



European Monitoring Centre
for Drugs and Drug Addiction

THREAT ASSESSMENTS

Methamphetamine in Europe

EMCDDA-Europol threat assessment
2019

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Summary

Currently, the data sources available suggest that overall methamphetamine availability and use in Europe remains relatively low, in comparison with other stimulant drugs. However, when viewed collectively, the data suggest that threats in this area appear to be growing to a point at which they cannot be ignored. Wastewater analysis and other epidemiological data sources suggest some recent methamphetamine diffusion to new markets, with the drug now appearing in some southern European countries and becoming more prominent in parts of central Europe. There is also evidence of large-scale production in Europe for non-European countries, and significant production in some countries bordering the European Union. The increasing presence of Mexican groups involved in large-scale production of smokable crystal methamphetamine in Europe is of particular concern. This could result in increased availability of this drug in the European Union in future. Overall, current developments in the availability of precursor chemicals and in European synthetic drug-production capacity indicate that if demand for this drug increased in Europe, illicit producers would be able to respond quickly. While still relatively low, seizures of methamphetamine, both in terms of numbers and quantities, are increasing: with very large increases in the quantity of methamphetamine seized in Turkey together with reports of methamphetamine production in that country. Many of the indicators on drug use and some indicators of the drug market are ill-adapted to distinguish between amphetamine and methamphetamine. As a result, especially in view of the overall greater part played by amphetamine, they are likely to be insensitive to changes in methamphetamine use in Europe. Currently, the availability of other stimulants on the European drug market appears to be high. However, if this were to change, a threat exists that methamphetamine availability and use could grow rapidly. Given the prominent role played by this drug in the global market for stimulants and its association with both severe acute and chronic health problems, it must be considered one of the priority areas for drug monitoring. In the current environment, where new drug trends can emerge rapidly, contingency planning to improve Europe's preparedness for any future escalation in problems in this area would also be beneficial.

Key findings

The market for methamphetamine in the European Union is small compared with the markets for other stimulant drugs, such as cocaine, amphetamine or MDMA, and has been relatively stable over the last 10 years or so. However, recent developments, such as seizures of unusually large amounts of crystal methamphetamine and the dismantling of large-scale production facilities in the European Union in 2019, could indicate that this is changing. The production and consumption of methamphetamine is at present mainly concentrated in a small number of Member States or specific user groups rather than being an EU-wide issue.

Methamphetamine has been a feature of the drug problem in Czechia, Slovakia and Germany, as well as some Nordic countries, for a number of years. More recently, some other countries, including France, Spain and Turkey, have recorded notable increases in the number of seizures or quantities of methamphetamine seized. However, the majority of EU countries appear to have experienced only marginal or small increases in the availability of methamphetamine over the last years, reflected in seizures data.

Like many other drugs, methamphetamine is also available to consumers on darknet markets. The sale of methamphetamine on these marketplaces appears to have increased the amount of methamphetamine trafficked via post and parcel services within or via the European Union. However, the distribution of methamphetamine by EU-based vendors or to customers in the European Union remains limited compared with other substances available on these platforms.

Large quantities of methamphetamine have been seized in Turkey since the mid-2000s and Turkey now seizes more methamphetamine annually than all EU countries combined. This is likely a result of the smuggling of the drug from Iran, a major methamphetamine producer, into Turkey for export to Asian markets. However, there is also some methamphetamine manufacturing and consumption in Turkey, which should be closely monitored.

The main drug precursors used for the production of methamphetamine are ephedrine or pseudoephedrine and BMK. BMK is produced within the European Union from alternative chemicals, such as APAAN (alpha-phenylacetoacetonitrile), APAA (alpha-phenylacetoacetamide) and MAPA, which are imported from Asia, particularly China.

Most of the methamphetamine sold in the European Union is produced in the European Union. Czechia is a centre for the production of the more potent *d*-isomer of methamphetamine (the type used for making smokable 'crystal meth'), which is produced in small-scale illicit laboratories from medicinal products containing pseudoephedrine. Of the 300 illicit methamphetamine laboratories reported in the European Union in 2017, a total of 264 were found in Czechia. Member States surrounding Czechia including Austria, Germany, Poland and Slovakia have also dismantled small-scale illicit methamphetamine laboratories, but in much smaller numbers.

Organised crime groups (OCGs) are involved in the medium- to large-scale production of methamphetamine in Czechia, the Netherlands and, potentially, on a smaller scale in the Baltic area.

In Czechia, the production of crystal methamphetamine for export to other EU Member States is dominated by Vietnamese OCGs.

Dutch OCGs use their expertise and production facilities for synthetic drugs such as MDMA and amphetamine to also engage in the production of methamphetamine for export from the European Union to countries like Japan and Australia.

OCGs may produce methamphetamine on a small scale in Lithuania and Latvia for local consumption and export to other Baltic and the Nordic countries. However, only a few illicit laboratories have been detected in these countries in the last few years.

The production in small-scale 'kitchen type' laboratories is typically carried out by methamphetamine consumers to supply small circles of users, in various Member States. Such small-scale production is not thought to be linked to organised crime groups.

Some methamphetamine produced outside the European Union is trafficked to lucrative markets in Asia via the European Union. OCGs use EU citizens as couriers in order to avoid border controls. Nigerian organisers or OCGs appear to orchestrate most of the trafficking of methamphetamine originating from West Africa via the European Union to Asia. Methamphetamine originating from Iran also appears to be trafficked via Turkey to the European Union and onwards to markets in Asia, particularly Japan.

Introduction

Methamphetamine is reported to be the most widely consumed synthetic stimulant in the world. In many countries it is reported as the second most prevalent illicit drug after cannabis. This results from both historical and more recent factors. Following its initial synthesis from ephedrine in 1919, methamphetamine use has evolved over the years. Originally a non-controlled substance used as a medicine, it was then used as a stimulant by the military in World War II. By the late 1940s it had become widely consumed in some parts of the world. Although it was controlled internationally by the UN Convention on Psychotropic Substances in 1971, it has been an illicit drug of increasing popularity.

Today, methamphetamine is the cause of serious public health, social and security problems across the globe. The harms associated with methamphetamine use vary considerably depending on the route of administration and patterns of use, with injecting and smoking being particularly high-risk behaviours. Methamphetamine use can lead to problems, including cardiovascular and cerebrovascular conditions, dependence, psychological and psychiatric disorders, infectious diseases and death. Thus, the potential diffusion of this drug is a cause for concern. The problems associated with methamphetamine use are especially visible in North America and Asia, although its use is also spreading to new areas, notably to some countries in Africa and the Middle East, and in certain parts of the southern hemisphere.

Although methamphetamine use remains limited in Europe as a whole, especially when compared to other stimulants like cocaine and amphetamine, it is the cause of significant harm in some Member States. In Czechia it accounts for one in every two admissions to specialised drug treatment. In addition, since the late 1990s, methamphetamine use has grown to become an important component of Slovakia's drug problem. Diffusion is also occurring to some extent in other countries in central and eastern Europe, notably Germany and Austria. Moreover, methamphetamine is increasingly detected in the Nordic countries, particularly in Norway where it appears to be replacing amphetamine to a large extent. Data from wastewater studies show the use of methamphetamine in Finland and Cyprus. These developments, combined with the relative ease with which the drug can be produced, and evidence of growing methamphetamine production outside the areas in which it has historically been found, raise concerns about the potential for further diffusion of methamphetamine and related problems in Europe.

This threat assessment provides a review of the key issues and latest developments relevant to understanding Europe's methamphetamine problem today. It has been produced jointly by the European Monitoring Centre for Drugs and Drug Addiction (EMCDDA) and Europol. It has been compiled from information supplied to the EMCDDA and Europol by

the Member States of the European Union and third parties. Key sources of information used in this report include the EU Serious organised crime threat assessment (Europol, 2017); statistical data reported annually to the EMCDDA by the Reitox network; information held by Europol, including data provided by the EU Member States for the mid-term review of the EU Serious organised crime threat assessment; data on precursors made available by the European Commission; international reports, such as those of the United Nations Office on Drugs and Crime (UNODC) and the International Narcotics Control Board (INCB); and the scientific literature. The report also relies on data concerning sites related to synthetic drug production that are dismantled and reported annually by the EU Member States to Europol and the EMCDDA.

Historical background

Methamphetamine was first synthesised from ephedrine in Japan in 1919 by Akira Ogata. Ephedrine had been isolated from the *Ephedra vulgaris* plant by another Japanese chemist, Nagayoshi Nagai, some years earlier (Zábranský, 2007). The drug was patented in 1920, then marketed in hydrochloride form by the Burroughs Wellcome company under the brand name Methedrine (Logan, 2002).

