



Research methods

The use of multi-national web surveys for comparative analysis: Lessons from the European Web Survey on Drugs



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ABSTRACT

Background: Most comparative drug policy analyses utilise measures of drug use, often from general population surveys (GPS). However, the limitations of GPS are well-recognised, including the small numbers of people who use illicit drugs sampled. Web surveys offer a potential solution to such issues. Therefore EMCDDA conducted a study to assess the potential for using such surveys to supplement information obtained from GPS.

Methods: The European Web Survey on Drugs (EWSD) asked about use of cannabis, amphetamines, cocaine and MDMA in 14 countries from 2016 to 2018. Each participant country translated the questionnaire as necessary and devised its own sampling strategy. Individuals aged 18+, resident in the participant country, who had used one or more of the drugs covered by the survey in the past 12 months were included in the analysis. Participation was anonymous and voluntary.

Results: More than 40,000 people completed the survey, with recruitment mostly through social media. Larger samples of users of all drug types than found in GPS were generally obtained. However, the respondent profiles differed markedly between countries, e.g. the proportion aged 18–24 ranged from 30% to 80%. The results relating to use showed both inter-country similarities and differences, e.g. mean daily amounts of cocaine used varied between countries but increases in amounts used with increased frequency of use were similar. Price data showed good external validity.

Conclusion: Web surveys offer the possibility of collecting information from large numbers people who use illicit drugs quickly and cheaply and can fill important gaps in our knowledge of patterns of use, particularly by recreational users. However, they also have limitations. Standardising questionnaires and approaches to data cleaning and analysis facilitates comparisons between countries but obtaining comparable samples may be challenging. Multinational surveys need to balance standardisation of methods with responsiveness to differing country contexts; our collaborative model does this.

Introduction

Most comparative drug policy analyses are underpinned by measures of the extent and nature of drug use. In the past, information on patterns of use of illicit drugs have generally been obtained from either general population surveys (GPS) or treatment samples, but these both have drawbacks. In many European countries, GPS include only small numbers of users of many drug types, making data on patterns of use unreliable. Also the high cost of such surveys (Van Gelder, Bretveld, &

Roeleveld, 2010) means that they are often undertaken only every few years. On the other hand, data collection using treatment populations will provide information on those with extreme drug use patterns and will not reflect the consumption patterns of the majority of people who use only occasionally (EMCDDA, 2018a, 2018b). Other sources of variability, which can hamper cross-national comparisons of information obtained from GPS, include differences in question wording, mode of data collection and sampling methods.

Collecting information through the internet appears to have the

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potential to overcome a number of these issues and web surveys have been shown to be a valuable tool for collecting information on sensitive topics like drug using habits (Batterham, 2014; Ramo & Prochaska, 2012; Van Gelder et al., 2010), as they provide a sense of anonymity and privacy (Burkill et al., 2016; Miller & Sønderlund, 2010). Moreover, some studies suggest that people who use drugs are more likely to disclose their tobacco and alcohol use via web-based survey than with self-administered, paper questionnaires (Lygidakis et al., 2010). As the access to online spaces has become normalised, this ‘setting’ has come to play an increasingly important role in the identification of new trends in drug use, trade in illicit drugs, or as a medium for people just discussing their experiences (Belackova et al., 2018; Davey, Schifano, Corazza, & Deluca, 2012; Deluca et al., 2012; EMCDDA, 2016; Schifano et al., 2005).

Web-based surveys, therefore, appear likely to be useful for collecting information on patterns of drug use from a wider range of people who use illicit drugs quickly and cheaply and be a way of overcoming some of the problems of other data sources and non-probabilistic, web-based surveys are increasingly being used to gather information from targeted groups of people who use drugs (see Barratt, Potter et al., 2015; Van Laar, Frinjs, Trautmann, & Lombi, 2013, 2016). There are also other problems associated with this method, such as self-selected samples limiting generalisability and introducing the potential for multiple responses and unknown biases, which need to be borne in mind when considering the use of this approach. Despite these limitations, this method of data collection appears likely to be a valuable adjunct to other data sources.

In recent years there has been an increase in drug researchers using web surveys in multiple countries, covering a variety of drug topics. The development and success of such web surveys as the Global Drug Survey (see Winstock, Barrett, Ferris, & Mair, 2016) and other multinational online surveys (Potter et al., 2015; Salustowicz & Malczewski, 2015; Van Hout, Benschop, & Bujalski, 2017) shows their versatility and value as a complementary tool to more established data sources. Countries differ in their drug monitoring efforts, having different skill set and political environment, and these collaborative approaches may help minimising such differences when performing multi-national comparisons.

However, these surveys are often conducted as one-off exercises as part of a specific research project and this, and the fact that there is often a lack of wider access to the datasets and methodological information, can limit their usefulness for routine monitoring and policy development (EMCDDA, 2018c). This paper describes some initial lessons from a pilot project undertaken by the EMCDDA to investigate the potential and limitations of this method for collecting comparable data from different countries for use in policy development and analysis. Building on the work done by Trautmann, Kilmer, and Turnbull (2013), the European Web Survey on Drugs (EWSD) sought to recruit a broad range of people who use drugs, from those just experimenting or very occasional users to those who use in a more intensive, and possibly, problematic way. The study covered the four most used illicit substances in Europe (EMCDDA, 2018a), for which questions had been tested in the previous study, but due to space limitations this paper mainly presents results for cocaine. Cocaine was selected as there are signals of increased in cocaine use in Europe currently making new information on consumption of this substance particularly salient (EMCDDA, 2018b). However, for comparison with data from GPS, cannabis data was used as this is the most used illicit substances in Europe (EMCDDA, 2018a) so the GPS data for this substance is more robust.

