



European Monitoring Centre
for Drugs and Drug Addiction

RAPID COMMUNICATION

Recent changes in Europe's cocaine market

Results from an EMCDDA trendspotter study
December 2018





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Study rationale and methods

In recent years, signals from both formal and informal monitoring sources based in a number of European countries have been indicating increased cocaine production and availability: the opening of new online markets, reports of increased use, use of new technologies (cryptomarkets, social media and encrypted messaging platforms), and rising numbers of cocaine-related hospital admissions, and even deaths, in some countries.

To investigate these changes and developments in the supply and demand of one of Europe's more established illicit drugs, a targeted 'trendspotter' study was initiated by the European Monitoring Centre for Drugs and Drug Addiction (EMCDDA) and carried out between March and June 2018. The primary aim of the study was to increase understanding of recent changes in the cocaine market in Europe. More specifically, it set out to explore levels of and patterns in powder cocaine and crack cocaine use; the market, including production, supply and product availability; drug-related harms and deaths; and the implications for law enforcement, health and social responses, and monitoring.

The study commenced with a phase of data collection and a literature review undertaken by a team drawn from various sectors within the EMCDDA, and culminated in an expert meeting in Lisbon on 21-22 June 2018. Fourteen experts attended the meeting, sharing their experiences and contributing to an in-depth analysis of the topic, providing insights from drug research and monitoring, wastewater analysis, law enforcement, and health perspectives.

The trendspotter study methodology incorporates a range of investigative approaches and data collection from multiple sources (EMCDDA, 2018d). This study included two web surveys among experts on the topic; a review of the international literature and available monitoring data; and, as part of the expert meeting, 14 expert presentations and findings from three facilitated working groups. The analysis was based on triangulation of these information sources, with a view to providing as complete and verified a picture as possible. The combination of routine and survey data with key informant reports and law enforcement intelligence provided a rich and in-depth view of a rapidly changing phenomenon. This report summarises the study findings and conclusions. Where results are literature-based, references are cited; otherwise, findings are based on EMCDDA monitoring and the qualitative sources described above. In this report, the

term 'cocaine' refers to cocaine products in general (salt and base forms). Where it is possible to distinguish between the different products, the term 'powder cocaine' is used to refer to the hydrochloride salt form and the term 'crack cocaine' (or simply 'crack' or 'freebase') is used to refer to the base form.

Cocaine: a range of products

Cocaine is most commonly used in its hydrochloride salt form. Cocaine hydrochloride salt is generally prepared by extracting the crude coca paste from the coca leaf; this paste is then purified to the base form, which is then converted into a hydrochloride salt using hydrochloric acid (Casale and Klein, 1993). Cocaine hydrochloride usually appears as a white crystalline powder. This form of cocaine is generally snorted (intranasal route) but can also be dissolved in water and injected. The hydrochloride salt is not smokable, as it is destroyed at high temperatures, resulting in negligible to no psychoactive effects. Street names for cocaine hydrochloride include (but are not limited to) coke, blow, snow, flake, white, powder, dust, C and Charlie. The combination of cocaine hydrochloride and heroin, generally injected, is often referred to as a 'speedball'.

Crack cocaine is obtained by dissolving cocaine hydrochloride in water; this solution is then made alkaline using ammonia or sodium bicarbonate. This mixture is then heated, producing a solid residue (Perrine, 1996). While practically insoluble in water, crack cocaine is smokable and vaporises at a temperature of 90 °C, much lower than the hydrochloride salt's melting point of 190 °C. Crack cocaine can also be injected if a weak acid such as lemon juice is added to it to increase its solubility (Waninger et al., 2008). Examples of street names include base, rock(s), crack, moonrock, snow coke, gravel, etc. Smoking the mixture produces a crackling sound, which is the origin of the term 'crack'.

The speed of onset of the effects of cocaine varies depending on the route of administration. The inhalation of vapours (crack only) achieves the fastest onset of effects, after approximately 3-5 seconds, followed by the intravenous and intranasal routes. The duration of effects is reported as approximately 5-15 minutes for inhalation of vapours, 20-60 minutes for the intravenous route and 60-90 minutes for the intranasal route (Goldstein et al., 2009).

Cocaine markets: production and supply

Global market context

The quantity of cocaine seized worldwide in 2016 reached 1 129 tonnes, a 23 % increase on the previous year and the highest level ever reported (UNODC, 2018). The main consumer markets for cocaine are North America and western and central Europe. North America (the United States and Canada) remains the world's largest cocaine market, where more than one third (34 %) of all cocaine users reside. In 2016, the United States was the main destination country for cocaine shipments intercepted in South America, the primary cocaine-producing region in the world. Between 2013 and 2016, the quantity of cocaine seized in the United States rose by more than 40 %, and the annual prevalence of cocaine use among the general population in the United States increased during the same period (SAMHSA, 2017). The number of cocaine-related deaths in the United States more than doubled between 2013 and 2016, with the latest figures reporting more than 10 000 deaths, often related to cocaine used in combination with synthetic opioids.

Europe is the second largest market for cocaine, with an estimated retail market with an annual value worth a minimum of EUR 5.7 billion (EMCDDA, 2018b). However, findings from the recent *World Drug Report* (UNODC, 2018) reveal that most increases in the quantities of cocaine seized in 2016 took place outside these two main cocaine destination markets, confirming the ongoing spread of cocaine trafficking to emerging markets, which contributes to the proliferation of trafficking routes across the globe. Although relatively small compared with the amounts seized in North America and Europe, the quantity of cocaine seized in Asia tripled between 2015 and 2016, especially in south Asia, which saw a 10-fold increase. The quantity of cocaine seized in the Near and Middle East/south-west Asia doubled in 2016 compared with the previous year.

In South America, Central America and the Caribbean, the available data suggest that less than 1 % of the adult population had used cocaine in any form (except by chewing coca leaves) during the past 12 months (UNODC, 2017). A recent trendspotter study covering 32 countries in these three regions revealed that in 18 countries a recent increase in the market availability of cocaine (powder and/or base) had been noted, while less than half of the countries involved in the study reported a recent change in powder cocaine use, and the available data suggest a possible downward trend in powder cocaine use in South America (EMCDDA and COPOLAD, 2018).

Trends in coca cultivation and cocaine production

Recent surges in cocaine availability across global drug markets reflect the significant developments in global cocaine manufacture, with recent data indicating record levels of production. In 2016, global coca bush cultivation was estimated to have increased for the third consecutive year, to reach 213 000 ha (UNODC, 2018), its highest level since a peak of 221 300 ha in 2000 (UNODC, 2004). This represents an increase of 36 % on 2015 and of 76 % on 2013, when global coca cultivation was at its lowest level since 1990. The 2016 increase in the global coca acreage was due to increases in each of the three Andean producer countries (Bolivia, Colombia and Peru), albeit of different magnitudes, with the largest increase taking place in Colombia. Coca cultivation increased by an estimated 14 % in Bolivia (to 23 100 ha) and 9 % in Peru (to 43 900 ha) between 2015 and 2016. More significantly, the coca acreage in Colombia increased by 52 %, from 96 000 ha in 2015 to 146 000 ha in 2016. As a result, Colombia accounted for 68 % of estimated global coca cultivation in 2016, Peru for 21 % and Bolivia for about 11 % (UNODC, 2018).

Multiple factors explain the increases in coca production in these countries. In the case of Colombia, the main explanations appear to be the negotiations for a peace agreement with the Revolutionary Armed Forces of Colombia (FARC), the suspension of eradication by means of aerial spraying of herbicides on coca crops and a reduction in alternative development programmes (UNODC, 2018). The increase in coca cultivation has resulted in an increase in total cocaine production, which may have reached 1 410 tonnes in 2016, an all-time high. Again, Colombia is estimated to be the largest cocaine producer and the country where the largest increase in production has taken place, resulting in an estimated 866 tonnes of cocaine being produced in 2016 (3 times more than in 2013 and 34 % more than in 2015). Cocaine production has also increased in Bolivia and Peru, but not as dramatically as in Colombia (UNODC, 2018).

However, larger harvests of coca leaves are probably not the only explanation for the dramatic increase in estimated global cocaine production. There is also some evidence of increased sophistication in cocaine manufacturing methods, resulting, for instance, in streamlined hydrochloride production processes using limited amounts of chemicals, and the recycling of chemicals for use in multiple production runs. Another trend observed recently, which is probably linked to the latter, is the processing of larger batches of base cocaine into powder cocaine, when previously this was done one kilogram at a time (Mallette et al., 2018).

