.7	0.4	0.2	0.2	0.0	0.6
Poland	2.9	1.8	0.8	0.2	0.2	8.4	0.7
Portugal	0.0	0.3	0.0	0.0	0.0	5.2	0.3
Romania	7.8	3.6	0.7	0.3	0.2	13	0.3
Serbia	3.1	2.1	0.6	0.2	0.2	46	0.8
Slovakia	2.6	1.9	0.4	0.1	0.2	6.8	0.3
Slovenia	2.0	1.3	0.3	0.2	0.1	3.2	0.3
Spain	1.8	2.4	0.4	0.1	0.1	3.0	0.4
Sweden	0.7	0.7	0.4	0.0	0.1	10	0.4
Ukraine	0.0	0.0	0.0	0.0	0.0	9.6	0.2
<b>Average</b>	<b>2.9</b>	<b>2.2</b>	<b>0.7</b>	<b>0.2</b>	<b>0.2</b>	<b>10</b>	<b>0.5</b>

(<sup>a</sup>) For each substance, the inconsistent response pattern is defined as one in which any of the following has been found: (1) past 30-day frequency is higher than past 12-month frequency; (2) past 30-day frequency is higher than lifetime frequency; or (3) past 12-month frequency is higher than lifetime frequency. For ecstasy and inhalants, only lifetime frequency and past 12-month frequency have been compared.

(<sup>b</sup>) Students answering 'Definitely not' to the question 'If you had ever used cannabis, do you think that you would have said so in this questionnaire?'

(<sup>c</sup>) Instead of releVIN, some countries used national alternatives as a dummy drug.

## Under-reporting

The tendency of respondents to give answers that they believe will show them in a good light is a significant methodological problem in surveys about undesirable social behaviours. This factor is particularly important in surveys covering illicit substance use. At the end of the core part of the questionnaire used in the 2019 ESPAD survey, students were asked about their hypothetical willingness to admit cannabis use. The question was worded: 'If you had ever used cannabis, 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 reporting that they would definitely not report cannabis use are shown in Table 12.

The ESPAD average of students responding that they would definitely not report cannabis use was 10 %. In more than two thirds of the countries, less than 15 % of the students responded that they were definitely unwilling to admit cannabis consumption if they had used it. Among these, particularly low rates (about 5 % or less) were found in Norway, Germany, Spain, Slovenia, Finland, the Faroes, Monaco, Portugal and Denmark.

In Georgia, Iceland, Lithuania, Kosovo, North Macedonia and Croatia, the values ranged between 15 % and 21 %. The highest figure was reported in Serbia (46 %). 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 question. It should also be borne in mind that the question is hypothetical. 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.

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 in the previous paragraph. There is, however, no reason to believe that such differences would undermine the overall conclusions of the study. Therefore, low-prevalence countries would most likely remain 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 fake drug 'relewin' was included among a list of existing substances in the questionnaire. Countries may use another name instead of relewin for the dummy drug if there is a risk that the students may confuse it with a national drug street name for any existing substance. The average across all ESPAD countries for reported relewin use was 0.5 % (Table 12). In Bulgaria and Cyprus, however, the proportion of students reporting use of the dummy drug was higher than 1 %. With the exception of those 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 lysergic acid diethylamide (LSD). For each country, the proportion of students reporting use of the dummy drug could serve as a baseline for plausibility – meaning that if, say, 0.5 % of students in a country claim to have used the dummy drug, then the first 0.5 % of students reporting use of a real drug should be interpreted with caution.

## Some methodological issues to be addressed in future

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 school/class, not the student, it will be important to consider in the future cluster effects in 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 made up of students who are spread across classes and schools. This could affect 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.

## Country-specific methodology remarks

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

Deviations from the common ESPAD methodology and methodological problems that are deemed important when interpreting the results are listed for individual countries.

**Austria.** The data collection was performed online (instead of using pencil and paper). The school participation rate was low (30 %) compared with other countries but higher than that in the previous survey. No serious sample bias was detected, and weightings were introduced for school types in order to adjust for a selection bias due to school non-participation.

**Bulgaria.** Compared with 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.

**Cyprus.** Only government-controlled areas were included in the sample. Active parental consent was demanded, which resulted in higher refusal rates. Cyprus also reported the highest student refusal percentage (12 %) and a relatively small net sample (1 224 students). Moreover, a relatively large proportion of the questionnaires was discarded during the central data-cleaning process (4.2 %). This may indicate that the quality of the data collected in this country tended to be not as good as the quality of the data of the average ESPAD country. Moreover, compared with 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.

**Denmark.** The data collection was performed online (instead of using pencil and paper). Less than half of the sampled schools took part in the study (like the previous survey). Although the participation rate was low (21 %), there was no indication that non-responses should be strongly associated with school type or gender. Furthermore, the data were weighted considering geographical area.

