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EMCDDA PAPERS

Drug precursor developments in the European Union

Abstract: MDMA, amphetamine and methamphetamine are produced in the European Union in illicit laboratories to satisfy the demands of European consumers, and in the case of MDMA in particular, increasingly to supply consumers in other regions of the world. To produce these illicit drugs, chemical starting materials called drug precursors are needed. These chemicals may also have legitimate uses, necessitating a regime of regulation at the global level to prevent their diversion for illicit use and thereby limiting the supply of illicit drugs. A set of EU regulations provide an implementing framework for precursor trade within the European Union and between the European Union and the rest of the world.

In order to avoid regulatory regimes, producers of illicit synthetic drugs have introduced alternative chemicals that are not listed in the precursor regulations. These chemicals, which are normally imported, are converted into drug precursors that are then used for synthetic drug production. Because alternative chemicals are not controlled, they are cheaper than drug precursors and can be traded with little risk of interdiction or heavy penalties. The emergence of these new substances is a serious challenge to the international precursor control system.

Keywords precursors amphetamine MDMA methamphetamine speed meth crystal meth ecstasy synthetic drugs BMK PMK P-2-P MDP-2-P EU regulations control measures pre-precursors designer precursors

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Introduction

The European Monitoring Centre for Drugs and Drug Addiction (EMCDDA) is involved in monitoring the illicit drug market in the European Union. When considering the illicit drug market a broad definition is used, encompassing the illicit production, trafficking, wholesale distribution and sale of illicit drugs to the end user. The drug market has wide-ranging impacts on both security and public health, and therefore such a holistic and systemic perspective is important for the effective delivery and monitoring of drug control policy and supply reduction activities. The availability of drug precursors has a direct impact on illicit drug production activities.

Apart from drugs that are used in their natural form, such as cannabis, or medicines diverted from legitimate supplies, the production of illicit drugs requires the use of chemicals either to facilitate their extraction from natural materials, or to form semi- or fully synthetic substances. Restricting the availability of those chemicals, the drug precursors, has been a key component of drug supply reduction efforts since the late 1980s. At global level, the prevention of diversion of drug precursors, solvents and reagents used for illicit drug manufacture is underpinned by the United Nations Convention Against Illicit Traffic in Narcotic Drugs and Psychotropic Substances of 1988 ('the 1988 UN Convention'). Under the 1988 UN Convention, the International Narcotics Control Board (INCB) has the responsibility to monitor Governments' control over drug precursors used in the illicit manufacture of drugs, and to assist them in preventing the diversion of those chemicals into the illicit traffic. In the European Union, competent authorities, typically the customs, police or health authorities in each Member State, are responsible for implementing the EU regulations on drug precursors. These entities work in close cooperation with industry in order to implement the European drug precursor regulations. Both the UN Convention and EU regulations are based on lists of substances that are subject to a variety of controls.

To circumvent the precursor control system, producers of illicit synthetic drugs have sought alternative chemicals that are not listed as drug precursors. Once imported, these substances can be transformed into drug precursors relatively easily. These alternative substances have been called 'pro-precursors' (King, 2009) 'pre-precursors' (EMCDDA, 2009) or 'masked precursors' (INCB, 2019). The reduced risk of interception (at least initially), the ability to import them without fear of sanctions and the lower price of the unregulated chemicals make this an attractive proposition for drug producers (Tops et al., 2018).

Scope of this report

The chemicals used for the production of the main synthetic drugs produced in the European Union — amphetamine, methamphetamine and MDMA — are the focus of this paper. Historically, these drugs were produced by chemically modifying starting materials, referred to as drug precursors. The effective control of the trade in these starting materials under precursor legislation caused the manufacturers to seek alternative chemicals and synthesis pathways for the production of these drugs (see Figure 1). In the past 10 or so years, a number of approaches have been used to produce synthetic drugs in the absence of easily diverted precursors. One approach involves producing the precursor from a non-controlled substance, for example BMK from APAA. Another approach relies on *N*-protected derivatives of drugs, non-controlled substances that can be converted into illicit drugs. For the purpose of this paper, the term alternative chemicals covers the wide range of substances variously referred to in both official and unofficial reports as 'designer precursor', 'masked precursor', 'pre-precursor' or 'masked drug'.

The next section explains how the precursors and alternative chemicals can either be 'scheduled' or 'non-scheduled', that is, included or not included in the lists contained in drug precursor regulations.