Finally, there is some limited information available suggesting that the last stage of the cocaine production process, namely converting base to hydrochloride, may be being carried out in Europe. This may mean that cocaine is being exported to Europe in base form, but evidence documenting this is lacking. Alternatively, the base-to-hydrochloride laboratories detected in Europe may be associated with the practice of importing cocaine hidden in carrier materials such as plastic. The cocaine in such cases is often retrieved in the form of base in secondary extraction facilities and then needs to be transformed into hydrochloride before being sold. Although it is known that using carrier materials to hide cocaine for importation into Europe is one of the methods used by traffickers, it seems that few secondary extraction laboratories have been dismantled in Europe, with only five countries reporting ten facilities since 2014 via the ad hoc European Reporting on Illicit Cocaine Extraction-Conversion Sites tool jointly developed by the EMCDDA and Europol. It is also possible, however, that more secondary extraction facilities have been found but have remained unreported.

Trafficking to Europe

Around 98 000 seizures of cocaine were reported in the European Union in 2016, amounting to 70.9 tonnes. Compared with the previous year, there was a small increase in the quantity of cocaine seized in 2016, and a more marked increase in the number of seizures. Although the increase was small in terms of the overall quantity of cocaine seized, significant increases were reported in countries in south-eastern and Baltic regions of the European Union. Between 2014 and 2016, Romania reported a 70-fold increase in the quantity of cocaine seized (2.3 tonnes in 2016), Poland reported a 15-fold increase (0.4 tonnes in 2016), Bulgaria, Cyprus, Latvia and Malta reported a four- to five-fold increase, and Turkey reported a more than two-fold increase in the amount seized during this period.

Western EU countries remain, however, the primary destination countries for wholesale cocaine trafficking. With seizures of around 30 tonnes of cocaine, or 43 % of the estimated EU total in 2016, Belgium displaced Spain (15.6 tonnes) as the country reporting the highest annual seizures of the drug. More recently, France reported 17.5 tonnes of cocaine seized in 2017.

Regarding the record seizures in Belgium, more recent data are available from the Port of Antwerp: 41 tonnes were seized in 2017, and by the end of the first half of 2018 cocaine seizures at the port had already exceeded 21 tonnes. Information on seizures outside the European

Union show that, on top of these record numbers, 36 tonnes of cocaine in consignments having Antwerp as their final destination were intercepted in transit ports in Latin America in 2016. The following year, this figure rose to 45 tonnes, and 16 tonnes were seized during the first half of 2018. There are multiple reasons why the Port of Antwerp is used by organised crime groups for cocaine importation in Europe: it is physically a very open harbour area and is located within the city of Antwerp, facilitating rapid dispatch goods. The proximity of the Netherlands, which is known to be a central hub for organised crime groups involved in drug supply, is also a contributing factor. Antwerp is also one of the largest fruit handlers in Europe, with direct cargo lines scheduled weekly from Colombia, Ecuador, Guatemala and Panama. However, Antwerp is not the only port showing increased levels of cocaine importation into Europe. The container ports of Algeciras in Spain, Le Havre in France and Hamburg in Germany have all recorded large bulk seizures of cocaine.

Organised crime groups involved in the supply of cocaine

The increased influx of cocaine into Europe appears to have been facilitated by the involvement of a greater number of organised crime groups (OCGs). While the established Italian OCGs (the 'Ndrangheta and the Camorra) still hold a firm position in the international cocaine trafficking business, new players have emerged in recent years. The Italian OCGs were already known to have established their own trafficking connections directly in source countries in South America (McDermott, 2018). However, other established or emerging European OCGs that previously acquired their cocaine from the Italian OCGs have recently set up their own trafficking lines. They now procure cocaine for their national markets directly from source countries, which affects wholesale cocaine prices by removing an intermediate actor. Europol intelligence suggests that some British, Dutch, Irish, Italian and Spanish crime groups have developed into important brokers in the cocaine trade in this way.

Another important development is the increasing use of national overseas territories as transit points in order to benefit from their inclusion in the European single market and European customs territory and their geographical location close to source countries such as Colombia and Venezuela. For example, French OCGs make increasing use of connections through French Guiana and the French Antilles to smuggle bulk loads back to mainland France. Intelligence also suggests that Surinamese OCGs increasingly make use of a 'French' route via Cayenne and Orly airport in Paris to traffic cocaine into Europe, in order

to avoid more closely monitored routes between the capital of Suriname, Paramaribo, and the Dutch airport of Schiphol. Between 2016 and 2017, the number of drug couriers arrested at Orly airport in Paris increased from 144 to 264. However, it is believed that between 3 500 and 4 000 drug couriers manage to pass undetected yearly, carrying about 3-4 tonnes of cocaine into France. These drug couriers are mainly women, nationals from the poorest areas in overseas national territories and recruited on the basis of payments of between EUR 5 000 and EUR 6 000 per kilogram of cocaine they smuggle into Europe.

In addition, members of the so-called Balkan cartel have become more visible in South America in recent years. The Balkan OCGs have developed into modern and dynamic criminal networks and are held responsible for the transportation, financing and distribution of large amounts of cocaine shipped from South America into Europe. Their ability to access cocaine close to or directly from the source, combined with their presence in major European ports, results in their ability to control the end-to-end supply of cocaine. Similarly, Moroccan OCGs are now in the process of becoming an important player in the cocaine trade (Colman, 2018). They are known to be present mostly in the Netherlands and Belgium but also in France and Spain, as these OCGs make use of their established cannabis resin trafficking routes between western Europe and their country of origin. Finally, a significant presence of Colombian OCGs in Spain has been reported, as has close cooperation between Colombian OCGs and Spanish OCGs. Colombians in Europe are presumably performing a supervisory role in the cocaine trade between their country of origin and European markets, but they may also be exporting their expertise in processing cocaine products in secondary extraction laboratories to mainland Europe.

The fragmentation of the cocaine trade in Europe appears to have resulted in increased competition among OCGs for national and cross-border territories in cocaine supply and retail. One of the consequences has been an increase in violence and drug-related homicides in a number of European countries, such as, Belgium, Italy, the Netherlands and the United Kingdom. Recent media reports have highlighted an escalation in the number of homicides and kidnappings among criminal groups linked to the cocaine trade in these countries.

| The cocaine trade in online drug markets

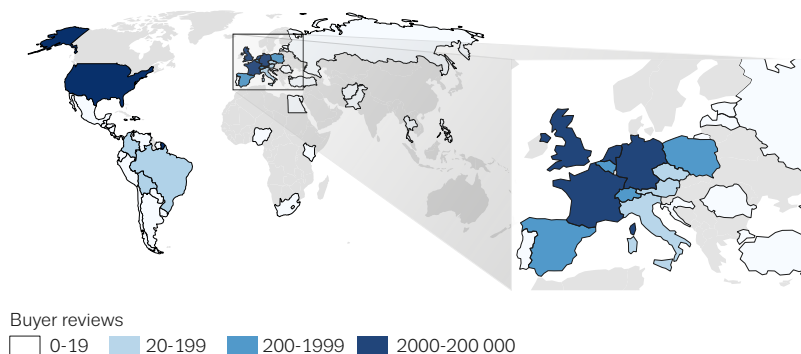
Another potential form of fragmentation of the market can be seen in the use of new and more sophisticated

technologies that allow an increasing number of actors to operate within more horizontal networks to deliver low-volume direct-to-consumer cocaine sales via the darknet and encrypted communication applications. Although the extent to which they are replacing traditional retail supply is not yet clear, these new sales methods have the potential to considerably alter the nature of the cocaine trade.

Cocaine is among the drugs that generate the highest revenues for dealers operating in online and anonymised darknet markets. These cryptomarkets exist on the deep web, an area of the internet that has been intentionally hidden and is inaccessible through standard web browsers. A recent study revealed that on the AlphaBay marketplace, one of the leading cryptomarkets until it was taken down in 2017 (EMCDDA and Europol, 2017), cocaine was the drug that generated the third largest sales volume between 2015 and 2017 and also the third highest revenue, with total sales estimated at EUR 5.81 million in the United Kingdom, EUR 2.65 million in the Netherlands and EUR 1.55 million in Germany. Most cocaine-related transactions on AlphaBay occurred at the retail level, with 71 354 transactions made during that same period, which accounted for the greatest proportion of all revenue (more than EUR 8 million) (Christin, 2017). Cocaine remains one of the most expensive commonly used drugs sold in European cryptomarkets, with prices per gram varying according to their geographical location and ranging from EUR 72 in Sweden, to EUR 85 in Italy and EUR 145 in Finland (Janetos and Tilly, 2017). While these prices appear to be higher than retail prices for cocaine at street level, the attraction of cryptomarkets includes both a sense of security in terms of evading law enforcement and also a perceived higher level of quality assurance through the rating systems applied to drug transactions with particular vendors; for these, buyers are prepared to pay a premium.