In the 1920s and 1930s, the medical and paramedical use of methamphetamine and amphetamine (Benzedrine, Dexedrine) increased in Europe and in the West in general. For instance, amphetamine was prescribed for depression and other mood disorders in the United Kingdom, but was also sought out for its stimulant effects (by students, for instance). Problematic side effects of chronic and non-medical use of amphetamine, including hypertension, depression, dependence, and psychiatric disturbances have been documented since the late 1930s (ACMD, 2005). Nevertheless, both amphetamine and methamphetamine enjoyed widespread acceptance as safe and beneficial drugs among the medical profession and the public at large, well into the 1960s.

In 1938, the Berlin-based Temmler pharmaceutical company started production of methamphetamine under the brand name Pervitin (Griffiths et al., 2008). During World War II, Pervitin was widely distributed to German troops in an attempt to enhance performance and increase concentration, and became known in Germany as "pilot's chocolate" and "pilot's salt". The drug also gained popularity among German civilians (UNODC, 2003; Zábranský, 2007). In Japan, methamphetamine was first commercially manufactured in 1941. It was supplied to Japanese soldiers, especially pilots, and to workers in key war industries under the brand name Philopon from 1942 onwards. Methamphetamine use spread in the Japanese population, who dubbed the drug 'shabu' (Tamura, 1989). 'Shabu' and 'yaba' are names commonly used

today for illicit methamphetamine tablets consumed mainly in parts of Southeast Asia.

On the Allied side, although millions of methamphetamine tablets were supplied to US military personnel (AMCD, 2005), the stimulant given to soldiers was more commonly amphetamine, which again also resulted in some subsequent post-war diffusion of use to civilian populations (Zábranský, 2007).

Fuelled by the sale of the enormous war surplus of amphetamines to the general population, this initial wave of synthetic stimulant use continued into the late 1940s. There was widespread medical and non-medical use of amphetamine in Europe (especially in Sweden and the United Kingdom), amphetamine and methamphetamine in North America (notably in the United States), and methamphetamine in the Far East (specifically Japan) (AMCD, 2005; Tamura, 1989; UNODC, 2003; Zábranský, 2007).

Although initial restrictions on the prescription and sale of amphetamine and methamphetamine products (tablets, ampoules, inhalers) were imposed in all three regions in the early 1950s, demand remained high, and use of amphetamines continued in the 1950s and 1960s. The overwhelming majority of the amphetamines available at that time were manufactured legally by pharmaceutical companies and prescribed by medical practitioners for a wide variety of disorders, including depression, attention deficit disorder, alcoholism, obesity and anorexia (AMCD, 2005; Tamura, 1989).

During the 1960s in North America and Europe, supply channels began to shift and illicit sources of supply gradually emerged, probably responding to the increasing restrictions placed on the medical use of these drugs. In Europe, the United Kingdom and Sweden experienced increasing misuse of amphetamine from the 1950s, with amphetamine obtained from licit medical prescription being diverted into the illicit market. Over time, methamphetamine and amphetamine diverted from therapeutic use were replaced on the market by illicitly produced amphetamine sulfate and, by the 1980s, methamphetamine had virtually disappeared from the United Kingdom's illicit drugs market (AMCD, 2005). This pattern was common for most European countries where amphetamine, joined later by MDMA, was the main non-cocaine stimulant drug used for a considerable period.

A notable exception to this is Czechia where the illicit production and use of methamphetamine has been a major component of the country's drug problem since the 1970s. At that time, a simple formula for methamphetamine production, known locally as Pervitin, was rediscovered, probably in Prague. Production, usually by small groups of user-producers, was facilitated by the existence of the VUAB factory, which was an

important manufacturer of ephedrine. Some of the factory's output was diverted to the illicit market. Other medicinal products that contain ephedrine or pseudoephedrine, such as Solutan (later Modafen and Paralen plus), were widely available and were also used, together with other freely available chemicals, in the production of methamphetamine using the 'reduction method'. Although the VUAB factory ceased production of ephedrine in 2003 (Griffiths et al., 2008), illicit methamphetamine production is still common in Czechia, with around 250 sites dismantled annually.

Consumer markets for methamphetamine in Europe

Chemistry and physical form of methamphetamine

Methamphetamine is a synthetic substance that acts as a stimulant of the central nervous system and is closely related to amphetamine. Methamphetamine exists in two optical isomeric forms (enantiomers), *d*-methamphetamine ⁽¹⁾ and *l*-methamphetamine ⁽²⁾. Both enantiomers are psychoactive, having stimulant effects (Kuczenski et al., 1995; Mendelson et al., 2006), but the *d*-enantiomer is more potent, and its effects last longer than those of the *l*-enantiomer. At high doses, the *l*-enantiomer is reported to produce an intoxication similar to that caused by the *d*-enantiomer, but its psychoactive effects are relatively short-lived and less desired by experienced injecting methamphetamine users (Mendelson et al., 2006). Illicit methamphetamine encountered in Europe is typically a mixture of the *d*- and *l*-enantiomers in equal proportions, known in chemistry as a racemic mixture (*d,l*-methamphetamine). Racemic methamphetamine and *d*-methamphetamine are expected to have comparable abuse liabilities (Mendelson et al., 2006).

In addition, methamphetamine may exist in two forms: base and salt. The pure base form is a clear, colourless, volatile oil, which is insoluble in water and can be readily converted into methamphetamine hydrochloride (the most prominent salt form) using hydrochloric acid. The hydrochloride salt form is a crystalline solid, which is soluble in water. In the methamphetamine powder found on the illicit market, granulated crystals are usually mixed with cutting agents such as lactose, dextrose or caffeine. Large white or translucent crystals of methamphetamine hydrochloride, suitable for smoking, can be produced from a starting material that has a high concentration of methamphetamine (base or hydrochloride). This is often called 'ice' or 'crystal meth', because of its appearance. Methamphetamine hydrochloride

⁽¹⁾ *d*-Methamphetamine is also known as (S)-(+)-methamphetamine.

⁽²⁾ *l*-Methamphetamine is also known as (R)-(-)-methamphetamine.

is commonly sold in tablets as 'shabu' or 'yaba' in parts of Southeast Asia, but may also be found as an ingredient of tablets sold as 'ecstasy' in Europe.

The method by which methamphetamine is administered depends on the form of the drug available. Powder (racemic) methamphetamine is usually administered in the same way as amphetamine powder, either inhaled intra-nasally (snorted), 'bombed' (wrapped in cigarette paper and swallowed) or dissolved and ingested or injected. Although smokable in this form, it is the larger crystals of relatively pure *d*-methamphetamine hydrochloride ('crystal meth') that are normally smoked, often in small glass pipes, and these crystals may also be dissolved and injected or crushed and snorted. The purity of methamphetamine depends largely on the quality of the precursors used and the skills of the producing chemist, but also on the addition of cutting agents. Powder methamphetamine is more likely to contain adulterants and tends to be of lower purity than the crystal form of the drug. Adulteration of crystal methamphetamine, though apparently rare in Europe, has also been documented (EMCDDA and Europol, 2016).

The methamphetamine powder found on the illicit drugs market is similar to amphetamine powder in many ways, including purity and appearance, and the two are often indistinguishable to both users and dealers. It is important to bear this in mind when considering the implications of a spread of methamphetamine use in Europe, since the close physical resemblance of the two drugs may facilitate the diffusion of methamphetamine in markets where amphetamine is currently the stimulant of choice, as seems to be the case in some northern European countries (see below).

| Methamphetamine-related harms and responses

Several physical and mental health problems are associated with the use of methamphetamine, and these may vary depending on the route of administration. For example, when injected, there is an increased risk of infection with blood-borne viruses, including hepatitis C and HIV, if injecting equipment is shared among users. The smoking of methamphetamine is also linked to problems, particularly if it occurs in high-dose 'binges' lasting several days. Although relatively few European countries have identified significant numbers of high-risk methamphetamine users (see 'European consumer markets for methamphetamine'), it is possible that in some countries, amphetamine and methamphetamine may be used interchangeably by some people.

Most research findings on the health consequences of use of amphetamines come from the United States and Australia, where the smoking of crystal methamphetamine is the predominate form of use. Nevertheless, many of the findings

also apply to the use of the drug in powder form or by injection, which are more common in Europe. Methamphetamine use can lead to a range of problems including cardiovascular and cerebrovascular conditions, dependence, psychological and psychiatric disorders, infectious diseases and death. Methamphetamine smoking is associated with respiratory damage, including pulmonary oedema, and teeth and gum decay ('meth mouth'). Acute methamphetamine intoxication ('overdose') can lead to severe hyperthermia, kidney failure and heart attack. The most serious mental health harms associated with the use of amphetamines include psychosis, depression, suicidal behaviour, anxiety and violent behaviour (Darke et al., 2008). People seeking treatment for methamphetamine problems often present with high levels of other psychiatric problems, in particular psychosis, which can be induced or exacerbated by the use of stimulants (EMCDDA, 2014, 2015).

