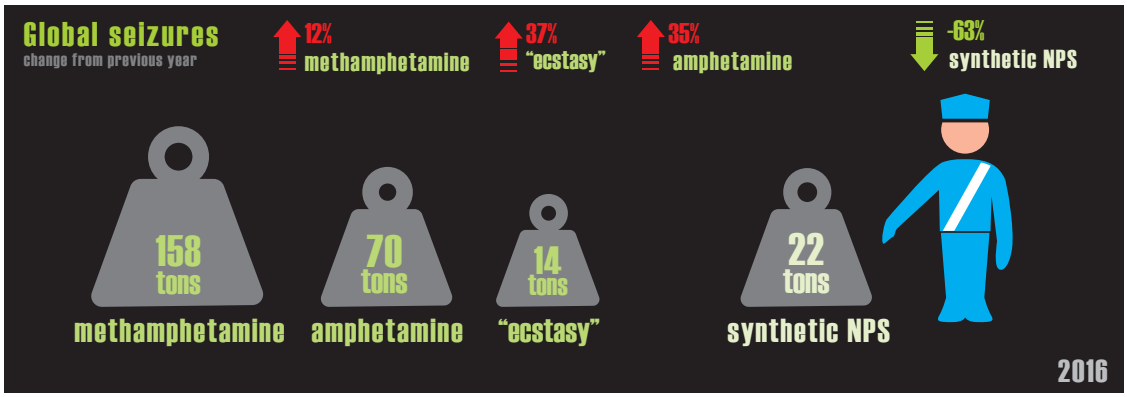
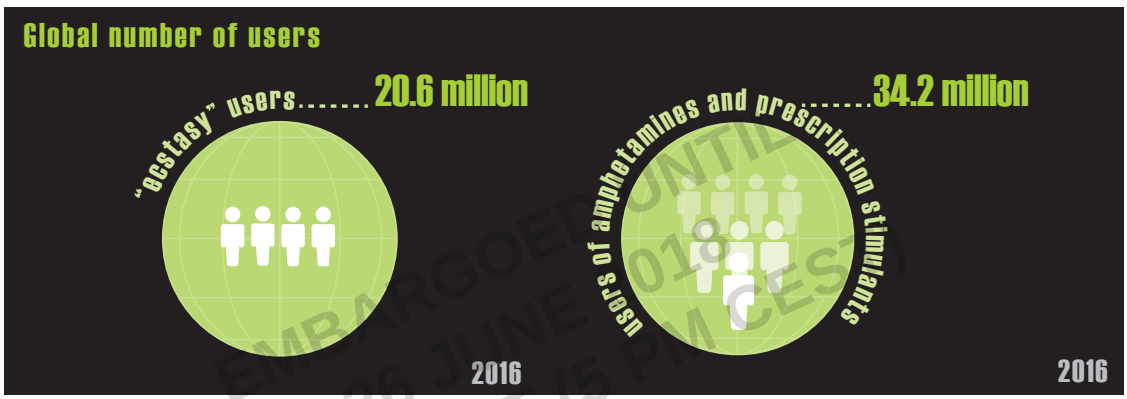
D. SYNTHETIC DRUGS





The present chapter contains a brief overview of a segment of the drug market that has grown in complexity in recent years. It encompasses both amphetamine-type stimulants (ATS), such as amphetamine, methamphetamine and "ecstasy", and new psychoactive substances (NPS).

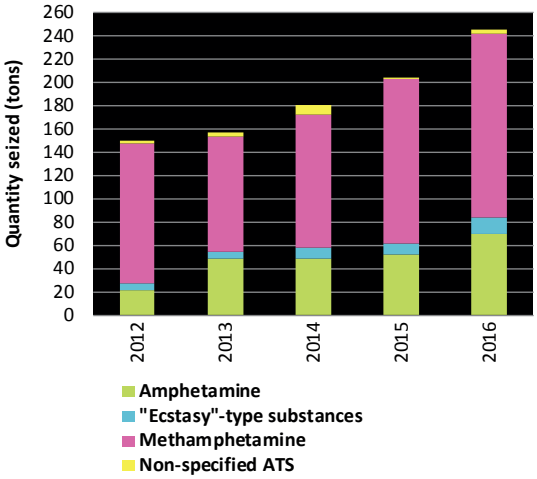
Amphetamine-type stimulants

The global market for ATS is characterized by a combination of ongoing trends and new challenges. The persistence of methamphetamine, as reflected in seizure, manufacturing and use statistics, continues, particularly in North America and East and South-East Asia, where crystalline methamphetamine is a growing concern. There continues to be a large market for "ecstasy" in Australia and New Zealand, while Western and Central Europe remain a trafficking hub for the substance. Recently, other new developments have been observed: synthetic drug markets have developed in South Asia, and there are indications that amphetamine trafficking and use may be expanding beyond established markets in the Near and Middle East/South-West Asia to countries in North Africa.

Significant increase in the quantity of amphetamine-type stimulants seized globally

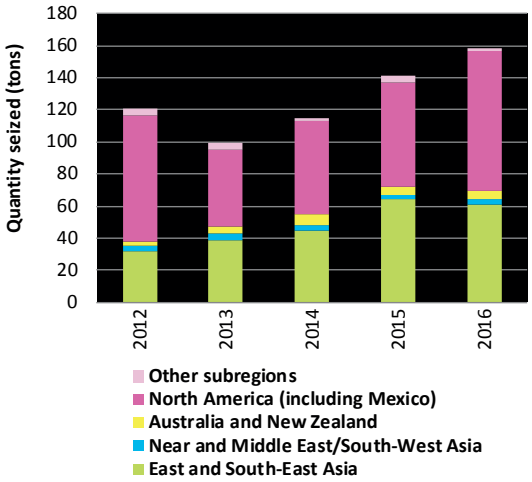
Seizures of all types of ATS have risen since 2015. The global quantity of ATS seized in 2016 increased by a fifth from the previous year, rising from 205 tons to 247 tons. Methamphetamine continues to account for the largest share of global quantities of ATS seized. In keeping with the upward trend in global methamphetamine seizures over the past few years, seizures continued to increase in 2016, to more than 158 tons. The global quantity of "ecstasy" seized almost tripled from 2012 to 2016, reaching 14 tons, and the global quantity of amphetamine seized also increased in 2016, to 70 tons, having remained at the 50-ton mark in the previous three years.

FIG. 1 Quantities of amphetamine-type stimulants seized worldwide, by type, 2012–2016



Source: UNODC, responses to the annual report questionnaire, 2012–2016.

FIG. 2 Quantities of methamphetamine seized worldwide, by subregion, 2012–2016



Source: UNODC, responses to the annual report questionnaire, 2011–2016.

Rise in global methamphetamine seizures continues

In 2016, the global quantity of methamphetamine seized increased for a fourth consecutive year. That year, 87 tons of methamphetamine were seized in North America, almost 26 tons more than the quantity of methamphetamine reported to have been seized in East and South-East Asia in 2016. Methamphetamine seizures continued to remain stable in Australia and New Zealand in 2016. It seems reasonable to assume that the increase in global methamphetamine seizure quantities in recent years is not only a result of increased law enforcement activities but also, in connection with other indicators, a reflection of the dynamic and growing market for methamphetamine.