A recent study compared the darknet trading geography of cannabis, opioids and cocaine across four of the largest cryptomarkets with the global prevalence levels of use of those drugs (Dittus et al., 2018). The results showed that cocaine vendors were primarily located in a small number of highly active consumer countries, mostly in the United States and Europe, rather than in producer countries (Figure 1). This reinforces the findings on transaction size on AlphaBay described above, indicating that darknet vendors primarily inhabit the role of local retailers rather than removing or replacing higher levels of the supply chain. Darknet vendors probably still rely on some of the same producers and traffickers involved in the conventional cocaine trade. However, it appears that cryptomarkets reconfigure the 'last mile' of the cocaine supply chain and provide a novel form of retail distribution in certain consumer countries (see, for example, Demant et al., 2018).

FIGURE 1
Countries of origin of cocaine vendors on the darknet and number of trades based on buyer reviews



Source: adapted from Dittus et al. (2018) (<https://arxiv.org/pdf/1712.10068.pdf>). Copyright 2018 IW3C2 (International World Wide Web Conference Committee), published under Creative Commons CC BY 4.0 License.

New methods in the supply of cocaine to consumers

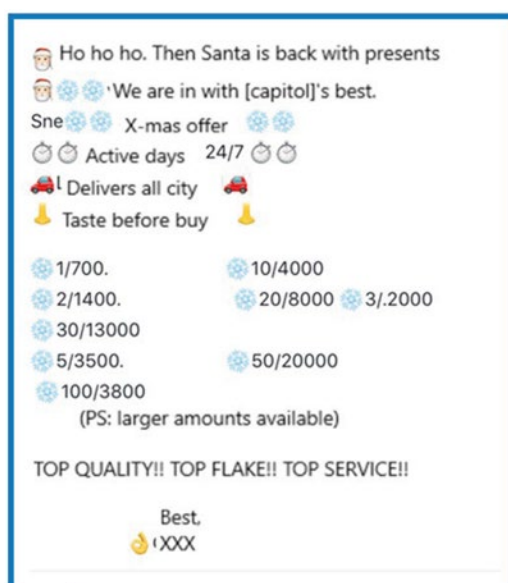
Innovative methods of supplying cocaine to consumers have emerged across Europe. It is reported that call centres are operating that are dedicated to distributing cocaine via couriers in some parts of Belgium (De Ruyver et al., 2018). The call centres themselves, however, are physically located in western Balkan countries and Spain. Belgian consumers order a consignment via a central telephone number and then couriers operating in the national territory from which the order was made deliver the order rapidly to the location specified. These couriers appear to be very difficult to investigate or map, as there is a high turnover of undocumented couriers travelling to Belgium for a short period then returning, for example, to Albania. Reports show that, during these short periods, a courier can sell up to 1 kg of cocaine per week on average. A similar phenomenon has been reported in the greater Paris area, where home deliveries of cocaine are organised through similar call centres (Cadet-Tairou et al., 2017). In the United Kingdom, 'county lines' crime relates to the supply of drugs, primarily crack cocaine and heroin, from cities to market towns, coastal areas and rural locations couriered by young people; drugs are ordered using a branded mobile phone line. The most recent assessment of county lines crime in the United Kingdom suggests that there were more than 1 000 lines in operation, with links to increasing levels of serious violence. Communication among vendors, 'runners', or couriers, and buyers is facilitated by the use of semi-private encrypted communication applications such as WhatsApp and Telegram, which makes it difficult for law enforcement to monitor such communication. Open public social media applications such as Instagram, Twitter and Facebook are used to promote time-limited offers to a wider, not targeted public. Emojis (e.g. snowflakes for

powder cocaine), synonyms like 'snow', and videos and pictures of cocaine are used to promote and convey information about special trade offers (Figure 2). Research projects and media releases show that such public social media platforms and semi-private encrypted communication tools are commonly used across Europe for mid-level and retail cocaine trafficking, with reports of their use coming from the United Kingdom, Denmark, Finland, Germany, Italy, Norway, Spain and Sweden.

Purity increases and stable prices

Overall, indexed trends suggest an increase in cocaine purity between 2010 and 2016, with cocaine purity in

FIGURE 2
Facebook post openly advertising powder cocaine sale



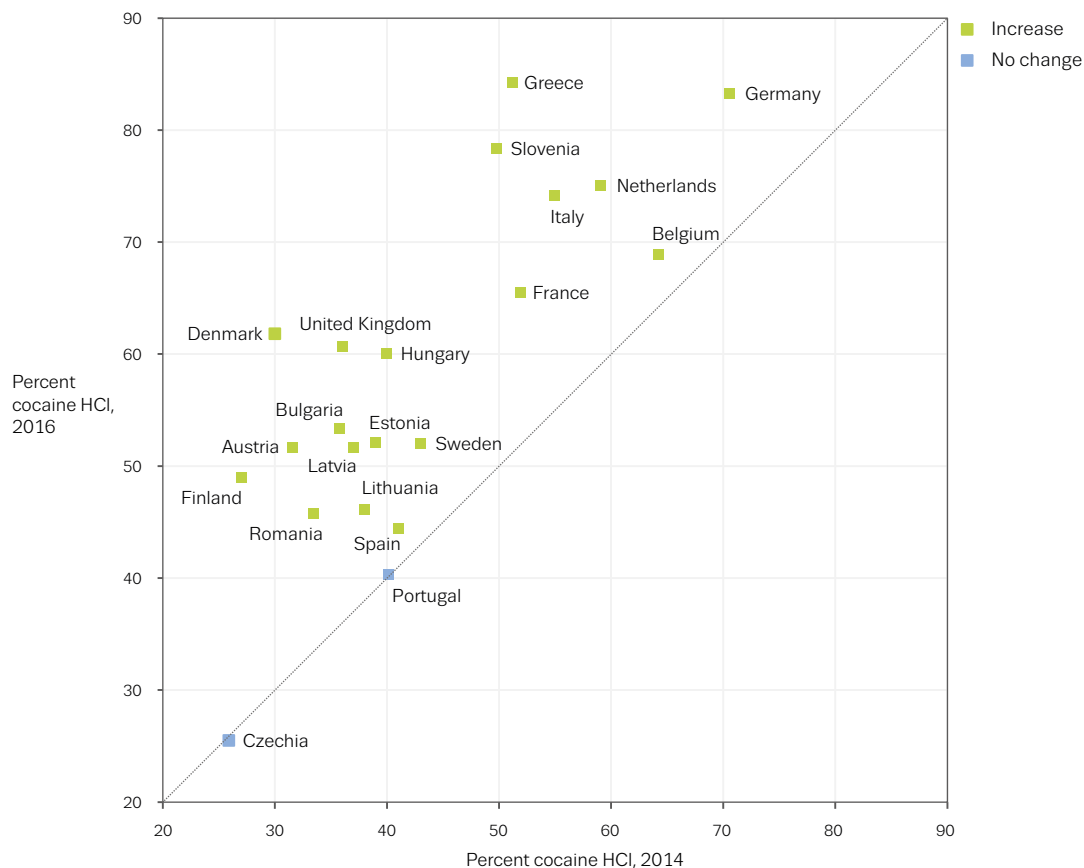
Europe at the highest level seen in the past decade (EMCDDA, 2018b). When analysing cocaine purity trends between 2014 and 2016, increases can be seen in all the countries where data are available for both years, except Czechia and Portugal (Figure 3). Two clusters of countries emerge when looking at the changes in purity levels: one cluster is composed of countries where increases occurred in national average purity levels that were already above EU average levels back in 2014, and the other cluster of countries is made up those where increases occurred in national markets with relatively average purity levels (between 30 % and 50 % in 2014). In both clusters, some countries showed particularly marked increases compared with the baseline year, such as Greece, France and Slovenia in the first cluster of countries, and Denmark, the United Kingdom and Hungary in the second cluster of countries. It is also worth noting the increases in east European countries such as Latvia, Bulgaria, Lithuania and Romania, although average purity levels did not reach those observed in many major western European countries. The reported retail price of cocaine varies considerably among countries in Europe, ranging from EUR 44 (Portugal) to EUR 104 (Bulgaria) per gram, with an

interquartile range of EUR 51-73 in 2016 (or the most recent year for which data are available) (EMCDDA, 2018b). The indexed trend in the price per gram of cocaine in Europe between 2006 and 2016 shows a slight decrease over that period and a relatively stable trend in the past 2 years.

Adulteration

Cutting drugs with cheaper materials is usually undertaken to increase profit along the distribution chain but may also enhance or modify the effects of the drug and may cause additional adverse health consequences for the user. Among all illicit substances, powder cocaine appears to be the most adulterated: purity is lowest at street-level retail, samples contain on average three other compounds and, in one study, over 20 different substances were reported to be used as adulterants (Broséus et al., 2015; Villar Núñez et al., 2018). In addition to inert diluents such as sugars, talc, plaster and starch, pharmacologically active adulterants are often found in both powder cocaine and crack cocaine, including various local anaesthetics,

FIGURE 3
Changes between 2014 and 2016 in percentage purity of cocaine hydrochloride



NB: an increase is defined as a rise of 3 percentage points or more between 2014 and 2016.

analgesics, other licit and illicit stimulants, nootropic agents and anti-allergy drugs (Kudlacek et al., 2017).

