



European Monitoring Centre
for Drugs and Drug Addiction

New psychoactive substances in Europe

An update from the EU Early Warning System
March 2015



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Introduction

This short report provides an update on new psychoactive substances (NPS) in Europe for 2014. It is based on an analysis of information collected by the EU Early Warning System, which includes the 28 Member States of the European Union, Turkey and Norway (see opposite). The report highlights recent developments, including the growth of the market over the past few years, as illustrated by seizures by law enforcement and other indicators, as well as the growing number of serious harms that are being reported as a result. The seizure data collected on NPS presented in this report should be regarded as minimum estimates due to the lack of standardised reporting in this area. It should be noted that these data are not directly comparable with the data on established illicit drugs.

At a glance

Over the past five years or so there has been an unprecedented increase in the number, type and availability of new psychoactive substances in Europe. Continuing this trend, during 2014 a total of 101 new substances were reported for the first time to the EU Early

Key figures

101 new psychoactive substances reported for the first time in 2014

More than 450 new psychoactive substances currently being monitored by the EMCDDA

46 730 seizures of new psychoactive substances amounting to **more than 3.1 tonnes** in 2013

21 495 seizures of synthetic cannabinoids amounting to **almost 1.6 tonnes** in 2013

10 657 seizures of synthetic cathinones amounting to **more than 1.1 tonnes** in 2013

Seven-fold increase in reported seizures of new psychoactive substances between 2008 and 2013

299 different new psychoactive substances detected across Europe in 2013, including many of those seen in previous years

16 public health alerts issued in 2014

6 risk assessments in 2014

EU Early Warning System

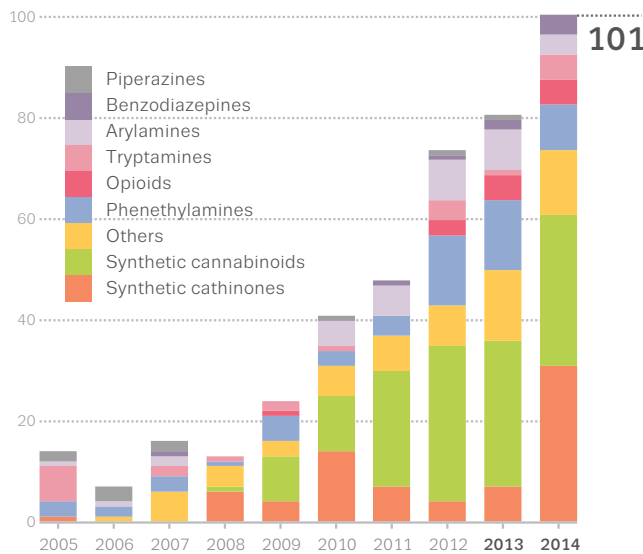
Since 1997, the EMCDDA has played a central role in Europe's response to new psychoactive substances. Its main responsibilities in this field are to operate the EU Early Warning System, with its partner Europol, and to undertake risk assessments of new substances when necessary. The EU Early Warning System works by collecting information on the appearance of new substances from the 28 Member States, Turkey and Norway, and then monitoring them for signals of harm, allowing the EU to respond rapidly to emerging threats.

More information can be found on the EMCDDA website under Action on new drugs (emcdda.europa.eu/activities/action-on-new-drugs).

Warning System: 31 cathinones, 30 cannabinoids, 9 phenethylamines, 5 opioids, 5 tryptamines, 4 benzodiazepines, 4 arylalkylamines and 13 substances that do not conform to the aforementioned groups (Figure 1). This brings the total number of substances being monitored by the European Monitoring Centre for Drugs and Drug Addiction (EMCDDA) to more than 450 — close to double the number of substances controlled under the United Nations international drug control conventions — with more than half of these being reported in the last three years alone.