Needle and syringe exchange programmes are effective in reducing the risks related to injection drug use, such as the transmission of infectious diseases, and broad access to a full supply of sterile syringes and other injecting equipment is recommended as a measure to reduce harms (ECDC and EMCDDA, 2011; MacArthur, 2014). Outreach health education and supervision of drug consumption are approaches that may help to reduce injecting risk behaviours. There is not yet a proven effective pharmacological treatment for methamphetamine dependence, although several stimulant substances are under trial. Pharmacotherapy is recommended as an adjunct to psychosocial treatment but it is not a primary component of treatment. There is evidence showing that two forms of psychosocial interventions, cognitive behavioural therapy and contingency management, can effectively reduce stimulant drug use and related problems, such as risky sexual behaviour. More information on this can be found in the Health and social responses to drug problems: a European guide (EMCDDA, 2017).

| European consumer markets for methamphetamine

By global standards, the size of the European consumer market for methamphetamine is limited, and has appeared relatively stable, although this may now be changing (see below). Under present practice, prevalence of use data on amphetamine and methamphetamine are generally aggregated and reported together as 'amphetamines', which makes it difficult to estimate the size of methamphetamine consumer markets. The value of the combined market is estimated to be about EUR 1 billion, implying that at least 62 tonnes of amphetamines is consumed annually in Europe (EMCDDA and Europol, 2019). Despite the lack of quantitative data on methamphetamine use, other data, such as global drug seizures suggest that methamphetamine is the synthetic stimulant most consumed at world level (UNODC, 2018, 2019). In 2017, for instance, some 184 tonnes of methamphetamine

was seized worldwide, 55 % more than in 2016, compared with 58 tonnes of amphetamine. However, just 0.7 tonnes of methamphetamine was seized that year in Europe, where methamphetamine is still a minor player in the overall synthetic stimulant market. Thus, it is likely that the majority of the more than 1.2 million young Europeans (15-34) that have used amphetamines during the last year, used amphetamine rather than methamphetamine (EMCDDA, 2019c; UNODC, 2019).

Both amphetamine and methamphetamine can be taken orally or nasally; in addition, a significant part of the high-risk use in some countries involves the use of these drugs by injection. Although methamphetamine can also be smoked, this route of administration is not frequently reported in Europe. Amphetamine and methamphetamine may be sold interchangeably (EMCDDA and Europol, 2016).

Consumption of synthetic stimulants in Europe historically has been dominated by amphetamine and MDMA, with methamphetamine use being largely confined to Czechia and Slovakia, where the drug is known as 'Pervitin' and 'piko'. However, recent reports have highlighted changes, and the development of methamphetamine use outside these two long-standing consumer markets. Europe's current methamphetamine problem has no single face, and distinct patterns of use among different user populations are emerging in some parts of Europe. These range from socially integrated users who snort or swallow the drug, to marginalised users who inject or smoke methamphetamine.

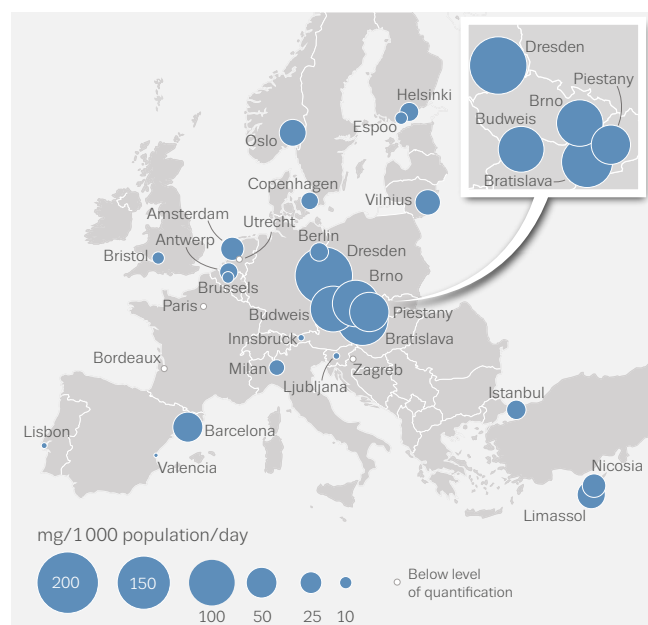
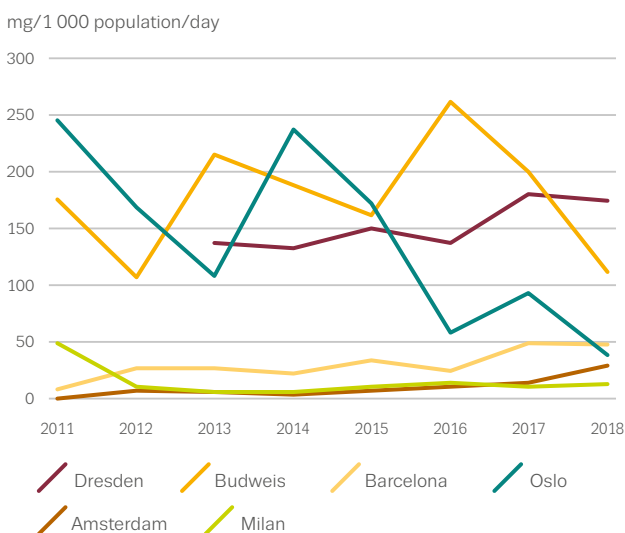
Wastewater analysis and other data show that methamphetamine use now appears to be present in several other Member States including Cyprus, the east of Germany, Spain and northern Europe (see Figure 1). Wastewater data from 7 years of monitoring, however, showed no major changes in the general patterns of methamphetamine use observed across Europe.

Available data for 2017 indicate that methamphetamine was seized more often than amphetamine in Cyprus, Czechia, Italy, Latvia, Lithuania, Slovakia and Turkey. This implies that users of amphetamines may be using methamphetamine rather than amphetamine in those countries.

According to the most recent information available for Czechia, high-risk methamphetamine use among adults (15-64) was estimated at around 0.50 % in 2017, corresponding to 34 700 users. This is an increase from the 20 900 users estimated in 2007, though numbers have been relatively stable in recent years. In addition, it should be noted that injecting remains the primary mode of methamphetamine use in Czechia, where the drug is often used in the context of polydrug use with opioids (EMCDDA, 2019a).

In Slovakia, where methamphetamine predominates over amphetamine, last-year prevalence of use of amphetamines in the 15-34 age group was estimated in 2015 (latest figures available) at 0.8 % and lifetime prevalence among all adults (aged 15-64) was 1.4 % (EMCDDA, 2018).

FIGURE 1
Methamphetamine residues in wastewater in selected European cities: trends and most recent data



NB: Mean daily amounts of methamphetamine in milligrams per 1 000 population. Sampling was carried out in selected European cities over a week in each year

The European School Survey Project on Alcohol and Other Drugs, carried out every 4 years, estimated lifetime prevalence of use of amphetamines among school students aged 15-16 years at 1 % in Czechia in 2015, down from a peak of 5 % in 1999, and at 1 % in Slovakia in 2015, the same as in 1999 (EMCDDA, 2018; Hibell et al., 2000).

The emergence of the smoking of crystal methamphetamine in Greece and Turkey, and to a lesser extent in Cyprus, is a cause for concern. Use of methamphetamine in crystal form, known locally as 'sisa' or 'shisha' (the Persian word for glass), has been reported by low-threshold and treatment services in Greece since 2010. Most users smoke the drug in glass pipes but some inject it. Users in Athens have reported that methamphetamine is used mainly by young people, groups of immigrants and users of heroin (EMCDDA, 2014).

In a study of drug residues identified in syringes collected in six European cities, methamphetamine was not found at all in Amsterdam, Budapest or Lausanne ($N = 81, 226$ and 233 , respectively). In Paris, methamphetamine was detected in 3 of the 259 syringes and in Glasgow in 20 of 195 syringes analysed. The situation in Helsinki was markedly different, with 136 of the 284 tested syringes found to contain methamphetamine, suggesting that injection as a mode of methamphetamine use is more common there than in the other cities (EMCDDA, 2019b).

Methamphetamine use seems to be increasing among specific user groups, such as clubbers and men who have sex with men. Of particular concern are reports of methamphetamine use, including injection, among groups of men who have sex with men in metropolitan areas such as London and Paris in the context of so-called 'slamming' or 'chemsex' parties (Adfam and London Friend, 2019; EMCDDA, 2014).