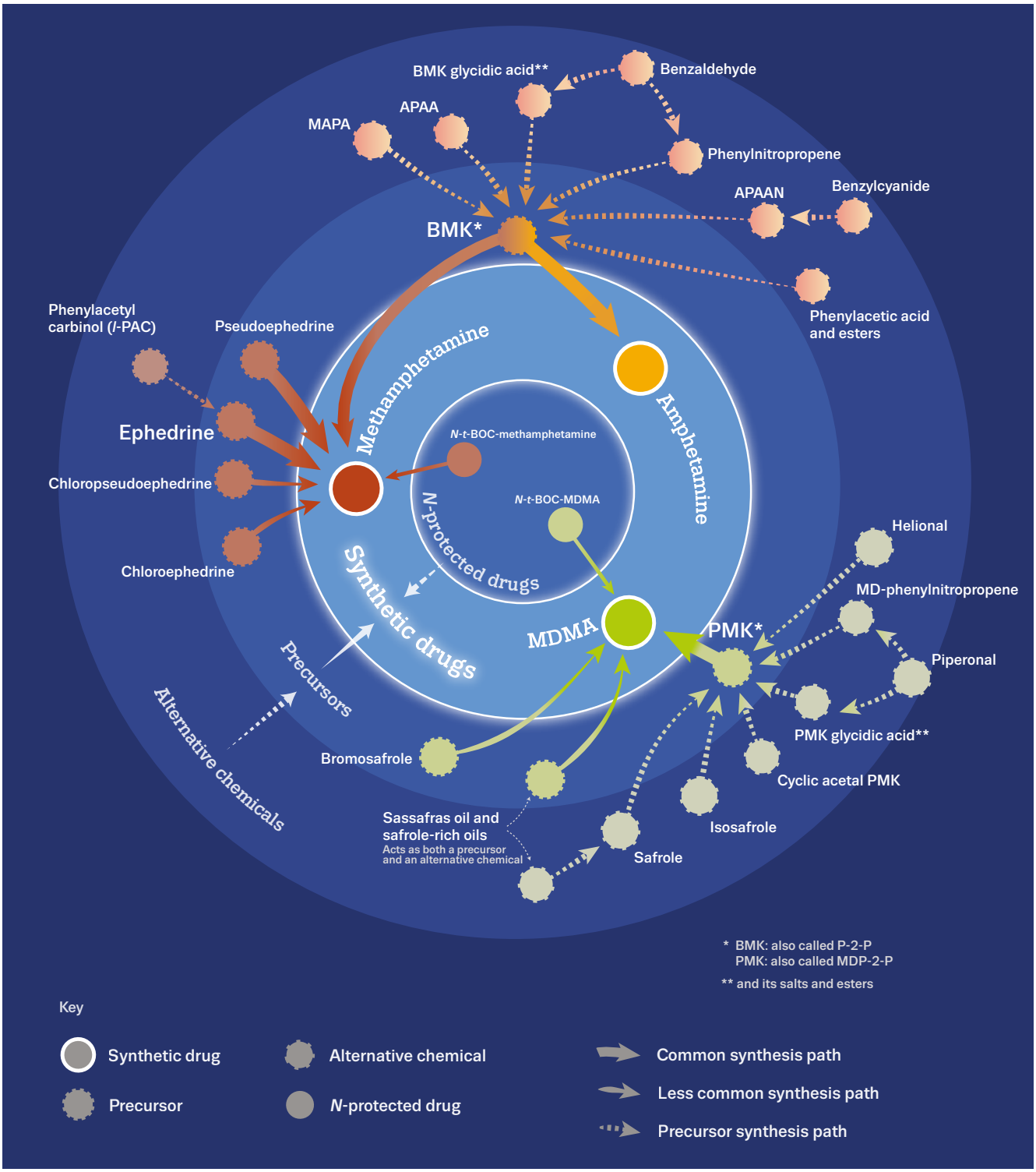
Regulation of drug precursors in the European Union

The European Union implements the 1988 UN Convention through two regulations of the European Parliament and of the Council. These are complemented with a number of Commission delegated and implementing regulations, which set out the provisions in detail. These regulations are directly applicable in the Member States. The delegated regulations may be amended after consulting the Group of Experts on Drug Precursors, which meets regularly and is composed of expert representatives from each EU Member State.

The regulations implement the 1988 UN Convention and are established to prevent the diversion of substances into illicit channels. This is an important point which will be further mentioned in the discussion.

Trade in drug precursors between the European Union and third countries is regulated through Regulation (EC) No 111/2005, as amended by Regulation (EU) No 1259/2013 (see consolidated version). The trade between EU Member States is regulated by Regulation (EC) No 273/2004,

FIGURE 1
Synthetic drugs, precursors and related chemicals: understanding the connections



amended by Regulation (EU) No 1258/2013 (see consolidated version). Each consolidated version contains an annex, listing the substances to which the regulations apply. European Commission delegated regulations place new substances under control measures by adding them directly to the regulations. Substances brought under control in this way include chloroephedrine and chloropseudoephedrine (precursors for methamphetamine) in 2016 and NPP and ANPP (precursors for fentanyl and derivatives) in 2018.