Seizure data from law enforcement also confirm the growth and importance of this drug market. Between 2008 and 2013 there was a seven-fold increase in the number of seizures reported across Europe. In 2013 almost 47 000 seizures weighing more than 3.1 tonnes (Figures 2 and 3) were reported to the EU Early Warning System. Synthetic cannabinoids, which are sold as legal replacements for cannabis, accounted for the majority of these figures, with over 21 000 seizures weighing almost 1.6 tonnes. Synthetic cathinones, which are sold as legal replacements for stimulants such as amphetamine and MDMA, were the second largest group, with almost 11 000 seizures weighing more than 1.1 tonnes. Together, synthetic cannabinoids and cathinones accounted for almost 70 % of the total number of seizures and over 85 % of the weight seized during 2013 (Figure 3).

FIGURE 1
Number of new psychoactive substances reported to the EU Early Warning System, 2005–14



The growth in the market is also responsible for the increase in serious harms reported to the EMCDDA in recent years. Most of these concern non-fatal intoxications and deaths, but they also include broader social harms, such as those caused by high-risk drug users switching from injecting heroin to synthetic cathinones. During 2014 serious harms that required urgent attention led to 16 public health alerts being issued by the EMCDDA, while 6 new substances — 25I-NBOMe, AH-7921, methoxetamine, MDPV, 4,4'-DMAR and MT-45 — required risk assessment by the EMCDDA’s Scientific Committee.

It is likely that the growth of the market in new psychoactive substances will continue to pose a range of challenges for public health and drug policy over the next few years. The major drivers of many of these are the speed at which they appear, their open sale, and that there is little or no information on their effects and harms. The stimulant 4,4'-DMAR and the opioid MT-45 are prime examples of the challenges faced, and demonstrate just how rapidly new psychoactive substances can move from obscurity to infamy by causing serious harm, with 59 deaths from these two substances reported in just one year. It is here that strong early warning systems can play a critical role in ensuring a timely response in order to protect public health.

FIGURE 2
Number of seizures of new psychoactive substances per country (map) and proportion of seizures by category of substance (pie chart), 2013

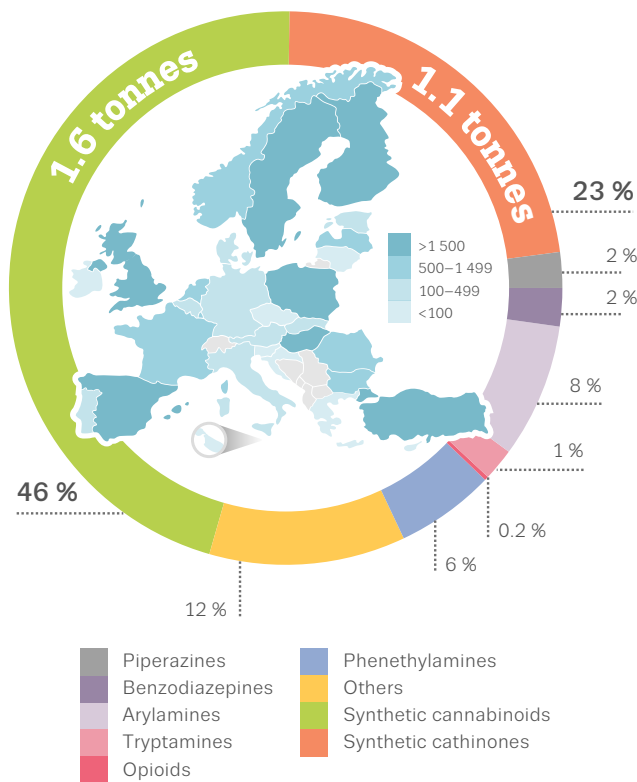
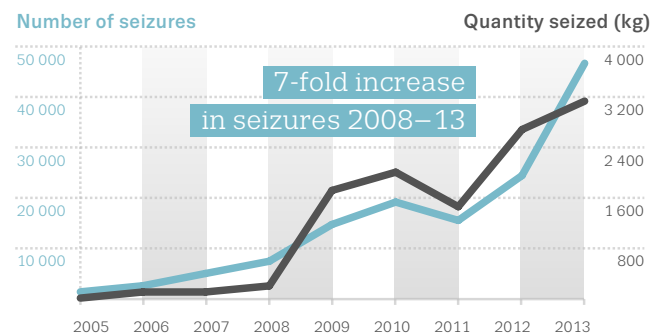


FIGURE 3
Number of seizures of new psychoactive substances and quantity seized, 2005–13



Note: 2009 data exclude six tonnes of ketamine seized by one country, due to a lack of contextual information.

