



# MONITORING DRUG USE IN THE DIGITAL AGE: STUDIES IN WEB SURVEYS

## **Complexity and differentiation of the MDMA retail market: insights from the European Web Survey on Drugs**

Lies Gremeaux

Department of Epidemiology and Public Health, Sciensano, Brussels, Belgium

**Abstract:** In recent years the European MDMA market has been characterised by the increasing availability of high-strength products, resulting in a number of deaths. Most studies documenting the patterns and trends in use of this stimulant have grouped tablet ('ecstasy') and powder/crystal forms together into a single category, which could lead to an underestimation of MDMA use. This study uses data from nine countries covered in the European Web Survey on Drugs (EWSD) to study intensity of use and patterns of buying behaviours among MDMA users, with specific attention given to comparing the use of MDMA in tablet form and in the form of powder/crystals. The results indicate significant price differences across the countries and that the number of tablets and quantity of powder/crystals consumed on a typical occasion was higher for regular users than occasional users. Through this analysis, this paper shows how using web surveys for drug data collection can be an effective way to develop a better understanding of the use of particular forms of drugs. This is especially of high importance in the case of rapidly evolving drug market changes, such as the volatile nature of MDMA purity in Europe

### Introduction

Over the past decade there has been a gradual revival of the MDMA (3,4-methylenedioxy-methamphetamine) market in Europe (EMCDDA, 2018). In 2020, 2.6 million European adults had used MDMA in the last year, with the highest prevalence of last-year use found among young adults (1.9 % of individuals between the ages of 15 and 34; EMCDDA, 2021). The use of MDMA is typically associated with recreational settings and problematic use is uncommon (EMCDDA, 2016), although frequent MDMA use has been associated with increased dosage (Fox et al., 2001; Frijns and van Laar, 2013; Scholey et al., 2004). However, in recent years the MDMA market has been characterised by the increasing availability of high-purity products that present difficulties for individual dosing (Smith et al., 2009; van der Gouwe and Rigter, 2018; Winstock, 2017), resulting in a number of deaths (EMCDDA, 2019). While for some time tablets (known as 'ecstasy') have been assumed to be the predominant form of MDMA consumed in Europe (Frijns and van Laar, 2013), the use of MDMA in the form of crystals or powder is on the rise in some countries (Brunt et al., 2015; Giné et al., 2016; Winstock et al., 2019).

Despite the fact that MDMA powder and crystals have both been available on the European drug market since the beginning of the 1990s (Smith et al., 2009), most studies documenting the patterns and trends in use of this stimulant have grouped tablet and crystalline forms together into a single category. As such, data on the use of powders and crystals are limited. This omission is unfortunate since clear

differences between tablets and these two forms have arisen, both with regard to chemical composition and related health risks (Brunt et al., 2015; Giné et al., 2016; Palamar et al., 2016). Increasingly, users appear to be perceiving the extended assortment of MDMA products as different psychoactive substances, in form, in name (ecstasy and MDMA), and in terms of the risks involved and the quality of the product (Edland-Gryt et al., 2017; Mounteney et al., 2018). Among the most recent generation of MDMA users, there appears to be a lack of understanding when it comes to terminology, especially surrounding the terms 'ecstasy' and 'MDMA', despite these referring to the same psychoactive substance (EMCDDA, 2016; Palamar, 2017, 2018; Turner et al., 2014).

A better understanding of this differentiation in MDMA forms — both in terms of the products available and the people who use them — is required to identify any potential changes to public health messages and strategies that may be needed to reduce the health and social harms associated with MDMA use. As such, this paper focuses on exploring the characteristics of MDMA users in the European Web Survey on Drugs (EWSD), studying intensity of use and patterns of buying behaviours, with specific attention given to comparing the use of MDMA in tablet form (ecstasy) and in the form of powder/crystals.