In addition, the regulations are supplemented by additional practical tools, such as 'Guidelines for economic operators' and e-learning courses for such operators and for customs authorities.

These regulations set out the procedures, working arrangements and limits for economic operators trading in drug precursors. The provisions include rules for obtaining and checking licences and registrations, statutory reporting obligations, import and export procedures, and the identification of anomalies or irregularities ('suspicious transactions').

Certain terms are defined in the EU regulations, including 'scheduled substance' and 'non-scheduled substance'. A scheduled substance is one that is contained in the annex of the regulations, including any mixtures or natural products (if the scheduled substance contained therein can be easily extracted), but excluding any medicinal products containing them (apart from those in category 4 of 111/2005). A non-scheduled substance is any substance which, although not listed in the annex, is identified as having been used for the illicit manufacture of narcotic drugs or psychotropic substances.

At international level, the 1988 UN Convention lists drug precursor chemicals in two tables. Table I contains substances which can be converted readily to controlled drugs or are essential for drug manufacturing, while Table II contains other chemicals such as solvents and reagents commonly used for drug processing. The substances listed in Table I are subject to more stringent controls than those in Table II. In the EU regulations, all of the chemicals in UN Tables I and II are broken down into four categories, described below. This four-tier categorisation system allows a greater flexibility in the application of controls, checks and monitoring, tailored to the needs of the European Union.

Category 1

This category contains the substances that are readily convertible to controlled drugs, and are subject to the strictest controls. Many of these are contained in Table I of the 1988 UN Convention.

Substance	UN Table	Typically used to make
1-Phenyl-2-propanone (BMK, P-2-P)	I	Amphetamine
3,4-Methylenedioxyphenylpropan-2-one (PMK, MD-P-2-P)	I	MDMA
4-Anilino-*N*-phenethylpiperidine (ANPP)	I	Fentanyl derivatives
Alpha-phenylacetoacetonitrile (APAAN)	I	Amphetamine
Chloroephedrine	–	Methamphetamine
Chloropseudoephedrine	–	Methamphetamine
Ephedrine	I	Methamphetamine
Ergometrine	I	LSD
Ergotamine	I	LSD
Isosafrol (cis + trans)	I	MDMA
Lysergic acid	I	LSD
N-acetylanthranilic acid	I	Methaqualone
Norephedrine	I	Methamphetamine
N-phenethyl-4-piperidone (NPP)	I	Fentanyl derivatives
Piperonal	I	MDMA
Pseudoephedrine	I	Methamphetamine
Safrole	I	MDMA

The stereoisomeric forms of the substances listed in this category not being cathine (also known as (+)-norpseudoephedrine), whenever the existence of such forms is possible. The salts of the substances listed in this category whenever the existence of such salts is possible and not being the salts of cathine.

Category 2

This category contains substances that are extensively used in the chemicals industry and which are also essential for drug processing (e.g. acetic anhydride and potassium permanganate for heroin and cocaine processing). These come from Table I or Table II of the 1988 Convention.

Substance	UN Table	Typically used to produce
Acetic anhydride (a)	I	Heroin
Phenylacetic acid	I	Amphetamine
Anthranilic acid	II	Methaqualone
Piperidine	II	Phencyclidine
Potassium permanganate	I	Cocaine

The salts of the substances listed in this category whenever the existence of such salts is possible.
(a) In Regulation No 273/2004 of the European Parliament and of the Council of 11 February 2004 on drug precursors, Category 2 is split in two subcategories, with acetic anhydride appearing in Category 2A and the others listed in Category 2B.

Category 3

This category contains the reagents and solvents typically used in drug processing found in Table II of the 1988 Convention.

Substance	UN Table	Typical use
Hydrochloric acid	II	Reagent
Hydrogen chloride	–	Reagent
Sulfuric acid	II	Reagent
Toluene	II	Solvent
Ethyl ether	II	Solvent
Diethyl ether	–	Solvent
Acetone	II	Solvent
Methylethylketone	II	Solvent

The salts of the substances listed in this category whenever the existence of such salts is possible and not being the salts of hydrochloric acid and sulfuric acid.

Category 4 (1)

This category relates specifically to medicinal products and veterinary medicinal products containing ephedrine, pseudoephedrine or their salts.

Substance	UN Table	Typically used to produce
Medicinal products and veterinary medicinal products containing ephedrine or its salts	–	Methamphetamine
Medicinal products and veterinary medicinal products containing pseudoephedrine or its salts	–	Methamphetamine

(1) Category 4 only exists in Regulation 111/2005 relating to extra-EU trade.