The veterinary anthelmintic levamisole has been the most common adulterant of cocaine products over the past decade, followed by the analgesic phenacetin; both were identified by forensic laboratories and drug checking services in 40-70 % of cocaine samples analysed in recent European studies (Broséus et al., 2015; Brunt et al., 2017; Villar Núñez et al., 2018). In addition, levamisole appeared in used syringes in France, and in Switzerland, where phenacetin was also tested for and detected (Lefrançois et al., 2017; Néfau et al., 2015).

Levamisole is used as a cutting agent primarily because of its large-scale availability from the veterinary medicine market, and its similar colour and melting point to those of cocaine (its free base melts before crack cocaine, leaving no traces in the pipe); it is cheap, heavier than cocaine and gives a specific cocaine-like sheen to the drug, allowing for further adulteration down the retail chain (Brunt et al., 2017b). Levamisole has also been described as an effect enhancer; although its own neuropharmacological mechanism may be synergistic with that of cocaine, the main effect is probably related to aminorex. Aminorex is a metabolite of levamisole and has amphetamine-like pharmacological properties. It has a longer half-life than cocaine and may prolong the perceived stimulating effect of the drug (Solomon and Hayes, 2017). This would explain why some clients of drug checking services actively seek levamisole-adulterated powder cocaine, and why, according to experts in our study, some powder cocaine and crack cocaine users consider unadulterated cocaine to be of lower quality.

The most recent data from drug checking services across Europe show an overall decline in cocaine adulteration and a growing proportion of samples diluted only by inert compounds. The resulting higher purity of cocaine may in part be an indication of a disrupted supply of cutting agents, possibly linked to attempts to control the trade in these substances in some EU countries, such as the Serious Crime Act 2015 in the United Kingdom, which allows the seizure and confiscation of cutting agents (ACMD, 2015).

Cocaine use

Prevalence of and patterns in cocaine use

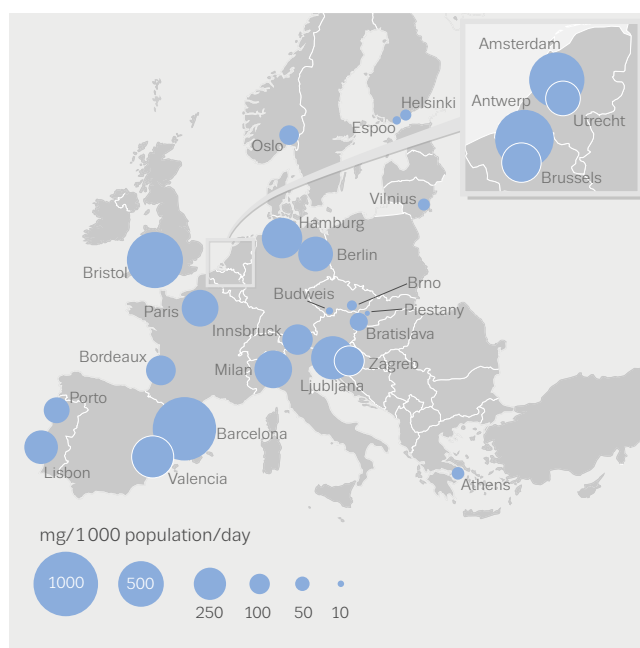
In recent years, cocaine has been part of a dynamic and interchangeable stimulant market characterised by an

increasing choice of high-purity stimulant drugs (potent ecstasy tablets, amphetamines, a multiplicity of cheap synthetic cathinones and other new psychoactive substances). The recent increase in the availability of higher purity cocaine on Europe's drug markets appears to be repositioning cocaine as the stimulant drug of choice.

Much information on cocaine use comes from general population and targeted surveys, and most surveys across Europe have traditionally collected data on cocaine as a generic category, rather than collecting data specifically on powder cocaine and crack cocaine. The most recent EU-level estimate suggests that around 2.3 million young adults (aged 15-34 years) used cocaine in the last year (1.9 % of this age group), with national estimates ranging from 0.2 % to 4.0 %. The countries with the highest prevalence of cocaine use in Europe include Denmark, Ireland, the Netherlands, Spain and the United Kingdom, with prevalence estimates of 2.5 % or more. Cocaine is the predominant stimulant used in this young adult group (ahead of MDMA and amphetamines) in a number of countries, mainly in southern and western Europe.

These geographical patterns in cocaine consumption are confirmed by analyses of wastewater data that have found

FIGURE 4
Cocaine residues in wastewater in selected European cities in 2017



NB: mean daily amounts of benzoylecgonine in milligrams per 1000 head of population. Sampling was carried out in selected European cities over a week in 2017.

Source: Sewage Analysis Core Group Europe (SCORE).

the highest levels of cocaine metabolites in cities in Belgium, Spain, the Netherlands and the United Kingdom, and the lowest concentrations in east European cities (EMCDDA, 2018b) (Figure 4). In most countries with multiple study locations, levels of cocaine metabolites in wastewater were higher in large cities than in smaller towns or cities. In addition to identifying geographical patterns, wastewater analysis can detect fluctuations in patterns of illicit drug use over a week. More than three quarters of cities showed higher levels of cocaine metabolites in wastewater at the weekend than on weekdays. This finding points to predominantly recreational use of cocaine in these cities. This conclusion is confirmed by cocaine hospital emergency presentations, with a similar pattern of increased emergency presentations for powder cocaine at weekends but an even distribution of crack cocaine-related emergency presentations throughout the week (see the 'Harms and deaths' section below).

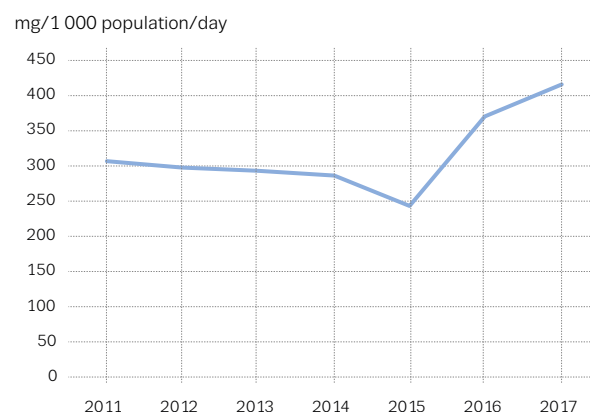
Recent trends in cocaine use

Recent trends in cocaine use across several indicators do not seem to uniformly reflect the increased availability and scale of supply of the drug at European level. Thus, although the decreases in last year use of cocaine reported for several years in a number of general population surveys seem to have ceased, the general picture now suggests stable levels of use. Of the countries that have produced surveys since 2015, only 3 reported higher estimates while 14 countries reported a stable trend and 1 reported a lower estimate than in the previous comparable survey.

In contrast, analyses of wastewater reveal an increase in cocaine residues in 26 of the 32 cities for which data were available for 2015 and 2017, following a relatively stable period between 2011 and 2015 in most cities (Figure 5). While these data clearly indicate an increasing trend in residues during 2015-2017, questions remain about what is driving the increase in cocaine metabolites. While it may indicate that more people are consuming cocaine, it may mean that there is greater use of cocaine by the same people. Alternatively, it may simply reflect the increased purity of cocaine in Europe, leading to increased metabolite detection in wastewater. This increase could also be explained by a combination of these three causes. Similarly, data from an ad hoc survey for the purpose of the present study among several European drug checking services identified an increase in the number of powder cocaine samples being submitted for testing in the past 2 years in recreational settings and an increase in purity.

FIGURE 5

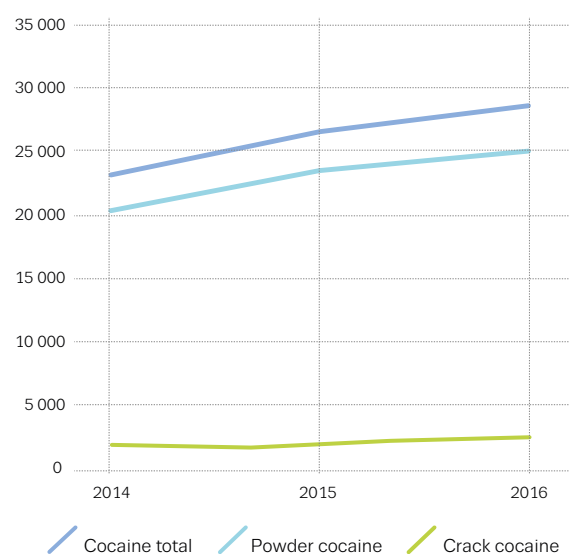
Aggregated trends in cocaine residues in wastewater in 10 European cities, 2011 to 2017



NB: trends in mean daily amounts of benzoylecgonine in milligrams per 1 000 head of population in Antwerp Zuid (BE), Barcelona, Castellon and Santiago (ES), Paris Seine Centre (FR), Zagreb (HR), Milan (IT), Eindhoven and Utrecht (NL), and Oslo (NO). These 10 cities were selected owing to the availability of annual data for 2011-2017.