The aim of the paper is to highlight the potential benefits, methodological challenges and analytical pitfalls associated with using web surveys for collecting data on drug use patterns for comparative analysis to stimulate encourage the development of methodological approaches for maximising the utility of such surveys.

Methods

The EWSD collected information about patterns of use and purchases of the most commonly used illicit drugs. The analysis presented here focuses on data on frequency and amounts of different drugs used and purchased in fourteen different European countries: Croatia, the Czech Republic, France, the Netherlands, Switzerland, the United Kingdom who took part in the first wave of the survey in 2016. Austria, Belgium, Estonia, Finland, Italy, Latvia, Lithuania and Poland participated in wave 2 in 2017/18 (Matias & Singleton, 2017). This survey was conducted by the national partners of the EMCDDA who chose to participate on a voluntary basis.

Based on the questionnaire from an earlier study (Trautmann et al., 2013), a short questionnaire on patterns of use of cannabis (resin and herbal), amphetamines, cocaine and MDMA (ecstasy) was developed using LimeSurvey© in English (in wave 2 a module on NPS use was added but that is not discussed in this paper and the amphetamines module was split in two: amphetamine and methamphetamine). Each national partner was responsible for translating and testing the questionnaire as necessary. For several countries, the questionnaire was made available in several languages. The core questionnaire consisted of 128 questions and included some modifications of the questionnaire used by Trautmann et al. (2013), in particular it was considerably shortened and respondents were given the opportunity to answer more than one module if they had used more than one of the drugs of interest in the previous year. The questionnaire covered some questions on patterns of use of a range of substances for different timeframes, some attitude questions and general demographics. Based on the European Model Questionnaire for surveys on drug use among the general population (EMCDDA, 2002), the attitudes questions were added as introductory questions in order to avoid starting with questions regarding drug using patterns which might be seen as threatening. Participants who reported using only one of the drugs of interest in the last 12 months were asked to answer a series of questions about that drug. Where participants reported having used more than one drug of interest in the past year, drug modules were offered in a random order from those that they had selected. At the end of each module participants were asked if they would be prepared to answer a module on another substance (again randomly selected from those they said they had used). Respondents could opt out, as is the nature of web surveys, at any stage in the questionnaire. The questionnaire, which was amended slightly between waves 1 and 2, and took on average 10 min to complete in wave 1 and 12 min in wave 2. For some of the background socio-demographic variables, for example highest level of qualification obtained or the average net income, the response categories were adjusted to fit the differing systems in the country while retaining the basic questionnaire structure. In some cases, additional questions or modules were added at the end to meet a specific country need based on the assessment done by the national partners. Examples of these are modules on heroin in Switzerland or fentanyl in Estonia. The results of those modules, applied in most instances in a single country and intended to inform the drug situation at national level, are not discussed in this paper.

For each substance covered, the questionnaire asked about:

- Substance use: lifetime, last 12 months and last 30 days prevalence.
- Frequency of use: Frequency of use in the past 12 months was assessed using two separate items: a question using a categorical response format with options ranging from daily to less than once a month; and a question on number of days of use. Frequency of use in the last 30 days was assessed only by number of days of use in the last 30 days. The categories for the frequency of use were based on the one used in the original study (Trautmann et al., 2013), infrequent use being defined as use on < 11 days in past year, occasional use as between 11–50 days in the past year and frequent use being 51 days or more in the past year.

- Mode of consumption and amounts consumed on a typical day.
- How they obtained the drugs and, if they bought them, how much they usually purchased, what they paid for this, and the proportion that was shared or sold on.

Each participant country devised its own sampling strategy based on their own networks and experience, but lessons learnt were also shared between participant countries. Countries were encouraged to develop sampling strategies that would reach a range of different user groups and to adopt a variety of methods in order to obtain responses from these groups. The recruitment strategies varied substantially and included: creating dedicated web pages; printing flyers to be distributed in clubs and bars; sharing information about the survey through a variety of different media (for example on student health insurance web sites, magazines, universities, social and counseling services websites, and specific webpages targeting people who use specific drugs, subcultures, and ‘psychonauts’); advertising the survey in drop-in and outreach centre premises; offering participants the incentive of entering a lottery; and using paid ads on social networking sites. For the paid ads, since clicking on the advertisement gave access to the survey, a ‘cost-per-click’ model was applied (Facebook, 2017), as done in previous studies (e.g. in Kayrouz, Dear, Karin, & Titov, 2016; Ramo & Prochaska, 2012). Amongst the countries which applied this strategy, campaigns differed in advertisement languages, number of advertisements, targeting criteria, duration, and the budget (Jerkovic, Rihtarić, & Horvat, 2017).

Individuals aged 18 and over who had used one or more of the drugs covered by the survey and who were resident in the participant countries were eligible to take part. Participation was anonymous, self-selecting and voluntary.

Non-eligible participants, questionnaires with large amounts of missing data and those with obvious flaws and inconsistencies in the answers, for example continually providing maximum answers for use of all drugs, were excluded from analyses. Since IP addresses were not recorded, repeat respondents could not be identified. However, more than 75% of respondents who answered sufficient questions to be included voluntarily supplied e-mail addresses (collected separately to their answers) at the end of the survey so that they could be sent a summary of findings and there were no duplicate emails collected, which suggests that duplicate questionnaires did not occur in sufficient numbers to influence the results. It was also possible to view the survey questionnaire without answering very many of the questions, and it is likely that the considerable numbers who started the questionnaire but did not answer many questions (see Table 1 below) were just interested in seeing the types of question being asked.

Descriptive analysis of the data was conducted in SPSS, using means and standard deviations for continuous variables and percentages for categorical variables.

Results

Characteristics of the web survey samples

The results presented here include data from the six Wave 1 countries and the eight Wave 2 countries who participated in the EWSD. These results have been selected to highlight some key issues for consideration when comparing web survey findings from different countries and areas for further methodological research.

