



European Monitoring Centre  
for Drugs and Drug Addiction

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# SELECTED ISSUES 2010

PROBLEM AMPHETAMINE AND METHAMPHETAMINE  
USE IN EUROPE





European Monitoring Centre  
for Drugs and Drug Addiction

# SELECTED COUNTRIES TRENDS IN DETERMINED SUBSTANCES 2010

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USE IN EUROPE

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European Monitoring Centre  
for Drugs and Drug Addiction

Cais do Sodré, 1249-289 Lisbon, Portugal  
Tel. +351 211210200 • Fax +351 218131711  
[info@emcdda.europa.eu](mailto:info@emcdda.europa.eu) • [www.emcdda.europa.eu](http://www.emcdda.europa.eu)

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## Introductory note and acknowledgements

In-depth reviews of topical interest are published as Selected issues each year. These reports are based on information provided to the EMCDDA by the EU Member States and candidate countries and Norway (participating in the work of the EMCDDA since 2001) as part of the national reporting process.

The most recent Selected issues are:

- Trends in injecting drug use in Europe;
- Drug offences: sentencing and other outcomes;
- Polydrug use: patterns and responses.

All Selected issues (in English) and summaries (in up to 23 languages) are available on the EMCDDA website:  
<http://www.emcdda.europa.eu/publications/selected-issues>

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- the heads of Reitox national focal points and their staff;
- the services within each Member State that collected the raw data;
- the members of the Management Board and the Scientific Committee of the EMCDDA;
- the Publications Office of the European Union.

### Reitox national focal points

Reitox is the European information network on drugs and drug addiction. The network is comprised of national focal points in the EU Member States, Norway, the candidate countries and at the European Commission. Under the responsibility of their governments, the focal points are the national authorities providing drug information to the EMCDDA.

The contact details of the national focal points may be found at:  
<http://www.emcdda.europa.eu/index.cfm?nodeid=403>

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# Problem amphetamine and methamphetamine use in Europe

## Introduction

Amphetamine and methamphetamine are two closely related synthetic substances that act as stimulants of the central nervous system. They can be ingested, snorted or injected, and methamphetamine, particularly in its crystalline form, can be smoked. The two substances can be so similar in their effects and appearance that often the user cannot tell them apart. Their effects include elevated mood; a sense of well-being; increased energy, wakefulness, concentration, alertness, and motor and speech activities; improved performance in physical and mental tasks; and reduced fatigue. Among other effects viewed by users as positive and rewarding are decreased social or sexual inhibitions, and the desire to lengthen social interactions or to socialise with others using the drug. This broad range of effects might explain why the use of amphetamines has been reported among many different population groups including soldiers, workers (e.g. truck or taxi drivers, hospital staff), students, sex workers, clubbers or problem heroin users.

Of the main illicit drugs, the patterns and geography of amphetamines <sup>(1)</sup> use in Europe are among the most difficult to describe. There are several reasons for this. First, the prevalence of amphetamines use varies greatly between countries. The diversity of user groups is possibly one of the largest of all illicit substances found in Europe. In addition, a small number of countries have problem amphetamines use at the heart of their drug problem and, when this is the case, it has very specific socio-historical and epidemiological characteristics. The stimulant market in Europe also appears to be changing frequently, particularly in nightlife settings, with shifts in popularity between substances such as

amphetamines, cocaine, ecstasy, piperazines or new stimulant drugs such as mephedrone. Finally, Europe is an important producer of amphetamines with several countries reporting illicit production facilities on their territory.

The provision of care for those with amphetamines problems is another area in which differences exist between countries. In general, treatment services are more attuned to the needs of amphetamines users in the countries where problematic use of these substances is longer established, while elsewhere services are targeted to the needs of the largest group of problem drug users <sup>(2)</sup>, mostly opioid users.