East and South-East Asia and North America: the main markets for methamphetamine

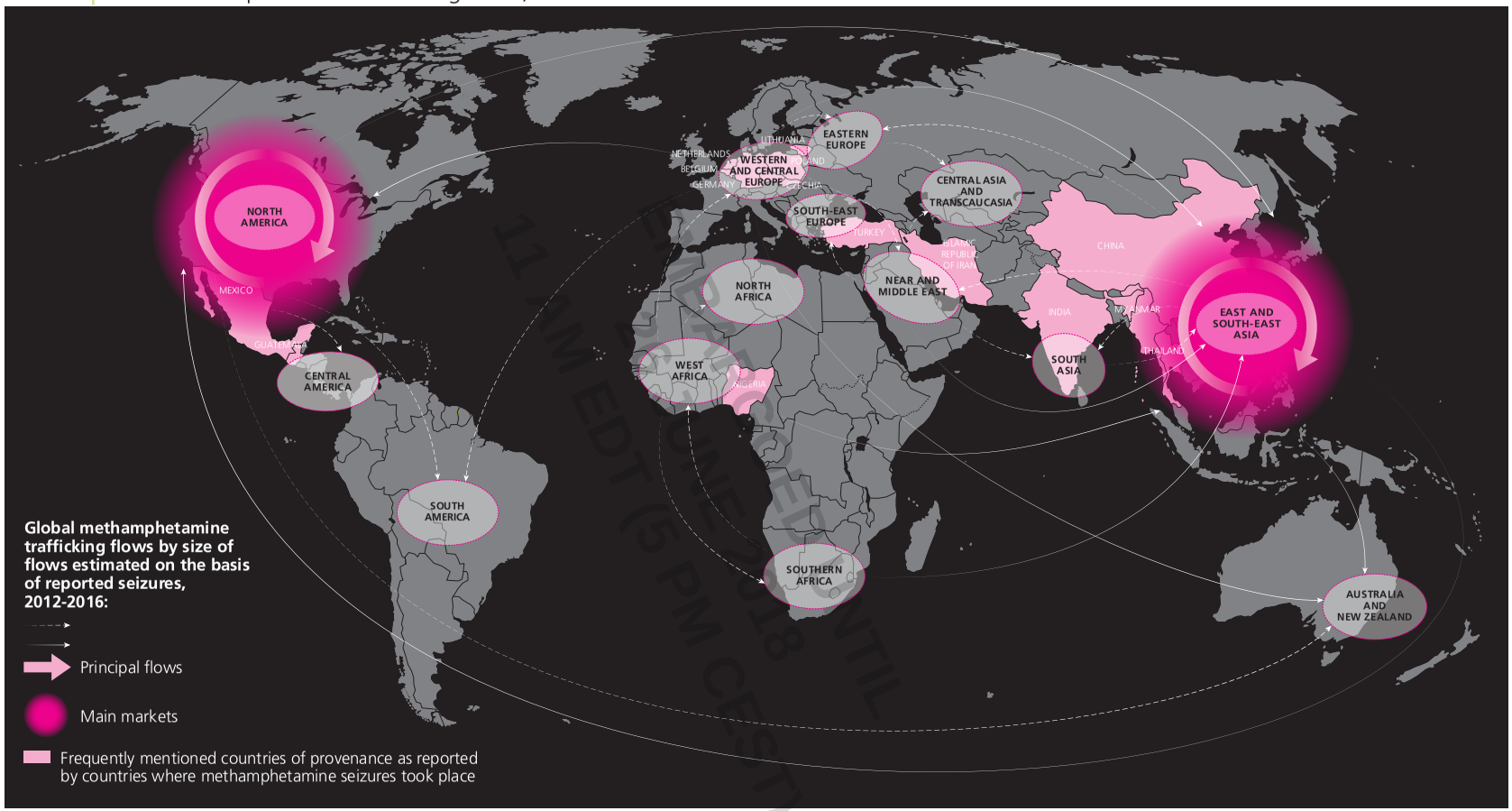
In an analysis of global trafficking flows based on seizure information, East and South-East Asia and North America emerge as the two core subregions for methamphetamine trafficking. Not only is methamphetamine trafficked extensively between countries within each of those subregions, but also most methamphetamine trafficked between regions is destined for countries in those two subregions. Additionally, a number of countries in Western and Central Europe, as well as India, Iran (Islamic Republic of), Nigeria and Turkey, have frequently been identified as the country of provenance of methamphetamine seized worldwide. Other subregions such as West, Central and Southern Africa appear to be transit areas for methamphetamine trafficking.

Crystalline methamphetamine: a growing market

Perceived increases in consumption and manufacturing capacity and increasing seizures point to a growing market for crystalline methamphetamine in North America, East and South-East Asia and Oceania. In East and South-East Asia and Oceania, methamphetamine has long been available in the form of both crystalline methamphetamine and methamphetamine tablets, but crystalline methamphetamine use has now become a key concern. Also called "crystal meth", "ice" or "shabu", crystalline methamphetamine is usually of much higher purity than the tablet form. Methamphetamine tablets, commonly known as "yaba" in East and South-East Asia, are small pills, typically of low purity, which in addition to methamphetamine often contain a large portion of caffeine, plus a range of adulterants.

In some countries in East and South-East Asia, health concerns relating to crystalline methamphetamine

MAP 1 | Main methamphetamine trafficking flows, 2012–2016

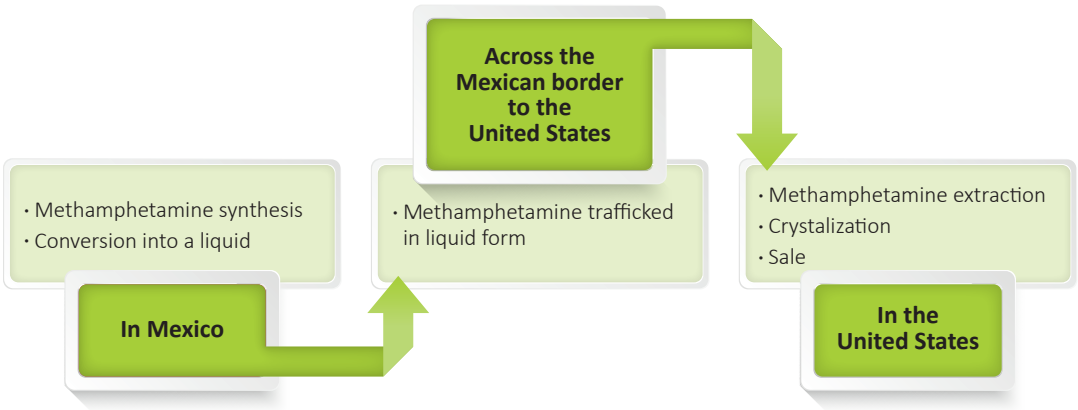


Sources: UNODC, responses to the annual report questionnaire and individual drug seizure database.

Notes: The size of the trafficking flow lines is based on the amount of methamphetamine seized in a subregion and the number of mentions of countries from where the methamphetamine has departed (including reports of "origin" and "transit") to a specific subregion over the period 2012–2016. The trafficking flows are determined on the basis of country of origin/departure, transit and destination of seized drugs as reported by Member States in the annual report questionnaire and individual drug seizure database: as such, they need to be considered as broadly indicative of existing trafficking routes while several secondary flows may not be reflected. Flow arrows represent the direction of trafficking: origins of the arrows indicate either the area of manufacture or the one of last provenance, end points of arrows indicate either the area of consumption or the one of next destination of trafficking.

The boundaries shown on this map do not imply official endorsement or acceptance by the United Nations. Dashed lines represent undetermined boundaries. The dotted line represents approximately the Line of Control in Jammu and Kashmir agreed upon by India and Pakistan. The final status of Jammu and Kashmir has not yet been agreed upon by the parties. The final boundary between the Republic of Sudan and the Republic of South Sudan has not yet been determined. A dispute exists between the Governments of Argentina and the United Kingdom of Great Britain and Northern Ireland concerning sovereignty over the Falkland Islands (Malvinas).

FIG. 3 | A reported strategy for trafficking methamphetamine from Mexico to the United States



Source: Diagram based on information reported by United States Drug Enforcement Administration, 2017 National Drug Threat Assessment (October 2017).

use are supported by treatment data. In Malaysia, for example, crystalline methamphetamine users accounted for 20 per cent of people receiving treatment for drug use, whereas in Brunei Darussalam, crystalline methamphetamine users accounted for almost all people (94 per cent) in treatment for drug use in 2015.[1]

Until recently, most crystalline methamphetamine seizures reported worldwide were in East and South-East Asia. After remaining stable for several years, crystalline methamphetamine seizures in East and South-East Asia almost tripled from 2013 to 2016, reaching 30 tons.[2] Overall, methamphetamine seizures have also increased significantly in the United States of America, from 30 tons in 2013 to 52 tons in 2016.

In North America, a trafficking strategy often employed by organized criminal networks to facilitate the concealment of shipments is to traffick methamphetamine in powder or liquid form from Mexico to the United States, where the substances are then converted to crystalline methamphetamine in so-called "conversion laboratories". Although the United States Drug Enforcement Administration reported that most of the conversion laboratories seized in the country in 2016 were located in California and other south-western states close to the Mexican border, conversion laboratories were also seized in Georgia, Kansas, Nevada, North Carolina and Oklahoma.[3] In 2013, more than 3 tons of liquid methamphetamine were reported to have been seized in Mexico.