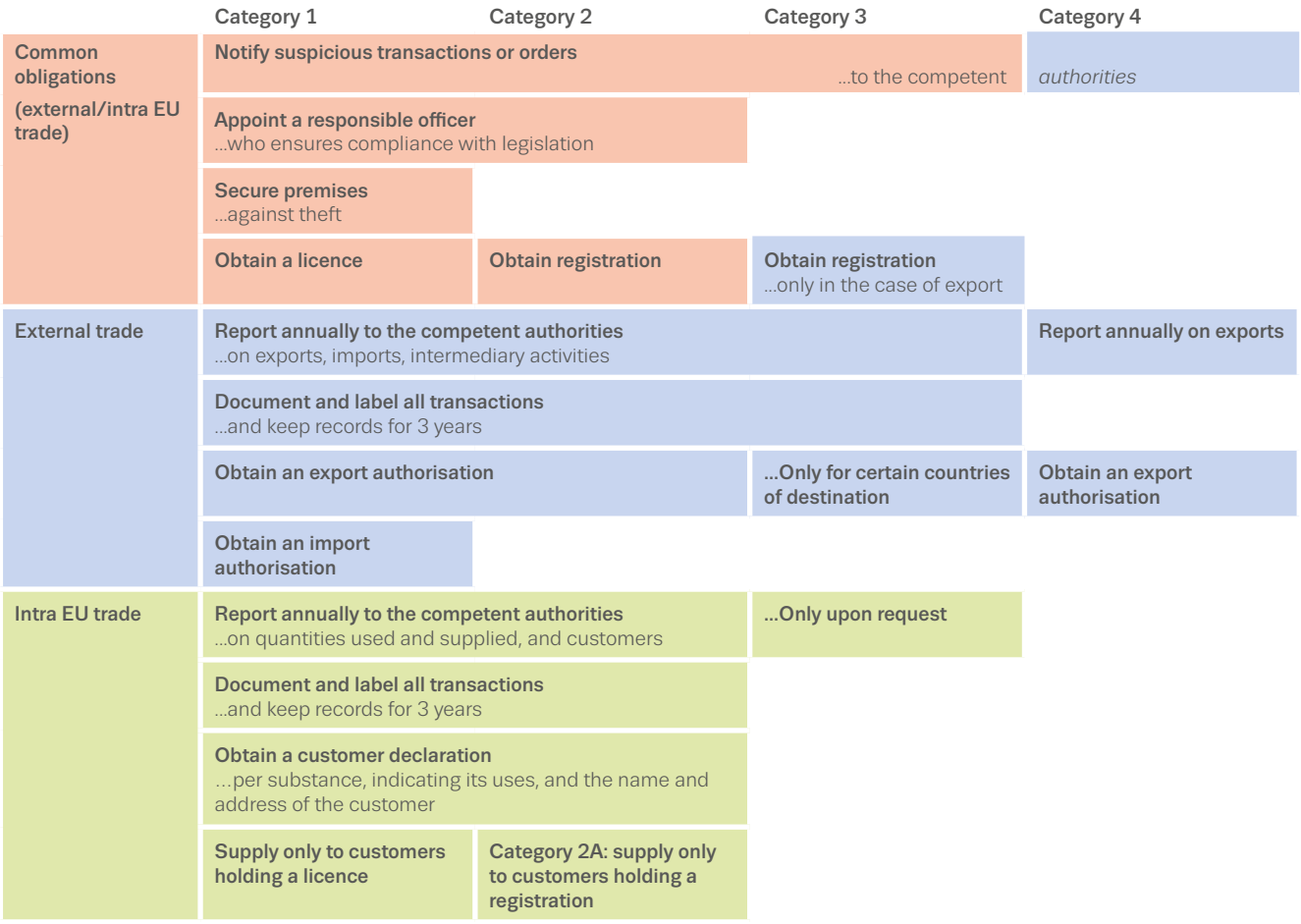
All of the substances contained on the UN lists are present in the EU lists, however, some additional chemicals are regulated in the European Union — these are chemicals not present in the UN lists that have been used in illegal drug manufacture in the European Union. Beyond the scheduled substance lists, the INCB maintains a limited international special surveillance list of non-scheduled substances. In the European Union, a 'voluntary monitoring list' is maintained by the European Commission. If necessary, the competent authorities of the EU Member States and the Commission may propose additions to the voluntary monitoring list in order to facilitate the identification of diversion attempts and respond rapidly to new trends.

The responsibilities of economic operators trading in drug precursors are summarised in a table of the 'Guidelines for operators' (see Figure 2) produced by the European Commission.

Economic operators play a key role in preventing the diversion of drug precursors and must facilitate the identification of suspicious transactions involving all scheduled substances; this is mandatory for categories 1 to 4, and voluntary and strongly recommended for non-scheduled substances. These provisions have proven to be effective in relation to scheduled substances, to the extent that the main substances used for making amphetamine and MDMA in the European Union (BMK and PMK) are rarely encountered. Voluntary cooperation offers the necessary flexibility to quickly respond to changing trends and patterns of diversion of drug precursors.