The market in new psychoactive substances

Until about a decade ago, only a handful of new psychoactive substances were reported each year in Europe. Most were sold on the illicit drug market, where they would usually be passed off as amphetamine or ecstasy. Some were specifically sold and sought after by name; others were sold as a new type of 'ecstasy'. They were produced in small amounts in amateur laboratories or on a commercial scale in clandestine laboratories by organised crime groups. These new psychoactive substances were called 'designer drugs'. Today, such drugs are still a part of Europe's drug market. Usually they appear as a result of the activities of organised crime. Sometimes this is because these criminal groups use an uncontrolled precursor chemical and end up making a new substance either accidentally or deliberately; this has been the case with MDMA manufacturers making PMMA, and, more recently, amphetamine manufacturers making 4-methylamphetamine (see 'Organised crime and the new psychoactive substances market'). At other times, new psychoactive substances can emerge from this route because established illicit drugs are in short supply.

The emergence of the 'legal highs' and 'research chemicals' markets, which took off in the mid-2000s with the stimulants BZP and methylone (soon followed by mephedrone), was largely responsible for the dramatic growth in the market in recent years, and for catapulting new psychoactive substances onto the global policy agenda. Key to the success of both these markets was the fact that they were sold openly in specialised 'head shops' in towns and cities as well as via the Internet.

One of the largest groups of 'legal high' products is smoking mixtures that contain synthetic cannabinoids, which are intended as legal replacements to cannabis. These products were first popularised in Europe by the 'Spice' brand in the mid-2000s which were sold as herbal smoking mixtures under the guise of incense or room odourisers, but since then hundreds of different products have been advertised and sold. These products have also been responsible for a large number of serious harms in recent years, exemplified by outbreaks of intoxications requiring emergency treatment in hospital in the United States and Russia.

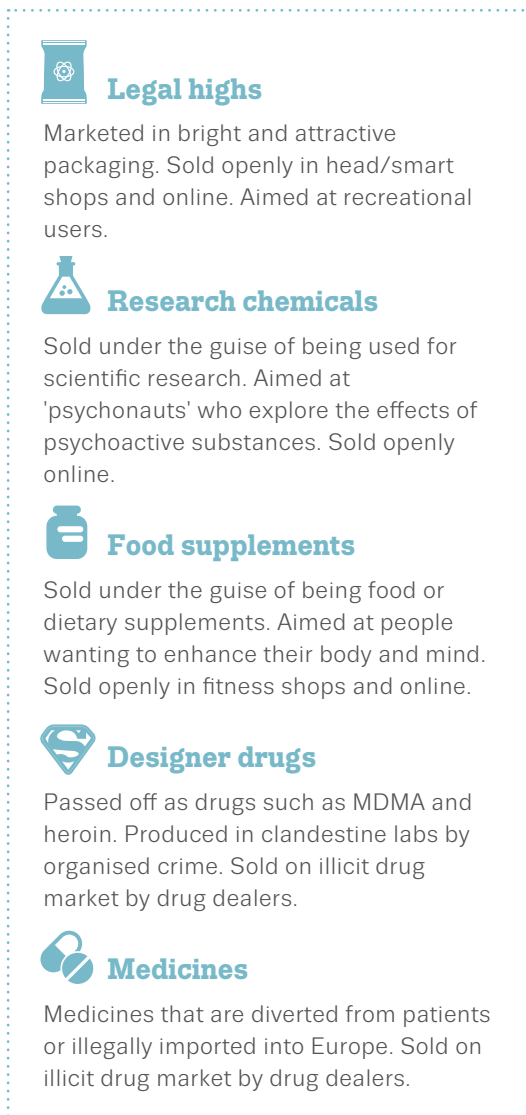
Organised crime and the new psychoactive substances market

Although there is limited evidence of the involvement of organised crime groups in the market, it appears that this is an emerging threat. Perhaps in an effort to increase profits, clandestine synthetic production within the EU — normally associated with synthetic drugs such as amphetamine and MDMA — has been reported for new psychoactive substances in the past few years; while chemical precursors for producing these substances have also been seized by law enforcement agencies at clandestine synthetic drug production facilities.