Methamphetamine was perceived to be the second greatest drug threat in the United States after heroin in 2016, and its availability, as reported by law enforcement agencies in the country, increased between 2013 and 2016.[4]

Western and Central Europe: an international trafficking hub for "ecstasy"

The established markets for "ecstasy" have traditionally been in Europe, North America and Oceania, with large quantities of the drug being seized over the years. Data on dismantled facilities manufacturing "ecstasy", together with seizure statistics, suggest that Western and Central Europe has remained an international hub for the manufacture and trafficking of "ecstasy". According to the European Monitoring Centre for Drugs and Drug Addiction (EMCDDA) and the European Union Agency for Law Enforcement Cooperation (Europol), Belgium and the Netherlands are key countries for the manufacture of 3,4-methylenedioxymethamphetamine (MDMA) in Europe.[5] Seizures of "ecstasy"

1 Drug Abuse Information Network for Asia and the Pacific.

2 Drug Abuse Information Network for Asia and the Pacific.

3 United States, *Drug Enforcement Administration, 2017 National Drug Threat Assessment* (October 2017).

4 Ibid., *2016 National Drug Threat Assessment Summary* (November 2016).

5 EMCDDA and European Union Agency for Law Enforce-

originating in Western and Central Europe have frequently been reported by countries in the Americas, East and South-East Asia and Oceania. Recent surveys also indicate an overall increase in the use of "ecstasy" in Europe.[6]

After 2005, the global "ecstasy" market went through a change triggered by a shortage of MDMA. As demand for "ecstasy" continued unchanged despite the shortage, traffickers turned to other chemicals as an alternative to MDMA in order to satisfy the existing market.[7] However, following a period in which products sold as "ecstasy" contained little or no MDMA, "ecstasy" tablets containing high doses of MDMA have reappeared on the synthetic drug market. Although in Europe "ecstasy" is mainly available in tablet form, "ecstasy" in the form of powder or crystalline MDMA has also emerged in some European countries.[8]

High levels of "ecstasy" use continue to be reported in Oceania, and estimated past-year prevalence rates for "ecstasy" use in the region are among the highest in the world. Perceived increases in the use of "ecstasy" were reported in New Zealand in 2016, whereas in Australia the reported past-year use of "ecstasy"[9] among the population aged 14 and older decreased from 2.5 per cent in 2013 to 2.2 per cent in 2016.[10] Although "ecstasy" seizures in New Zealand have remained below 50 kg annually, seizures have increased significantly in Australia, to around 5 tons in 2016 from less than 1 ton in the previous year. Trafficking and manufacturing data suggest that the "ecstasy" consumed in the region is sourced through a combination of domestic manufacture and international supply networks. For instance, in 2015 and 2016 a total of 17 laboratories manufacturing MDMA were reported to have been detected in Australia, and another 18 were detected in 2014 and 2015. New Zealand last reported the discovery of two MDMA manufacturing laboratories in 2013.

New developments: amphetamine spreads to North Africa and North America

For many years, amphetamine dominated synthetic drug markets in the Near and Middle East and Western and Central Europe, but recent reports of increasing quantities being seized in North Africa and North America point to the growing activity in other subregions. While the reasons for a spike in the quantity of amphetamine seized in North Africa are not entirely clear, it may be related to the trafficking of amphetamine destined for the large market in the neighbouring subregion of the Near and Middle East. The large quantities of amphetamine seized in North America could be due to an expansion of domestic manufacture.

Taken together, seizure data, information on trafficking and expert perceptions reported by Member States on use trends point to a growing amphetamine market in the Near and Middle East. Expert perceptions in the Near and Middle East reveal a picture of mixed trends on amphetamine use, as some countries have reported increases in use for several years, while others have reported trends of stable or decreasing use. The only countries in the subregion where expert perceptions have consistently suggested an increase in amphetamine use are the Syrian Arab Republic (2013–2015) and Jordan (2014–2016). Although aggregate treatment data for amphetamine are not available for countries in the Near and Middle East, treatment data for Jordan show that people treated for ATS use were the second largest group of people treated for drug use in the country in 2015, after cannabis.

Quantities of amphetamine seized in the subregion of the Near and Middle East/South-West Asia more than doubled, from 20 tons in 2015 to 46 tons in 2016, and accounted for 65 per cent of amphetamine seizures worldwide in 2016. About 39 per cent of reported amphetamine seizures in that subregion, totalling 18 tons, were in Saudi Arabia. A further 14 tons of amphetamine were seized in Jordan that

ment Cooperation (Europol), *EU Drug Markets Report: In-Depth Analysis*, Joint Publications Series (Luxembourg, Publications Office of the European Union, 2016).

6 EMCDDA, *European Drug Report: Trends and Developments 2016* (Luxembourg, Publications Office of the European Union, 2016).

7 United Nations Office on Drugs and Crime (UNODC), "Understanding the synthetic drug market: the NPS factor", Global SMART Update, vol. 19 (March 2018).

8 Claudio Vidal Giné and others, "Crystals and tablets in the Spanish ecstasy market 2000–2014: are they the same or different in terms of purity and adulteration?" *Forensic Science International,* vol. 263 (2016), pp. 164–168.

9 "Ecstasy" tablets sold as ecstasy in Australia may contain substances other than MDMA.

10 Australian Institute of Health and Welfare, *National Drug Strategy Household Survey 2016: Detailed Findings*, chap. 5, 28 September 2017. Available at www.aihw.gov.au/reports/illicit-use-of-drugs/2016-ndshs-detailed/data.

South Asia: an emerging synthetic drug threat

There are strong indications that synthetic drug trafficking is expanding in South Asia. For example, although quantities of synthetic drugs seized have remained at low levels in India for a number of years, large quantities were reported in 2016, with seizures of 24 tons of methaqualone and 2 tons of amphetamine. In 2016, most amphetamine seized in India was considered to have originated within the country. Most amphetamine and the smaller amounts of "ecstasy" and methamphetamine seized in India in 2016 were reported to have been destined for the domestic market. The remaining amounts seized in the country were reported to have been destined for Malaysia and to a lesser extent the Netherlands, the United Kingdom of Great Britain and Northern Ireland, and Zambia.

Although there is no information available on methaqualone trafficking in India for 2016, the 0.2 tons of methaqualone seized in that country in 2015 were reported to have been destined for countries outside South Asia, such as Malaysia, the United Republic of Tanzania and Zambia. A small number of methamphetamine laboratories were also reported to have been dismantled in India in 2011, 2014 and 2015. In 2016, the country reported the dismantling of two amphetamine laboratories and, for the first time, a mephedrone laboratory. The diversion of pharmaceutical preparations containing ephedrine or pseudoephedrine indicates the risk of illicit synthetic drug manufacture, and India reported seizures of more than 10 tons of ephedrine and 8.5 tons of pseudoephedrine in 2016.[a]

In 2015, Bangladesh reported seizures of almost 2 tons of methamphetamine tablets, which were reported to have been destined for the domestic market and trafficked from Myanmar. Previously, the country had reported the seizure of 3 tons of methamphetamine tablets in 2013.

[a] *Precursors and Chemicals Frequently Used in the Illicit Manufacture of Narcotic Drugs and Psychotropic Substances: Report of the International Narcotics Control Board for 2016 on the Implementation of Article 12 of the United Nations Convention against Illicit Traffic in Narcotic Drugs and Psychotropic Substances of 1988* (E/INCB/2016/4).

year, and large amounts of seizures were also reported by the United Arab Emirates (6 tons), Pakistan (4 tons), Lebanon (2 tons) and the Syrian Arab Republic (1 ton). Trafficking reports show that in that subregion, amphetamine is mostly trafficked between countries within the region and, as in previous years, most of the amphetamine seized in the subregion was considered to have originated in Lebanon and the Syrian Arab Republic. Countries such as Saudi Arabia and the United Arab Emirates were the countries most frequently reported as destination countries for amphetamine seized in the subregion in 2016. However, recent seizure reports indicate that countries in North Africa and Asia are also connected to the trafficking routes in the Near and Middle East. It remains to be seen whether these new reports of amphetamine trafficking from outside the subregion indicate the development of new routes.[11]

Recently, large amounts of amphetamine seizures have been reported in North Africa, with more than 6 tons reported in Egypt in 2016 and another 2 tons in 2015, as well as another 0.5 tons reported in Sudan in 2016. Information on the domestic availability of amphetamine in those countries is not available. However, limited data on synthetic drug trafficking, taken together with the geographic proximity of the Near and Middle East, suggest that seizures in Egypt and Sudan could be the result of a growing trafficking connection between North Africa and countries in the Near and Middle East. For instance, in 2016, Egypt was reported to be the intended destination of amphetamine seized in Jordan, while amphetamine seized in the Syrian Arab Republic was reported to have been destined for the Sudan and Egypt. So far, it remains unclear whether amphetamine seizures in North African countries are the result of isolated incidents or whether they are representative of a wider trend.

Amphetamine seizures have been reported in all countries of North America, including Mexico. However, amphetamine seized in the United States accounts for the majority of amphetamine seizures in that subregion and constituted a 6 per cent share of the total quantity of amphetamine seized worldwide in 2016. In 2016, amphetamine was trafficked both into and out of the United States from countries in various subregions, including Central America, Western and Central Europe, East and South-East Asia and New Zealand. Within North

11 For a more detailed analysis of amphetamine trafficking to and from countries in the Near and Middle East, see *World Drug Report 2017*.

America, amphetamine seized in Canada and in Mexico in 2016 was also reported to have departed from the United States. Use data for the United States do not indicate a growing market for amphetamine in the country; however, the large number of amphetamine laboratories dismantled from 2011 to 2015 suggests sizeable domestic amphetamine manufacture. Data on amphetamine manufacture for 2016 are not available, but the United States reported the dismantling of several amphetamine laboratories in 2015, 1 of industrial scale, 7 of medium scale and 34 of either small or kitchen scale. In 2014, the country had reported the dismantling of 62 amphetamine laboratories, 10 of which were of industrial scale.