FIGURE 2

Obligations on economic operators in the European Union



Source: European Commission

International cooperation

Drug precursors are produced all over the world. It is therefore essential that efficient and effective international cooperation is implemented in order to prevent their diversion to countries where drugs are produced.

International cooperation on precursors is facilitated by two main online tools developed by the INCB. The first, known as the Pre-Export Notification Online ('PEN Online') system, was launched in March 2006 to facilitate the exchange of pre-export notifications by the country of export to the country of import. The second, launched in March 2012, is the Precursor Incident Communication System (PICS), which facilitates communication and information sharing on precursor incidents between national authorities in 110 countries. Around 35 000 pre-export notifications and 200-300 precursor incidents are communicated via these systems each year (INCB, 2019). Pre-export notifications may result in Member States preventing the supply of a chemical, if the competent authority in the receiving country is not convinced of the legitimacy of the order. This is known as a 'stopped shipment'.

In addition to the international framework of cooperation enshrined in the 1988 UN Convention, the European Union has established closer cooperation with some third countries by concluding bilateral agreements to prevent drug precursors' diversion through monitoring licit trade.

At present the European Union has agreements on 'cooperation regarding the control of precursors and chemical substances frequently used in the illicit manufacture of narcotic drugs and psychotropic substances' with 11 countries: Bolivia, Chile, China, Colombia, Ecuador, Mexico, Peru, Russia, Turkey, the United States and Venezuela.

Another avenue exists in Europe for technical cooperation on the topic of drug precursors. The Council of Europe's Pompidou Group hosts a drug precursors network which meets on an annual basis. This network brings together experts from law enforcement, competent authorities, specialised magistrates and representatives of the European Chemical Industry Council.

Precursors for synthetic drugs produced in the European Union

The main synthetic drugs produced in the European Union — amphetamine, MDMA and methamphetamine — are produced from the scheduled precursors, BMK, PMK, ephedrine and pseudoephedrine. This section describes the alternative routes to these precursors that have been reported in the European Union.

Routes to BMK

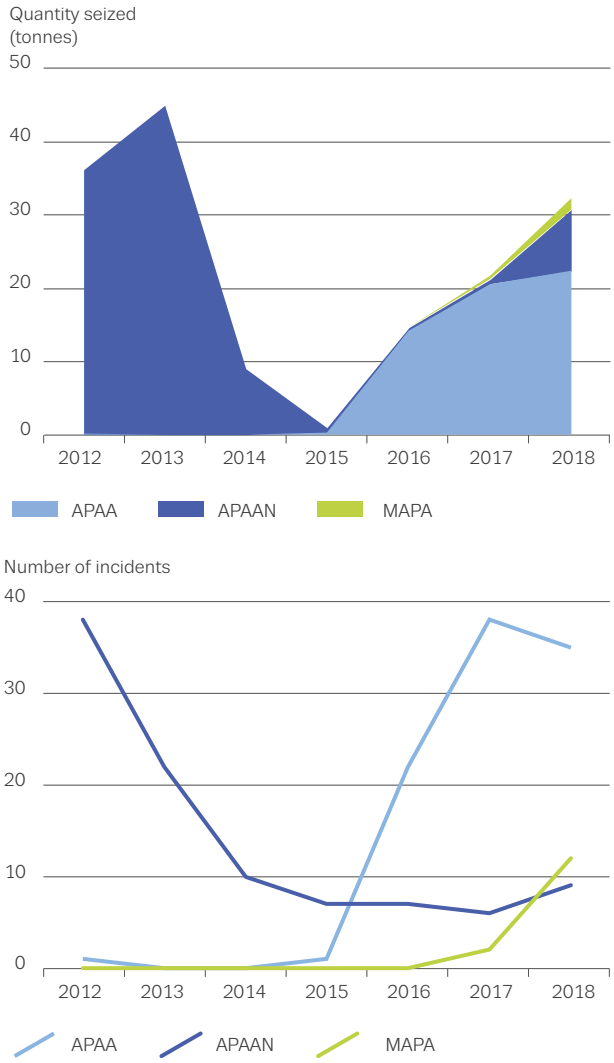
The concept of using alternative chemicals to make scheduled drug precursors has been known for some time. In Poland, three clandestine facilities manufacturing BMK from phenylacetic acid for sale to amphetamine manufacturers were dismantled in the 2000s (Krawczyk et al., 2009). In the European Union, perhaps the first recorded example of an alternative chemical being used in an illicit laboratory was in the Netherlands in 2008, when the 'bisulfite adduct' of BMK was detected. Such was the importance of this finding that in its annual report on precursors of 2009, the INCB urged governments globally to exercise vigilance with regard to the possible 'chemical masking' of scheduled precursors for illicit purposes (INCB, 2009). Since then, the situation has been continuously evolving, with controls being introduced on new substances often followed by the emergence of alternative chemicals, presenting challenges for detection and identification and frustrating drug supply reduction efforts.