Organised in two parts, this Selected issue aims to provide a comprehensive overview of the history, health effects, supply and use of amphetamines in Europe, as well as describing their problematic use and the responses to them in the European countries that are most heavily affected. The first part begins with a short history of the use of these drugs and a presentation of the laws that are used to control them. This is followed by an analysis of drug supply information, mainly from police and customs services. The next section gives an overview of the prevalence of amphetamines use in the Europe population. The last section of Part I covers the mental and physical health effects of amphetamines use, including a review of the information on infectious diseases and deaths related to these drugs. In Part 2, countries are grouped in four geographical regions and sub-regions according to their amphetamines problems, with particular attention given to those with significant levels of problem amphetamines use. Treatment responses to amphetamines problems are also described for the different countries or groups of countries.

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<sup>(1)</sup> Here, amphetamine and methamphetamine are referred to collectively as amphetamines.

<sup>(2)</sup> Problem drug use is defined as 'injecting drug use or long-duration/regular use of opioids, cocaine and/or amphetamines'; for more information see the EMCDDA website.

### Data and focus of this report

This Selected issue is based on data routinely collected by the EMCDDA, reports in the scientific literature as well as a special data collection in 14 countries in which amphetamines use is particularly relevant in the national drug situation (<sup>1</sup>). Therefore, some of the information presented in this report covers the 27 EU Member States, Norway and the candidate countries Croatia and Turkey, while other sections focus on all or some of the 14 countries that reported data for this Selected issue. Much of the information on which this Selected issue is based is published in the national languages of the reporting countries, and has been reported to the EMCDDA as part of the 2009 National reports provided by each country. In general, these sources are not explicitly referred to in the text of this publication, but the reader can refer to the Reitox National reports, available online on the EMCDDA website, for a full list of sources.

(<sup>1</sup>) Belgium, Czech Republic, Estonia, Latvia, Luxembourg, Hungary, Netherlands, Poland, Slovakia, Finland, Sweden, United Kingdom, Croatia, Norway.

- Countries providing additional data
- Countries not providing additional data, but with evidence of problem amphetamines use



# Part 1: Overview of amphetamines use in Europe

## Historical background

Amphetamine was first synthesised in Germany in 1887, methamphetamine powder in 1893 and crystal methamphetamine in 1918/19 in Japan. Widespread medicinal use of the drugs in Europe appears to date from the 1930s, with the introduction of benzedrine (amphetamine) and pervitin (methamphetamine) as over-the-counter medicines. The stimulatory effects of these substances on the central nervous system were soon recognised, and amphetamine and methamphetamine tablets were widely distributed to troops during the Second World War.

In the 1940s and 1950s, as accounts about side-effects and addiction surfaced, countries attempted to restrict the availability of amphetamines by making them prescription drugs. In the 1960s, recreational amphetamines use reached high levels among some sub-populations in parts of Europe. Control measures culminated in the 1970s with the adoption at UN level of the International Convention on Psychotropic Substances <sup>(3)</sup>.

Together with the control measures on amphetamines, the arrival of heroin on the drugs market saw the use of amphetamines dwindle in most western European countries, as problem drug users switched over to heroin. In Scandinavian countries, however, amphetamines retained their popularity. While amphetamines were still available as prescription drugs in Czechoslovakia in the 1970s, manufacturing in kitchen labs and injecting of methamphetamine emerged. In what is now the Czech Republic, small closed groups of users organised around methamphetamine producers, and by the late 1980s most people who were dependent on drugs other than alcohol were pervitin users.

In the 1990s, the emergence of the electronic music scene led to a rise in amphetamines use in recreational settings, though the prevalence of problem use of the drug remained

low. Toward the close of that decade, countries in the north of Europe experienced another wave of amphetamines use, with problem amphetamines users outnumbering problem opioid users. Indications of amphetamines use appeared in the Baltic States and Poland only in the 1990s, since when it has increased. In much of southern Europe, amphetamines have never been among the most prevalent drugs. Current patterns of supply and demand in Europe reflect the history of amphetamines in the region.

## Legislation

Synthetic psychoactive substances are controlled internationally by the United Nations Convention on Psychotropic Substances of 1971, which lists them in four Schedules requiring different levels of control. Amphetamine and methamphetamine are listed in Schedule II, which contains 'substances whose liability to abuse constitutes a substantial risk to public health and which have little to moderate therapeutic usefulness' (UN, 1976). In the European Union, these substances are classified as illicit drugs in all Member States.