New psychoactive substances

Following the emergence of hundreds of new psychoactive substances (NPS), the range of psychoactive substances available on the market has probably never been greater. NPS are marketed in many different ways and forms, their use is observed among many different groups, and the patterns of their emergence and persistence show significant differences between countries and regions. The effects of some NPS on the human body are not yet fully understood: safety data regarding their toxicity are often unavailable, and their long-term side effects are not known. This situation poses additional challenges for identification, prevention, treatment and control efforts. Although the global NPS market is extremely diverse, only a few substances seem to have established markets of their own or replaced traditional drugs, but the harm caused by their use remains considerable. Some single substances have become cemented in niche markets, specifically among small and vulnerable population groups, while others have penetrated the existing established markets of controlled substances, increasing the complexity of the offer of products in the market. The global analysis of NPS in this chapter includes ketamine, which differs from other NPS in that it is widely used in human and veterinary medicine, whereas most NPS have little or no history of medical use. To ensure comparability with figures presented in previous editions of the *World Drug Report*, the analysis also includes substances that have come under international control since 2015, unless stated otherwise.

New psychoactive substances: facts and figures

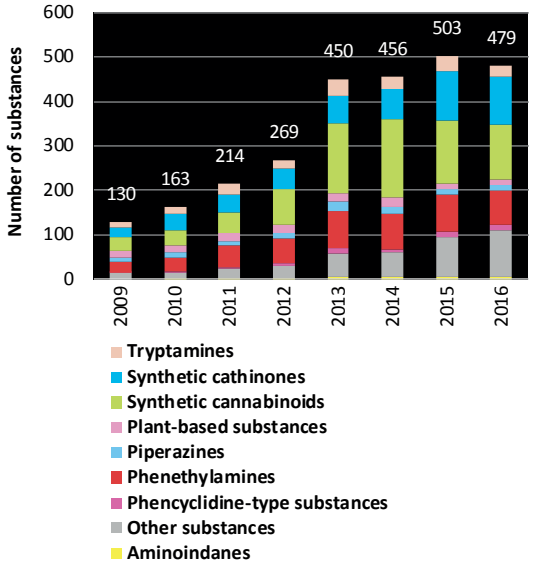
The global NPS market continues to be characterized by the emergence of large numbers of new substances belonging to diverse chemical groups. From 2009 to 2017, 111 countries and territories reported a cumulative total of 803 individual NPS.[12] Since the United Nations Office on Drugs and Crime (UNODC) began monitoring NPS in 2009, the number of NPS reported annually increased year on year until 2015, but seems to have stabilized since.

Among all NPS reported to UNODC by the end of 2017, synthetic cannabinoids constitute the largest category in terms of the number of different substances reported (251 substances), followed by the categories of "other substances" (155), synthetic cathinones (148) and phenethylamines (136). Only a comparatively small number of tryptamines, piperazines, aminoindanes and plant-based NPS are reported annually. The category of "other substances", which includes structurally diverse substances, has grown considerably, especially since 2014, totalling 155 substances by the end of 2017. This category includes NPS-derivatives of prescription medicines, including fentanyl analogues and derivatives of benzodiazepine.

Since UNODC global monitoring of NPS started in 2009, more than a quarter of the countries and territories reporting NPS have identified more than 100 different substances. At the same time, just under a quarter of all countries and territories reporting NPS have reported only one substance, which may be attributable to limited technical capacity for identifying NPS. The substances reported by the largest number of countries and territories include ketamine, khat, JWH-018, methylone, 4-methylmethcathinone, 25I-NBOMe, 5F-APINACA and AM-2201, which were each reported by at least 47 countries. With exception of ketamine and khat, all of those substances were placed under international control between 2015 and 2017.

12 UNODC, early warning advisory on new psychoactive substances, 2017. UNODC would like to thank EMCDDA, the International Narcotics Control Board and the World Customs Organization for making available information on NPS to the early warning advisory on new psychoactive substances.

FIG. 4 Number of new psychoactive substances reported annually, 2009–2016



Source: UNODC, early warning advisory on new psychoactive substances.

Emergence of new psychoactive substances: some stay, some disappear

The NPS market continues to be dynamic. New substances continue to emerge, with some establishing themselves on the market and others disappearing after a short time. In 2016, 72 NPS were reported for the first time, a much smaller number than in 2015 (137 NPS). About 70 of the 130 NPS reported at the start of UNODC global monitoring in 2009 have since been reported every year to date. While this persistence does not necessarily indicate widespread use, it suggests that some NPS seem to have established themselves on the drug market. Several of these persistent NPS were placed under international control after 2015. On the other hand, about 200 NPS reported between 2009 and 2014 were no longer reported in 2015 and 2016 and may have disappeared from the market, although this is difficult to determine given the complexity of NPS identification in many parts of the world.

4-fluoroamphetamine establishing a niche market

The stimulant 4-fluoroamphetamine (4-FA) is an example of an NPS that seems to have established itself on the drug market in some countries. In the Netherlands, from 2007 to 2009, when the availability of MDMA, the main component of "ecstasy" tablets, decreased, 4-FA was mainly sold as "amphetamine" or "ecstasy". This changed after the MDMA and amphetamine markets rebounded[13] and 4-FA established its own niche market in the Netherlands among users who reportedly preferred 4-FA over MDMA for its specific psychoactive effects.[14] The use of 4-FA reportedly produces the desired entactogenic effect, which is perceived to be less intense than that of MDMA and have a reduced tendency to cause confusion, changes in perception and dizziness. Similar to MDMA, 4-FA is typically consumed at music-related events such as festivals, dance parties, clubs and after-parties. The use of 4-FA is related to several adverse events including death, cerebral haemorrhage, myocardial infarction, acute heart failure, hypertension and tachycardia.[15] There are indications that the use of 4-FA may have increased in other European countries, such as Denmark, Germany and Spain.[16]

Most new psychoactive substances are stimulants but other effect groups are growing

Grouped by their main pharmacological effect, the largest portion of NPS reported since UNODC monitoring began are stimulants, followed by synthetic cannabinoid receptor agonists and classic hallucinogens. Smaller effect groups such as opioids,

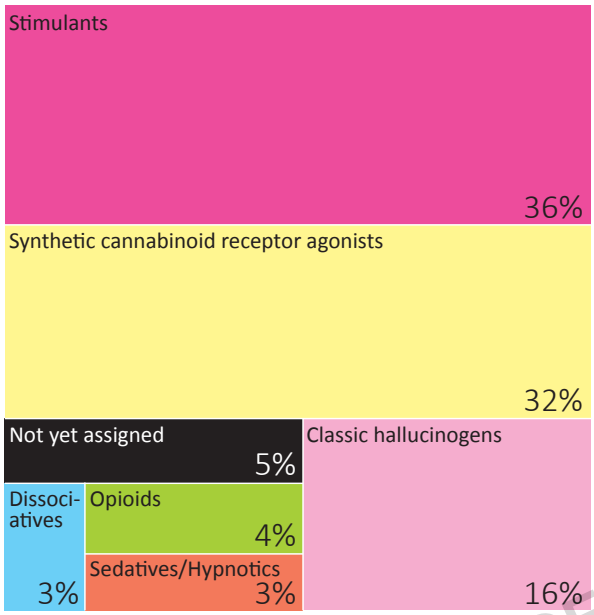
13 *World Drug Report 2017*: Market Analysis of Synthetic Drugs—Amphetamine-type Stimulants, New Psychoactive Substances (United Nations publication, Sales No. E.17.XI.10).

14 Felix Linsen and others, "4-Fluoroamphetamine in the Netherlands: more than a one-night stand", *Addiction*, vol. 110, Nr. 7 (2015).

15 Laura Hondebrink and others, "Fatalities, cerebral hemorrhage, and severe cardiovascular toxicity after exposure to the new psychoactive substance 4-fluoroamphetamine: a prospective cohort study", *Annals of Emergency Medicine*, vol. 71, No. 3 (2018).

16 Claudio Vidal Giné, Iván Fornís Espinosa and Mireia Ventura Vilamala, "New psychoactive substances as adulterants of controlled drugs. A worrying phenomenon?" *Drug Testing and Analysis*, vol. 6, Nos. 7 and 8 (2014); Sys Stybe Johansen and Tina Maria Hansen, "Isomers of fluoroamphetamines detected in forensic cases in Denmark", *International Journal of Legal Medicine*, vol. 126, No. 4 (2012); J. Röhrich and others, "Detection of the synthetic drug 4-fluoroamphetamine (4-FA) in serum and urine", *Forensic Science International*, vol. 215, Nos.1-3 (2012).