Furthermore, the trend in the number of people seeking treatment for powder cocaine-related problems across Europe has also shown an increase in recent years (Figure 6). The overall number of people entering treatment for the first time in their lives for powder cocaine use has increased by almost a quarter (23 %, around 4 700 clients) since 2014. Fourteen countries reported increases in the number of first-time treatment entrants for primary powder cocaine use between 2014 and 2016, with increases of more than 30 % in Greece, France, Italy, Hungary and the United Kingdom. Increases in the number of first-time treatment entrants for crack cocaine between 2014 and 2016 were reported in Belgium, Ireland, France, Italy and the United Kingdom. Overall, the latest European data reveal a lag of about 12 years between first powder cocaine use, on average at the age of 22, and first treatment for cocaine-related problems, on average at the age of 34. This long period from initiation to development of problems and seeking treatment raises a number of questions regarding the recent increases in demand for treatment for cocaine-related problems. For example, it is unclear if the cocaine-related problems that encouraged people to seek treatment between 2014 and 2016 intensified with the current increase in high-purity cocaine available on national markets or if these problems developed among a cohort of cocaine users who started using cocaine during the last wave of high availability of cocaine in Europe in 2006.

FIGURE 6
Trend in the number of first-time treatment entrants for primary cocaine use between 2014 and 2016 in 28 European countries



Powder cocaine and crack cocaine: different user groups

For research and monitoring purposes, people who use cocaine have been categorised in different ways, according to the setting, the product used or the motivation for using. It should be noted that the terminology used in the literature and in collecting the current data is sometimes used interchangeably to refer to crack cocaine and powder cocaine, and the size of certain user groups may be underestimated as a result. Such underestimation may also be because of stigma (people not perceiving themselves as crack users or refusing to admit its use), a misunderstanding of the products by the users, researchers or professionals, or the inadequacy of the monitoring instruments. For example, the latest data on new clients entering treatment in Europe show that 18 % reported smoking/inhaling as the main route of administration for cocaine hydrochloride. Since cocaine hydrochloride produces negligible to no stimulant effects when smoked, this may be due to clients reporting their crack use as cocaine use or to a lack of understanding of the difference between inhaling and snorting. In any case, these limitations may lead to underestimation of various using populations and may bias any attempt to characterise different groups.

Recreational/occasional users and nightlife settings

Unlike other recreationally used drugs, which are often associated with specific subcultures and settings, cocaine has a more universal profile, and its various forms and routes of administration allow for a certain tailoring of its effects. A French study on the drug-using careers of people who used cocaine found that initiation was often motivated by curiosity and the perceived high status of the drug, which 'one does not simply refuse'. Users often seek energy, endurance, a feeling of ease and friendliness in social contacts, and sexual stimulation; the duration and intensity of the effects were considered by users to be easier to control than those of other drugs (Reynaud-Maurupt et al., 2011).

Experts involved in this study reported that in European party settings, powder cocaine is often combined with other drugs, and the typical combinations include ecstasy/MDMA and new psychoactive substances. Alcohol is the most common substance used in combination with cocaine; users report being able to consume more alcohol while maintaining a relatively high level of perceived sobriety, which may represent an important motivation to consume for some but can lead to the consumption of extreme quantities of alcohol. This can have severe harmful consequences for some, owing to the production of a toxic molecule, cocaethylene, in the body (see the 'Harms and deaths' section below). The temporal order of use of alcohol and cocaine seems to play an important role for users, as alcohol ingested after cocaine helps to soothe anxiety and other unpleasant feelings associated with the diminishing effects of the stimulant drug (Pakula et al., 2009).

These characteristics of cocaine, perceived as a permissive, functional and easily controlled drug that enhances social interactions and combines easily with alcohol, make it appealing in a wide range of nightlife settings, such as pubs, bars, concert venues and private parties. Trendspotter experts reporting on nightlife settings described the increasing acceptability and normalisation of use of powder cocaine across diverse social groups, which are manifested in greater overtness and visibility of use.

Occasional users often do not pay for cocaine, which is offered to them for free by friends and acquaintances, especially in party settings (Reynaud-Maurupt et al., 2011). This finding is confirmed by the 2017-2018 European Web Survey on Drugs: getting cocaine for free from friends was the most common source mentioned, by between 59 % and 67 % of respondents, in Austria, Latvia and Poland.

Only in Belgium had fewer respondents got cocaine for free than had bought it from a dealer (44 % compared with 55 %). Purchasing their own cocaine from a dealer represents for some recreational users a step towards more serious engagement in cocaine use. Experts in this study reported that, with cocaine having recently become more affordable, drug-using partygoers have tended to switch from cheaper, 'second-class' stimulants, such as speed (amphetamines) or synthetic cathinones, to cocaine. It was also reported that, with the recent economic growth in some Baltic countries, cocaine has now entered the range of products offered by retail dealers, alongside cannabis and amphetamines, in these countries.

| Socially integrated regular users

A subset of recreational cocaine users develops a more regular pattern of use, when the socially enhancing effects or increased efficiency are sought beyond party settings and cocaine is used in demanding work environments or as part of other daily routines. Cocaine is also used among this group for its enhancing effects on sexual behaviours. A need to cope with tiredness after weekend activities, exhaustion and also the availability of the drug were described as contributing to regular cocaine use (Reynaud-Maurupt et al., 2011). This group of cocaine users is characterised by attempts to control the habit while slowly progressing towards dependence and may remain relatively hidden from social services. Treatment experts in this study reported that help is generally sought only after the user has developed severe health and social problems, which appear with more frequent or heavy use. This group most likely constitutes the large majority of those entering treatment for powder cocaine-related problems in Europe. About 25 000 individuals sought treatment for powder cocaine problems for the first time in their lives in 2016. Alcohol is the most commonly reported secondary problem substance among this group, and one fifth of those entering first-time treatment for cocaine use report using cocaine on a daily basis. The male to female ratio among this group is 6:1.

| Users of crack cocaine

Smoking crack cocaine radically transforms the effects of the drug; the rapidness and intensity of onset lead to a sensation or 'rush' that is rarely described by users of powder cocaine (Reynaud-Maurupt et al., 2011). Crack users describe feelings of detachment, pleasure and disconnection from problems not dissimilar to those associated with heroin. The initial pleasure is short and followed by a sharp withdrawal involving anxiety, feelings

of guilt and a strong craving to use again, often leading to compulsive patterns of use. Experts in the field reported that, unlike in the case of heroin, crack cocaine dependence does not necessarily involve daily use; crack is often used in binges that may last for days until physical or economic exhaustion.

In Europe, crack cocaine has historically seemed to be limited to some cities in the west (in Spain, France, Germany, the Netherlands and the United Kingdom), although the most recent reports suggest diffusion from capitals such as Paris and Dublin to smaller, regional cities. National experts reported that users of crack cocaine are often marginalised, either street homeless polydrug users (Ireland), migrants from eastern Europe who switch from amphetamines to crack (France), migrants who belong to ethnic minority groups (France and Denmark) or nationals who are long-term users of crack cocaine and other drugs (Frankfurt). In Paris, the open drug scene associated with crack cocaine appears to extend from the usual confined drug scenes to more public areas and is linked to noticeable street violence. A recent qualitative study in Frankfurt indicated that users in opioid substitution treatment who miss the high associated with heroin turn to crack as a replacement (Werse et al., 2018). It was also reported that heroin users whose veins are damaged from injecting may begin smoking crack cocaine. Recent EMCDDA data show that 40 % of all crack users seeking treatment report heroin as their secondary drug (EMCDDA, 2018c). Furthermore, every third person entering treatment for a crack cocaine-related problem in Europe is a woman. Crack cocaine is reported to contribute to a vicious circle of crack cocaine use and sex work among female users, with prostitution functioning as a means to fund dependence and crack cocaine use acting as a 'numbing' way to cope with sex work (Daniulaityte and Carlson, 2011).

In the context of this study, experts reported that in most European countries where crack cocaine use is observed, crack cocaine has a different distribution chain from powder cocaine and users purchase crack cocaine or 'rocks' as a finished product to be consumed. An interesting phenomenon is, however, observed in France. Although chemically identical, freebase and crack in France represent two separate markets and have different user groups, based primarily on a belief that these are two different substances. Crack cocaine, usually associated with the negative images of street dealers and marginalised drug users ('crackheads'), is believed to be a residue from the production of cocaine hydrochloride and considered a low-class drug. Conversely, freebasing powder cocaine with baking soda or ammonia is believed to purify the substance, and cocaine is traditionally

consumed in this way in private or alternative party settings by recreational drug users (Gandilhon et al., 2013). The most recent developments suggest a convergence of the two scenes. Less-experienced freebase users developing a severe dependence are merging with the established marginalised group in the existing crack scene in order to consume cheaper, ready-to-use products.