For all of the drug types covered in the survey, larger samples of people who reported use in the past year than are generally obtained in general population surveys (EMCDDA, 2018a) were achieved in both waves of the EWSD (Table 1). However, there was considerable variation between countries in both the sample size and the profiles of the respondents.

It can be seen that many more people entered the questionnaire than are eligible or willing to participate. In general, about half of the

questionnaires generated are from eligible respondents but there was some variation by country. There was also considerable inter-country variation in the achieved sample sizes.

Table 2 shows the proportion of the samples who reached the survey through different recruitment methods (as reported in response to a question at the end of the questionnaire). Although recruitment strategies differed among the participating countries, there were some commonalities. As would be expected with a web-based survey, most countries used primarily online recruitment and it can be seen that social media was the most common route into the survey in all countries except the United Kingdom. This may also be influenced by the fact that most countries set up a Facebook page for the survey to which people interested in participating may have been routed even if they first saw the information elsewhere.

It is important to note that the category ‘through social media’ itself encompasses a number of different strategies. In particular, some organisations who conducted the survey used Facebook ads and this proved a very effective way of generating a large volume of respondents very rapidly. Croatia was the first country to adopt this approach but they shared their experience with other countries. In wave 1 Switzerland, France and the Netherlands all also used these ads, but did so in different ways and to differing extents (see Jerkovic et al., 2017). In Wave 2 all the countries except for Italy made use of Facebook ads, but had different targeting strategies. While Facebook and similar online recruitment methods can be very cost-effective tools for accessing people who use drugs recreationally the targeting of the advertisements needs careful consideration. In Austria, for example, the selection criteria used did not include country of residence so this is why the proportion of those accessing the survey who were eligible for the analysis was low (20%).

Accessing the survey through advertisements on websites other than social media platforms, was the next most common route and was reported by more than 1 in 10 respondents in Austria, Estonia, Finland and Latvia. In Finland and Latvia, a marketing company was contracted to help advertise the survey, which may in part explain the higher proportion of participants accessing the survey in this way in those two countries. Websites providing drug information were also common ways to access the surveys, particularly in the United Kingdom but also in France and the Netherlands. In Italy a considerable proportion of participants heard about and then accessed the survey through an interview given to a relevant national newspaper, and this is reflected in the proportion of participants reporting they heard about the survey in ‘Other ways’. This may also be a factor in the larger proportion of those accessing the survey who were eligible to participate (67%) than in other countries; they were clear before going to the survey what it was about and who it was for.

The characteristics of age and sex of the achieved samples varied between countries. The proportion of the sample who were aged 18–24 years ranged from 30% in the Czech Republic to 82% in Austria. At the other end of the age spectrum, in the Netherlands and the UK over 20% of the sample were aged 35 or over, and more than 5% were aged 45 or more. In contrast, less than 5% of respondents in Austria and Lithuania were aged 35 or more (Fig. 1). In most countries around two thirds of participants were male, while in Lithuania and Poland the gender balance was much more even, with 53% and 51% respectively being male. The proportion of transgender people who participated to the survey was below 1% in all countries (Fig. 2).

Patterns of drug use

The data on patterns of use show considerable variation between countries but also some similarities. Table 3 shows that the proportion of respondents to the cocaine module who were classed as using the drug frequently (i.e. they used it on more than 50 days a year) varied quite widely, from none in the Czech Republic and 5% or less in Estonia, Latvia, Lithuania and Poland to over 10% in Belgium, France,

Table 1
Achieved sample size by drug type and country.

Country	Total no. accessed survey	Eligible ^a No. (% of those accessing survey)	Eligible & resident ^b No. (% of those accessing survey)	Agreed to cannabis module	Agreed to cocaine module	Agreed to amphetamine(s) module ^c	Agreed to methamphet-amine module	Agreed to MDMA module
Wave 1								
Croatia	9142	4635 (51%)	4430 (48%)	3713	874	1056		1416
Czech Republic	1058	585 (55%)	529 (50%)	468	145	115		204
France	4849	2993 (62%)	2608 (54%)	2014	822	618		1061
Netherlands	1238	758 (61%)	703 (57%)	428	303	318		510
Switzerland	2862	1548 (54%)	1307 (46%)	1024	370	291		423
United Kingdom	1216	444 (37%)	358 (29%)	265	137	39		175
Wave 2								
Austria	12992	7213 (56%)	2635 (20%)	1948	816	940	134	1080
Belgium	8164	4502 (55%)	4379 (54%)	3142	1260	506	66	1256
Estonia	6438	2130 (33%)	2051 (32%)	1596	399	388	40	643
Finland	7945	3952 (50%)	3851 (48%)	2947	541	1139	378	1099
Italy	3083	2162 (70%)	2063 (67%)	1549	348	61	23	237
Latvia	8908	3733 (42%)	3530 (40%)	2598	343	312	72	577
Lithuania	3210	1114 (35%)	1076 (34%)	736	141	120	33	231
Poland	9090	4395 (48%)	4245 (47%)	2796	583	816	234	1191
TOTAL	80195	40164 (50%)	34160 (42%)	25224	7082	6719	980	10103

^a Consented to participate, were aged 18+, had used one of the drugs covered in the last 12 months, adequate quality response.

^b Resident in the country conducting the survey.

^c In wave 1 amphetamines includes methamphetamine, in Wave 2 just amphetamine (there was a separate methamphetamine module).

Table 2
How respondents heard about the survey by country.