FIG. 5 Proportion of new psychoactive substances, by psychoactive effect group, December 2017



Source: UNODC, early warning advisory on new psychoactive substances.

Note: The analysis of the pharmacological effects comprises NPS registered up to December 2017. Plant-based substances were excluded from the analysis as they usually contain a large number of different substances, some of which may not have been known and whose effects and interactions are not fully understood.

dissociatives and sedatives/hypnotics have grown over the past few years, in proportional terms, at the expense of synthetic cannabinoids and classic hallucinogens. The number of NPS in each group and their growth does not necessarily indicate their scope of use and/or magnitude of threat to public health. This is demonstrated by NPS with opioid effects, which, albeit small in number, have been associated with a growing number of often fatal overdose events in recent years.[17]

Decreasing quantities of synthetic new psychoactive substances seized

Analysing trends in synthetic NPS seizures by looking at aggregate quantities seized, for example, is challenging because of the many different forms in which they appear. Five grams of an NPS may constitute less than 10 doses or several tens of thousands of doses, depending on whether the seized material consists of an NPS sprayed on herbal material or of an NPS in the form of a powder of high purity with potent effects even at the microgram level. Analysis of NPS seizures is also limited by the fact that most substances are not under national or international control and therefore may not be seized and/or reported systematically to UNODC. Quantities of NPS seized may also not reflect their availability, since detecting them represents a challenge to law enforcement authorities, one reason being that international trafficking mostly occurs in small quantities and via postal mail.

As seizures of ketamine, as well as of khat and kratom, are discussed later in this chapter, the analysis below focuses on synthetic NPS other than ketamine and plant-based substances.

Quantities of synthetic cannabinoids have dominated global seizures of synthetic NPS since 2012. The number of countries reporting seizures of synthetic cannabinoids has been relatively stable, but the quantities reported have declined sharply since 2014. However, in 2016, large quantities of synthetic cannabinoids were seized by the United States (5 tons), the Russian Federation (0.7 tons) and Turkey (0.6 tons).

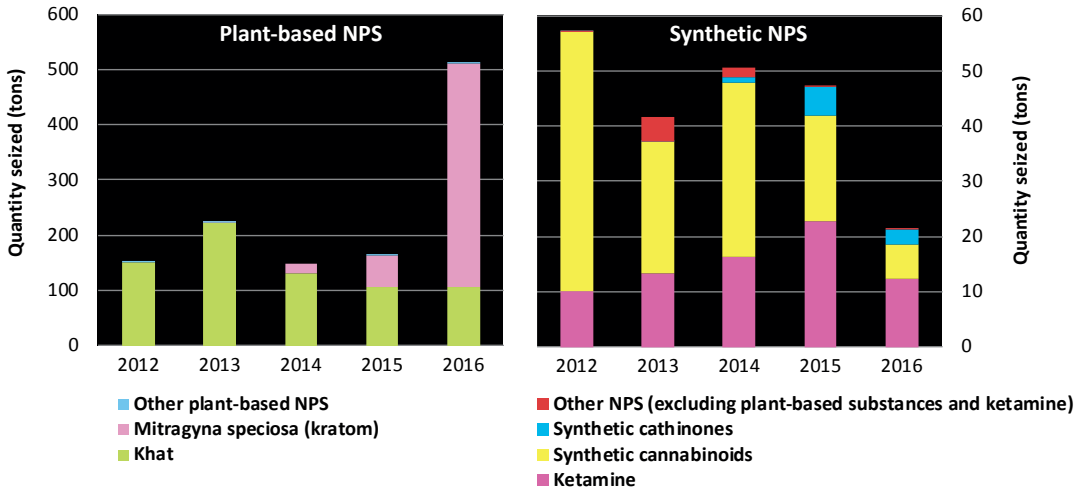
In terms of synthetic cathinones, the number of countries and territories reporting seizures and the quantities seized have actually increased, and synthetic cathinones constituted 30 per cent of global seizures of synthetic NPS (excluding ketamine) by weight in 2016. The Russian Federation (2 tons), Hong Kong, China (0.2 tons) and Belgium (0.1 tons), in particular, reported large quantities of synthetic cathinone seizures in 2016.

The analysis of NPS seizure data across countries is complex due to the large number of different substances involved and the variety of NPS products available, which often contain more than one psychoactive substance. According to 2014–2015 seizure data submitted to UNODC by seven Member States,[18] the type of NPS seized varied greatly from one year to another. Among NPS seized, the proportion of substances that were seized in both years analysed (2014 and 2015) ranged from

17 For more information on this topic, see booklet 2 of the present report.

18 UNODC, responses to the 2016 questionnaire on new psychoactive substances submitted by Australia, Belgium, Estonia, Finland, Sweden, Turkey and the United Kingdom. The reporting years for seizures were 2014 and 2015.

FIG. 6 | Annual quantities of new psychoactive substances seized globally, 2012 to 2016



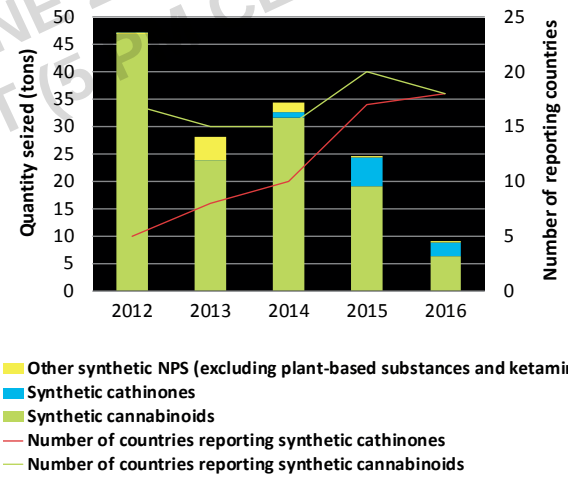
Source: UNODC, responses to the annual report questionnaire, 2012–2016.
Note: Figures include ketamine and plant-based NPS.

a low 12 to 27 per cent per country. That rather small overlap of similar substances from one year to the next highlights the highly dynamic market and underscores the challenges that law enforcement agencies, border control and customs authorities are facing. While in some countries, almost half of all NPS seizure cases in the period 2014–2015 concerned substances that were placed under international control in 2015, in other countries the proportion of such substances was as low as 6 per cent. This reflects the heterogeneity of the NPS market and the challenge of identifying a set of NPS that are of general international concern.

Trends in the use of new psychoactive substances

The comparison of epidemiological data on the use of NPS in different countries is not easy because the definition of NPS may differ from country to country and may include substances that have been placed under national or international control. There are limited data available to make comparisons of the prevalence of NPS use over time and limited survey tools for capturing NPS use, and NPS users have limited knowledge about the substances they use. The information on the use of NPS presented in this chapter should be read as an update of the more detailed analysis contained in the *Global Synthetic Drugs Assessment 2017*.[19]

FIG. 7 | Annual quantities of synthetic new psychoactive substances (excluding ketamine) seized globally and number of countries reporting seizures of synthetic cannabinoids or cathinones, 2012–2016



Source: UNODC, responses to the annual report questionnaire, 2012–2016.

Although data on trends in NPS use are still limited to very few countries, in the past three years there seems to have been a shift away from herbal smoking mixtures and an increase in the use of NPS in

19 UNODC, *Global Synthetic Drugs Assessment: Amphetamine-type Stimulants and New Psychoactive Substances* (Vienna, 2017).

New trends in the use of kratom

The leaves of the kratom tree *(Mitragyna speciosa)*, an indigenous plant found in South-East Asia, contain mitragynine, which produces a range of dose-dependent psychoactive effects. Low doses may have stimulant effects, whereas higher doses may result in sedative, dysphoric and euphoric effects.[a] Kratom has been widely used in a traditional context in South-East Asia: for example, as a herbal remedy for diarrhoea, fatigue and pain. However, it has also been utilized for non-medical purposes.[b] In recent years, kratom has gained popularity in countries in North America and Europe as a plant-based NPS. At the global level, 31 countries reported the detection of kratom between 2012 and 2017.[c]

An increasing number of reports in the scientific literature associate the use of high doses of kratom with adverse health events, including tachycardia, seizures and liver damage. In addition, regular use of the substance may cause dependence, while discontinuing its use can cause the development of withdrawal symptoms.[d] In North America in particular, a variety of products have been marketed as kratom, which may actually contain kratom in combination with other, often unknown, substances. The severe adverse health events associated with the use of such products could be related to differences in dosages of the powdered, refined form of kratom rather than in the traditional forms of use in South-East Asia.[e] In North America, the use of kratom products has been reported in the context of self-management of opioid withdrawal symptoms in small-scale studies in the United States.[d] The reportedly increasing popularity of kratom products may also be related to its wide availability: its sale is not controlled in many countries, it can be easily obtained through online shops and, compared with opioid-replacement therapies, its price is low.[f] In the United States, 44 deaths have been associated with the use of products containing kratom in polydrug use. The United States Food and Drug Administration issued a warning against the consumption of kratom over concerns about the potential risk of abuse and dependence.[g] The role of kratom products in drug overdose cases, including fatalities, is still not fully understood.