About half of the European Union's Member States have laws that set out the same penalty for all drugs, whereas others vary the level of penalty available for the substance according to the level of harm it may cause (regardless of any therapeutic value). A distinction between drugs may also be made depending on the offence; penalties may be equal for personal use offences but may differ for supply offences, or vice versa. No country that varies penalties depending on the type of drug involved has set penalties for offences involving amphetamine and methamphetamine at the lowest level. Of these countries, all except the United Kingdom legally class the two drugs equally. Under United Kingdom law, amphetamine is in class B while, following reports of increased use and production, methamphetamine was moved in 2007 from class B to class A, the 'most harmful' category.

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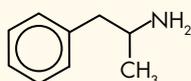
<sup>(3)</sup> The International Convention on Psychotropic Substances is available online.

## Amphetamine and methamphetamine

Amphetamine (CAS-300-62-9) and methamphetamine (CAS-537-46-2) are members of the phenethylamine family, which includes a range of substances that may be stimulants, entactogens or hallucinogens. Thus, amphetamine is *N*, $\alpha$ -methylphenethylamine and methamphetamine is *N*, $\alpha$ -dimethylphenethylamine, or by their International Union of Pure and Applied Chemistry (IUPAC) systematic names *N*, $\alpha$ -methylbenzeneethanamine and *N*, $\alpha$ -dimethylbenzeneethanamine, respectively.

### Amphetamine

Molecular structure

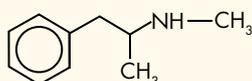


Molecular formula: C<sub>9</sub>H<sub>13</sub>N

Molecular weight: 135.2

### Methamphetamine

Molecular structure



Molecular formula: C<sub>10</sub>H<sub>15</sub>N

Molecular weight: 149.2

More information is available on the EMCDDA online drug profiles on amphetamine and methamphetamine.

In recent years, the Czech Republic and the United Kingdom have introduced restrictions on the sale of cold remedies containing pseudoephedrine, as they are purchased to make illicit amphetamines. Following reports that methamphetamine was being illegally manufactured using pseudoephedrine and ephedrine contained in cold and flu remedies, the United Kingdom's Medicines and Healthcare Products Regulatory Agency (MHRA) limited from 1 April 2008 over-the-counter sales of products containing these precursors, restricting these to packs containing not more than 720 mg pseudoephedrine and 180 mg ephedrine. Larger packs would be available on prescription only

(MHRA, 2008). The Czech National Institute for Drug Control also changed from 1 May 2009 the marketing authorisation, to restrict over-the-counter medicines containing pseudoephedrine (those with up to 30 mg per tablet) to a maximum monthly dose of 1 800 mg of pseudoephedrine (i.e. 60 tablets, 30 mg each) per person. Mail order sales were banned, and supply would be monitored via the central database of electronic prescriptions. In November 2009, the maximum was reduced to 900 mg (30 tablets) of pseudoephedrine per single purchase in pharmacies. The restriction was changed due to a ban on the use of a central database for electronic prescription with regard to issues of personal data protection. Importation of medicines containing pseudoephedrine from neighbouring countries (Germany and, to a greater extent, Poland) has reportedly increased greatly since June 2009. This increase is thought to be in response to the reduced availability of these medicines through Czech pharmacies.

## Supply: production and trafficking

Synthetic drugs such as amphetamines tend to be produced in or near their consumer markets. Therefore, compared to plant-based drugs such as cannabis, heroin and cocaine, they are less frequently the subject of transcontinental trafficking activities. This, however, may not be true for their precursor chemicals, especially ephedrine and pseudoephedrine, used for methamphetamine production, and 1-phenyl-2-propanone (P2P, or benzyl methyl ketone, BMK), which is mostly used to produce amphetamine and may also be used to manufacture methamphetamine. Data presented in this section, mainly from police sources, can be used to build up a picture of the production and trafficking activities related to amphetamines and their precursors and to describe the products available on the illicit drugs markets, their price and purity.