	Drug info sites/helplines	Social media (eg Facebook, Twitter)	Ads on websites (other than on social media)	Friends	Other ways	Base
Croatia	2.5%	83.1%	9.4%	4.7%	0.4%	3416
Czech Republic	5.5%	82.2%	1.5%	9.9%	0.9%	456
France	23.3%	66.2%	2.0%	5.9%	2.6%	1892
Netherlands	15.2%	77.2%	5.5%	1.3%	0.7%	545
Switzerland	5.3%	86.5%	2.9%	4.7%	0.7%	1008
UK	65.3%	26.3%	2.3%	5.7%	0.4%	262
Austria	7.5%	74.7%	12.4%	4.6%	0.8%	1756
Belgium	1.6%	86.5%	9.2%	2.3%	0.3%	3107
Estonia	1.0%	79.7%	12.6%	5.7%	1.0%	1624
Finland	4.3%	70.3%	13.7%	6.0%	5.7%	2801
Italy	8.4%	66.3%	2.8%	6.5%	16.0%	1423
Latvia	1.2%	70.8%	21.9%	4.8%	1.4%	2497
Lithuania	4.1%	89.0%	1.9%	4.4%	0.6%	683
Poland	4.5%	80.9%	11.7%	2.6%	0.4%	2658
Total	6%	77%	10%	5%	2%	24128

Italy and Switzerland. Frequent use of MDMA/ecstasy showed slightly less variability, ranging from 1% of respondents to that module in the Czech Republic to 8% in Austria and Croatia. Although there was inter-country variability in the proportions, in general, respondents who used amphetamines were more likely to report occasional (11–50 days per year) or frequent use than those who used cocaine or MDMA.

Respondents to the survey were asked how much of each of the drugs they used on a typical day that they used that particular substance. Table 4 shows the average amounts of cocaine used in each frequency of use group by country. As would be expected, the amounts used on a typical day were significantly associated with frequency of use. This pattern of increased quantities used on a typical day as frequency of use increased could be seen in all countries and was particularly noticeable among participants reporting frequent use. There was some variation in the mean amounts used per day of use between countries, among participants reporting infrequent use ranging from 0.6 g per day in Austria and Belgium to 1.1 g per day in Finland and Croatia. The mean amounts used among participants reporting frequent

use varied from 1.3 g per day in Austria, Belgium, the Czech Republic and Switzerland to 2 g per day in Croatia and 2.2 g per day in the UK (among participants reporting frequent use in Estonia, Latvia, Lithuania and Poland reported similar or higher amounts per day but based on very small numbers). However, this variation might be expected as both price and purity will vary between countries and may have an impact on amounts used.

The prevalence of cannabis use in the general population is much higher than that of stimulants in all European countries (EMCDDA, 2018a) and it is therefore not surprising that in the EWSD larger samples of people who used cannabis were obtained (Table 5). It also allows for frequency of use responses to be grouped into four broader categories, than the ones used for stimulants. In all the wave 1 countries of the EWSD, except the Netherlands, about three-quarters of those respondents to the cannabis module were classed as regular or intensive users (using cannabis on over 50 days in the previous year) and over two-fifths were intensive users (using over 250 days in the past year). In the Netherlands, 58% of respondents were classed as regular or intensive users, while almost a fifth of participants reported infrequent use (10 days or less per year) compared with less than a tenth of respondents in the other countries. In wave 2 countries, the frequency of use was lower, either similar to that in the Netherlands or in the case of countries from the Baltic regions even lower, with the largest frequency group being participants who use cannabis infrequently.

Comparing web surveys with other data sources

The higher prevalence also means that general population surveys on drug use carried out in Europe include sufficient numbers of users of cannabis for data on frequency of use to be routinely collected and reported to the EMCDDA. The question generally included in the European GPS relates to frequency of use in the last month, whereas the EWSD focused on frequency of use in the last year so the data are not directly comparable. Nevertheless, roughly equivalent categories can be constructed and comparison of the two data sources gives some insight into the differences between the participants in the EWSD and the people who use drugs who participate in GPS. Table 5 shows that in most countries the distribution of frequency of cannabis use in the web survey samples is very different to that in the GPS, in which the majority are infrequent or occasional users and less than 20% are classed

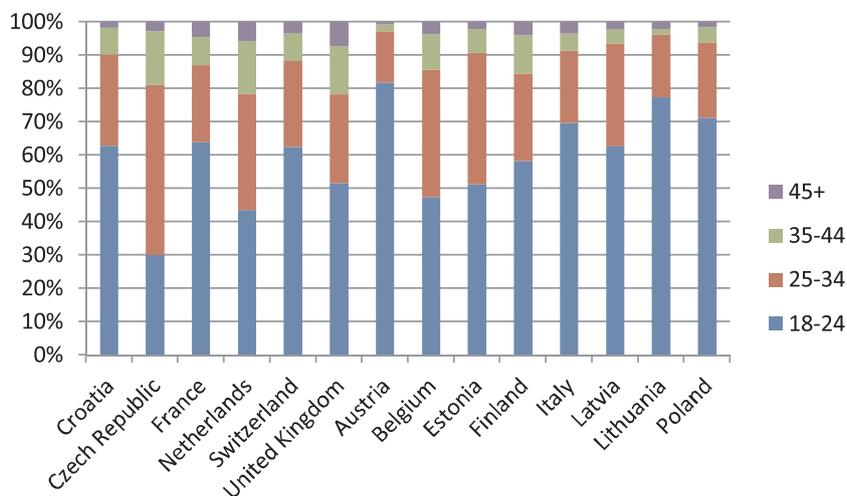


Fig. 1. Age distribution of the EWSD participants – overall (any drug) by country.

as intensive users. The extent of the difference, however, varies considerably by country.

In our web survey, people who said they bought their drugs were asked how much they usually bought and how much this amount cost. The answers given to these two questions were used to calculate the price in Euros per gram. Table 6 compares the price per gram for powder cocaine obtained from the EWSD with the routine retail price data reported to EMCDDA in 2016. The routine price data may be collected by different methods, often from law enforcement sources, and different measures of central tendency can be reported. It can be seen that, despite the sources of variability in both sets of data, there is generally quite good agreement between the two data sources, with prices for a gram of cocaine ranging from 50€ in the Netherland to 120€ in Finland, based on the EWSD data.