**France.** The data collection was performed in the framework of a single project called EnCLASS that took place in spring 2018, which matched the ESPAD and Health Behaviour in School-aged Children surveys. The data collection was performed online. Not all ESPAD core questions were included in the survey: only questions about drug use were retained, while those on gaming and gambling were excluded. No optional questions were included. Although generally high, the school participation rate was lower than

in 2015 (88 % versus 94 % in 2015), probably because of the late start to the survey (May) and oversampling of vocational schools. Despite the differences mentioned above from the ESPAD methodology, the French team found no significant signs that these deviations had compromised representativeness for young people in France or comparability with the ESPAD data of the other countries.

**Georgia.** The occupied territories of Abkhazia and South Ossetia were excluded from the sample. A relatively high student refusal rate was reported.

**Germany.** Only the federal state of Bavaria was included in the sample. A relatively high student refusal rate was reported.

**Iceland.** The data collection was performed online (instead of using pencil and paper). Standard classroom report information was not collected, which has caused uncertainties about student participation rates and the classroom situation during data collection.

**Ireland.** A relatively small net sample (1 940 students) was reported.

**Kosovo.** Schools in Northern Kosovo under the parallel structures and working with plans of the Ministry of Education of Serbia were excluded (including less than 4 % of the target population). A relatively high student refusal rate and a relatively small net sample (1 756 students) were reported.

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

**The Netherlands.** The data collection was performed online (instead of using pencil and paper) and carried out during the autumn of 2019 (October to November). The target population was redefined to give an average age in line with other participating countries. Less than half of the sampled schools took part in the study (like the previous survey), but the Dutch team found no reason to believe that non-participation was selective. However, school type was considered when the weightings were computed. There were low school participation rates, which in turn led to a small net sample (1 288 students).

**North Macedonia.** Inconsistency measurements related to reliability indicate that the collected data may be of a somewhat lower quality than the data of the average ESPAD country.

**Norway.** The data collection was performed online (instead of using pencil and paper). Standard classroom

report information was not collected, which has caused uncertainties about student participation rates and the classroom situation during data collection. The necessary data for the response rate were collected via e-mail before the survey.

**Serbia.** The proportion of Serbian students answering that they would have been unwilling to admit to cannabis use is very high (46 %). This is the highest figure found in the 2019 ESPAD survey (the ESPAD average is 10 %). Although the question included in the ESPAD questionnaire was hypothetical in nature, the high figure for this country gives rise to some uncertainty and may indicate that under-reporting of drug consumption is higher in Serbia than in most other ESPAD countries.

**Sweden.** A relatively large proportion of the questionnaires was excluded (4.3 %). Sweden included a third option for the question on gender ('Other gender identity'). Discarded questionnaires included those of students selecting this option (2.4 %).

**Ukraine.** Autonomous Republic of Crimea was not included in the survey, nor were the territories of Donetsk and Luhansk, which are not controlled by the Ukrainian government.



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The Italian ESPAD coordination team at the CNR Institute of Clinical Physiology (CNR-IFC) was responsible for coordinating the national data collections, collecting country reports and data sets, and constructing the 2019

international database. The team also produced results tables and text for the 2019 ESPAD methodology report besides the full online version of the 2019 ESPAD report (main report and statistical supplement).

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## Collaborating persons

For each of the 35 countries that participated in the 2019 data collection, the most important collaborators are listed below, beginning with the PIs.

### Austria

Julian Strizek (PI); Markus Hojni; Jennifer Delcour; and Alfred Uhl

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**Czechia**

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**Denmark**

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**Estonia**

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**The Faroes**

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**Finland**

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**Germany**

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**Greece**

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### Cyprus

Cyprus National Addictions Authority; Centre for Education About Drugs and Treatment of Drug Addicted Persons; Ministry of Education and Culture

### Czechia

Czech National Monitoring Centre for Drugs and Addictions, Office of the Government of the Czech Republic (NMC); National Institute of Mental Health (NIMH)

### Denmark

National Institute of Public Health, University of Southern Denmark; Danish Health Authority; Ministry of Health

### Estonia

National Institute for Health Development; Estonian Ministry of Social Affairs

**The Faroes**

Ministry of Education, Research and Culture

**Finland**

Finnish Institute for Health and Welfare

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**Ireland**

TobaccoFree Research Institute Ireland; TU Dublin; Focas Research Institute; Department of Health; Institute of Public Health in Ireland (IPH)

**Italy**

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**Lithuania**

Ministry of Education, Science and Sport of the Republic of Lithuania; Lithuanian National Agency for Education; Lithuanian Educational Research Association

**Malta**

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### Portugal

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Research Institute for Child Psychology and Pathopsychology; Office of Public Health of the Slovak Republic; St Elizabeth College of Health and Social Work; Slovak Centre of Scientific and Technical Information; National Monitoring Centre for Drugs

### Slovenia

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

### Spain

Spanish Observatory on Drugs and Addictions; Government Delegation for the National Plan on Drugs; Ministry of Health

### Sweden

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

### Ukraine

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