## Seizures and market data: sources and interpretation

Systematic and routine information to describe illicit drug markets and trafficking is limited. Drug seizures are often considered as an indirect indicator of the supply, trafficking routes and availability of drugs. They are a more direct indicator of drug law enforcement activities (e.g. priorities, resources, strategies), while also reflecting both reporting practices and the vulnerability of traffickers. Data on purity and retail prices of illicit drugs may also be analysed in order to understand retail drug markets. Retail prices of drugs reported to the EMCDDA reflect the price to the user. Trends in price are adjusted for inflation at national level. Reports on purity, from most countries, are based on a sample of all drugs seized, and it is generally not possible to relate the reported data to a specific level of the drug market. For purity and retail prices, analyses are based on the reported mean or mode or, in their absence, the median. The availability of price and purity data may be limited in some countries and there may be questions of reliability and comparability.

The EMCDDA collects national data on drug seizures, purity and retail prices in Europe. Other data on drug supply comes from UNODC's information systems and analyses, complemented by additional information from Europol. Information on drug precursors is obtained from the European Commission, which collects data on seizures of these substances in the European Union, and the INCB, which is involved in international initiatives to prevent the diversion of precursor chemicals used in the manufacture of illicit drugs.

The data and estimates presented in this report are the best approximations available, but must be interpreted with caution, as many parts of the world still lack sophisticated information systems related to drug supply.

## Amphetamine

Europe accounted for more than 80 % of all amphetamine facilities discovered in 2008, while global seizures of the drug in 2008 totalled 23 tonnes, 98 % of which was confiscated in two regions, western Asia (14 tonnes) and Europe (8 tonnes) (UNODC, 2010). Most of the amphetamine seized in western Asia is in the form of tablets

known as 'Captagon', which are reported to contain amphetamine trafficked from south-east Europe to the Arabian Peninsula (CND, 2009).

Production of amphetamine in Europe is concentrated in the Netherlands, Poland and Belgium, and some is produced in Estonia, Lithuania and Germany. In 2008, 39 sites involved in the production, tableting or storage of amphetamine were discovered in the European Union and reported to Europol: 15 in the Netherlands, 11 in Poland, nine in Germany, three in Belgium and one in Lithuania (see Figure 1). Of the 39 sites, 28 handled only amphetamine, while the remaining 11 handled at least one additional synthetic drug, often MDMA.

Law enforcement agencies in Europe reported more than 39 000 seizures of amphetamine powder amounting to 8.1 tonnes of the drug in 2007 <sup>(4)</sup>. This represents the largest annual amount of the drug seized, rising from 3.8 tonnes in 2001. The Netherlands reported an estimated 2.8 tonnes of amphetamine seized, representing 34 % of the European total, followed by the United Kingdom with 1.8 tonnes (22 %), Germany with 0.8 tonnes (10 %), Belgium with 0.5 tonnes (6 %), and Poland and Norway with 0.4 tonnes each (5 %).

The purity of amphetamine samples intercepted in Europe in 2008 varied widely. The mean purity of samples ranged from less than 10 % in Denmark, Austria, Portugal, Slovenia, the United Kingdom, Croatia and Turkey, to greater than 25 % in Latvia, the Netherlands, Poland and Norway. In most of the 17 countries with sufficient data for analysis of trends over the past five years, the purity of amphetamine has been decreasing or remained stable <sup>(5)</sup>.

In 2008, the mean retail price of a gram of amphetamine ranged from EUR 6 to EUR 36 in the 17 reporting countries, and it was EUR 9–20 in over half of them. In all 13 countries reporting data over the five-year period 2003–08, amphetamine retail prices decreased or remained stable <sup>(6)</sup>.