People who inject powder cocaine and crack cocaine: a worrying increase

Like any other soluble drug, cocaine can be injected and the transition to injecting often marks progression to more severe levels of dependence and harms (Dunn and Laranjeira, 1999). Cocaine has been identified in disposed syringes in France and Switzerland, either alone or in combination with other substances (Lefrançois et al., 2017; Néfau et al., 2015). Cocaine and heroin are known to be injected together to intensify the desired effects and to suppress the unpleasant effects of both drugs. Data from drug consumption rooms in France, Germany, Luxembourg, Spain and Switzerland indicate an increase in the number of injection events over the past 3 years involving powder cocaine alone or in combination with heroin, while a decrease in the number of heroin injection events in these consumption rooms is reported. Some also report an increasing trend in crack cocaine injecting as a cheaper alternative to traditional speedball preparations: instead of using powder cocaine, crack cocaine is used in combination with morphine sulphate, methadone or buprenorphine. This study also identified other combinations, including crack cocaine with heroin and benzodiazepines. Of all clients entering treatment for cocaine-related problems in Europe, 5 % report injecting as the main route of administration of powder cocaine and 3 % report injecting as the main route of administration of crack cocaine.

Harms and deaths

Cocaine-related harms

Reports of health problems related to the use of powder cocaine and crack cocaine appear to be relatively common. It is likely that the risks are greater when cocaine use is associated with polysubstance use and with the use of high-purity products. As mentioned earlier, cocaine is commonly consumed with high quantities of alcohol. However, if ethanol is present during the metabolism of

cocaine, a portion of the cocaine undergoes a chemical reaction with ethanol that results in the production of cocaethylene. In most users, cocaethylene produces euphoria and has a longer duration of action than cocaine. Some studies suggest that it may be more cardiotoxic than cocaine and may be 18 to 25 times more likely than cocaine alone to result in immediate death (Andrews, 1997).

There are also reports of toxicity associated with the use of cocaine adulterated with other substances, most commonly levamisole and phenacetin. Acute adverse effects of levamisole include nausea, diarrhoea and dizziness; prolonged exposure may cause fever, insomnia, headache and convulsions (Brunt et al., 2009). Chronic use of levamisole in cocaine has been reported to be associated with weakened immune system, white matter disease, inflammation of blood vessels and other amphetamine-like adverse consequences related to the metabolite aminorex (Brunt et al., 2017b). Phenacetin has been documented to have carcinogenic, neurotoxic and nephritic adverse effects, as well as causing hallucinatory and cardiac side effects (Solomini et al., 2017).

Cocaine may cause significant acute toxicity, which can manifest as neuropsychiatric effects and sympathomimetic/stimulant effects. Common effects include agitation, anxiety, restlessness, insomnia, paranoia and auditory hallucinations, as well as chest pain, increased heart rate and raised blood pressure. Severe acute toxicity may be characterised by hyperthermia, acute renal failure and seizures (Pasic et al., 2017). Cocaine has a strong reinforcing action, causing a rapid psychological dependence, an effect even more pronounced in those who smoke crack cocaine. Mental health risks associated with cocaine include depressed mood and, in the long term, depressive symptoms.

Crack cocaine use has been associated with diverse health outcomes, and its use is associated with a higher risk of sexually transmitted infections (with HIV and hepatitis C virus, among others). Harmful associations have been found between crack cocaine use and several major health outcomes, including substantial evidence for infectious diseases and moderate evidence for neonatal harm and violence (Butler, 2017). Recently, cocaine use has been reported to have played a facilitating role in an HIV outbreak among people who inject drugs in Luxembourg.

Cocaine hospital emergency presentations

There are limited systematically collected data on acute drug toxicity in Europe. A review of the latest national

reports submitted by European countries to the EMCDDA shows that seven out of ten reporting such data observed an increase in the number of cocaine-related emergencies in their most recent data, compared with the previous year.

Complementary information about acute health harms related to cocaine use comes from reports from a 'sentinel' network of emergency settings (Euro-DEN Plus), which collects systematic data on drug-related presentations to emergency departments. The network is composed of 32 sentinel centres in 20 European countries. During the period 2014-2017, there were 4 460 presentations for powder cocaine use-related acute toxicity (19 % of all presentations related to drug use) and 565 crack cocaine use-related presentations (2 % of the total). Powder cocaine was involved in one third or more of the presentations in nine of the thirty-two Euro-DEN centres, which were primarily located in countries in the south and west of Europe.

Of those who presented with powder cocaine-related toxicity, 76 % were male, and the mean age was 32 years for males and 30 years for females. Alcohol co-ingestion was recorded in 57 % of the presentations. The mean number of drugs used in the presentations involving cocaine was 1.8. Around half of the presentations (46 %) involved cocaine alone; 48 % related to polydrug use involving cocaine, with either one or two additional drugs.

The most common clinical features were tachycardia (39 %), anxiety (32 %), agitation/aggression (29 %), chest

pain (19 %) and palpitations (18 %). Some form of treatment was required for 59 %, primarily sedation, indicated for one third of the patients (33 %) (Figure 7). Sixteen patients died; these were adults aged 19-49 years, and in a majority of cases (10 deaths), cocaine had been taken with other substances, including heroin, other opioids, benzodiazepines and amphetamines. In terms of change over time, there was a small increase in the proportion of presentations involving powder cocaine between 2014 (17 %) and 2017 (21 %).

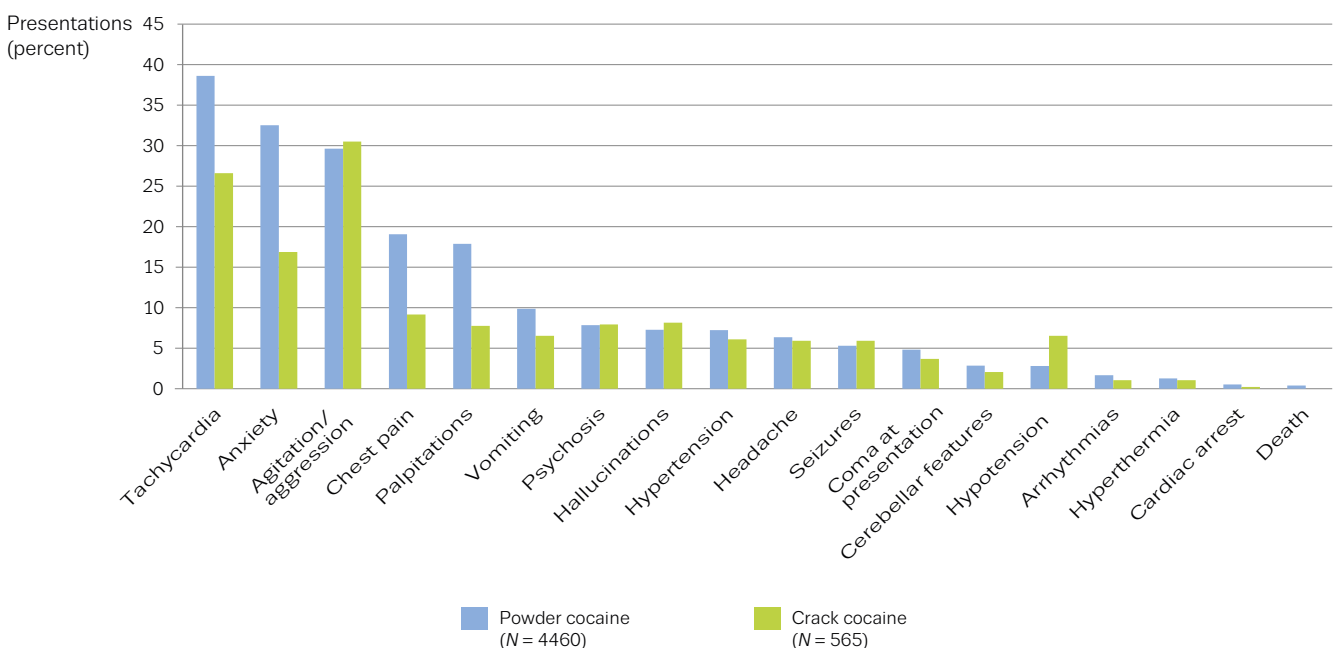
A comparison of the powder cocaine-related and crack cocaine-related cases shows that crack cocaine users were older, with a mean age of 37.6 years for males and 35 years for females, were less likely to have used cocaine alone (33 %) and were more likely to have used heroin (40 %, compared with 12 % of those presenting with powder cocaine-related toxicity). Crack cocaine presentations were distributed evenly throughout the week, whereas powder cocaine presentations were more frequent on Saturdays and Sundays.