Overall, methamphetamine consumption patterns appear to have remained relatively stable across Europe, but signs that use of the drug is spreading to new countries have emerged in recent years. Indeed, although problems associated with the drug remain concentrated in Czechia and Slovakia, which together account for more than 65 % of the reported 4 900 methamphetamine clients entering treatment in Europe in 2017, there have been moderate but steady increases in the numbers entering treatment for problems associated with methamphetamine in EU countries reporting data such as Bulgaria, Cyprus, France, Greece and the United Kingdom between 2013 and 2017 (EMCDDA, 2019c). A new development should also be noted with some concern: Turkey reported the highest number of methamphetamine clients after Czechia and Slovakia in 2017 (EMCDDA, 2019). Due to the chronic and acute harms associated with the use of methamphetamine, the potential diffusion of the drug warrants vigilance.

Methamphetamine production

Current production methods in Europe

Methamphetamine can be produced using a number of different techniques relying on a variety of precursor chemicals. The most common production methods in Europe rely on pseudoephedrine, ephedrine or BMK, and the end-products that can be made, their quality and quantity, strongly depend on the availability of these precursors and the expertise of the producers.

TABLE 1

Key information on the production of different forms of methamphetamine hydrochloride available in the European Union

Form	Description	Precursor	Production locations
<i>d</i> -Methamphetamine	High-potency crystal form suitable for smoking	Ephedrine or pseudoephedrine typically extracted from medicines BMK may also be used, but this is less common in Europe and requires an extra production step using tartaric acid	Czechia: small and mid-scale Austria, Bulgaria, Germany, Poland and Slovakia: small-scale Netherlands: small, mid and large-scale
Racemic methamphetamine (equal mixture of <i>d</i> - and <i>l</i> - forms)	Mid-potency powder used in similar way as amphetamine	BMK	Netherlands: mid and large-scale Lithuania: small to mid-scale
<i>l</i> -Methamphetamine	Lower potency form used in medicines, e.g. decongestants		Not deliberately produced on its own in illicit labs in Europe

Ephedrine and pseudoephedrine

Ephedrine and pseudoephedrine are internationally controlled drug precursors. They are the main precursors used in the production of methamphetamine in Bulgaria, Czechia, Germany, Poland, Slovakia and a number of other Member States. Production based on ephedrine and pseudoephedrine results in *d*-methamphetamine (Table 1). These two substances can be extracted from medicines, and some EU Member States such as Czechia, and more recently Germany and Poland, have implemented national restrictions on the sale of such medicines. In these countries, sales are restricted to small packet sizes sold under the supervision of a pharmacist. However, there is no harmonised approach to this at EU level, and the sale of medicines containing pseudoephedrine or ephedrine is not restricted in all Member States. This has given rise to the trafficking of such medicines from countries with less restrictive sales regulations to countries where methamphetamine production takes place.

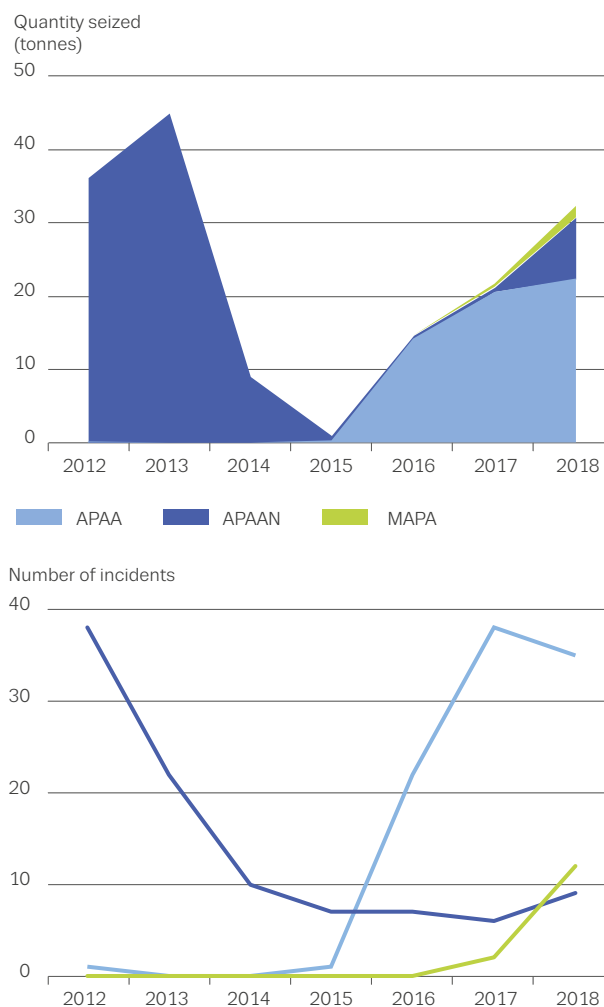
Benzyl methyl ketone (BMK)

BMK is a drug precursor for amphetamine as well as methamphetamine and is an internationally controlled substance. Around 2011, in response to strict controls preventing the diversion of BMK (also called phenyl-2-propanone or P-2-P) for the production of amphetamine in the European Union and to various improvements to the precursor monitoring regime, organised crime groups started to import large quantities of APAAN (alpha-phenylacetonitrile), a chemical which can be readily converted into BMK. China is the main source of APAAN imported into the European Union, where it is often converted into BMK in dedicated laboratories. However, following the scheduling of APAAN in the European Union in December 2013 and at international level in October 2014, alternative chemicals have appeared: first glycidic derivatives of BMK, then APAA and then MAPA. The dynamic and rapidly changing nature of the precursor market is evident from the declining number of incidents involving APAAN and the concomitant increase in incidents related to APAA between 2012 and 2018 (Figure 2). In 2018, the emergence of MAPA suggests that drug producers may be preparing for the impact of control measures on APAA, introduced at the beginning of 2019.

Other production methods

Chloroephedrine is a precursor for the production of *d*-methamphetamine. Multi-tonne quantities of this precursor were discovered during law enforcement operations in Germany and Czechia in 2014. Methamphetamine produced from chloroephedrine is similar to methamphetamine

FIGURE 2
Incidents involving APAAN, APAA and MAPA reported to INCB, 2012-18



Source: INCB (2019)

produced from ephedrine and pseudoephedrine. Chloroephedrine is a chemical intermediate produced as part of the methamphetamine synthesis process and has no legitimate use. Since July 2016, both chloroephedrine and chloropseudoephedrine are scheduled as drug precursors at EU-level⁽³⁾. These precursors do not seem to have gained traction in methamphetamine production in Europe, perhaps due to the availability of alternative substances coupled with the rapid response from the regulatory systems.

Producers of methamphetamine are likely to continue to innovate and identify additional precursors, alternative chemicals and production methods if the controlled precursors such as pseudoephedrine, ephedrine or BMK become unavailable or prohibitively expensive, as illustrated by the switch from APAAN to APAA and more recently to MAPA.

⁽³⁾ Commission Delegated Regulation (EU) 2016/1443 of 29 June 2016 amending Regulation (EC) No 273/2004 of the European Parliament and of the Council and Council Regulation (EC) No 111/2005 as regards the inclusion of certain drug precursors in the list of scheduled substances.

An apparently marginal but worrying development in the European Union is the appearance of non-scheduled substances that can be easily converted into illicit drugs without resorting to the usual drug synthesis methods. Although technically these substances may be considered as precursors, they are fundamentally different to the controlled drug precursors, as they contain the full illicit drug molecule with a protective chemical group attached, rendering it a different chemical entity and therefore outside the international control regimes for drugs and drug precursors. This is another example of innovation by illicit drug producers, using what are known in organic chemistry as protection/de-protection techniques. These techniques are also used to minimise the risks associated with the international trafficking of controlled drugs and precursors.

This was first documented in Europe in December 2016 when *N-t*-BOC-MDMA and *N*-methoxycarbonyl-MDA were detected in the Netherlands. Using a rudimentary process of heating in acidic conditions for a relatively short time, these substances are easily converted to the illicit drugs MDMA and MDA respectively. According to the INCB, the first detection of *N-t*-BOC-MDMA was in Australia in 2015. The corresponding methamphetamine derivative, *N-t*-BOC-methamphetamine was identified in China in 2015 and in New Zealand in January 2017, where it was found in a consignment imported from China (INCB, 2018). As of August 2019, *N-t*-BOC-methamphetamine has not been reported in Europe.

Production trends in the European Union

Most of the EU Member States report that there is no or only limited production of methamphetamine on their territory. There are three identifiable production centres for methamphetamine in the European Union: Czechia and areas bordering Czechia in neighbouring countries; the Baltic States with a focus on Lithuania; and the Netherlands. In addition, Bulgaria regularly reports the detection of small-scale laboratories.