Alongside the 'legal highs' and 'research chemicals' markets is a range of products containing new psychoactive substances that are sold under the guise of being 'food supplements' (Figure 4). These products are aimed not at recreational drug users but at the growing number of people looking to enhance their body and mind, allowing new psychoactive substances to reach new groups of consumers. One such substance that was detected for the first time in Europe in 2014 is adrafinil, which is a derivative of the medicine modafinil. This substance is sold as a 'nootropic' supplement with claims that it will increase energy, focus and memory.

New psychoactive substances can also emerge on the drug market from the diversion of medicines. In recent years this group has become more important as a result of the misuse of prescribed medicines within the EU and the growing illegal importation of medicines from outside the EU.

FIGURE 4
The new psychoactive substances market



Overall, the growth in the market of new psychoactive substances has only been possible because of the growing interconnectedness of the world, driven by globalisation and the Internet. Many of the new psychoactive substances that are destined for these markets are produced in bulk by chemical companies based in China and India, and shipped to Europe by air freight, where they are processed, packaged and then sold to consumers (see 'Processing and packaging "legal highs" in Europe'). In 2013 the EMCDDA's monitoring of Internet shops identified 651 selling 'legal highs' or 'research chemicals' to EU consumers. There are many more shops that sell food supplements that contain new psychoactive substances, but these are not routinely monitored by drug monitoring systems.

Processing and packaging 'legal highs' in Europe

In 2014, in one EU country police dismantled a processing and packaging facility that was producing a range of 'legal high' products, including smoking mixtures, which were intended as legal replacements for cannabis. The seizure included large quantities of the synthetic cannabinoid cumyl-5F-PINACA in liquid form; 1 tonne of non-processed herbal material sent from two other EU countries and Australia; acetone, propylene glycol, vegetable glycerine, various aromas and food colourants. At this facility the synthetic cannabinoid was mixed with acetone, sprayed onto plant material and then packaged as smoking mixtures using the 150 kg of empty printed foil bags sent from China.

Estimating the prevalence of use of new psychoactive substances is often a challenge, especially through general population surveys. One insight is provided by the 2014 Flash Eurobarometer, a survey of just over 13 000 young adults aged 15–24 in the EU Member States, which asked about the use of new psychoactive substances. It found that 8 % of respondents had used a new psychoactive substance at least once, with 3 % using them in the last year. The highest levels of use in the last year were in Ireland (9 %), Spain, France (both 8 %), and Slovenia (7 %), with the lowest reported by Malta and Cyprus (0 %). Most respondents who had used new substances in the last year either bought them from, or were given them by, a friend (68 %). Just over a quarter (27 %) bought them from a drug dealer, while 10 % purchased them from a specialised shop and 3 % bought them on the Internet (multiple answers were possible).

While the 101 new substances reported for the first time in 2014 to the EU Early Warning System are from a diverse number of chemical families with various pharmacological effects that span the range of drugs controlled under the UN International Drug Control Treaties, this report focuses on three groups: the synthetic cannabinoids and synthetic cathinones, which together are the largest group of new psychoactive substances that are monitored; and the opioids, many of which pose an especially serious risk to public health.

Synthetic cannabinoids

Synthetic cannabinoids were first detected in Europe towards the end of 2008. In 2014 a further 30 new synthetic cannabinoids were reported for the first time, bringing the total number reported to the EU Early Warning System to 134. This makes the synthetic cannabinoids the largest group of substances monitored by the EMCDDA, and reflects the overall demand for cannabis within Europe and the rapid pace by which manufacturers can produce and supply new cannabinoids in order to circumvent drug laws (Figure 5). The overall importance of these substances is also reflected in seizure data. In 2013 over 21 000 seizures were reported, comprising more than

40 % of the total number of seizures for new psychoactive substances (Figure 3). The total weight of the seizures in 2013 came to just under 1.6 tonnes (Figures 6 and 7); about 0.6 tonnes was seized as powder, often in bulk amounts; the remaining amount was often seized as plant material. These powders are used to manufacture 'legal high' products, and represent millions of doses; 10 cannabinoids accounted for approximately 90 % of the total weight of powders seized in 2013, with 39 other cannabinoids making up the remainder. Notable seizures of powders in 2013 include 182 kg of AM-2201, 115 kg of 5F-UR-144, and 114 kg of 5F-AKB48. Between 2008 and 2013 there has been a 200-fold increase in the number of seizures of synthetic cannabinoids.