## Methodology

Data were taken from the second wave (2017–2018) of the European Web Survey on Drugs (EWSD). In this analysis, only countries with sample sizes of at least 100 respondents to the MDMA module were included, namely Austria, Belgium, Estonia, Finland, Italy, Latvia, Lithuania, Luxembourg and Poland. The sample for the current study ( $N = 6\,465$ ) consists exclusively of last-year users who were over 18 years old and residents of the country of data collection. The EWSD allowed for data collection related to the form in which MDMA was consumed, as indicated by the respondents. Since the MDMA market varies considerably across the countries covered by the EWSD, caution is required when interpreting the variation between country samples. In addition, there are differences in the sampling methodology between EWSD countries, which may affect the composition of the final samples. For this reason, in the following sections, patterns in consumption and related buying behaviours will be presented based mainly on individual country samples.

Differences in buying practices were explored in terms of prices and purchase methods. Prices per quantity (euro per tablet and euro per gram for powder/crystals) were obtained by combining information regarding the price users reported paying per purchase and the usual amount of drugs (number of tablets or grams of powder/crystals) bought per purchase.

Characteristics of users and their consumption patterns were compared based on respondent data related to age, consumption of other substances in the past year <sup>(1)</sup> and frequency of MDMA use over the same period. In relation to the latter, two categories of user types were defined based on the frequency of use in the past year: occasional users, reporting MDMA use on fewer than 11 days in the last year (less than once a month) and regular users, reporting MDMA use on 11 days or more in the last year (almost once a month and above) <sup>(2)</sup>.

Analyses were carried out using SAS (version 9.3). Non-parametric tests (Mann-Whitney U and Kruskal-Wallis) were used for examining differences in continuous variables across groups.

## Results

### Characteristics of MDMA users in the EWSD sample

While the age range of the survey respondents who reported MDMA use was 18 to 71 years old, the vast majority of respondents were young adults (93 % in the age category 18–34 years old) and respondents over the age of 40 were much less common (2.3 %). The majority (78 %) of all respondents were occasional MDMA users. Across all countries, the proportion of respondents that used MDMA regularly (at least on 11 days or more in the last year) ranged from 13 % in Italy to 32 % in Austria.

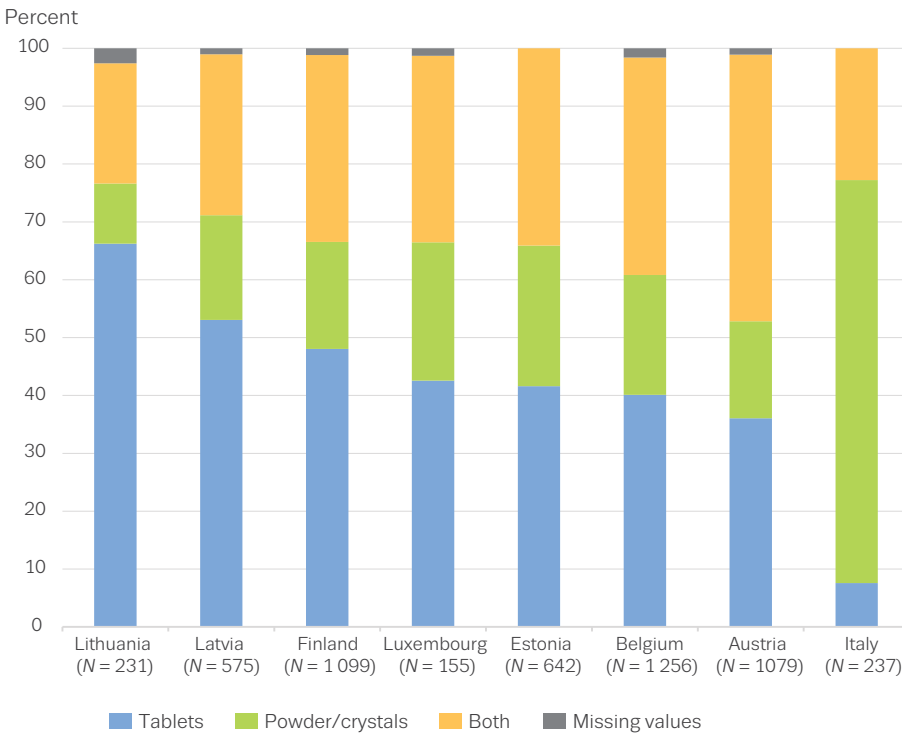
Furthermore, recent use (defined as use in the last year) of multiple substances was clearly the norm: just 1.4 % of the respondents indicated that they used only MDMA in the past 12 months, while about half (51 %) of the respondents reported the use of more than three different types of psychoactive substances (not including alcohol) in that period. Combinations of substances used during the past year were highly diverse within and across country samples, although cannabis was the most widespread (with last-year and last-month use at 93 % and 78 % respectively).