Illicit laboratories converting APAAN into BMK were first detected in Europe in the 2009-11 period (Europol, 2011), with European seizures of APAAN amounting to well over 40 tonnes in 2013. APAAN was controlled in Europe in December 2013 and seizures for the next year fell to 11 tonnes. APAAN was subsequently placed in Table I of the 1988 UN Convention, effective from 6 October 2014. The response to this control was the emergence of APAA, a substance chemically related to APAAN (see Figure 3), which was first detected in Europe at the end of 2012 and found in so-called 'conversion labs' (places where precursor manufacture takes place) in the Netherlands in 2016. In 2017, a further development, possibly pre-empting the control of APAA was the appearance of MAPA (Figure 3). Between 2017 and August 2019 more than 10 tonnes of MAPA have been seized globally, mainly in the Netherlands. In March 2019, the Commission on Narcotic Drugs (CND) decided to add APAA to Table I of the 1988 Convention. In the same way APAA replaced APAAN to a certain degree when it was controlled, it is possible that MAPA could become the next alternative chemical of choice for producing BMK in Europe (see Figure 3).

Whereas APAAN was rapidly brought under control in the European Union and then internationally, the glycidic derivatives of PMK and BMK, which emerged in 2010 and 2012 respectively (INCB, 2013), have not yet been subject to control measures. They have been detected in illicit drug laboratories in the European Union since 2015. It is worth noting that the glycidic derivatives of BMK are less commonly encountered than the PMK equivalents, perhaps due to the availability of

FIGURE 3

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



Source: INCB (2019)

APAAN, APAA and then MAPA (INCB, 2019). The scheduling of APAA in the European Union is expected in 2020.

Routes to PMK

MDMA, commonly known as 'ecstasy' when found in the form of tablets, is produced primarily from PMK, which itself can be produced from piperonal and safrole (and safrole-rich oils). The global licit trade in PMK is almost non-existent. Legitimate trade of piperonal is known to be significant, whereas the licit trade in safrole and safrole-rich oils is considerably more limited. Since the 2000s, these chemicals have mainly been imported from Asia.

Seizures of safrole and safrole-rich oils and of PMK decreased considerably between 2008 and 2012, a period that coincided with the reduced availability of MDMA in Europe. While seizures of these substances in recent years have been uncommon, they have not completely disappeared; for example, more than 4 tonnes of PMK and almost 3 000 litres of safrole were seized in the Netherlands in 2017.

As mentioned earlier, PMK may be produced from alternative chemicals, such as glycidic derivatives of PMK and their salts and esters. Seizures of these substances were first detected in Europe in 2010, and for the first time found in illicit synthetic drug production laboratories in the Netherlands in 2015, perhaps as a result of the poor availability of safrole in the preceding years.

In 2014, during a survey by the INCB on the use of alternative chemicals, several governments mentioned a substance called 'helional' (2-methyl-3-(3,4-methylenedioxyphenyl)propanal), a precursor of MDMA and other similar substances. In May 2014, Dutch authorities reported a seizure of 800 litres of helional at a 'clandestine warehouse'; more than 500 kilograms of APAAN was also seized from the same site (INCB, 2015), indicating that precursor developments continued to evolve and careful and continuous monitoring was essential.

Seizure data confirm that, as noted above, the glycidic derivatives of PMK are the most common alternative substances used to produce PMK in the European Union.

In 2017, a seizure of '3,4-methylenedioxyphenylacetonitrile' was made in France. This substance is to PMK what APAAN is to BMK, clearly demonstrating the interplay between the alternative chemicals used to produce drug precursors for illicit drug manufacture.

The CND decided in March 2019 to add glycidic derivatives of PMK to Table I of the 1988 Convention (at the same time as the decision to control APAA).

Routes to ephedrine

Ephedrine and pseudoephedrine and are internationally controlled drug precursors. They are the main precursors used for production of methamphetamine in Czechia, Bulgaria, Germany, Poland and Slovakia. Production based on ephedrine and pseudoephedrine results in *d*-methamphetamine ('crystal meth' or 'ice'). Ephedrine and pseudoephedrine can be extracted from medicines, and some EU Member States such as the Czechia, and more recently Germany and Poland, have implemented national restrictions on the sale of such medicines. In these Member States, 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 ephedrine or pseudoephedrine is not restricted in all Member

States. This has given rise to the trafficking of such medicines from outside the European Union or from EU Member States with less restrictive sales regimes to Member States where methamphetamine production takes place.