Currently, neither kratom nor the psychoactive substances contained in its leaves are under international control. Given the scarcity of data on the potential pharmacological, therapeutic and toxicological effects of kratom and kratom products, and the lack of controlled laboratory studies, it is difficult to understand the health risks and potential benefits associated with their use.[d]

a Walter C. Prozialeck, Jateen K. Jivan, and Shridhar V. Andurkar. "Pharmacology of kratom: an emerging botanical agent with stimulant, analgesic and opioid-like effects", *Journal of the American Osteopathic Association*, vol. 112, No. 12 (2012), pp. 792–799; Zurina Hassan and others, "From kratom to mitragynine and its derivatives: physiological and behavioural effects related to use, abuse and addiction", *Neuroscience and Biobehavioral Reviews*, vol. 37, No. 2 (2013), pp. 138–151.

b *World Drug Report 2013* (United Nations publication, Sales No. E.13.XI.6).

c UNODC early warning advisory on NPS; EMCDDA, "Kratom *(Mitragyna speciosa)* drug profile" (www.emcdda.europa.eu/publications/drug-profiles/kratom).

d Walter C. Prozialeck, "Update on the pharmacology and legal status of kratom", *Journal of the American Osteopathic Association*, vol. 116, No. 12 (2016), pp. 802–809.

e Darshan Singh, Suresh Narayanan and Balasingam Vicknasingam, "Traditional and non-traditional uses of mitragynine (kratom): a survey of the literature", *Brain Research Bulletin*, vol. 126, part 1 (2016), pp. 41–46.

f George C. Chang Chien, Charles A. Odonkor and Prin Amorapanth, "Is kratom the new legal high on the block?: The case of an emerging opioid receptor agonist with substance abuse potential", Pain Physician, vol. 20, No. 1 (2017), pp. E195–E198.

g United States Food and Drug Administration, Public Health Focus, "FDA and kratom". Available at www.fda.gov/NewsEvents/PublicHealthFocus/ucm584952.htm.

tablet and liquid form.[20] A change in NPS packaging in the United Kingdom was noted following the implementation of NPS legislation. The marketing of NPS previously focused on presenting them to give the perception of being legal alternatives to traditional drugs, with substances contained in bright, colourful and appealing packaging, but since about 2016 NPS have been increasingly presented in plastic wraps or bags with no detailed information on their contents.[21]

Recent data on the prevalence of NPS use show divergent trends. Data from England and Wales show that past-year NPS use among people 16–59 years old has fallen significantly, from 0.7 per cent in the period 2015/16 to 0.4 per cent in the period 2016/17.[22] NPS past-year use in Ireland, among the general population (15–64 years old), also declined from the period 2010–2011 to the period

20 Global Drug Survey 2017, detailed findings. Available at www.globaldrugsurvey.com.

21 Scotland, United Kingdom, Highland Substance Awareness Toolkit, "NPS at Crew Annual Report 2016–2017". Available at www.highlandsubstanceawareness.scot.nhs.uk/.

22 United Kingdom, Home Office, *Drug Misuse: Findings from the 2016/17 Crime Survey for England and Wales*, Statistical Bulletin 11/17 (July 2017).

2014–2015, from 3.5 per cent to 0.8 per cent. Findings in Australia, likewise, show a substantial drop in past-year use of synthetic cannabinoids in people aged 14 years or older, from 1.2 per cent in 2013 to 0.3 per cent in 2016.[23] Other countries where data were available, however, experienced an increase in NPS use among the general population. For example, in Czechia, NPS use rose from 0.5 per cent in 2014 to 1.2 per cent in 2015, and in Romania NPS use rose from 0.3 per cent in 2013 to 0.9 per cent in 2016. National household surveys are likely to underestimate drug use prevalence because they may be affected by the underrepresentation of a number of population subgroups known to have much higher than average rates of substance use, including the homeless and other marginalized groups.

Diverging trends in the use of new psychoactive substances among young people

Monitoring the rate of substance use among students provides an important insight into current youth risk behaviours and potential future trends in NPS use. In the several countries where recent trend data relating to young people are available, a decline in NPS use can be seen. In the United States, for example, past-year use of synthetic cannabinoids has dropped significantly among twelfth graders, from 11.3 per cent in 2012 to just under 3.7 per cent in 2017. That decrease may be due to several factors, namely legislation implemented in the United States during that period which placed a large number of synthetic cannabinoids under national control, and increasing awareness of the health risks associated with the use of those substances. In recent years, the use of synthetic cathinones among youth has become an issue of concern in the United States, but the level of use of those substances by twelfth graders has also decreased since 2012, from 1.3 per cent to 0.6 per cent in 2017.[24] In England, of the young people registered in specialist substance misuse services in the period 2016/17, the percentage that reported problematic use of NPS (4 per cent) was lower than for "ecstasy" (11 per cent) and cocaine (9 per cent).[25] The proportion of young people reported by specialist services as having problems with NPS fell by 45 per cent from the level seen in the period 2015/16.

In 2016, a survey of drug use among university students was conducted in Bolivia (Plurinational State of), Colombia, Ecuador and Peru, which revealed the use of synthetic cannabinoids for the first time in those countries.[26] Only a small proportion of those reporting the use of synthetic cannabinoids reported having used them exclusively; a far larger proportion had used them in combination with herbal cannabis. From 2012 to 2016, the number of synthetic cannabinoids reported by countries in South America increased each year, suggesting the growing importance of such substances among specific subgroups of the population in that subregion.

Continued use of new psychoactive substances by vulnerable and high-risk groups

Patterns of NPS use of among marginalized, vulnerable and socially disadvantaged groups, including homeless people and people with mental health disorders, continue to be documented in some countries.

Use of new psychoactive substances among the homeless population

The use of new psychoactive substances among homeless people has been documented in Czechia, Finland, Hungary, Ireland, the United Kingdom and the United States. Most recently, areas with the highest levels of social deprivation in Scotland reported an increase in the use of such substances.[27] In Manchester, England, a study was conducted on the homeless population in 2016. The study of 53 homeless people showed that rough sleepers (n=28) were more prone to the use of new psychoactive substances than non-rough sleepers (n=25). A total

23 Australian Institute of Health and Welfare, *National Drug Strategy Household Survey 2016: Detailed Findings.*

24 United States, Department of Health and Human Services, National Institute on Drug Abuse; "Monitoring the future survey: high school and youth trends", 14 December 2017. Available at www.drugabuse.gov/.

25 United Kingdom, Public Health England, Department of Health, *Young People's Statistics from the National Drug Treatment Monitoring System (NDTMS), 1 April 2016 to 31 March 2017* (London, 2017).

26 UNODC, *III Estudio Epidemiológico Andino sobre Consumo de Drogas en la Población Universitaria: Informe Regional 2016* (Lima, 2017).

27 National Records of Scotland, "Drug-related deaths in Scotland in 2016", 15 August 2017. Available at www.nrscotland.gov.uk/.

of 93 per cent of rough sleepers (n=26) had used such substances in the past year, compared with 64 per cent (n=16) of non-rough sleepers.[28] The majority (81 per cent) of those reporting use of new psychoactive substances also reported using other drugs, including cocaine and cannabis. Of those who reported using new such substances in the past year (n=42), 64 per cent had used them every day, and 14 per cent had used them five or six days per week. Synthetic cannabinoids were the substances most often reported. In Czechia, data pertaining to clients of needle-syringe programmes in the period 2013 and 2014 indicated that repeated synthetic cathinone use was associated with polydrug use and homelessness.[29]

Use of new psychoactive substances associated with mental health disorders

The use of new psychoactive substances among people with mental health disorders has previously been documented in studies in the United Kingdom. In Scotland, the use of such substances among inpatients aged 18–65 on general adult psychiatric wards was equal to 22 per cent (n=86) of total admissions analysed (n=388) between July and December 2014.[30] Of inpatients reporting NPS use, a diagnosis of drug-induced psychosis was significantly more likely, and a diagnosis of depression was significantly less likely. NPS use was prevalent among young male psychiatric inpatients, in particular among those diagnosed with drug-induced psychosis. Illicit drug use, specifically cannabis use, was common in this group. Stimulant NPS use was identified in adult inpatients released from general psychiatric wards more than three times more frequently than was synthetic cannabinoid use.