Cocaine-related deaths

Increases in cocaine-related deaths have gained media attention recently in the United Kingdom, France and other European countries. The most recent EMCDDA data show that there were an estimated 1 220 cocaine-related deaths in 2016, or one in seven of the drug-related deaths estimated to have occurred in that year in the 28 EU Member States, Norway and Turkey (EMCDDA, 2018b).

FIGURE 7

Clinical features among powder cocaine-related and crack-related cases in 2014-2017, in Euro-DEN centres



Acute cocaine-related deaths are underestimated, as some fatalities, in particular deaths due to cardiac infarction and stroke, may not all be recognised as related to cocaine use. In terms of the available data on post-mortem toxicology, there were 371 deaths in which the presence of cocaine was reported in the United Kingdom, 253 in Spain, 120 in France, 71 in Germany, 38 in Italy and 32 in Austria. These are probably underestimates, as full toxicology information was not available for all cases. It should be noted that cocaine-related deaths are rarely caused by cocaine alone, and polydrug intoxication is the norm, with cocaine commonly identified along with other substances such as heroin, other opioids, amphetamines, benzodiazepines and alcohol.

Although the numbers may be underestimations, a preliminary analysis of the time trends reported up to June 2018 suggests an increase in most countries with available data. Of 19 countries (17 EU countries plus Norway and Turkey), 12 report an increase in the number of cocaine-related deaths, 5 report a stable situation and 2 report a decrease. Noticeable increases are reported, for example, in France, from 57 to 120 cases between 2014 and 2016; in England and Wales, from 247 to 371 cases during the same period; and in Austria, Germany and Turkey (Figures 8 and 9). The trend in Turkey occurred in the context of a large increase in drug-related deaths reported overall and requires further investigation.

In several countries in the east and south-east of Europe, such as Bulgaria, Cyprus, Latvia, Hungary and Malta, the overall number of drug-related deaths is very small and, consequently, trend analysis of cocaine-related deaths is difficult. There are some signs of an increasing trend, however, for example in Slovenia, where 18 cocaine-related deaths were reported in 2017, compared with 2 to 5 cases reported annually in recent years.

Long-term cocaine use increases the mortality risk among cocaine users compared with their peers of the same age and gender. A recent Spanish longitudinal study showed that, compared with those in the general population, mortality was four times higher (standardised mortality ratio (SMR) = 4.1, 95 % CI = 3.5-4.8) among cocaine users and more than 10 times higher (SMR = 11.6, 95 % CI = 10.5-12.8), among those using both cocaine and opioids (Colell et al., 2018).

FIGURE 8
Trends in the number of cocaine-related deaths in selected EU countries (2012-2016)

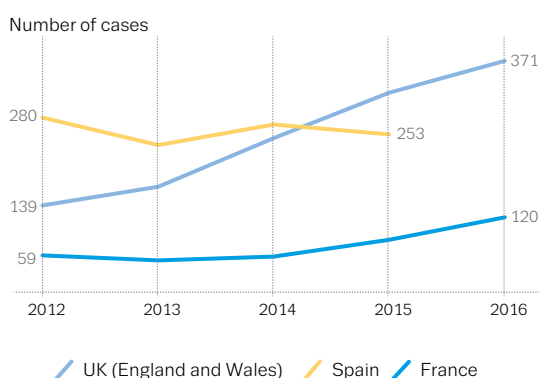
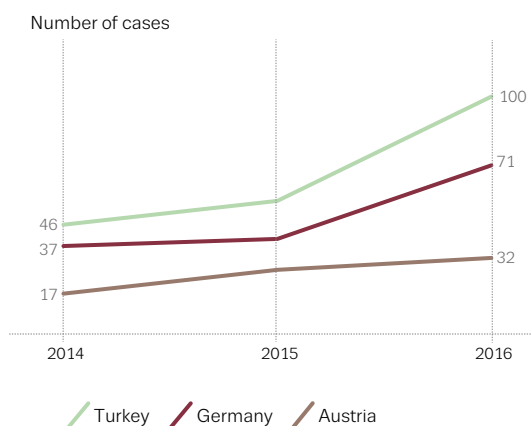


FIGURE 9
Trends in the number of cocaine-related deaths in selected EU countries and Turkey (2014-2016)



Health responses to cocaine and crack cocaine use

In response to an increase in cocaine-related treatment demand, some countries have developed targeted programmes and interventions for cocaine users seeking help. Extending opening hours specifically for working individuals with powder cocaine problems, as in Austria, is one of these measures. Very recently, a specific programme using a combination of a community reinforcement approach and contingency management, and targeting specifically people with cocaine problems, has been developed in Belgium. However, overall, targeted programmes for cocaine users remain limited in Europe.

Psychosocial interventions (e.g. cognitive behavioural therapy (CBT), motivational interviewing and brief interventions), contingency management, management of psychiatric disorders and symptomatic pharmacological treatment are the most commonly applied interventions when treating users seeking support for cocaine or crack dependence in Europe. This information was corroborated by the responses to an EMCDDA survey of over 100 European treatment practitioners on current practices and shortcomings in responding to powder cocaine-related and crack cocaine-related problems in Europe (Figure 10). Concerns raised by the practitioners were an immediate need to improve access to existing drug treatment services for young cocaine users and polydrug users using cocaine; improve cooperation between drug services and mental health services; encourage closer coordination with emergency departments; and develop more targeted cocaine-related harm reduction responses. The importance of cocaine-related training opportunities and guidelines for professionals was also highlighted, especially in addressing moderate and severe cocaine and crack dependence.

Very few developments have been observed in the area of cocaine-related treatment during the past decade. Research to assess the effectiveness of stimulant medications such as modafinil and bupropion as cocaine substitutes is still ongoing. As in opioid substitution therapy, these stimulant medications with less abuse potential than the illicit drug are intended to reduce craving and withdrawal and thereby promote abstinence. Research into a cocaine vaccine is also still ongoing. This vaccine works by inducing the production of cocaine antibodies, which bind to cocaine molecules in the bloodstream and prevent them from passing through the blood-brain barrier. Other experimental methods, such as transcranial magnetic stimulation, computer-assisted CBT, acupuncture and the use of cannabis as a harm reduction measure, have also been explored; however, no evidence of their effectiveness has yet been documented (EMCDDA, 2018a).

Instead of or in addition to using public services, cocaine users may seek help in private luxury clinics. However, the high cost makes this option exclusive and affordable to

FIGURE 10

Tag cloud of cocaine and crack treatment-related keywords from a survey of 108 practitioners



NB: Created using The Cloud Generator (<https://www.jasondavies.com/wordcloud/>).

only a small proportion of users. The main treatment approaches seem to be similar to those provided by public services, while some clinics offer alternative methods with limited scientific evidence for their effectiveness in the area of drug addiction. These providers generally offer individualised programmes with multi-professional teams in which at least one staff member is assigned exclusively to one client. A non-exhaustive web-based search indicates that luxury clinics advertising treatment to cocaine users are mainly located in western Europe (e.g. France, Spain, Switzerland and the United Kingdom).

Harm reduction interventions primarily target high-risk cocaine-related behaviours, such as unsafe injection and crack cocaine smoking practices, and promote safer sexual behaviours. Examples of these interventions include smoking and injecting drug consumption rooms in Denmark, Germany, France, Luxembourg and the Netherlands. These settings offer an environment where cocaine can be used under the supervision of specially trained staff. In low-threshold agencies, for example in Ireland, France and Portugal, crack cocaine kits including pipes and filters are provided to users to encourage safer smoking practices (e.g. Pfau and Cadet-Tairou, 2018); in Belgium, bicarbonate of soda is included in crack cocaine kits to encourage users who transform powder cocaine into crack to use baking soda instead of the commonly used and more harmful ammonia. Drug checking services also play a role in the reduction of cocaine-related harms in some EU countries. These can be important in informing users about risks associated with high-purity or adulterated cocaine and how to reduce such risks.

Discussion

The European drug market appears to be experiencing a surge in the availability of high-purity cocaine. As a consequence, the stimulant of choice for many drug users, which in recent times used to be of moderate purity and sold at varying prices, has now become an affordable commodity with high purity levels.

Supply pressure: more players, competition and innovation in the cocaine trade

The main drivers behind this surge in cocaine supply include a sharp increase in coca production in source countries since 2014. Closer to home, an increasing number of European and non-European organised crime groups are now directly involved in the cocaine trade between source countries and national markets in the

various Member States. New trafficking routes are emerging or gaining importance, for example routes through overseas territories close to source countries (e.g. Guyana) and traditional cocaine-smuggling methods are evolving, with innovative concealment methods, intimidation and bribery. We are also observing the multiplication and diffusion of entry points into Europe. Traditional trafficking hubs in Spain, the Netherlands and Italy are being complemented by ports and airports in Belgium, France and Germany, and this may represent only the tip of the iceberg, as other routes and trafficking modes, such as private aviation, may simply go undetected. As a result, large quantities of cocaine appear to be entering Europe at a regular pace, and law enforcement and customs agents are facing challenges in containing the flow.