In an apparently isolated case in Czechia in 2014, ephedrine was found to be produced via a novel method using *l*-PAC, which can be synthesised relatively easily from a specially modified yeast, dextrose and benzaldehyde.

Chloroephedrine is also a precursor for the production of *d*-methamphetamine. Multi-tonne quantities of this precursor were discovered during law enforcement operations in Czechia and Germany, also in 2014. Chloroephedrine is a chemical intermediate, produced as part of the methamphetamine synthesis process and has no licit use. Since July 2016, both chloroephedrine and chloropseudoephedrine have been scheduled as drug precursors in the European Union.

The alternative chemicals used to produce ephedrine do not seem to have gained traction in methamphetamine production in Europe, perhaps due to the availability of alternative substances or the rapid response from the regulatory system. However, these developments strongly suggest that illicit synthetic drug producers perform their own research and development activities in order to keep ahead of the regulations.

'Precursor-free' route

A recent and significant drug precursor development in the European Union is the use of non-scheduled substances that can be converted into illicit drugs without the need to involve the typical drug precursor at all. These are created by producing the drug and then making a derivative that is easily converted back to the drug. The number of these cases detected and reported to date has been low. Their existence, however, points to a concerning new and potentially important development in the precursor field. Although technically these substances may be considered as precursors, they are fundamentally different from all other precursors as they contain the full illicit drug molecule with a chemical group attached, rendering it a different chemical entity and therefore outside the international control regimes for illicit drugs and drug precursors. This is another example of innovative chemical development by illicit drug producers, using what are known in organic chemistry as protection/de-protection techniques. Using these techniques minimises the risks associated with the international trafficking of illicit drugs and drug precursors.

This method 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 readily 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 subsequently identified in China in 2015 and in New Zealand in January 2017, where it was found in a consignment imported from China (INCB, 2018). *N*-*t*-BOC-methamphetamine has not been detected in Europe (as of August 2019).

Such is the pace of change in this area that by the time this report is published, there may already be further developments and even more alternative substances and chemical innovations. There are several obvious alternative substances that could emerge in the near future, but these will not be speculated on here. Suffice to say, the EU retail synthetic drugs market is valued at more than EUR 1.5 billion (EMCDDA and Europol, 2019), and those involved in this trade are unlikely to stop their operations any time soon.

Discussion

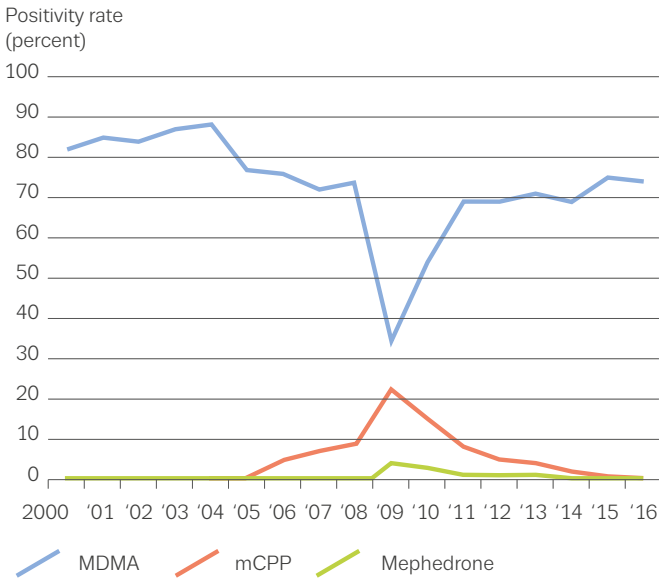
The enhanced level of information exchange and international cooperation arising from the introduction of PEN Online and PICS has been central to improving precursor diversion control globally. Particularly in relation to BMK and PMK, the drug precursor regulations have been effective at what they were designed to do: prevent diversion from legal to illegal channels.

In the past, a reduction in the availability of a particular precursor was sufficient to have an impact on the production of an illicit drug. An example of this is the significant reduction in the supply of MDMA at the end of the last decade, which coincided with a reduction in the availability of PMK and safrole around 2008 due to global precursor restriction efforts. Despite the success of this supply reduction effort, however, there were some unintended consequences: new psychoactive substances like m-CPP, BZP and to a lesser extent mephedrone replaced MDMA in a proportion of ecstasy tablets seized in the Netherlands during the same period (Figure 4).

As with any manufacturing industry, ensuring the availability of the raw materials needed in the illicit sector is key to business continuity. The strategy adopted by synthetic drug manufacturers to achieve this has been to introduce alternative chemicals that can be readily transformed into the scheduled substances needed to produce illicit drugs. A prominent example of this was the erratic availability of BMK in Europe between 2006 and 2009, which led to the introduction of APAAN (see below). Such innovation in production methods

FIGURE 4

Effects of restricted precursor availability on the content of ecstasy tablets in the Netherlands



Source: Netherlands Forensic Institute

introduces new levels of complexity into this sector of the drugs market. Moreover, since non-scheduled chemicals are less risky to traffic, they are cheaper, too. According to the Dutch Police, in 2017 the black-market price of a litre of good quality BMK from China was more than EUR 1 000, while with the price of a kilogram of APAAN from China was EUR 35-50. Each kilogram of APAAN yields approximately 350 millilitres of BMK, which meant that the effective cost of APAAN was around one tenth that of BMK.