Discussion

The experience of the European Web Survey on Drugs (EWSD) illustrates the potential of web surveys for collecting information from very large numbers of people who use drugs, quickly and comparatively cheaply. Many of the countries involved in the project are only able to run general population surveys on the topic of drugs every four years and then, because the prevalence rates of use of many drugs other than cannabis is low, the number of people in the sample who have used these drugs in the past year is too low to permit analyses of their

characteristics. Even in countries with more frequent data collections, the low prevalence rates, the sensitivity around questions about illegal activities, and the constraints on questionnaire length mean that obtaining detailed information on patterns of use and information concerning purchases is not feasible. While a number of web surveys have been conducted on different drug topics these are generally done as part of one-off research projects and in a limited number of countries, although the Global Drug Survey takes place annually in quite a few European countries. However, policymakers and practitioners generally have little opportunity to influence the content of these or to access the data for bespoke analysis to meet their specific needs. The European web survey on drugs has been designed to address these issues and has provided participant countries with a range of completely new information about patterns of use among some people who use drugs which can be used to shape European drug policies. The information presented here is just a fraction of the wealth of information available from even such a short survey, selected to illustrate some of the opportunities and challenges associated with these surveys. The entire international dataset being made available to each participating country will allow further cross-country comparisons. The triangulation of these data with other sources will improve our understanding of different drug market dynamics and can help identify ways in which routine data collection tools may benefit from adjustment to better reflect the drug using patterns.

Despite their promise, there are a number of more problematic

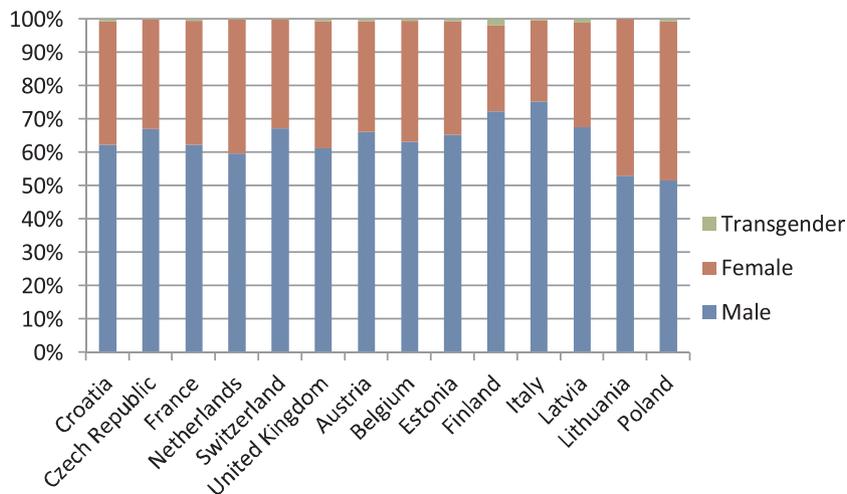


Fig. 2. Gender distribution of the EWSD participants – overall (any drug) by country.

Table 3
Distribution of stimulant users by frequency of use groups and country.

Country	Cocaine				Amphetamines				MDMA			
	Infrequent use	Occasional use	Frequent use	Total (n)	Infrequent use	Occasional use	Frequent use	Total (n)	Infrequent use	Occasional use	Frequent use	Total (n)
Croatia	75%	17%	8%	846	54%	30%	16%	1002	69%	23%	8%	1356
Czech Rep	87%	13%	0%	142	54%	24%	22%	114	75%	24%	1%	198
France	64%	25%	11%	795	58%	30%	12%	589	66%	29%	5%	1030
Netherlands	67%	23%	9%	299	56%	30%	14%	300	72%	26%	2%	503
Switzerland	65%	21%	14%	357	60%	26%	14%	273	78%	17%	4%	413
UK	79%	15%	6%	128	67%	22%	11%	36	75%	23%	2%	168
Austria	71%	22%	7%	779	56%	30%	15%	912	68%	24%	8%	1066
Belgium	61%	27%	12%	1207	65%	18%	17%	484	77%	19%	4%	1228
Estonia	85%	12%	3%	389	72%	21%	7%	386	81%	16%	3%	642
Finland	81%	13%	6%	525	59%	24%	17%	1109	83%	14%	3%	1078
Italy	64%	25%	11%	340	80%	20%	0%	60	87%	12%	2%	231
Latvia	89%	7%	5%	331	69%	20%	12%	301	85%	12%	3%	571
Lithuania	89%	9%	2%	133	71%	19%	10%	116	75%	19%	6%	227
Poland	88%	10%	2%	582	68%	20%	12%	787	78%	18%	4%	1181

Notes: The totals may differ from those provided in Table 1 as some participants may not have replied to the questions on the frequency of use or did not have adequate quality response. Infrequent use = < 11 days in past year; occasional use = 11–50 days in the past year; and frequent use = 51 days or more in the past year.

Table 4

Grams of cocaine consumed on a typical consumption day per user group and country.