The total number of respondents who provided valid answers to the question about the forms of MDMA usually consumed was 6 396 (99 %). Respondents could indicate whether they habitually consumed MDMA in tablets, as powder/crystals or in both forms. The results by country are shown in Figure 1.

<sup>(1)</sup> This included cannabis, cocaine, crack, amphetamine, methamphetamine, heroin, LSD and other hallucinogens, GHB, ketamine, and new psychoactive substances; while alcohol was not included.

<sup>(2)</sup> The categorisation is based on the earlier research of Frijns and van Laar (2013); a further breakdown for comparison with heavy MDMA use (defined as weekly use) was not possible since country samples were not large enough to provide valid results.

FIGURE 1  
Sample and distribution of usual MDMA forms across countries



The proportion of respondents usually consuming powder/crystals was the lowest in Lithuania (10 %) and the highest in Italy (70 %).

A comparison of the subgroups using different forms of MDMA showed that people who usually only consume powder/crystals were on average slightly older (25 years old) than those who usually only consume tablets (23.5 years old) or those combining the two forms (23.9 years old). The age differences were small but statistically significant. At the country level, the age difference between powder/crystals users and tablet users was clear for most of the countries, with the exception of Belgium, Italy and Latvia. In addition, in Estonia, Finland, Italy, Latvia and Poland people that generally only consume powder/crystals reported significantly fewer types of substances used in the past year.

### Patterns of buying behaviour in the retail MDMA market

A total of 6 328 respondents (98 %) provided information with regard to their habitual methods for acquiring MDMA. The biggest group of respondents (46 %) indicated that they usually buy their MDMA. Notably, almost one in four (23 %) indicated that they had not bought MDMA themselves in the past year because it was free, shared or given. This proportion ranged from 15 % of respondents in Finland to 34 % in Latvia. Only 8.7 % of the total sample indicated that they usually (also)

make purchases via online sources, of which the majority (57 %) were Finnish respondents.

About 96 % of those that bought MDMA reported that they usually make a purchase of no more than 10 tablets or 10 grams or less when buying powder/crystals. In addition, about 98 % of the respondents reported that they did not make purchases of more than EUR 100 or EUR 200 per occasion for tablets and powder/crystal respectively, indicating that the sample mainly reflects information relating to the retail level of the drug market (Aldridge et al., 2016). Table 1 displays the average prices respondents reported paying for MDMA tablets and powder/crystals in their usual purchase by country. To prevent the averages being affected by exceptional deviating values, 5 % trimmed means were calculated.

The results indicate significant price differences across the study countries, with the lowest prices both for tablets and powder/crystals found among Belgian and Polish respondents, while the highest prices were reported by Finnish respondents. It should be underlined that accurate comparison between countries remains difficult and requires further research since prices are intertwined with multiple aspects such as purity, frequency of use and the social status of respondents, for which available information is currently limited.

TABLE 1

## Trimmed mean and median prices of MDMA tablets and powder/crystals of usual purchases by country

Country	MDMA tablets				MDMA powder/crystals			
	N	5 % trimmed mean (EUR/tablet)	CI 95 %	Median (EUR/tablet)	N	5 % trimmed mean (EUR/g)	CI 95 %	Median (EUR / g)
Austria	666	10.77	[10.25–11.29]	10.00	540	40.07	[37.88–42.25]	40.00
Belgium	705	5.22	[5.05–5.39]	5.00	471	26.70	[26.00–27.79]	30.00
Estonia	307	9.92	[9.53–10.31]	10.00	199	58.15	[53.86–62.45]	60.00
Finland	618	16.72	[16.34–17.09]	18.33	338	79.28	[75.03–83.53]	80.00
Italy	48	11.92	[10.34–13.49]	10.00	144	50.14	[45.23–55.05]	50.00
Latvia	251	8.97	[8.55–9.39]	10.00	115	28.58	[23.33–33.83]	20.00
Lithuania	141	7.53	[7.01–8.06]	8.00	41	52.37	[20.52–84.22]	20.00
Luxembourg	74	8.80	[8.00–9.60]	10.00	53	36.15	[37.88–42.25]	35.00
Poland	594	5.37	[5.17–5.55]	4.70	250	27.49	[25.41–29.56]	23.50

Abbreviation: CI 95 %, 95 % confidence interval.