Czechia and surrounding area

For reasons outlined in 'Historical background' (page 6), Czechia has long been a centre of significant methamphetamine production. The number of laboratories manufacturing methamphetamine discovered by Czech law enforcement authorities has remained stable over the period 2015-2017, with 264 illicit laboratories dismantled in 2017 (Police of the Czech Republic, 2017) (Table 2). Although many are small-scale, there appears to have been an increase in the production capacity of some laboratories over the same period, perhaps due to the involvement of Vietnamese OCGs (see 'Organised crime groups', page 18). Czechia accounts for the largest number of methamphetamine production laboratories in Europe and an estimated 6.5 tonnes is consumed annually in the country (EDMR, 2019). Small numbers of small-scale, 'kitchen laboratories' continue to be discovered elsewhere, predominantly in regions of Austria, Germany, Poland and Slovakia bordering Czechia (see Table 2). There have been some indications that a small portion of production has been displaced from Czechia to the Netherlands in recent years.

In addition to domestic Czech OCGs, Vietnamese OCGs have become involved in the production of 'crystal meth' (*d*-methamphetamine) in Czechia, supplying the drug to consumers in the country, as well as in bordering Member States and Norway.

In Czechia, methamphetamine is produced mainly from ephedrine or pseudoephedrine, which is extracted from medicinal products originating mainly in European countries and trafficked by land. Until recently, Turkey was reported to be the source of such medicines, which were trafficked by land, transiting countries including Bulgaria, Hungary, Poland, Romania and Slovakia. However, the INCB reports that Turkey is less often identified as a source, and that controls implemented to tackle the problem are having the desired effect (INCB, 2019). The national police in Czechia now report that Poland is a key transit country for such medicines diverted from elsewhere in the European Union (Police of the Czech Republic, 2018). The production of methamphetamine detected in Poland, though at a low level, shows some signs of a possible increase. In 2017, eight illegal laboratories

TABLE 2

Number of dismantled methamphetamine laboratories reported in the European Union, 2015-17

	Czechia	Bulgaria	Germany	Poland	Netherlands	Slovakia	Lithuania	Hungary	Spain	Total
2015	263	12	9	2	2	3	2	1	0	294
2016	261	10	11	5	2	2	0	0	0	291
2017	264	6	4	8	9	7	1	0	1	300

Source: Data reported to EMCDDA or Europol

producing methamphetamine were dismantled by Polish law enforcement authorities, compared with five in 2016 and only two in 2015. Moreover, it is reported that the laboratory set-ups are becoming more professional. This apparent increase in production is attributed to Polish as well as Czech and Vietnamese OCGs. Polish OCGs are believed to be significant suppliers of pseudoephedrine extracted from medicinal products used for the production of methamphetamine in Czechia. Time will tell if the changes to legislation in Poland, introduced in June 2015 and early 2017, intended to limit the availability of pseudoephedrine, will have an impact on the availability of the precursor in Czechia. In addition, in 2016, new Czech legislation introduced higher sentences of up to 18 years of imprisonment for individuals convicted of drug production; however, it is too early to assess if this has had any deterrent effect.

Lithuania

Few methamphetamine production facilities have been dismantled in Lithuania in recent years (one in 2017 and two in 2015). There are, however, indications that production may still be going on there. Methamphetamine couriers and shipments linked to Lithuanian OCGs are frequently intercepted in Member States in the region such as Estonia and Latvia en route to Finland, Sweden and Norway. Analysis of the methamphetamine seized on this route indicates that it has been produced from the precursor BMK (which is typically produced from alternative chemicals) rather than pseudoephedrine or ephedrine.

The Netherlands and Belgium

The Netherlands is the main centre of synthetic drug production in Europe. Large-scale illicit laboratories, mainly producing MDMA and amphetamine, are dismantled regularly in the country. Methamphetamine production in the Netherlands was previously limited compared to MDMA and amphetamine, with Dutch law enforcement detecting small-scale laboratories producing methamphetamine at a rate of 1 or 2 per year over the past decade. However, the situation is changing, as recent information suggests that some Vietnamese groups may have shifted their methamphetamine-production operations, based on ephedrine or pseudoephedrine, from Czechia to the Netherlands. It is also important to note that large-scale laboratories producing methamphetamine from BMK have been found in the Netherlands in the past and more recently in Belgium (see below).

Methamphetamine produced from BMK is in the racemic form (see Table 1), however, it is possible to produce *d*-methamphetamine from BMK by employing an additional processing step involving the use of tartaric acid. This process

has been identified in large-scale illicit laboratories dismantled in the Netherlands. The potent *d*-methamphetamine in smokable crystal form is in particular demand in markets outside the European Union, such as Japan and Australia, where 1 gram can fetch as much as EUR 730, and the large-scale production output of the Netherlands appears to be primarily intended for these non-EU destinations. In evidence of this are the several multi-kilogram shipments of methamphetamine produced in the Netherlands that have been seized in Australia in recent years. However, in some cases methamphetamine produced in the Netherlands may be destined for the consumer markets of other EU Member States. For example, Spain and to a lesser degree Poland report that some of the methamphetamine on their drug markets comes from the Netherlands.

In early 2019, indications emerged that Mexican suspects are involved in the supply and manufacture of methamphetamine in the European Union, possibly in cooperation with Dutch and Belgian OCGs, although clear links between these suspects and Mexican OCGs have not been established at this stage. Mexican OCGs have been involved for many years in the manufacturing of large quantities of methamphetamine in Mexico and Central America, chiefly for export to the United States but also for markets in Asia and Oceania, and they are a significant threat.

Mexican suspects were implicated in the operation of an illicit methamphetamine laboratory on an 85-metre barge moored in Moerdijk (Netherlands) in May 2019. Law enforcement authorities seized methamphetamine oil with a street value of more than EUR 4.5 million, 6 kilograms of *d*-isomer or 'crystal' methamphetamine and arrested a Dutch suspect, the captain of the boat, as well as three Mexican nationals suspected of operating the methamphetamine production laboratory (Boffey, 2019). The investigation into the production operation also revealed links to a known Dutch chemist previously involved in large-scale synthetic drug production in the Netherlands.

In June 2019, Dutch law enforcement authorities seized 2.5 tonnes of methamphetamine in Rotterdam with a street value of hundreds of millions of euros. The seized methamphetamine was believed to be intended for markets other than the Netherlands (Reuters, 2019). The shipment arrived in the Netherlands via Spain, but the involvement of Mexican nationals and possibly OCGs in the production and trafficking is suspected. The premises where the methamphetamine was seized are linked to companies registered in Spain and Mexico. This trafficking operation was also linked to outlaw motorcycle gangs (OMCGs) active in the Netherlands.

In addition, in August 2019, Dutch law enforcement authorities seized 32 kilograms of methamphetamine in a warehouse in

Hilversum and arrested three suspects. The methamphetamine originated from Mexico and was hidden inside an industrial magnet during transit from Mexico to the European Union (Pieters, 2019).

Methamphetamine is also increasingly trafficked to the European Union from Mexico using post and parcel services as well as by couriers. It is clear that some of the methamphetamine produced in the European Union with Mexican involvement and the methamphetamine sent to the European Union from Mexico is intended for markets in Asia and Australia; however, some may also be distributed in Europe. The market for methamphetamine in the European Union remains much smaller than the markets for other synthetic stimulant drugs such as amphetamine or MDMA. Nevertheless, the emergence of trafficking networks and the expansion of methamphetamine production in the European Union need to be closely monitored.

The production of methamphetamine in the European Union outside these production centres appears to be limited in terms of the number of laboratories and the overall quantities manufactured, with production in such settings almost exclusively based on ephedrine or pseudoephedrine extracted from medicines.

External methamphetamine production affecting the European Union

Methamphetamine is produced and consumed in several regions of the world in much larger quantities than in the European Union, with Asia and North America identified as the largest markets for the drug at global level (UNODC, 2017a). However, even though most of the methamphetamine consumed in the European Union is thought to be produced in the European Union, large-scale production and trafficking of methamphetamine elsewhere in the world does have an impact on the European Union.

In some cases, the European Union has been a region of origin for ephedrine and pseudoephedrine trafficked to regions with significant methamphetamine production, such as Mexico, Central America and Iran. Methamphetamine may also be smuggled into Europe on a limited scale to meet demand for the drug among specific diaspora communities originating in Southeast Asia.

However, the two most significant methamphetamine production regions outside the European Union with an impact on Member States are likely to be Iran and West Africa. Methamphetamine produced in these regions is trafficked to consumer markets in Australia and Asia (Japan, Thailand, Malaysia, Indonesia, etc.) via transportation hubs in the European Union. Although some methamphetamine produced

in Iran and West Africa may be sold on EU drug markets, the evidence available would suggest that this is on a very limited scale. OCGs trafficking methamphetamine via Europe primarily rely on couriers carrying methamphetamine concealed in their luggage. These, often European, couriers mostly use air travel, changing flights within the European Union to attempt to mask their original point of departure and their intended destinations.