		Infrequent use	Occasional use	Frequent use
Netherlands	Mean	0.97	1.08	1.5
	N	173	84	39
Croatia	Mean	1.06	1.41	2.00
	N	578	130	100
Czech Republic	Mean	0.78	0.76	1.31
	N	109	17	8
France	Mean	0.96	1.19	1.35
	N	393	188	148
Switzerland	Mean	.85	1.00	1.31
	N	184	88	80
United Kingdom	Mean	.88	.82	2.18
	N	92	15	16
All wave 1 countries	Mean	.97	1.17	1.56
	N	1529	522	391
Austria	Mean	0.60	0.85	1.30
	N	472	161	49
Belgium	Mean	0.76	0.96	1.27
	N	662	308	139
Estonia	Mean	0.79	1.38	2.00
	N	273	43	9
Finland	Mean	1.15	1.38	1.67
	N	335	60	23
Italy	Mean	0.64	0.96	1.45
	N	174	81	34
Latvia	Mean	0.90	0.93	2.05
	N	188	17	6
Lithuania	Mean	0.95	0.86	3.00
	N	80	10	2
Poland	Mean	1.06	1.30	2.37
	N	352	52	10
All wave 2 countries	Mean	0.84	1.01	1.43
	N	2536	732	272

issues associated with the use of these surveys. Some of these relate to the way in which the sample is obtained and others concern factors relating to the completion of the survey through a remote web interface. Some are issues that relate to surveys in general that may be manifest differently or more extremely in the surveys such as these. The EWSD pilot project has provided an opportunity to investigate some of these methodological issues and their potential impact on the findings from these kinds of web surveys.

Sample size and representativeness

The EWSD, in common with many of these types of survey, recruits respondents through widespread, though targeted, advertising. This is necessitated by the absence of appropriate sampling frames covering all people who use drugs. The fact that people are not individually targeted may itself be a benefit, as people may feel that their responses are more anonymous. However, this approach raises issues of representativeness. The use of social media, in particular Facebook ads, generated large samples in many countries, but in considering the findings from these surveys it is important to consider how representative Facebook users are of the wider population. An preliminary exploration of the data suggests that generally it appears that Facebook users in the samples in the EWSD are more likely to be female and tend to be younger than individuals recruited by other means. For example in wave 1 of the EWSD, in which there was less use of social media to obtain the samples in some countries, 59% of those recruited through social media were aged 18–24, compared with 48% of those recruited through drug information websites or helplines and 38% of those recruited through advertisements on other websites. Similarly, the proportions who were female 39%, 33% and 28%, respectively. However, it is also interesting to note that there can be differences between countries in the profile of Facebook users and that these may also change with shifts in fashion. This suggests that over time, even if the same sampling methods are

Table 5
Distribution of cannabis users by frequency of use group and country – EWSD compared with GPS data.

Country	EWSD					General Population Surveys				
	Infrequent (< 11 days in past year)	Occasional (11-50 days in last year)	Regular (51-250)	Intensive (> 250)	Total number	Infrequent (0 days in the last month)	Occasional (1-3 days in the last month)	Regular (4-19 days in the last month)	Intensive (20 days or more)	Estimated Total number
Croatia	7.7%	16.0%	30.4%	45.9%	1039	36.7%	32.3%	20.9%	10.1%	392
Czech Republic	8.9%	13.9%	26.1%	51.1%	180	42.4%	21.5%	33.8%	2.3%	272
France	9.5%	13.8%	30.3%	46.4%	1375	40.5%	20.2%	19.6%	19.6%	1421
Netherlands	19.2%	22.9%	31.8%	26.2%	214	39.3%	26.7%	18.2%	15.8%	478
Switzerland	9.9%	18.6%	27.7%	43.7%	533	N/K	N/K	N/K	N/K	N/K
United Kingdom	6.2%	14.8%	33.3%	45.6%	81	51.5%	34.9%	9.2%	4.4%	1451
Austria	18.3%	17.3%	30.3%	34.0%	1874	61.2%	20.0%	11.4%	7.5%	222
Belgium	20.3%	16.4%	24.6%	38.6%	3025	43.5%	23.2%	21.5%	11.9%	227
Estonia	45.5%	20.7%	21.8%	12.0%	1538	75.7%	17.0%	7.2%	0.0%	85
Finland	24.7%	21.6%	32.6%	21.2%	2839	63.0%	17.2%	15.0%	4.8%	213
Italy	21.9%	19.9%	28.6%	29.6%	1501	46.7%	22.9%	20.8%	9.6%	698
Latvia	40.8%	23.8%	25.3%	10.0%	2510	61.7%	23.9%	9.9%	4.6%	190
Lithuania	48.1%	22.6%	19.9%	9.4%	700	59.3%	22.4%	17.5%	0.8%	129
Poland	36.2%	25.3%	25.1%	13.4%	2694	54.6%	38.1%	3.7%	3.7%	52

Note: The categories differ between the EWSD and general population surveys data as for GPS frequency of use is asked only to those who have used cannabis in the last 30 days.

used, the profile of respondents may change and that to obtain continuous coverage of particular groups from year to year it may be important to consider new sampling strategies. This is an issue that needs further investigation, but analysis of trends using web surveys needs to bear this in mind. The costs per click of Facebook ads, and per participant also differed among the countries, with the cheapest being in Croatia, while the most expensive was in Switzerland (Jerkovic et al., 2017). The cost per completed questionnaire obtained through this approach therefore varied quite considerably but was still quite low. More methodological work to understand how to use these types of ads more effectively would be useful.

The United Kingdom did not use Facebook for recruitment and did not set up a national Facebook page, using the main EWSD page hosted by the EMCDDA as the entry point to the survey, which explains the very low proportion who reported hearing about the survey through social media. The greater dependence on advertisements on drug information sites and helplines in the United Kingdom than in other countries (the route to the survey reported by 65% of respondents, compared to the overall average of 6%) may also be a factor in the low proportion of those accessing the survey who were eligible to take part (29%). Visitors to such sites may be young people (under 18 who due to issues of consent were not included in the survey) or will not necessarily

be people who use drugs but may be interested in seeing what the survey is about.