## Intensity of MDMA use

To obtain information on the usual doses taken by people when using MDMA, the habitual number of tablets and/or amount of powder/crystals taken were asked for separately, and answers could include decimals to indicate the amounts in grams as well as the number of tablets. For respondents who indicated that they usually consume both forms, estimates for the number of tablets and grams were correlated ( $r = .27$ ,  $p < .001$ ), and therefore, it is assumed that most people reported equivalents of a total consumption at a certain occasion, regardless of form. To account for this, the responses of those that consume both forms were combined with those of the other subgroups for further calculations on the intensity of use.

In the total sample, the number of tablets used per occasion ranged from 0.15 to 12, with a median of 1 tablet. Only 9.1 % of the subgroup using tablets reported taking less than one tablet per occasion, while 79 % usually consumed 1 to 2 tablets. For the amount of powder/crystals used per occasion, the range was from 0.05 to 6 grams, with a median of 0.30 grams.

Previous studies have indicated that people who use drugs more frequently may also use larger quantities on each occasion. Therefore, further analysis looked at variation in usual amounts used by different subgroups based on frequency of use — categorised as occasional (fewer than 11 days of use in the last year) and regular users (11 or more days of use in the last year) (Table 2).

Overall, the number of tablets consumed on a typical occasion was higher for regular users than occasional users across all country samples. The number of tablets consumed by

regular users was at least 40 % higher than for occasional users. Furthermore, in most countries, the median values for occasional users were lower than the mean numbers, which indicates that the distribution of the numbers was skewed to the right, with a small proportion of occasional users indicating the use of relatively high numbers of tablets. Similarly, for users of powder/crystals, significantly higher amounts of grams used per occasion were reported by regular users in all countries (with the exception of Lithuania). However, for both frequency subtypes, it is again important to consider the potential of skewed numbers to lead to larger disparities between the frequency subtypes across countries. For example, a larger difference in consumption between occasional and regular users was found for Italy and Latvia, while the difference was smaller in other countries, such as Belgium and Poland.

## Discussion

Currently, most general population surveys in Europe do not consider differences in the use of the two forms of MDMA outlined in this paper (tablets and powder/crystals), which could lead to an underestimation of MDMA use (Palamar, 2017; Palamar et al., 2016). Unlike most general population surveys, the EWSD reached a large sample of MDMA users across several countries, which allowed for a further breakdown and study of specific patterns of use, which could again be broken down by the different forms of MDMA consumed. In addition to the existing prevalence data generated by general population surveys, this type of information is yet another important piece of the puzzle, which can help inform professionals in the drug domain on actual

TABLE 2

## Mean and median amounts of MDMA consumption on a usual occasion, by usual form, user frequency and by countries

Country	Amount of MDMA tablets used per occasion								
	Occasional users <sup>(a)</sup>				Regular users <sup>(b)</sup>				Mann-Whitney test
	N	Mean number of tablets per occasion	CI 95 %	Median number	N	Mean number of tablets per occasion	CI 95 %	Median number	
Total sample	3 683	1.43	[1.39–1.46]	1	1 154	1.98	[1.90–2.06]	2	**
Austria	553	1.21	[1.13–1.28]	1	287	1.89	[1.71–2.06]	1.5	**
Belgium	713	1.5	[1.42–1.58]	1	233	1.99	[1.77–2.21]	1.5	**
Estonia	368	1.58	[1.47–1.69]	1	103	2.12	[1.84–2.40]	2	**
Finland	676	1.49	[1.43–1.55]	1	167	2.04	[1.87–2.22]	2	**
Italy	50	1.11	[0.98–1.25]	1	16	1.63 <sup>(c)</sup>	[1.28–1.97]	2	**
Latvia	375	1.38	[1.27–1.49]	1	65	1.87	[1.51–2.23]	2	**
Lithuania	140	1.54	[1.33–1.76]	1	48	2.26	[1.77–2.74]	2	**
Luxembourg	91	1.28	[1.23–1.44]	1	16	1.63 <sup>(c)</sup>	[1.15–2.10]	2	n.s.
Poland	717	1.42	[1.36–1.48]	1	219	1.98	[1.83–2.13]	2	**