In a recent study in England, the current rate of use of NPS by patients prior to admission to a secure mental health setting stood at 12 per cent (218 patients).[31] About 20 per cent of mental health units had required an emergency response to assist with NPS use in the past 12 months. Those responses were related to emergency treatment for NPS that induced physical and psychological symptoms, such as collapse, cardiovascular symptoms and acute exacerbations of existing mental health conditions. Psychological symptoms were reported more frequently than physical symptoms. Some data indicate that male users of NPS admitted to acute inpatient wards in the United Kingdom are 10 times more likely to require care in the psychiatric intensive care unit than are inpatients that do not use NPS.[32]

High levels of use of new psychoactive substances reported by prisoners and people on probation

NPS use in prisons and among people on probation remains an issue of concern in numerous countries, including the United Kingdom and 14 other European countries,[33] New Zealand and the United States. It is likely that the high levels of NPS use in prisons are related to the challenge of detecting and identifying those substances. NPS use continued to be linked to violence, debt, organized crime and medical emergencies in most adult male prisons in the United Kingdom in 2017. Although NPS use was rarely identified prior to arrest, it was identified while the subject was either in custody or on probation.[34] Synthetic cannabinoids were the most frequent type of NPS used, and polydrug use was common. Some former detainees reported issues in maintaining their tenancies or placements in

28 Rob Ralphs, Paul Gray and Anna Norton, *New Psychoactive Substance Use in Manchester: Prevalence, Nature, Challenges and Responses* (Manchester, Substance Use and Addictive Behaviours, Research Group Manchester Metropolitan University, 2016).

29 Vendula Belackova and others, "'Just another drug' for marginalized users: the risks of using synthetic cathinones among NSP clients in the Czech Republic", *Journal of Substance Use*, vol. 22, No. 6 (2017), pp. 567–573.

30 Jack L. Stanley and others, "Use of novel psychoactive substances by inpatients on general adult psychiatric wards", *British Medical Journal*, vol. 6, No. 5 (2016).

31 United Kingdom, Public Health England, "A review of new psychoactive substances in secure mental health: summary document", (London, 2017).

32 Charlie Place and others, "Spice boys: an exploratory study around novel psychoactive substance use on a male acute ward", *Advances in Dual Diagnosis*, vol. 10, Nr. 3 (2017), pp. 97–104.

33 Countries reporting prison use: Bulgaria, Croatia, Czechia, Ireland, Finland, France, Germany, Hungary, Latvia, Poland, Portugal, Romania Slovenia and Sweden. EMCDDA, *High-risk Drug Use and New Psychoactive Substances: Results from an EMCDDA Trendspotter Study*, Rapid Communication Series (Luxembourg: Publications Office of the European Union, 2017).

34 United Kingdom, Her Majesty's Inspectorate of Probation and Care Quality Commission, *New Psychoactive Substances: The Response by Probation and Substance Misuse Services in the Community in England* (Manchester, 2017).

homeless hostels as a direct result of their NPS use. Continued NPS use was linked to addiction and inability to cope with withdrawal symptoms. The primary motives reported for ongoing use of NPS were the easier access to NPS compared with other drugs such as heroin or cocaine, and the desire to avoid detection. According to prison staff and detainees in the United Kingdom, prisons are becoming increasingly unsafe due to intoxicated NPS users and the violence associated with NPS-related debt and bullying.[35]

The proportion of detainees in New Zealand who had used synthetic cannabinoids in the previous 12 months declined from 47 per cent in 2013 to 20 per cent in 2016.[36] However, reported dependency among those users increased from 17 per cent in 2013 to 29 per cent in 2016, which underscores the health risks and dependence-inducing potential of synthetic cannabinoids. Detainees in New Zealand who had used synthetic cannabinoids in the previous 12 months used them an average of 97 days in 2016. In the United States, 29 per cent of prisoners in Illinois, for example, used synthetic cannabinoids in the 12 months prior to incarceration, some in combination with synthetic cathinones.[37] Among the most commonly reported reasons for their use were curiosity, desire to avoid positive drug test results, personal preferences and for relaxation.

Injecting use of stimulant new psychoactive substances remains a concern

The injecting of stimulant NPS, which are typically short-acting stimulants, remains a concern, in particular because of reported associated high-risk injecting practices. In addition to the high number of daily injecting episodes, the rate of sharing and reusing of injecting equipment is high among people who inject drugs (PWID) that inject stimulants.[38] Injecting use of NPS has been reported in France, Greece, Hungary, Ireland, Romania, Slovenia, the United Kingdom and the United States.[39]

The substitution of controlled drugs with stimulant NPS has been reported in Slovenia, where a study of 249 NPS users found that 3-methylmethcathinone (3-MMC) was being used as a replacement for cocaine.[40] While national data on PWID attending syringe exchange programmes in Hungary from 2011 to 2015 showed a transition from injecting use of amphetamine and heroin to injecting use of stimulant NPS,[41] the most frequently encountered substance in discarded injecting paraphernalia in 2016 was methadone, a prescription opioid, followed by several stimulant NPS.[42] Whereas methadone was mostly used in isolation, stimulant NPS largely co-occurred with additional substances.

Reports from needle exchange programmes in the United Kingdom indicate that many heroin users who switch to injecting stimulant NPS subsequently return to heroin injection after experiencing negative effects of NPS use. Injecting use of mephedrone has declined in England, Wales and Northern Ireland,[43] but those who had injected mephedrone during the preceding year were twice as likely to report having injected drugs with a needle or syringe that had previously been used by someone else.[44] A

35 United Kingdom, Her Majesty's Inspector of Prisons, *Her Majesty's Inspector of Prisons in England and Wales: Annual Report 2016–17* (London, 2017).

36 Chris Wilkins and others, *New Zealand Arrestee Drug Use Monitoring (NZ-ADUM): 2016 Report*, (Wellington, New Zealand Police and Massey University, 2017). Available at www.police.govt.nz/.

37 Lily Gleicher, Jessica Reichert and Dustin Cantrell, "Study of self-reported synthetic drug use among a sample of Illinois prisoners", 17 February 2017. Available at www.icjia.state.il.us/.

38 Andrea Fischer and others, The Link between Amphetamine-Type Stimulant Use and the Transmission of HIV and other Blood-borne Viruses in the Southeast Asia Region, ANCD Research Paper No. 25 (Melbourne, National Drug Research Institute, Australian National Council on Drugs, 2013).

39 *World Drug Report 2017* (United Nations publication, Sales No. E.17.XI.6).

40 Matej Sande, "Characteristics of the use of 3-MMC and other new psychoactive drugs in Slovenia, and the perceived problems experienced by users", *International Journal of Drug Policy*, vol. 27 (2016), pp. 65–73.

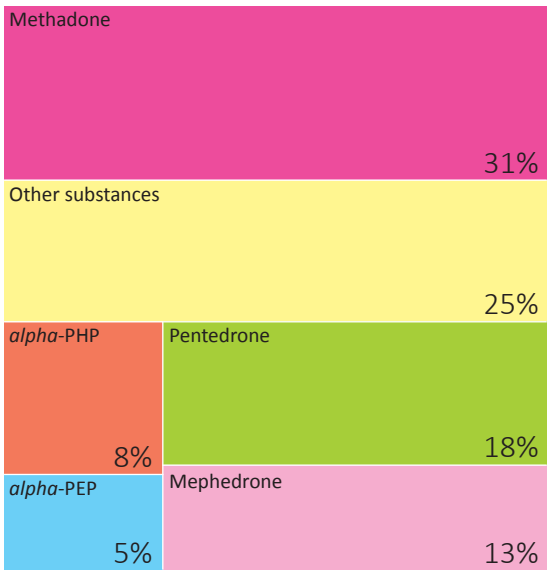
41 AnnaTarján and others, "HCV prevalence and risk behaviours among injectors of new psychoactive substances in a risk environment in Hungary: an expanding public health burden", *International Journal of Drug Policy*, vol. 41 (2017), pp. 1–7.

42 Valéria Anna Gyarmathy and others, "Diverted medications and new psychoactive substances: a chemical network analysis of discarded injecting paraphernalia in Hungary", *International Journal of Drug Policy*, vol. 46 (2017), pp. 61–65.

43 United Kingdom, Public Health England, "Shooting up: infections among people who inject drugs in the UK, 2016" (November 2017).

44 Ibid., "Shooting up: infections among people who inject drugs in the UK, 2015" (November 2016).

FIG. 8 Psychoactive substances found in discarded injecting paraphernalia in Hungary, 2016



Source: Valéria Anna Gyarmathy and others, "Diverted medications and new psychoactive substances—a chemical network analysis of discarded injecting paraphernalia in Hungary", 2017.

cross-sectional survey on PWID in Scotland covering 2,696 participants from selected agencies and pharmacies that provide injecting equipment recorded injecting use of NPS. Injection of NPS was first monitored in 2015/16, and for that survey period, 10 per cent of those who had injecting drug use in the past six months had injected NPS.[45]

Deaths related to new psychoactive substances are on the increase in some countries

In a number of countries, concerns have been growing over the harm caused by NPS, although the number of deaths caused by NPS constitute a relatively small portion of all drug-related deaths.[46]

45 Health Protection Scotland, University of the West of Scotland, Glasgow Caledonian University, West of Scotland Specialist Virology Centre, "Needle exchange surveillance initiative: prevalence of blood-borne viruses and injecting risk behaviours among people who inject drugs attending injecting equipment provision services in Scotland, 2008–09 to 2015–16" (Glasgow, Health Protection Scotland March, 2017).