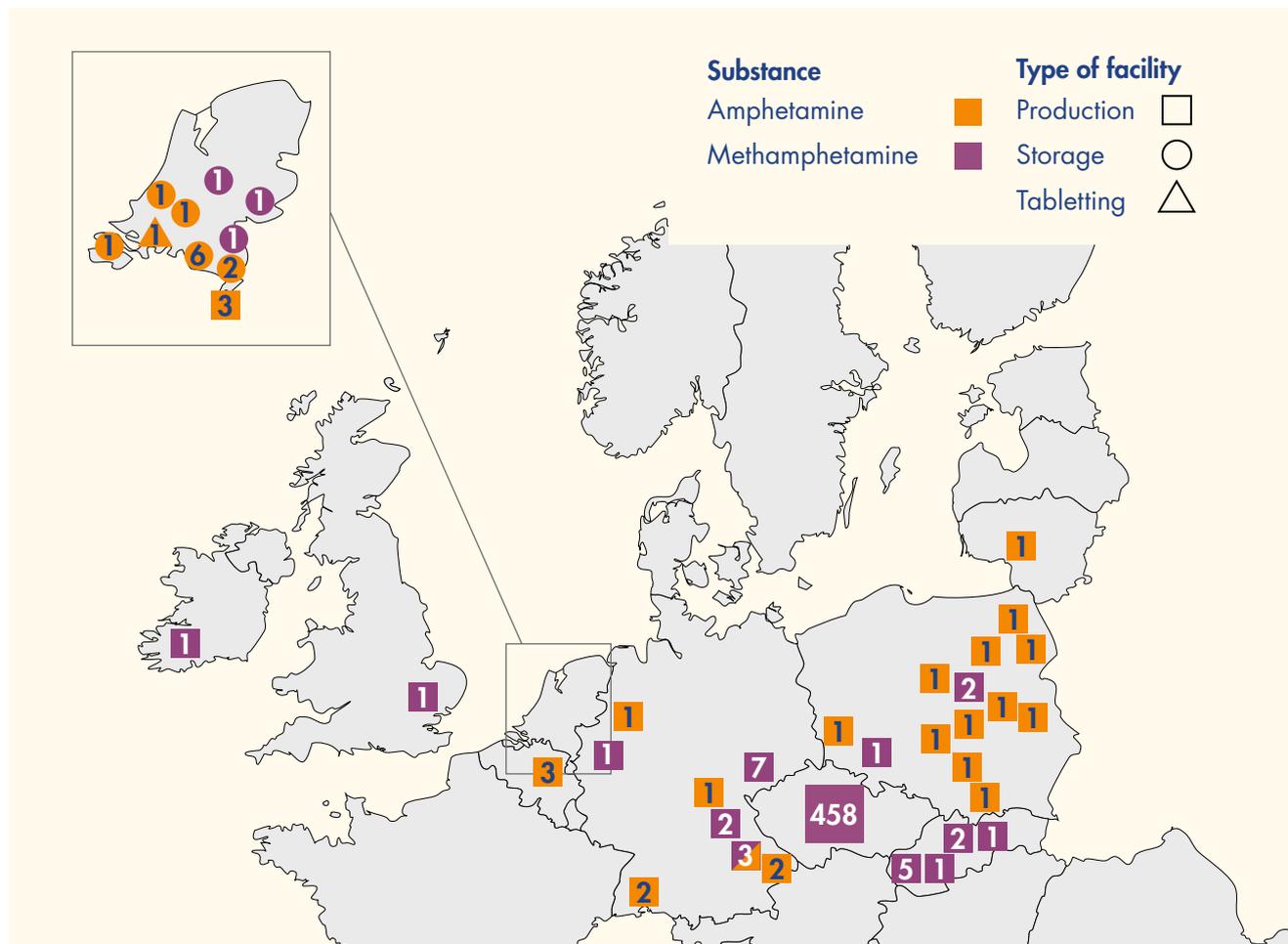
Global seizures of the precursor chemical P2P increased sharply to 5 260 litres in 2008 from 830 litres in 2007 and 2 600 litres in 2006. Seizures of P2P in the European Union increased to 629 litres from 582 litres in 2007. Most of the P2P intercepted in 2008 was confiscated in a large seizure of 564 litres in Lithuania, while Poland and Estonia reported

<sup>(4)</sup> Most recent year with data available from the two countries reporting the largest quantities seized. The data on European amphetamine seizures can be found in Tables SZR-11 and SZR-12 in the 2010 statistical bulletin.

<sup>(5)</sup> The data on European amphetamine purity can be found in Table PPP-8 in the 2010 statistical bulletin.

<sup>(6)</sup> The data on European drug prices mentioned in this section can be found in Table PPP-4 in the 2010 statistical bulletin.

**Figure 1:** Dismantled illicit amphetamines facilities reported to Europol in 2008



NB: This map displays the approximate location of illicit amphetamine and methamphetamine facilities uncovered in EU Member States in 2008, as reported to Europol.