Country	Grams of MDMA powder/crystals used per occasion								
	Occasional users <sup>(a)</sup>				Regular users <sup>(b)</sup>				Mann-Whitney test
	N	Mean grams of powder/crystals per occasion	CI 95 %	Median number	N	Mean grams of powder/crystals per occasion	CI 95 %	Median number	
Total sample	2 118	0.68	[0.64–0.71]	0.4	765	0.9	[0.83–0.98]	0.5	*
Austria	354	0.49	[0.43–0.55]	0.3	214	0.71	[0.62–0.79]	0.5	*
Belgium	479	0.62	[0.56–0.68]	0.5	176	0.74	[0.63–0.85]	0.5	*
Estonia	235	0.6	[0.50–0.72]	0.3	75	1.24	[0.73–1.30]	0.5	*
Finland	367	0.76	[0.65–0.87]	0.3	93	1.21	[0.91–1.52]	0.5	*
Italy	167	0.55	[0.46–0.63]	0.4	29	1.12	[0.73–1.51]	1	*
Latvia	153	0.79	[0.63–0.96]	0.5	39	1.16	[0.74–1.58]	1	*
Lithuania	33	1.23	[0.77–1.71]	1	20	1.04	[0.42–1.66]	0.5	n.s.
Luxembourg	58	0.45	[0.34–0.57]	2	14	0.46 <sup>(c)</sup>	[0.28–0.65]	0.5	n.s.
Poland	272	0.96	[0.82–1.10]	0.5	105	1.11	[0.87–1.36]	0.7	n.s.

Mann-Whitney test: \*  $p < 0.05$ ; \*\*  $p < 0.01$ . Abbreviation: n.s., not significant; CI 95 %, 95 % confidence interval. <sup>(a)</sup> Occasional use is defined as fewer than 11 days of use in the past year. <sup>(b)</sup> Regular use is defined as 11 or more days of use in the past year. <sup>(c)</sup> Please note small sample size.

trends and developments, as well as the related health and social threats posed by substance use.

The results from the EWSD indicate that MDMA in powder or crystal form has become established in the European drug market. In particular, the large proportion of respondents in Italy who reported using powder/crystals hints at a high level of accessibility to this form of MDMA in that country. It may also be the case that MDMA users in Italy prefer to consume the substance in powder/crystal form rather than tablets, due to unknown factors, or that the EWSD recruited a larger number of powder/crystals users in that country - although this seems unlikely. Importantly, since the EWSD does not recruit people

who use drugs from a known sampling frame, it is not known how representative these results are in relation to the total number of people who use drugs in the study countries.

Considering MDMA's reputation of being a 'lifestyle drug' mainly linked to nightlife settings (Mounteney et al., 2018), it is not surprising that mainly young adults responded to the MDMA module. The average age of users differed only marginally between the two different forms of MDMA, with users of only powder/crystals being on average slightly older than those who consume only tablets or both forms of the substance. One could argue that the web-based nature of EWSD and the applied recruitment strategies (for example,

recruiting participants through social media advertising) are more suited to engaging a mainly younger audience of non-problematic users. However, the overall EWSD sample clearly shows enough diversity of respondents, as described by Matias (2022). Regardless of the form of MDMA used, the respondents proved to be mainly occasional users, but results also confirm earlier findings that MDMA use generally implies high rates of polysubstance consumption (Boeri et al., 2008). In terms of ‘poly-drug’ combinations, cannabis was by far the most common drug taken by the respondents.