46 For more information on drug-related deaths, including those associated with NPS with opioid effects, see booklet 2 of the present report.

NPS-related deaths may not be systematically recorded in all countries and trends for NPS-deaths differ from country to country. In England and Wales, NPS-related deaths have increased over the past five years, reaching 123 cases of the total of 2,593 drug misuse deaths in 2016.[47, 48] While the number of deaths related to synthetic cannabinoids more than tripled, from 8 deaths in 2015 to 27 deaths in 2016, the number of deaths related to the synthetic cathinone mephedrone fell by more than half, declining from 44 deaths in 2015 to 15 deaths in 2016.[49] Over the same period, NPS-related deaths in Germany more than doubled, from 39 deaths to 98 deaths. Overall, 1,333 drug-related deaths were reported in Germany in 2016, a 9 per cent increase from the previous year.[50] In Ireland, deaths related to NPS decreased from 14 deaths in 2014 to 7 deaths in 2015.[51]

Increasing use of benzodiazepines

Increases in use and deaths related to benzodiazepine-type NPS, sold under names such as "legal benzodiazepines" or "designer benzodiazepines", are a growing public health issue in some countries.[52] In Scotland, of the reported 867 drug-related deaths in 2016, 286 deaths were related to NPS use, and in most cases, benzodiazepine-type NPS were found to have been implicated in, or to have potentially contributed to, the cause of death. Most cases involved etizolam, with a few relating to diclazepam or phenazepam.[53] In Barcelona, a drug-checking service reported a massive increase in the number of samples that tested positive for benzodiazepine-type

47 Of the 3,744 cases of death, 2,038 were related to opiates, 460 to anti-depressants, and 219 to paracetamol.

48 United Kingdom, Office for National Statistics, "Statistical bulletin: deaths related to drug poisoning England and Wales—2016 registrations", 2 August 2017. Available at www.ons.gov.uk/.

49 Ibid.

50 Germany, Bundeskriminalamt, "Globalisierung und Digitalisierung prägen auch die Rauschgiftkriminalität", press release of 8 May 2017.

51 Ena Lynn and Suzi Lyons, d, "National drug-related deaths index 2004 to 2015 data", 12 December 2017. Available at www.hrb.ie/.

52 UNODC, "Non-medical use of benzodiazepines: a growing public health threat?" Global SMART Update, vol. 18 (September 2017).

53 National Records of Scotland, "Drug-related deaths in Scotland in 2016".

NPS, from 2.3 per cent in 2014 to 48.8 per cent in 2016, suggesting an increase in use.[54]

The synthetic opioid overdose crisis

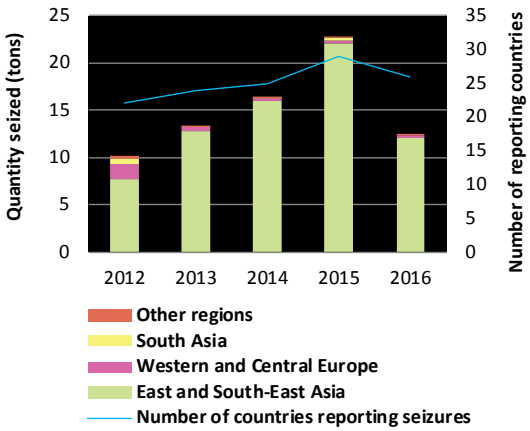
Many NPS with opioid effects have emerged in the past five years. Between 2009 and 2017, a total of 34 synthetic opioids, including 26 fentanyl analogues, were reported to UNODC early warning advisory by countries on all continents, and most of those synthetic opioids have been reported since 2016. The fentanyl analogues reported by most countries included furanylfentanyl, acetylfentanyl, ocfentanil and butyrfentanyl. Synthetic opioids belonging to other chemical groups were also reported, including U-47700, AH-7921, MT-45 and *O*-desmethyltramadol. The non-medical use of synthetic opioids in North America has escalated, leading to a crisis of overdose deaths, specifically in the United States and Canada, while dozens of deaths have also been reported in Europe (see booklet 3, section on opioids).

Ketamine

A widely used human and veterinary anaesthetic, ketamine is listed as an essential medicine by the World Health Organization. Because of its potential for abuse, the health risks associated with it, evidence of its illicit manufacture and its presence on illicit drug markets, ketamine is under national control in many countries.

The significant increases in global seizures of ketamine from 2012 to 2015 were largely attributable to increases in East and South-East Asia, with global seizures reaching 22 tons in 2015. In 2016, global seizures declined, which was largely due to a massive drop in quantities seized in China, including Hong Kong, China. In recent years, clandestine ketamine laboratories have been dismantled mainly in East and South-East Asia, with Chinese authorities dismantling 93 illicit ketamine manufacturing facilities in 2016 alone. In the same year, a clandestine ketamine manufacturing facility was dismantled in Malaysia for the first time ever.

FIG. 9 Quantities of ketamine seized globally and number of countries reporting ketamine seizures, 2012–2016



Source: UNODC, responses to the annual report questionnaire, 2012–2016.

54 S. Pérez González and others, "New designer benzodiazepines use in Barcelona", *European Psychiatry*, vol. 41, Suppl. (2017), p. 874.

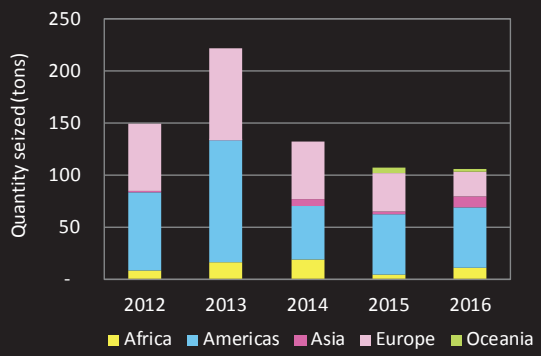
Khat: new aspects of a traditional plant-based drug

Khat *(Catha edulis)* is a shrub cultivated mainly in East Africa and the Arabian Peninsula. Khat leaves contain cathinone, a substance with stimulant effects similar to amphetamine, and their use has been a traditional practice in those areas. More recently, the use of khat has spread to Asia, Europe and North America, first among immigrants from the countries of traditional use and from there, into other communities.[a]

Although khat is not under international control, many national jurisdictions do not allow the import of khat leaves. Significant khat seizures are reported to UNODC each year, mainly by authorities of countries outside the areas of traditional use. The largest quantities seized are reported not in the country of origin but in the destination countries, including in North America and Europe.[b] Between 2012 and 2016, more than 700 tons of khat were seized by 35 countries.[c]

Traditionally, khat leaves are consumed in a fresh state, within 48 hours of being harvested. After that point, the quality of the leaves deteriorates and the quantity of cathinone, the main psychoactive component, decreases rapidly. In order to limit those effects and slow down the process of decay, khat leaves are often dried before being transported long distances.[d] Drying has the additional benefit of a reduction in the volume and weight of the leaves, making transportation easier. The number of countries reporting khat seizures increased from 2012 to 2016, and since 2015 seizures have been reported in other regions, such as Oceania, that are too far from the traditional sources to conserve freshness and hence maintain the potency of the khat. Despite the geographical expansion of khat shipments observed in seizure reports, the total quantities of khat seized are declining. Detailed studies on the global khat market and the patterns of khat use in destination countries are required to better understand this phenomenon.

Quantities of khat seized worldwide, 2012–2016 (tons)



Source: UNODC, responses to the annual report questionnaire, 2012–2016.

[a] Ling-Yi Feng and others, "New psychoactive substances of natural origin: a brief review", *Journal of Food and Drug Analysis*, vol. 25, No. 3 (2017), pp. 461–471; Birhane A. Berihu and others, "Toxic effect of khat *(Catha edulis)* on memory: systematic review and meta-analysis", *Journal of Neurosciences in Rural Practice*, vol. 8, No. 1 (2017), pp. 30–37.

[b] UNODC, questionnaire on new psychoactive substances for 2016.

[c] UNODC, responses to the annual report questionnaire, 2010–2016.

[d] World Customs Organization, Regional Intelligence Liaison Office for Western Europe; Ton Nabben and Dirk J. Korf, "Consequences of criminalisation: the Dutch khat market before and after the ban", *Drugs: Education, Prevention and Policy*, vol. 24, No. 4 (2017), pp. 332–339.