Europe outside the European Union

Small- and medium-scale production of methamphetamine takes place in countries neighbouring the European Union including the Western Balkan region and Turkey.

Turkey

In 2017, Turkey was the country in Europe seizing the largest amount of methamphetamine (658 kilograms). A proportion of this total was probably imported from Iran, but it is likely that some was produced in Turkey, as the dismantlement of several methamphetamine production facilities, often in connection with the arrest of Iranian nationals, has been reported in the Turkish press since 2017. The quantities of methamphetamine or precursors seized on many of the sites suggest that mid-to-large-scale production was taking place (Ensonhaber.com, 2017, 2019; Haberturk.com, 2019; Haberayyildiz.com, 2017 ; Yenisafak.com, 2018).

Ukraine and Russia

Seizure data for methamphetamine, ephedrine and pseudoephedrine indicate that some production of methamphetamine may also take place in Ukraine. For example, in 2016 with 253 kilograms, Ukraine seized more ephedrine than all the EU Member States combined (INCB, 2018). However, so far there have been no indications that methamphetamine produced in Ukraine is trafficked to the European Union in significant quantities.

There is no information available on the extent of methamphetamine production in Russia, which seized 3 kilograms of ephedrine in 2016 (INCB, 2018).

West Africa

Several methamphetamine production facilities have been dismantled in West Africa over the last 10 years but the available data are weak and unlikely to reflect the scope of methamphetamine production in West Africa or in Africa as a whole. There are indications that the methamphetamine produced in Africa is primarily *d*-methamphetamine. In March 2016, Nigerian authorities dismantled an industrial-scale illicit laboratory, where methamphetamine was produced using benzaldehyde and other chemicals following a method

known to be used in Mexico (INCB, 2018). This was one of six methamphetamine laboratories reported dismantled by Nigeria in the 2014-17 period (UNODC, 2019). In addition, Nigeria has reported seizing large amounts of ephedrine in recent years, including 785 kilograms in 2015 and 444 kilograms in 2016, though in most cases the precursor appeared to be en route to other African countries (INCB, 2019).

Reports indicate that methamphetamine is also produced in other West African countries. For example, Burkina Faso was reported to the EMCDDA as the country of manufacture of methamphetamine seized in Belgium in 2016. In 2015, Mali reported the seizure of 12 kilograms of ephedrine to the INCB and in 2017, Benin reported seizing 152 kilograms of ephedrine and 295 kilograms of ephedrine preparations (INCB, 2019).

As already noted, Australia is a significant destination market for methamphetamine trafficked via the European Union by various OCGs, including Nigerian OCGs using EU citizens as couriers. Countries in the European Union and elsewhere have been detecting large numbers of drug couriers originating from West Africa for a number of years, and it seems likely that methamphetamine production takes place on a larger scale in West Africa than is currently suggested by official figures.

It is likely that methamphetamine production may be taking place elsewhere in Africa. For instance, South Africa, Egypt and Kenya have also reported dismantling methamphetamine production facilities in the recent past (UNODC, 2014a, 2019). However, many seizures of illicit facilities may go unreported due to the lack of developed drug monitoring systems in Africa. Methamphetamine couriers departing from countries in eastern and southern Africa have been arrested in EU Member States, but the origin of the intercepted drugs is uncertain.

Iran

Significant amounts of methamphetamine are likely to be manufactured in Iran for domestic and international consumption, though some Iranian methamphetamine producers appear to have relocated their operations to Turkey (see above) and Afghanistan (see below). Although the numbers of dismantled illicit laboratories and methamphetamine seizures have declined, production of the drug in Iran appears to remain at a high level. In 2017, Iran reported seizing 2.3 tonnes of methamphetamine (down from 3.7 tonnes in 2013) and dismantling 141 laboratories (UNODC, 2019). However, because Iran has not reported seizures of either ephedrine or pseudoephedrine to the INCB since 2011, it is difficult to assess the scope of the illicit trade in methamphetamine precursors in the country (INCB, 2018). It is likely that significant quantities of ephedrine and pseudoephedrine are trafficked to Iran from the Kurdistan region of Iraq, which imports these precursors mainly from

Jordan (INCB, 2019; Mansfield and Soderholm, 2019). The INCB also notes that more methamphetamine may be manufactured in Iran starting from BMK than was previously the case (INCB, 2019). Methamphetamine produced in Iran is trafficked to markets in the Middle East and Southeast Asia, often using air couriers transiting European airports. Although such incidents have not been reported as frequently as in the past, Turkey continues to report that some methamphetamine is imported into Turkey by land from Iran and subsequently flown to Asia via Istanbul airport.

Afghanistan

A potentially important development has been noted in Afghanistan, where methamphetamine production is increasing, initially as a result of the relocation of some Iranian producers on Afghan territory. Access to methamphetamine precursors is reported to be easier in Afghanistan than in Iran, which introduced measures restricting access to medicines containing ephedrine and pseudoephedrine in 2012. In Afghanistan, the process used was initially based on the extraction of ephedrine and pseudoephedrine from medicines. This may still be the case, at least to some extent, as according to the INCB Afghanistan's official requirements of bulk pseudoephedrine are incommensurate with the country's pharmaceutical need and there is a risk that some of it could be diverted to produce methamphetamine (INCB, 2019). However, alternative starting materials may now be used. Furthermore, it has recently been reported that methamphetamine producers in Afghanistan are using ephedrine extracted from *Ephedra* plants growing wild in mountainous regions of the country (Mansfield and Soderholm, 2019). Some of these producers have stated that they achieved a 50 % reduction in production costs by using plant material (Mansfield, 2019).

It will be important to monitor this phenomenon, given the significant traffic of heroin to the European Union from Afghanistan via various trafficking routes described elsewhere (EMCDDA and Europol, 2019).

Mexico

Mexico is a major producer of methamphetamine, mainly for the US market, and it is certain that some methamphetamine is trafficked on a regular basis from Mexico via the European Union to destination markets in Asia and Australia (see above). However, seizures at airports indicate this to be a much less significant phenomenon compared to the trafficking of methamphetamine from West Africa or Iran, although it seems to be growing.

Trafficking and distribution of methamphetamine and its precursors in Europe

Given that most EU countries report limited or no production of methamphetamine on their territories, and as most of the methamphetamine consumed in the European Union would appear to be produced in the European Union, trafficking between Member States is currently the primary mode of distribution of the drug to EU consumer markets.

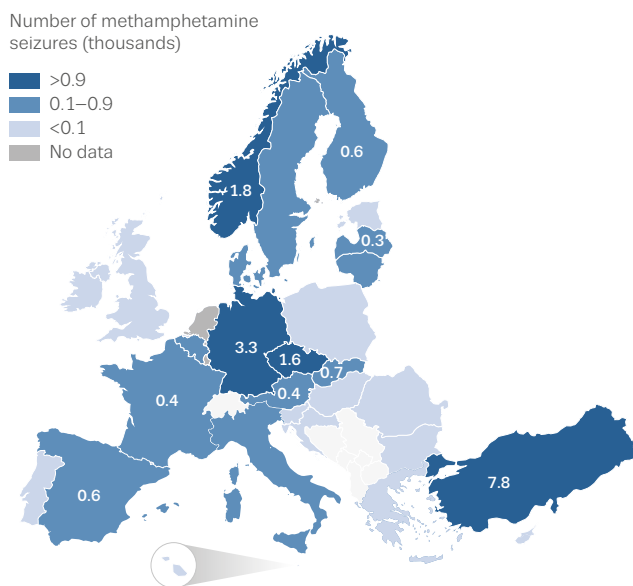
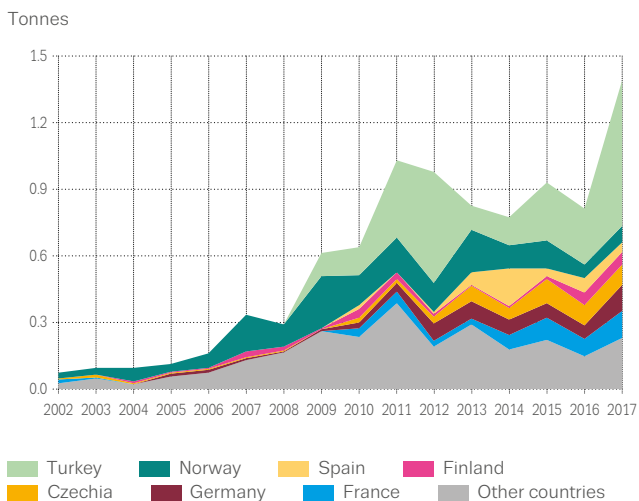
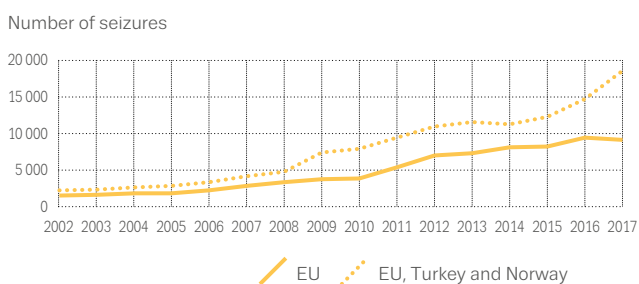
Intra-European trafficking of methamphetamine links the centres of production such as Czechia and the Netherlands to Member States with little or no methamphetamine production. As well as the road and rail networks, post and parcel services are increasingly being used to traffic methamphetamine across the European Union. The increase in parcel trafficking is likely linked to increased online trading in methamphetamine and other illicit drugs on darknet markets. Intra-European smuggling via passenger aircraft is thought to be largely absent, due to the intense screening that goes on at airports for the detection of explosives and other contraband. The situation with private aviation is less clear, however, it is reasonable to assume that trafficking of methamphetamine takes place in the context of polydrug trafficking using general aviation.