Given that the purity of MDMA products in Europe has never been higher or more volatile (van der Gouwe et al., 2017; van der Gouwe and Rigter, 2018), examining the habits related to dosage is essential for assessing risk with regard to MDMA use. Across the countries, our results confirm higher intensity of use among regular users, in line with previous research that has discussed, among other factors, people’s potential temporary tolerance of MDMA when increasing frequency of use (Frijns and van Laar, 2013; Scholey et al., 2004; Sterk et al., 2006). It is striking that the average consumption of tablets (1 to 2 MDMA tablets per occasion) remains similar to the results of research from several decades ago when tablets contained much less MDMA (Frijns and van Laar, 2013; Topp et al., 1999). Therefore, present-day tablet users generally consume more of the psychoactive compound per occasion of use than users in the past did.

For powder/crystals users, the difference in the quantities consumed by occasional and regular users is much more variable than for tablets, with differences being very limited in some countries. Some research has noted that controlling the dosage of powder/crystals might be even harder than for tablets, due to alternative routes of administration such as sniffing or dabbing (Smith et al., 2009; Winstock, 2017). Overall, further research is needed that not only questions the way users judge their doses, but which also considers the quality (purity) of the substance consumed.

Although MDMA is reported to be in the top three online/cryptomarket purchases, and an increasing number of people seem to be ordering drugs through the internet (Winstock et al., 2019), only a minority of the respondents indicated that they usually make purchases online, with the majority of MDMA purchases being made through dealers. This result supports earlier findings that a large proportion of darknet purchases of MDMA might be mainly for resale (Aldridge and Décarry-Héту, 2016), while the EWSD data provides information on the retail level. Again, country-level differences are substantial, with exceptionally high rates of cryptomarket users in Finland, which corresponds to similar results provided in recent reporting of the Global Drug Survey and the EWSD (Winstock et al., 2019; see also the accompanying paper by Berndt and Seixas, 2022).

Collecting data from a large sample of people using retail drug markets opens up new opportunities for monitoring routine retail prices across Europe, which up until now has been hampered not only by a lack of data and differences in central estimates used for reporting, but also by the fact that heterogeneously applied data collection methods do not always exclude the possibility of inadvertently collecting data on other (non-retail) levels of the drug market. Based on responses to the EWSD, retail prices found for MDMA tablets were generally similar to those found in statistics provided by routine monitoring data sources during the same period (EMCDDA, 2019). In addition, the EWSD data also provided clear estimates for retail prices of MDMA powder/crystals, which have not been systematically reported before. Price estimates are bound to be imperfect (Caulkins, 2007) but can nevertheless be complementary to the existing sources of information. These kinds of data are valuable for trendspotting since price affects use. Price is thus a determinant of accessibility for certain user populations and can influence change in substance use behaviours (Peters and Kok, 2009). For instance, despite the fact that the motives behind people’s preferences regarding the consumption of different forms of MDMA were not asked for in the EWSD, the high retail price observed for powder/crystals and large cross-country price differences might support the argument that younger — and presumably less financially stable — users may opt for the tablet form of MDMA (which according to the analysed data is cheaper and more consistent in price across the countries studied). This, however, does not account for the different levels of purity found in tablets vis-à-vis powder/crystals, and, as such, the purity-adjusted price for MDMA powder/crystals may actually turn out to be less than that for tablets. Thus, one MDMA tablet cannot be directly compared with a gram of MDMA powder/crystals in terms of use and price. Overall, studying the different purity levels of these different forms of MDMA is an important area for future research.

## References

- Aldridge, J. and Décarry-Héту, D. (2016), ‘Hidden wholesale: the drug diffusing capacity of online drug cryptomarkets’, *International Journal of Drug Policy* 35, pp. 7–15.
- Berndt, N. and Seixas, R. (2022), ‘Running the European Web Survey on Drugs in a small country: results and challenges’, *Monitoring drug use in the digital age: studies in web surveys*, EMCDDA Insights ([https://www.emcdda.europa.eu/publications/european-web-survey-drugs-small-country-results-challenges\\_en](https://www.emcdda.europa.eu/publications/european-web-survey-drugs-small-country-results-challenges_en)).
- Boeri, M. W., Sterk, C. E., Bahora, M. and Elifson, K. W. (2008), ‘Poly-drug use among ecstasy users: separate, synergistic,