A key factor that characterises the recent changes is that the alternative chemicals entering the market differ fundamentally from substances like BMK and PMK, which were diverted from licit trade. The new 'designer precursors' have no known legitimate uses and are made specifically to circumvent controls, often being produced by rogue companies. As such, most of the tools available under the current legal framework, such as the notification requirement for suspicious transactions and import/export authorisations, which are designed to prevent such diversion from licit supply, are not effective to counter the use of alternative chemicals in illicit drug manufacture.

Another negative consequence of the introduction of alternative chemicals to make scheduled drug precursors has been the additional levels of processing that must go on in the illicit drug production laboratories or in dedicated 'conversion labs'. This additional processing stage requires large amounts of additional chemical reagents and leads to the production of acidic waste, which is illegally dumped, entailing significant clean-up costs for authorities and land owners as well as causing damage to the environment (Claessens et al., 2019).

This is particularly evident in the main synthetic drug producing region of Europe in the Netherlands and Belgium.

On the one hand, it can be argued that the effectiveness of controls has been so profound that scheduled drug precursors have to a large extent been replaced by alternative chemicals for synthetic drug production, at least for the main illicit synthetic drugs produced in Europe. On the other hand, the prevention of diversion of drug precursors has the goal of reducing the availability of the illicit drugs and with synthetic drug production in Europe currently at a high level, it appears that the international drug precursor control regime is challenged by these developments. The ability of organised crime groups to introduce cheaper, non-scheduled alternative chemicals means that the current system of maintaining a list appears not to be sufficient to reduce the supply of illicit drugs. Recognising this issue, the European Union introduced two innovative changes in the EU precursor legislation, known as the 'catch all' provision and the 'fast-track' procedure.

The 'catch-all' provision, introduced at the end of 2013, allows Member States to prohibit the introduction of non-scheduled substances into the customs territory of the Union or their departure from it, where there is sufficient evidence that those substances are intended for the manufacture of illicit drugs. However, some Member States have reported some issues with its implementation.

The 'fast track' procedure was introduced at the same time and empowers the European Commission to add non-scheduled substance to the lists of scheduled substances by means of delegated acts. This is done when it is considered that voluntary monitoring by the industry is insufficient to prevent the use of a non-scheduled substance for the manufacture of illicit drugs. The 'fast track' procedure was used in the case of chloroephedrine and chloropseudoephedrine in July 2016, and NPP and ANPP (precursors used in the production of fentanyl and some of its derivatives) in February 2018.

At the time of writing this report, the European Commission is undertaking an evaluation of the precursor regulation regime in the European Union.

Conclusion

The effective implementation of drug precursor legislation in the European Union has driven innovation in the precursor trade, as avoiding controls is an important factor for producers and importers of these substances. Another important factor that may have contributed to the successful prevention of diversion of scheduled drug precursors, and hence driven innovation, has been the introduction of the improved online

tools, PEN Online and PICS. While authorities have become more connected, producers have reacted by circumventing the control regime, usually by research and development and often basic chemistry.

There is no indication that such developments will diminish in the coming years. In fact, the precursor arms race between regulators and illicit drug producers can only be expected to intensify as the system adapts and reacts to the emergence of new alternative substances. The current approach is constantly being challenged by this phenomenon, and a fundamental discussion on drug precursor control has started at EU and at global level. Fresh ideas about how to counter these issues are needed if synthetic drug production in the European Union and the rest of the world is to be addressed. As noted in this paper, the European Union is already taking proactive measures to address these issues and, furthermore, stands ready to contribute to international efforts to find a way forward.

Abbreviations of chemical names

ANPP	4-anilino-*N*-phenethylpiperidine
APAA	alpha-phenylacetoacetamide
APAAN	alpha-phenylacetoacetonitrile
BZP	benzylpiperazine
l-PAC	*l*-phenylacetocarbinol
m-CPP	meta-chlorophenylpiperazine
MAPA	methyl alpha-phenylacetoacetate
MDA	3,4-methylenedioxyamphetamine
MDMA	3,4-methylenedioxy-*N*-methylamphetamine
NPP	*N*-phenethyl-4-piperidone

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About the EMCDDA

The European Monitoring Centre for Drugs and Drug Addiction 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.

Related publications

EMCDDA

- *Synthetic drug production in Europe*, 2015

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