Seizures of methamphetamine and precursors

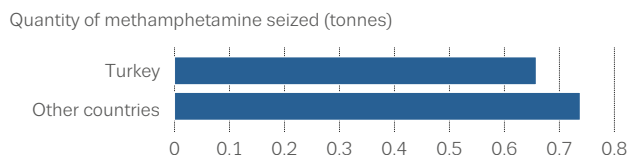
The number of seizures of methamphetamine has shown an overall upward trend since 2002 but with signs of stabilisation in recent years; the quantity seized has been increasing, albeit with some fluctuation, since 2009 (Figure 3). With 9 000 seizures amounting to 0.7 tonnes reported in the European Union in 2017, methamphetamine seizures are at much lower levels than those of amphetamine (35 000 seizures and 6.4 tonnes). In 2017, France (122 kilograms), Germany (114 kilograms) and Czechia (93 kilograms) seized the largest amounts in the European Union. In 2017, Turkey seized the largest quantity of methamphetamine in Europe (658 kilograms), a similar amount to that reported for the European Union and Norway (662 kilograms) (EMCDDA, 2019c).

Data collected by the European Commission regarding seizures of precursors in the European Union showed that in 2017, Member States seized 25 kilograms of ephedrine and 13 kilograms of pseudoephedrine in bulk powder form as well as 3 506 litres of BMK and 5 065 kilograms of APAAN. The trafficking of small quantities of certain chemical reagents to Member States that do not report production on their territories indicates that small-scale amateur production may take place in those Member States. In addition to these scheduled drug precursors, in 2017 more than 10 tonnes of APAA and 4 tonnes of glycidic derivatives of BMK were seized; these substances

FIGURE 3
Number of methamphetamine seizures and quantity seized: trends and 2017 or most recent year



NB: Number of seizures (thousands) for the 10 countries with highest values.



Source: EMCDDA, European Drug Report 2019: Trends and Developments

can be readily converted to BMK for amphetamine or methamphetamine synthesis and are not currently scheduled substances. Open source information monitoring continues to detect the interception of significant quantities of APAA: 1.4 tonnes in Luxembourg and 4.2 tonnes in the Netherlands at the end of 2017 and 2.5 tonnes in Bulgaria in 2018. The fact that greater quantities of non-scheduled substances than scheduled substances are seized confirms the recent trend of precursor substitution described in 'Current production methods in Europe' (page 10).

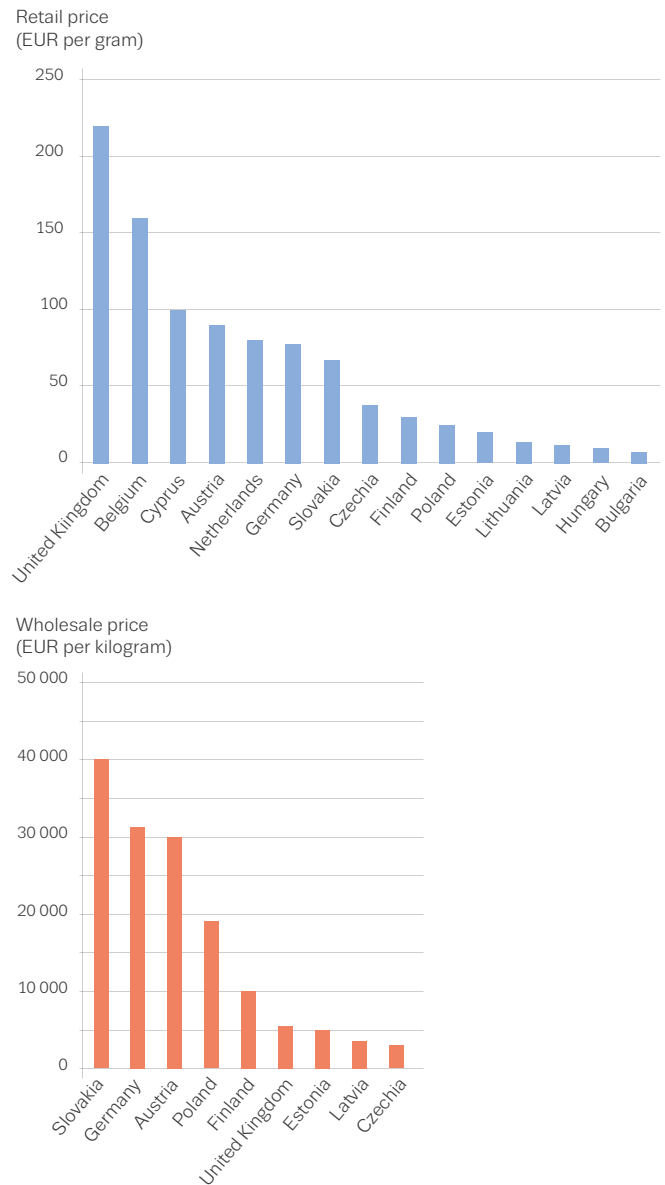
Turkey seems to have emerged recently as a producer of methamphetamine (see above), and it is an important transit country for various illicit commodities smuggled into the European Union including heroin and certain counterfeit goods. Methamphetamine originating from Iran and precursors such as ephedrine and pseudoephedrine from other source countries transit Turkey before reaching the European Union. Precursors are typically trafficked onwards to production centres in the European Union, while methamphetamine is often intended for trafficking to markets in Asia. EU Member States are also used as transit points for the trafficking of precursors. Large shipments of ephedrine and pseudoephedrine destined for different countries outside the European Union have been intercepted in the Netherlands.

Prices and purities

The average reported purity is usually higher for methamphetamine than for amphetamine, although the average may be inflated by the influence of the higher purity crystalline form. The prices for methamphetamine vary greatly across the European Union and even within individual Member States, at both the retail and wholesale levels, and methamphetamine in crystalline form commands higher prices than the powder form. Recent information suggests that the larger crystals of methamphetamine command premium prices. Among the 14 countries with information, the most commonly reported price for 1 gram of methamphetamine varied from EUR 7.5 in Bulgaria to EUR 160 in Belgium, with Czechia reporting EUR 37 and neighbouring Slovakia almost twice as much (EUR 65). Available data on the most common methamphetamine prices at the wholesale level indicate that prices per kilogram vary from about EUR 3 000 in Czechia to EUR 40 000 in Slovakia (Figure 4).

The retail price of methamphetamine tends to be lowest closest to centres of production. For instance, the price in Germany varies greatly across regions depending on their distance from Czechia, the primary source of methamphetamine consumed in Germany. The price of methamphetamine in urban centres such as Berlin can still be significantly higher than in surrounding areas. Overall, there is no clear picture on trends in methamphetamine prices across

FIGURE 4
Retail and wholesale methamphetamine prices in 2017, or the most recent year in countries providing data



Source: Source: EMCDDA and Europol

Europe, as the data available at present do not discriminate between crystalline and powder forms of the drug.

According to Australian law enforcement experts, the wholesale price of methamphetamine in Australia ranges from EUR 50 000 to EUR 170 000. Given these high prices, it is understandable that this market is seen as very lucrative by organised crime groups (EMCDDA and Europol, 2019).

Trafficking modi operandi

European law enforcement authorities have identified a number of modi operandi associated with the trafficking of

methamphetamine within Europe, particularly the use of couriers and the use of fast parcel and postal services for distributing small quantities.

Wholesale trafficking of methamphetamine

There is little information available regarding the trafficking of methamphetamine in large quantities across Europe. However, compared with other synthetic drugs such as amphetamine or MDMA, it appears to be marginal. Available information suggests that organised crime groups involved in the trafficking of methamphetamine from Czechia to neighbouring countries or to the Nordic countries have switched to trafficking larger consignments through couriers, instead of the formerly common practice of users travelling to Czechia to buy small quantities of the drug (Police of the Czech Republic, 2016).