FIGURE 5
Rapid replacement of synthetic cannabinoids on the European market

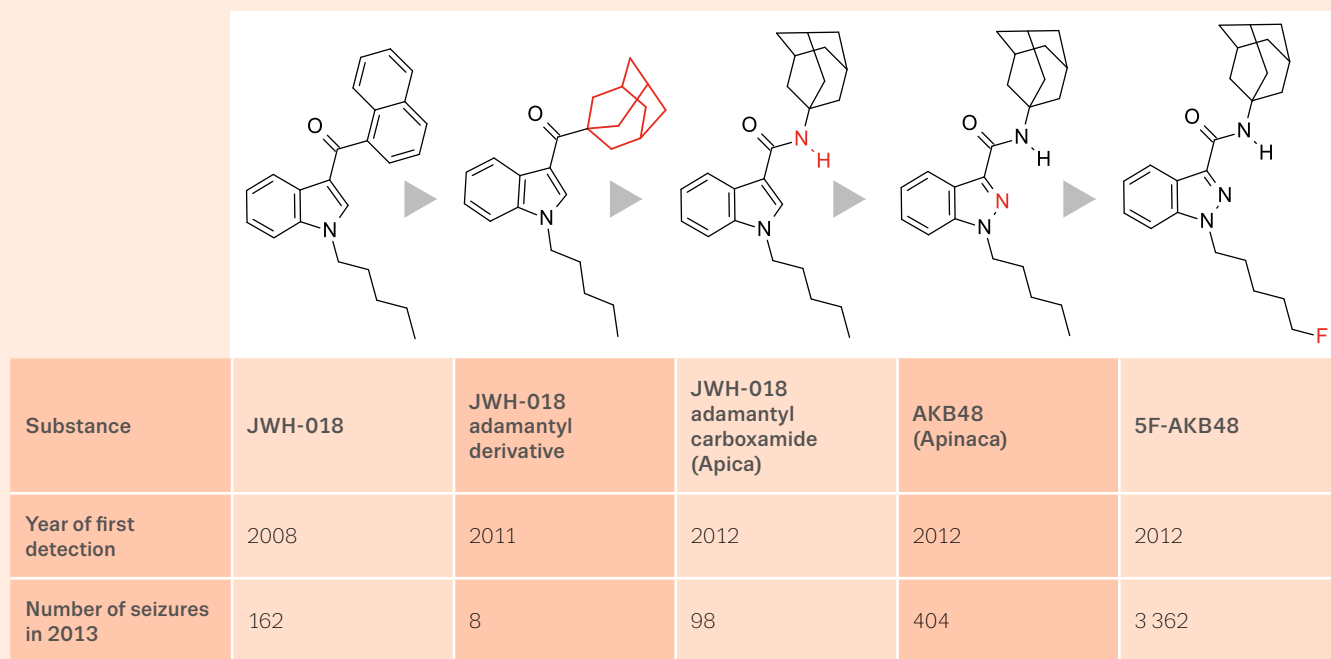


FIGURE 6
Number of seizures of synthetic cannabinoids per country (map) and proportion of seizures by sub-category (pie chart), 2013