The EWSD, like other international web surveys, was able to reach significant sample sizes in several European countries, confirming that this method allows access to large numbers of participants from different countries, with fewer resources compared to traditional surveys (Barratt & Lenton, 2015; Brick, 2015). However, our survey, as has been found previously (Trautmann et al., 2013), attracted a higher proportion of participants reporting frequent use than are found in the general population, which given that people opted in to the survey is perhaps not surprising; very occasional users are probably less likely to feel that a survey about patterns of drug users applies to them. On the other hand, the question arises as to whether people who use drugs frequently are properly covered in GPS sampling frames. Though large samples were reached with this web survey in most countries, it is important to recognise that such surveys are not representative of the general population and also are not representing any pre-defined groups of people who use drugs (Barratt, Ferris, & Lenton, 2015). In using the data it is important to take this into consideration.

A comparison of the characteristics of the respondents to the French web survey recruited using Facebook compared to other sources and with respondents to their 2014 GPS sample (Legleye, Beck, & Spilka,

Table 6
Prices paid in Euros per gram of cocaine purchased (participants who said they purchased the cocaine they used) by country from the EWSD compared with routine price data reported to the EMCDDA in 2016.

Country	EMCCDA routine data on cocaine prices					EWSD				
	Min.	Max.	Mean	Median	Mode	Min.	Max.	Mean	Median	Mode
Austria	50	150	:	:	100	14	160	84.3	90	100
Belgium	22.2	125	60.74	50	50	12.5	200	50.83	50	50
Croatia	64.5	91.2	:	:	79	9	133	73.5	66.5	67
Czech Republic	37	92.49	70.08	73.99	73.99	33.3	133.1	74.67	73.9	73.92
Estonia	80	150	:	:	110	15	200	103.75	105	120
Finland	80	150	:	:	100	10	230	107.36	120	120
France	60	75	:	65	:	8	150	70.05	70	80
Italy	62.75	93.58	78.16	:	:	6.5	125	77.6	80	100
Latvia	70	120	:	:	100	10	200	89	100	100
Lithuania	20	70	65	:	:	50	180	85.4	90	100
Netherlands	30	200	50	50	50	15	100	44.6	50	50
Poland	46.9	47.62	:	:	47.26	11.75	141	66.7	70.5	70.5
United Kingdom	48.8	146.4	:	:	48.8	17	127	80	76	63, 1

Note: Switzerland is not part of the European Union, so routine data is not sent to the EMCDDA, therefore has not been included in this table.

2017) showed that web survey respondents were more likely to be male, aged 18–25 years, have reached a higher educational level, live alone or as a couple, and be a student. These characteristics were most marked in respondents recruited via Facebook. The survey included large numbers of young students who are quite probably under-represented in GPS surveys in many countries which focus on households and may exclude university halls of residence. However, such variability will be less important if these factors are not related to patterns of use or if the analysis focuses on specific sub-samples. Our initial exploratory analysis found the association of age, gender and recruitment method on the likelihood of reporting intensive cannabis use varied by wave. In wave 2 all variables were significantly associated although they did not explain much of the variation seen. Nevertheless, it suggests that these factors need to be considered when using web survey data, although, the importance of a probability sample and generalisability varies depending on the use to be made of the data. Some methods are also available that may be help to address the problem of the non-probabilistic nature of these samples. These include incorporating a web survey element as part of a mixed methods approach to surveys of probabilistic samples, or by making adjustments to align the sample to general population samples using weighting based on sociodemographic variables, such as propensity score weighting (Schonlau & Couper, 2017). More research to better understand the relative strengths of these approaches and for what purposes they are most appropriate is an area for further development.

In this pilot project, the success of Facebook ads in generating a large sample in Croatia led to its adoption by other countries. This has proved beneficial in terms of sample sizes achieved and may mean that the types of users being accessed are similar across countries so it might improve inter-country comparability. Nevertheless, there have been differences in how the Facebook ads were targeted, which may need to be considered when comparing the data as well as the difference between countries as to who uses Facebook highlighted above. In addition, the large numbers of responses from Facebook users (running these ads is like turning on and off a tap) may swamp other types of drug users in the sample or lead to a neglect of other potentially valuable recruitment sources. As when collecting qualitative data, it may be that after achieving a certain sized sample of one particular group, the value of getting more of the same rapidly diminishes.

To address this issue, it will be important to investigate different methods of recruitment that may be able to draw in a wider range of people who use drugs, and several participant countries have tried several other approaches, although generally with limited success. This is an area that requires further development. In addition, it is important to consider how participants can be categorised in order to understand which sub-groups of people who use drugs they represent. This will probably require revisiting some of the variables that are included as standard in both the web survey and the general population surveys in order to allow the mapping of data from one source onto the other.

As web-based surveys become more common, survey fatigue and mistrust may become an issue, in the same way as they have reduced response rates to telephone surveys. There are signs of this effect in the much lower samples obtained in the Netherlands and the United Kingdom. This suggests that coordination and collaboration between different researchers responsible for carrying similar type of web surveys on drug issues will be beneficial, in order to prevent potential participants to become overwhelmed with several and similar requests.

One issue for web surveys is that it is difficult, while maintaining anonymity, to control for people completing the survey multiple times. One can introduce cleaning routines and build in data checks that identify for example people who are going through pressing the same key all the time, or people entering unreliable answers. We also looked at the remarks entered at the end of the questionnaire which revealed a few people who indicated that they were not being honest. However, these are not foolproof measures and in terms of questionnaire design there is a trade-off between incorporating a lot of range checks to

improve data completeness against the potential irritation caused by lots of interruptions when people are completing of the questionnaire.

Questionnaire design and reliability and validity

Designing questions for completion online needs to take account of the fact that many people will be answering on a smartphone. This has an impact both on the questionnaire layout and on how long people are going to be prepared to engage in the activity.