- and indiscriminate patterns', *Journal of Drug Issues* 38(2), pp. 517–541.
- Brunt, T. M., Nagy, C., Bücheli, A., Martins, D., Ugarte, M., Beduwe, C. and Venture Vilamala, M. (2015), 'Drug testing in Europe: monitoring results of the Trans European Drug Information (TEDI) project', *Drug Testing and Analysis*, doi:10.1102/dta.1954.
- Caulkins, J. (2007), 'Price and purity analysis for illicit drugs: data and conceptual issues', *Drugs and Alcohol Dependence* 90, pp. S61–68.
- Edland-Gruyt, M., Sandberg, S. and Pedersen, W. (2017), 'From ecstasy to MDMA: recreational drugs use, symbolic boundaries and drug trends', *International Journal of Drug Policy* 50, pp. 1–8.
- EMCDDA (2016), *Recent changes in Europe's MDMA/ecstasy market*, Rapid Communication, Publications Office of the European Union, Luxembourg.
- EMCDDA (2018), *European drug report 2018: trends and developments*, Publications Office of the European Union, Luxembourg.
- EMCDDA (2019), *European drug report 2019: trends and developments*, Publications Office of the European Union, Luxembourg.
- EMDCCA (2021), *European drug report 2021: trends and developments*, Publications Office of the European Union, Luxembourg.
- Fox, H. C., Parrott, A. C. and Turner, J. J. (2001), 'Ecstasy use: cognitive deficits related to dosage rather than self-reported problematic use of the drug', *Journal of Psychopharmacology* 15, pp. 273–281.
- Frijns, T. and van Laar, M. (2013), 'Amphetamine, ecstasy and cocaine: typology of users, availability and consumption estimates', in Trautmann, F., Kilmer, B. and Turnbull, P., *Further insights into aspects of the EU illicit drugs market*, Publications Office of the European Union, Luxembourg.
- Giné, C. V., Ventura Vilamala, M., Espinosa, I., Lladanosa, C. G., Alvarez, N. C., Fruitós, A. F., Rodriguez, J. R., Salvany, A. D. and de la Torre Fornell, R. (2016), 'Crystals and tablets in the Spanish ecstasy market 2000–2014: are they the same or different in terms of purity and adulteration?', *Forensic Science International* 263 pp. 164–168.
- Matias, J. (2022), 'European Web Survey on Drugs: An overview of the project', *Monitoring drug use in the digital age: studies in web surveys*, EMCDDA Insights ([https://www.emcdda.europa.eu/publications/european-web-survey-drugs-overview-project\\_en](https://www.emcdda.europa.eu/publications/european-web-survey-drugs-overview-project_en)).
- Monteney, J., Griffiths, P. N., Bo, A., Cunningham, A., Matias J. and Pirona, A. (2018), 'Nine reasons why ecstasy is not quite what it used to be', *International Journal of Drug Policy* 51 pp. 36–41.
- Palamar, J. (2017), 'There's something about Molly: the under-researched yet popular powder form of ecstasy in the United States', *Substance Abuse* 38(1), pp. 15–17.
- Palamar, J. (2018), 'What's in a name? Correlates of ecstasy users knowing or agreeing that Molly is ecstasy/MDMA', *Journal of Psychoactive Drugs* 50(1), pp. 88–93.
- Palamar, J. J., Keyes, K. and Cleland, C. M. (2016), 'Underreporting of ecstasy use among high school seniors in the US', *Drug and Alcohol Dependence* 165, pp. 279–282.
- Peters, G. J. and Kok, G. (2009), 'A structured review of reasons for ecstasy use and related behaviours: pointers for future research', *BMC Public Health*, doi:10.1186/1471-2458-9-230.
- Scholey, A. B., Parrott, A. C., Buchanan, T., Heffernan, T. M., Lingd, J. and Rodgers, J. (2004), 'Increased intensity of ecstasy and polydrug usage in the more experienced recreational ecstasy/MDMA users', *Addictive Behaviors* 29 (2004) 743–752.
- Smith, Z., Moore, K. and Measham, F. (2009), 'MDMA powder, pills and crystal: the persistence of ecstasy and the poverty of policy', *Drugs and Alcohol Today* 9(1), pp. 13–19.
- Sterk, C., Theall, K. and Elifson K. (2006), 'Young adult ecstasy use patterns: quantities and combinations', *Journal of Drug Issues* 36(1) pp. 201–228.
- Topp, L., Hando, J., Dillon, P., Roche, A. and Solowij, N. (1999), 'Ecstasy use in Australia: patterns of use and associated harm', *Drug and Alcohol Dependence* 55, pp. 105–111.
- Turner, A., Moore, C., Guatam, L. and Cole, M. (2014), 'Investigating the terminology used to describe Ecstasy', *Drugs and Alcohol Today* 14(4), pp. 235–244.
- van der Gouwe, D. and Rigter, S. (2018), *DIMS annual report 2017*, Trimboos-instituut, Utrecht.
- van der Gouwe, D., Brunt, T. M., van Laar, M. and van der Pol, P. (2017), 'Purity, adulteration and price of drugs bought on-line versus off-line in the Netherlands', *Addiction* 112(4), pp. 640–648.