The most common *modi operandi* associated with the trafficking of methamphetamine from the Netherlands include the use of couriers, shipments concealed in air freight or containers or the use of fast parcel and postal services. The latter method is associated with the sale of methamphetamine on online marketplaces.

Use of postal systems and parcel services

Some methamphetamine is trafficked to and via Europe in relatively small (under one kilogram) quantities, concealed in parcels and packages. The use of the postal system to traffic methamphetamine in this way is also linked to the trafficking of methamphetamine tablets (*yaba*) to the European Union from Southeast Asia to meet the limited demand among specific diaspora communities in the European Union originating from this region or to the distribution of the drug purchased on online marketplaces. More recently, small quantities of methamphetamine shipped mainly from the Netherlands by postal services have been seized in Austria (Groupe Pompidou, 2019). This may be related to online supply, such as via the darknet for demand in Austria, or in transit to other nearby consumer markets, for example in Czechia.

Online trade in methamphetamine

Like many other illicit drugs, methamphetamine is available on darknet markets. In the European Union, the share of methamphetamine traded between EU-based vendors and clients is small compared to other illicit drugs available. However, methamphetamine both in its racemic and crystalline *d*-form is available on these marketplaces.

The global nature of the larger darknet marketplaces also allows EU consumers to obtain methamphetamine from

suppliers based outside the European Union. There have been isolated cases of intercepted methamphetamine shipments trafficked using post and parcel services from production zones outside the European Union, e.g. Mexico, to destinations in the European Union. However, EU law enforcement authorities have repeatedly seized methamphetamine trafficked using post and parcel services transiting the European Union intended for destinations in Asia. The source regions for methamphetamine trafficked via the European Union include Central America, Mexico and Africa.

An analysis of drug advertisements on the darknet from January 2015 to August 2019 found that from the 283 000 listings identified, only 4 000 were for methamphetamine shipping from Europe. Most of the methamphetamine sold on the darknet in Europe is apparently shipped from Germany (38 %), the Netherlands (27 %) and the United Kingdom (13 %), and only a small proportion from Czechia (1 %).

In August 2019, a total of 181 active advertisements for methamphetamine shipping from Europe were found on Berlusconi (125), Empire (49) and Tochka (7) markets. By comparison, there were 1 922 listings for cocaine, 1 770 listings for MDMA and 961 listings for amphetamine during the same month. This indicates that methamphetamine is much less traded on the darknet than the other common stimulants found on the European drug market, reflecting the situation prevailing on offline markets and consumer preferences.

Organised crime groups

As has been highlighted throughout the report, various types of OCGs are involved in the production and distribution of methamphetamine in the European Union. This section draws together the information to provide an overview of OCG involvement. There is some information on the OCGs involved in the trafficking of methamphetamine via Europe and the role of some OCGs in the intra-EU trafficking of methamphetamine. However, there is no clear picture of the extent of organised crime involvement in the low-level distribution of methamphetamine in Member States with significant methamphetamine seizures. Some low-level distribution and production activities associated with the 'ant-smuggling' (little and often) method and small-scale production in kitchen-type laboratories appear to be organised primarily by methamphetamine consumers to supply small circles of users rather than by OCGs.

The large-scale production of methamphetamine is linked to organised crime networks featuring sophisticated structures for the acquisition of precursor substances, access to other chemicals and custom-made equipment and the distribution

of the final product. Small-scale production in Bulgaria is also linked to organised crime groups.

| Dutch OCGs

Dutch OCGs are well-known for their abilities to produce significant amounts of MDMA and amphetamine, however, they have access to resources and expertise to also engage in the large-scale production of methamphetamine. Methamphetamine produced by Dutch OCGs is mainly intended for export to Australia, Japan and New Zealand, although some is also exported to other EU countries. The extent to which Dutch OCGs cooperate with Mexican OCGs is not currently well understood, although their collusion is becoming increasingly apparent.

| Vietnamese OCGs

In addition to their prominent role in the production of methamphetamine in Czechia, Vietnamese OCGs are also involved in the trafficking and distribution of methamphetamine in several other EU countries as well as in a range of other criminal activities including cannabis production, the facilitation of illegal immigration and trafficking in human beings. These trafficking activities often rely on links between Vietnamese groups in the main countries of production and contacts among the Vietnamese diaspora communities in destination countries. In addition, Vietnamese OCGs in Czechia also use these contacts to procure medicines containing pseudoephedrine in other Member States for the production of methamphetamine. Associates of Vietnamese OCGs buy medicines containing ephedrine or pseudoephedrine in multiple pharmacies in countries where the production of methamphetamine typically does not take place. They then traffic these pharmaceuticals back to Czechia. It is suspected that some Vietnamese groups may exploit legal business structures, such as pharmacies, to obtain medicines containing ephedrine or pseudoephedrine and divert them for the production of methamphetamine.

Vietnamese OCGs have further increased their share of the methamphetamine production carried out in Czechia and they have also gradually increased their activities in Member States bordering Czechia over the last 3 years. They are increasingly involved in the production of methamphetamine in Slovakia and Poland and are more frequently involved in the trafficking and distribution of methamphetamine in Austria and Germany. Some links have also been discovered between the Vietnamese OCGs based in Czechia and methamphetamine production in the Netherlands.

| Nigerian OCGs

Nigerian OCGs are probably among the most prolific groups involved in the international trafficking of methamphetamine at global level. They smuggle methamphetamine to various markets including Japan and Australia. These countries are significant consumer markets for methamphetamine and have also been targeted by couriers originating from or travelling via Europe in the past. Over the past years, Europol has repeatedly noted an increase in the number of methamphetamine couriers originating from the European Union arrested in destination markets, particularly Japan. It is thought that these trafficking activities are primarily orchestrated by Nigerian OCGs, which have established global distribution networks for the trafficking of methamphetamine produced in West Africa (reporting to Europol). Nigerian groups rely on the use of non-Nigerian couriers in order to avoid border control checks based on risk profiles.

| Mexican OCGs

Mexican groups maintain large-scale laboratories and produce significant amounts of methamphetamine for the consumer market in the United States. They have substantial resources, knowledge and access to drug precursors trafficked to Mexico from countries outside the Americas. EU Member States have previously intercepted large shipments of drug precursors transiting the European Union and destined for Mexico. Over the past years, Mexican OCGs have shifted some of their methamphetamine production to other Central American countries such as Guatemala and Honduras. The ability to purchase methamphetamine directly from Mexico may increase the trafficking flow of methamphetamine in the direction of Europe, although this remains to be seen. The involvement of some Mexican nationals in methamphetamine production facilities dismantled in the Netherlands and Belgium in 2019 may be a sign that Mexican OCGs have started producing the drug in Europe, potentially for sale on the European market. However, while it seems likely that there is some degree of collusion between Mexican and Dutch OCGs, the information available at the time of writing does not make it possible to either confirm or deny that this is the case.

| Outlaw motorcycle gangs

Outlaw motorcycle gangs (OMCGs) maintain chapters across Europe and are involved in polydrug trafficking especially in the Nordic countries. It is likely that OMCGs are involved in the distribution of methamphetamine alongside other synthetic drugs in the Nordic countries. While Nordic OMCGs have not been linked to intra-European methamphetamine trafficking, they may procure methamphetamine from OCGs involved in trafficking and then distribute the drugs in their domestic markets.

Conclusion

Based on the findings presented here, it can be concluded that, after a period of relative stability, the threat posed to Europe from methamphetamine appears to be increasing. While slow and limited diffusion to neighbouring countries from the historic producing-region of Czechia is continuing, a number of new developments could rapidly become a cause for concern. Methamphetamine is increasingly present in the Nordic countries, particularly Norway where it is present on the amphetamine market. There have been some notable developments that are worthy of continued attention, such as those related to the availability of drug precursors and new alternative chemicals for the production of methamphetamine, the criminal groups involved in production and trafficking and the relatively recent innovation of supply via darknet markets. Europe's role in the supply of methamphetamine to countries outside the European Union relates mainly to the supply of large quantities to lucrative markets by synthetic drug-producing OCGs situated in or around the Netherlands. The involvement of Mexican nationals in methamphetamine production in the Netherlands and Belgium is particularly concerning.

Distinct patterns of methamphetamine use and different user populations are emerging in several regions of Europe, ranging from socially integrated users who snort or swallow the drug to marginalised users who inject or smoke methamphetamine.

The exchange of information and monitoring of methamphetamine markets in the European Union therefore remains an important activity. The analysis of drug residues in samples of municipal wastewater is a promising technique for monitoring the spread of methamphetamine use in Europe in a timely manner. In areas where methamphetamine is present in the drug market, law enforcement agencies are encouraged to continue to maintain an operational focus on it in order to limit its further spread.

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