The use of a standard questionnaire for the EWSD has been adopted partly for practical reasons (changes to the questionnaire would introduce additional costs into the process for programming and data processing) and also to facilitate cross-national analysis. Some variability is necessary to reflect different national contexts but these have been kept to a minimum. The questionnaire was based on one used in an earlier study (Trautmann et al., 2013) but was considerably shortened. Having fewer questions in each module allowed us to build in the potential for individuals to opt to answer more than one module if applicable. Quite a large number of people did so and this approach is probably a large factor in the much bigger samples of people who use stimulants obtained in our surveys compared with the original study.

As in all surveys it is important to test the questionnaire, even when using questions that have been used in the past. The EWSD pilot study therefore incorporated a reliability and validity study conducted in the Czech Republic (Skarupova, 2017). Test-retest reliability was rated moderate to high for most items with sufficient sample sizes. In addition, cognitive interviews were conducted to test the comprehensibility of the questionnaire. The interviews, while finding that the questionnaire was generally well understood did highlight some questions that were difficult for people to answer. For example, we had included questions asking both the number of days in the past year people had used each drug and also a question that asked frequency of use but with banded categories, such as about once a week, etc. For drugs such as MDMA, which tend to be used sporadically at festivals or other events, the question with banded categories proved very difficult for respondents. Nevertheless, they would still give an answer, but it would be of poor quality. This shows the importance of question testing if possible as it cannot be taken for granted that questions will be understood as expected. In addition, questionnaire design needs to consider differences between drugs in how they are used.

Going forward in extending the EWSD, when considering changes to the questionnaire it will be important to consider both the potential impact on comparability between countries and over time and also, if we are making additions, the potential impact on survey response. It will also be useful to do similar studies in other countries to see if the reliability and validity of the questions varies between countries. The collaborative approach and phased implementation used by the EWSD has proved valuable in developing the methodology and sharing learning in order to improve the quality of the data generated.

In general, it appears from both comparisons with the 2012 study (Van Laar, Bommelé, Matias, & Singleton, 2017) and the findings of the test-retest reliability study in the Czech Republic that the reliability of our survey questions is good. However, it would be useful to do studies in some other countries to confirm and extend this.

Comparison with other data sources is another way of establishing the validity of the findings from web surveys. Comparison of the retail price data from each country in the EWSD compared to the routine price data submitted to the EMCDDA showed generally quite good agreement between the two data sources, despite the sources of variability in both sets of data. In particular, the lower prices for cocaine in Belgium and the Netherlands are also seen in the web survey. The marked differences between the two data sources in the UK and Lithuania may be a reflection of the small sample sizes on which the EWSD price data are based in these countries. This indicates that web surveys may be a potentially valuable new source of retail price data and in the case of the cocaine price data presented here was very

encouraging. There are likely to be potential biases in most data sources in the illicit drugs field so web surveys are valuable as an additional source for cross checking established data collections. However, it is important to bear in mind in any of these analyses, the particular sub-groups represented within these surveys and also how these may change from survey to survey. An important area for development will be to establish some core variables that can be used to identify the composition of the samples to help with comparisons between surveys of different types and at different times.

Conclusion

Web surveys offer the possibility of collecting information relatively quickly and cheaply from large numbers of people who use illicit drugs. They provide an opportunity to fill important gaps in our knowledge about how drugs are used, particularly by those considered to be recreational users. The importance of developing new data sources that are timely and adaptable to provide a better picture of substance use across Europe in an era of rapid change is increasingly recognised. The experience of the EWSD shows that web surveys can make a valuable contribution to this ‘better picture’, as a supplement to the monitoring tools currently in place in Europe. They allow data collection from large numbers of people who use drugs who are willing to provide honest information on drugs and (their) drug use.

The main added value of the EWSD was to develop and test a web survey tool to collect information on the amounts of drugs used by different groups of people in several European countries as well as information on purchases. This topic was chosen, as there is no routine data collection and only limited data are available.

The co-operative model adopted for the European Web Survey on Drugs has proved successful, with a central European institution co-ordinating the study and each participating country being responsible for the translation of the questionnaire and for developing adequate recruitment strategies. This facilitated alignment to local country-by-country contexts and needs, while maintaining considerable comparability. It also proved an efficient use of resources, for example sharing translations, materials and expertise. The deployment of a more streamlined and focused questionnaire based on a previous study (with an average time of 12 min for completion) led to larger samples of respondents who had used some of the less commonly used substances, about which information is particularly sparse in many routine monitoring sources.

The use of the same questionnaire and administration mode facilitates cross-national comparisons but the differing recruitment strategies may affect comparability. However, similar recruitment strategies, e.g. the use of Facebook ads, will reach varying groups in different countries anyway, due to differing patterns of social media use. Web surveys are clearly a valuable means of collecting some types of information but will always have limitations. As with other data sources, they can provide part of the picture and triangulation with other information will be important. In particular, those involved with web surveys must recognise that quantity alone does not necessarily equal quality and that, as with other surveys, attention needs to be given to the basics of questionnaire and survey design. It is important that methodological studies are undertaken both to better understand their limitations and to enhance their utility, something that we are trying to encourage in the development of the European Web Survey on Drugs. As is the case for all such surveys, the findings from the survey have to be considered alongside other data sources to provide insights into the validity of using the data for cross-national comparisons.

Cross-European collaborations and large international web surveys show considerable promise as a means of gathering data on drug use from people across Europe and globally. Making these data accessible to a wider audience and sharing the lessons learned from conducting them will be important to maximising their contribution and value to those engaged in developing and implementing drug policy.

Conflict of interest

Authors declare no conflict of interest.

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Ethical review

Ethical approval was requested by the participating countries, where needed. Only participants aged 18+ who provided informed consent could participate in the study. Anonymity and confidentiality were ensured for all participants.

Availability of data and materials

The dataset may be available upon agreement with the EMCDDA and the participating countries.

Author contribution

All authors were involved in the study design, data collection and wrote the paper.

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