Winstock, A. R. (2017), 'MDMA: how you take it might be more important than you think', Posted 23 May, Global Drug Survey, London, <https://www.globaldrugsurvey.com/mdma-how-you-take-it-might-be-more-important-that-you-think/>.

Winstock, A. R., Barratt, M. J., Maier, L. J., Aldridge, A., Zhuparris, A., Davies, E., Hughes, C. et al. (2019), *Global Drug Survey (GDS) 2019 key findings report*, Global Drug Survey, London, [https://issuu.com/globaldrugsurvey/docs/gds2019\\_key\\_findings\\_report\\_may\\_16\\_](https://issuu.com/globaldrugsurvey/docs/gds2019_key_findings_report_may_16_).



## About the EMCDDA

The European Monitoring Centre for Drugs and Drug Addiction (EMCDDA) is the central source and confirmed authority on drug-related issues in Europe. For over 25 years, it has been collecting, analysing and disseminating scientifically sound information on drugs and drug addiction and their consequences, providing its audiences with an evidence-based picture of the drug phenomenon at European level. Based in Lisbon, the EMCDDA is one of the decentralised agencies of the European Union.

## About this series

EMCDDA Insights are topic-based reports that bring together current research and study findings on a particular issue in the drugs field. This paper is published as part of *Monitoring Drug Use in the Digital Age: Studies in Web Surveys*, an EMCDDA Insights that provides an overview of current knowledge and the latest developments in the field of web surveys on drug topics. The Insights contains in-depth reports on the methodology of web surveys, the available studies being carried out in different drug topics and analyses of the [European Web Survey on Drugs](#). The Insights will be of interest to researchers and scientists, people who use drugs, policymakers and their advisors, specialists and practitioners, and all those concerned with the issue of drugs and innovative methods.

**EMCDDA project group:** João Matias, Alexander Soderholm, Katerina Skarupova, André Noor and Jane Mounteney.

**Recommended citation:** Gremeaux, L. (2022), 'Complexity and differentiation of the MDMA retail market: insights from the European Web Survey on Drugs', in *Monitoring drug use in the digital age: Studies in web surveys*, EMCDDA Insights ([https://www.emcdda.europa.eu/publications/insights/web-surveys/complexity-differentiation-mdma-retail-market-insights-european-web-survey-drugs\\_en](https://www.emcdda.europa.eu/publications/insights/web-surveys/complexity-differentiation-mdma-retail-market-insights-european-web-survey-drugs_en)).

---

**Legal notice:** Neither the EMCDDA nor any person acting on behalf of the EMCDDA is responsible for the use that might be made of the following information.

Luxembourg: Publications Office of the European Union

PDF ISBN 978-92-9497-803-5 ISSN 2314-9264 doi:10.2810/789306 TD-XD-22-007-EN-N

© European Monitoring Centre for Drugs and Drug Addiction, 2022  
Reproduction is authorised provided the source is acknowledged.

This publication is only available in electronic format.

EMCDDA, Praça Europa 1, Cais do Sodré, 1249-289 Lisbon, Portugal  
Tel. (351) 211 21 02 00 | [info@emcdda.europa.eu](mailto:info@emcdda.europa.eu)  
[emcdda.europa.eu](http://emcdda.europa.eu) | [twitter.com/emcdda](https://twitter.com/emcdda) | [facebook.com/emcdda](https://facebook.com/emcdda)