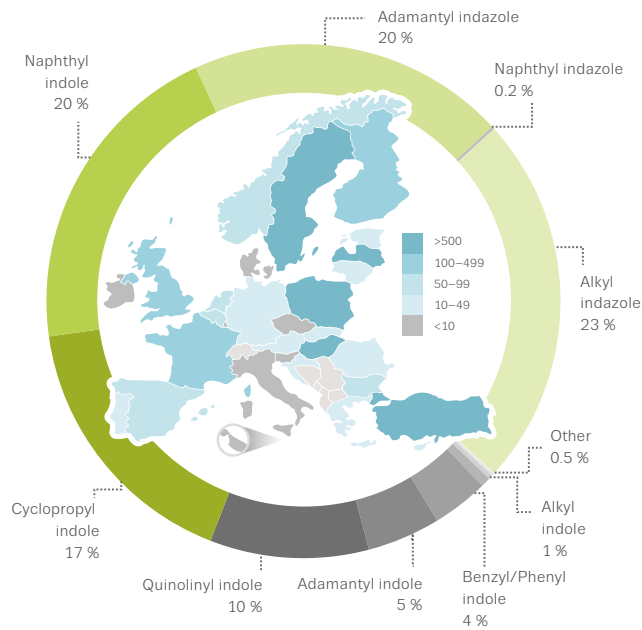


FIGURE 8
Number of seizures of synthetic cathinones per country (map) and proportion of seizures by substance (pie chart), 2013

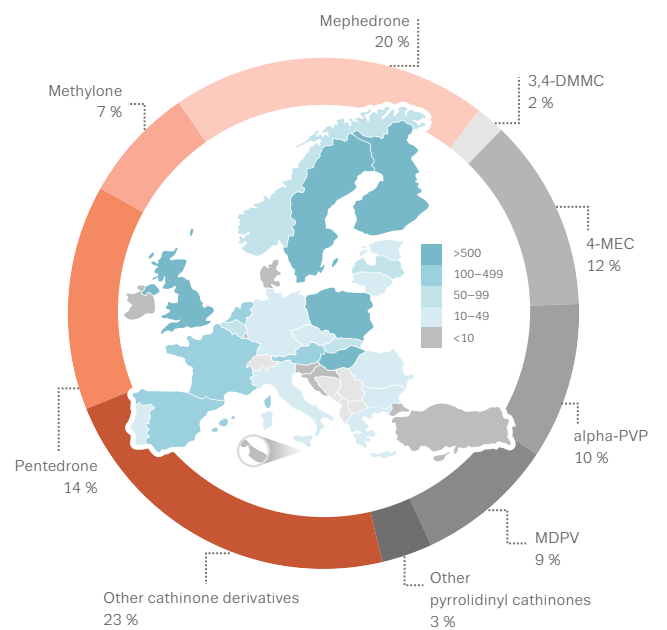


FIGURE 7
Number of synthetic cannabinoid seizures and quantity seized, 2008–13

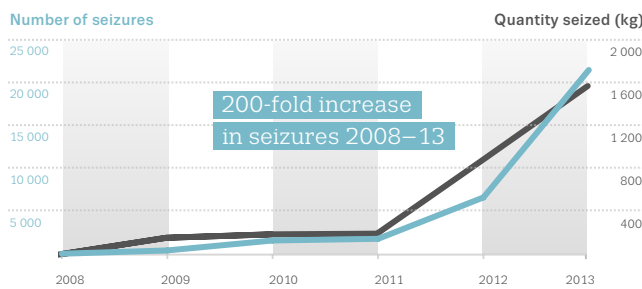
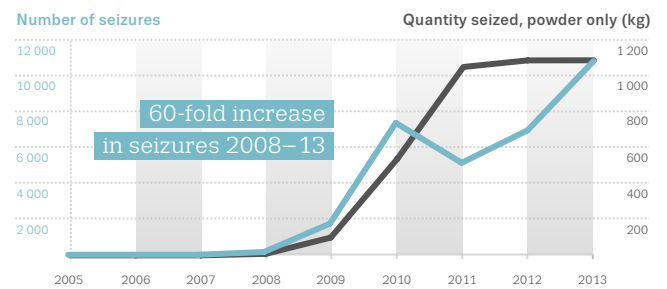


FIGURE 9
Number of synthetic cathinone seizures and quantity seized (powders), 2005–13



Synthetic cathinones

The large number of seizures of synthetic cathinones reflects the demand for stimulants in Europe, with many of them used as replacements for MDMA, amphetamine and cocaine. During 2014 some 31 synthetic cathinones were reported for the first time. This brings the total number of cathinones to 77, making them the second largest group of substances monitored by the EMCDDA. Almost 11 000 seizures of synthetic cathinones weighing more than

1.1 tonnes were made in Europe during 2013 (Figure 8). In terms of the main cathinones seized, 3-MMC (an isomer of the popular drug mephedrone) (341 kg), 4-MEC (201 kg), pentedrone (197 kg) and alpha-PVP (115 kg) accounted for almost 80 % of the total amount seized. Between 2008 and 2013 there has been a 60-fold increase in the number of seizures of synthetic cathinones (Figure 9).