A reorganisation of the cocaine supply chain is also visible at mid-level and retail level, with the emergence of fragmented, looser and more horizontal structures. Novel technologies such as encrypted communication applications, the darknet, social media and cryptocurrencies are playing an important role in enabling smaller groups and individual 'entrepreneurs' to engage, with a perception of less risk, in cocaine dealing. Entrepreneurship in a competitive cocaine market is evidenced by innovative distribution strategies such as cocaine-exclusive call centres. These new methods, reflecting an 'Uberisation' of the cocaine trade, are clear signs of a competitive market in which sellers have to promote additional services beyond the product itself, such as fast delivery anywhere at any time. The trade in cocaine between vendors and buyers traditionally operated mostly within small circles and was concealed from the public. We are now seeing a qualitative change in the nature of cocaine dealing, whereby social media is used to promote cocaine and other illicit drugs relatively openly, with the aim of reaching as many potential consumers as possible.

Smaller organised crime groups and darknet vendors, as opposed to large structured criminal syndicates, are increasingly operating in local markets at national level and are competing for various consumer bases. As a consequence, cocaine has become a modern-day commodity, and the levels of purity and perceived quality of the product are now a major selling point. The opportunity for retail vendors to sell discounted high-purity cocaine in the Member States appears to have been facilitated by a number of interlinked factors. First, an influx of cocaine into Europe, with reports of surpluses, may have resulted in high-purity wholesale cocaine being sold off to mid-level and retail vendors at lower prices. Second, fewer intermediaries being involved in the supply

chain reduces opportunities to further adulterate the initial product. Third, increased purity and a reduction in psychoactive adulterants in cocaine products have been linked to regulatory changes that have limited opportunities to procure traditional cutting agents such as levamisole and benzocaine.

Diffusion to new and emerging markets

Cocaine has always played an important role in the European stimulant market, primarily in western European countries. However, there are signs that cocaine is expanding into new markets in eastern Europe and beyond. Cocaine use was rare in these markets, where amphetamines have a long tradition of being the stimulant of choice among most user groups. Recent data show, however, an increase in seizures, purity levels and reports that cocaine is entering the range of drugs on offer by street dealers. It is suggested that this may be linked to increased economic growth observed in the eastern EU region in recent years. Another factor may be a saturation of the cocaine market in some western European countries, requiring organised crime groups to seek new markets within and beyond the EU's borders to the east. It is also possible that Europe has become a transit region for new cocaine markets in western Asia.

Expansion into new markets has also been observed within national territories, for example in France, where organised crime groups are expanding their operations from major cities to smaller, regional cities. This diffusion of cocaine markets may be due to oversaturation and a high degree of competition in traditional localised markets. One potential consequence is a so-called glocalisation of cocaine-related consumption patterns. For example, crack used to be a particularly localised phenomenon observed among small pockets of highly marginalised users in a few European cities such as Frankfurt and Paris. However, crack cocaine use is now appearing across various user groups in other cities such as Copenhagen, Dublin, Lisbon and Luxembourg.

Consumer dynamics: a complex picture

From a consumer perspective, there is some evidence of interchangeability between cocaine and other stimulant drugs, depending on the availability and purity of cocaine on the market. The recent increase in availability of high-purity cocaine may have shifted the preference of certain subgroups of stimulant users, for example in nightlife settings, from what users consider 'second-class' stimulants, such as amphetamine, mephedrone and other

cathinones, towards now-higher purity cocaine. Recent significant reductions in the availability of new psychoactive substances, including cathinones, on the European market may have contributed to this phenomenon.

Several additional factors appear to be associated with an increased preference for cocaine. There are reports that use of cocaine is becoming normalised in certain youth populations, coupled with increased disposable income among these groups following the economic recovery in most European countries. Most experts agree that those participating in certain youth cultures appear to display a lower risk perception towards cocaine. This normalisation of use can be partly attributed to cocaine being increasingly glamourised in popular culture, for example in recent popular TV series such as *Narcos* and *Gomorra*. Such normalisation and misunderstanding of the harms caused by cocaine-related products may have negative repercussions. For example, reports from France indicate that an erroneous distinction is being made in some subgroups between base cocaine ('freebase') and crack, with the potential for users to underestimate the risks associated with this more dangerous form of cocaine use.

Finally, this study also raises the question of the extent to which supply factors are currently shaping consumers' behaviour. Data available from the EMCDDA epidemiological indicators on drug use do not yet reflect the evidence of increasing supply of cocaine into the European market. On the other hand, targeted surveys and data collection in nightlife settings, in drug consumption rooms and in wastewater studies appear to point to a steady rise in cocaine use in recent years. What is less clear is if these data are identifying actual increases in the number of users, that a similar number of users are using more frequently or using higher purity products, or a combination of these factors. Importantly, further research is needed to confirm whether the current supply of cocaine is attracting new, drug-naive users on a wider scale at population level or whether it is primarily tapping into an existing consumer base formed of various user groups in nightlife settings and high-risk drug users.

Harms and responses: implications for policy, practice and monitoring

Various harms have been linked to recent increases in the availability and use of cocaine. At a societal level, media reports have highlighted an increase in extreme violence among small organised crime groups competing for local cocaine markets. Intimidation of indebted consumers, bribery of officials and exploitation of women as drug

couriers are only some of the worrying indications of the violence associated with the increasing importance of the cocaine trade in Europe.

At consumer level, the available data from hospital emergency presentations reveal that it is primarily a young population of cocaine users that appears in emergency rooms at weekends, with similar temporal spikes in cocaine use at weekends to those observed in wastewater data. With increasing purity levels of cocaine and co-use of alcohol among young recreational cocaine users, more attention should be paid and efforts devoted to the development of tailored harm reduction interventions for this group. In addition, the development of treatment services catering to the needs of younger users developing cocaine-related problems is required. Such services could attract this subgroup of young users at an early stage in the development of problem use. Examples of such newly developed services for cocaine users have been reported in Belgium but still remain rare. New technologies such as e-health and m-health applications for cocaine users may play an important role in expanding the reach of current treatment and harm reduction services in Europe.

Data on trends in the number of cocaine-related deaths in Europe raise some concerns. The number of deaths involving cocaine, mostly in association with alcohol and opioids, has dramatically increased in several countries in recent years. In some countries, such as France and the United Kingdom, these increases mirror those observed in the number of opioid-related deaths during the same period. This may indicate that the rise in deaths involving cocaine may largely be driven by the ageing cohort of vulnerable high-risk opioid users still primarily observed in western Europe. Available evidence from the literature, confirmed by experts in this study, shows that cocaine — powder cocaine or crack — is used by high-risk opioid users, in or out of treatment, as a replacement or add-on to heroin or to opioid substitution treatment. This has important implications for practitioners in terms of managing the problem co-use of cocaine among these groups. Experts consulted and practitioners surveyed in this study were adamant regarding the priorities in this area. First, investment is required in efforts to build the capacity of professionals through skills development and training in the treatment of stimulant dependence, with a focus on diagnosis and management of psychiatric comorbidities. Second, more investment is needed at European level in research into the development of effective pharmacological treatments. Currently, most

research in this field is carried out in the United States, which may have different research priorities given the current opioid crisis there. In addition, greater investment in harm reduction and treatment services may be required, considering the possible expansion of crack cocaine use in Europe. The range of harms associated with crack cocaine use goes well beyond the direct effects of the product, with crime, sexual abuse and financial debts commonly reported among this group. Among users of crack cocaine, women, members of ethnic minority groups and new migrants are particularly at risk of harms related to their drug use. Tailored services catering to the specific needs of these populations, such as culturally relevant services or women-only services, should be a priority where crack cocaine use is observed.

Finally, this study also revealed important implications for monitoring. Most standard epidemiological drug indicators appeared to be ill suited to detecting the current emergence of cocaine use in specific groups and in the overall population. Some indicators are currently failing to show the required sensitivity and reliability in evidencing the geographical and temporal developments in particular patterns of use, such as that of crack cocaine use. More efforts and investment are required to fine-tune existing instruments. Increasingly, new data collection methods, such as wastewater analysis, collecting data from emergency presentations and collecting data from harm reduction services, such as drug consumption rooms, low-threshold agencies and drug checking services, may be useful. The results from these new data collection methods complement data obtained from existing routine data collection instruments and can provide, as observed in this study, an important insight into the latest drug trends and dynamics of specific drugs, such as cocaine, across different user groups, different settings and national drug markets in countries where these methods can be applied.

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About this publication

Using trendspotter methodology, this report explores signs of increasing availability and consumption of cocaine in Europe, in an effort to increase our understanding of recent changes in the cocaine market. The study investigates the consequences of these developments on acute health harms linked to cocaine and crack use and reviews the current public health responses to problems related to these drugs.

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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 20 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.

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