Opioids

New opioids are of special concern for public health. This is because they are often highly potent and are sold as heroin to unsuspecting users, and thus pose a high risk of overdose and death. The fentanyls, for example, are a family of drugs that have caused hundreds of deaths in Europe and the United States since they first appeared as 'designer drugs' sold as 'synthetic heroin' in California in the late 1970s. During 2014 three of the five opioids reported to the EU Early Warning System were fentanyls. This includes two fentanyls that were seized at a clandestine laboratory in Europe and acetylfentanyl which has been linked to more than 14 deaths in the United States after it was sold as heroin.

But it is not just the fentanyls that pose risks to users. More than 40 deaths were reported to the EMCDDA within months of the detection of the opioids AH-7921 and MT-45 on the European drug market. These substances were both sold as 'research chemicals', with Internet shops based in Europe and China selling kilogram quantities of the drugs.

Monitoring and responding to serious harms

Alongside information on the appearance of new psychoactive substances on the market, a key function of the EU Early Warning System is to identify signals of serious harms and respond as necessary. This requires monitoring each of the more than 450 substances that have been reported so far. As the market has grown in recent years, the EMCDDA has also had to deal with a growing number of reports of serious harms, often related to acute toxicity leading to hospitalisation and deaths. The EMCDDA has responded to this challenge by working to strengthen the ability of the EU Early Warning System and its network to identify, report, understand and respond to such harms. One of the core activities in this respect is issuing public health alerts, which serve to alert the network on serious and urgent issues. Since 2005 the EMCDDA has issued 117 public health alerts, with more than 70 % of these issued in the last five years. During 2014 some 16 alerts were issued. These included alerts on 4,4'-DMAR and MT-45 after deaths within Europe were reported (both of these substances were risk assessed during 2014), and on synthetic cannabinoids such as 5F-PB-22, ADB-PINACA and MDMB-FUBINACA after media monitoring by the EMCDDA identified serious harms in countries outside Europe.

The risk assessments conducted by the EMCDDA's Scientific Committee are another core activity in responding to serious harms. Six risk assessments were conducted in 2014. These were: 25I-NBOMe, a substance with hallucinogenic properties that was being sold as LSD; AH-7921, an opioid with similar properties to morphine that was linked to 15 deaths over a short period of time; MDPV, a stimulant sold as a 'legal high' that was being sold as cocaine on the illicit market and injected by high-risk drug users; methoxetamine, which was sold as a legal replacement for the dissociative anaesthetic ketamine; 4,4'-DMAR, a stimulant initially sold as a 'research chemical' that rapidly found its way into ecstasy tablets and has been linked to 31 deaths; and MT-45, an opioid that was sold as a 'research chemical' and was linked to 28 deaths over a nine-month period.

Summary

The data presented in this report suggest that the growth of the market in new psychoactive substances will continue to pose a range of challenges for public health and drug policy over the next few years. Particular challenges relate to the speed at which new psychoactive substances appear, their open sale and the lack of information on their effects and harms. Critically, strong national and regional early warning systems will continue to play a central role in the early detection of harms and help to ensure timely public health responses.

Resources

- Learn more about the EU Early Warning System: emcdda.europa.eu/ews
- Learn more about the EMCDDA risk assessments: emcdda.europa.eu/publications/risk-assessments
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The EMCDDA's publications are a prime source of information for a wide range of audiences including: policymakers and their advisors; professionals and researchers working in the drugs field; and, more broadly, the media and general public. Based in Lisbon, the EMCDDA is one of the decentralised agencies of the European Union.