Where possible, the distribution of reported facilities is presented on a sub-national basis. In the Czech Republic, due to the large number of sites dismantled and the lack of information on the location for many of them, a national value is given. One site was also located in the Portuguese Azores Islands.

Drug type is denoted by the symbol colour, with the number of facilities reported in the country or region indicated. Facilities handling both amphetamine and methamphetamine are indicated by two-colour symbols.

Source: Europol.

seizures totalling 39 litres and 22 litres, respectively (INCB, 2010). Russia, which apparently replaced China as the main source of P2P used to manufacture amphetamines in the European Union in recent years (EMCDDA–Europol, 2009), and where amphetamine is also manufactured illegally (UNODC, 2010), reported seizing a total of 2 130 litres of the chemical in 2008, or about 10 times more than in 2007 (191 litres) (INCB, 2010).

A relatively new trend in P2P trafficking is the ‘masking’ of the chemical, which is normally found in liquid form, into a powder known as P2P bisulphite, prior to importation into the European Union. It should also be noted that some European producers of amphetamine, for instance in Poland,

manufacture their own P2P from so-called ‘pre-precursors’ such as phenylacetic acid and benzyl cyanide.

### Methamphetamine

World methamphetamine production is concentrated in east and south-east Asia and North America, especially Mexico, but the drug is also increasingly manufactured in Oceania, South and Central America and southern Africa. In 2008, 18 tonnes of methamphetamine was seized worldwide, continuing a stable trend since 2004. Most of the drug was seized in east and south-east Asia, notably China, followed by North America, particularly the United States (UNODC, 2010).

Reported seizures of methamphetamine in Europe are small in number and quantity compared to those of amphetamine. In 2008, law enforcement agencies in 17 countries reported about 4 650 seizures totalling 302 kg of methamphetamine. Nordic and Baltic countries accounted for more than 95 % of all methamphetamine seized in Europe, with Norway reporting seizures of 103 kg (34 % of the European total) and Sweden 75 kg (25 %), followed by Estonia (38 kg, 12 %), Latvia (32 kg, 11 %), Lithuania (26 kg, 9 %) and Finland (17 kg, 6 %). Despite the large number of methamphetamine facilities discovered in the Czech Republic (see below), reported seizures amounted to only 4 kg of the drug (1 % of the European total), equal to the amount reported by Germany. The countries reporting the largest numbers of methamphetamine seizures in 2008 were Norway (1 380) and Sweden (846), followed by Slovakia (774), Latvia (494), the Czech Republic (405), Germany (356), Lithuania (162) and Finland (120).

Both the total amount of methamphetamine seized in Europe and the number of seizures of the drug have been increasing since 2001, with the greatest amount seized recorded in 2007 (336 kg) and the highest number of seizures in 2008.

The mean retail price of methamphetamine, reported by six countries, ranged between EUR 12 and EUR 126 a gram in 2008. The mean purity of the drug ranged between 22 % and 80 % in the 14 countries reporting it, with only three countries reporting mean purity levels above 60 %: Belgium (80 %), the Czech Republic and Slovakia (both 64 %).

By global standards, illicit supply of methamphetamine in Europe is small-scale, and centred around two regions: central Europe and the Baltic Sea (EMCDDA–Europol, 2009). Until recently, methamphetamine production was largely confined to the Czech Republic, where 458 mostly small-scale production sites were dismantled in 2008 and reported to Europol. This is the highest number ever reported by the Czech Republic of methamphetamine ‘kitchen laboratories’, which typically produce a few grams of the drug at a time. Small quantities of methamphetamine produced in the Czech Republic are probably exported to neighbouring countries, especially Slovakia and Germany (EMCDDA–Europol, 2009). However, seizures of methamphetamine production facilities were also reported to Europol in countries neighbouring the Czech Republic including Slovakia, Germany and Poland (see Figure 1), while Austria reported seizing three ‘kitchen labs’ in 2008. It seems that methamphetamine supply in central Europe is largely organised around small-scale production facilities run by users for their own needs and for some limited sales. In

## Methamphetamine

Methamphetamine can come in various shapes and forms. Powder methamphetamine found on the illicit drugs market is similar to powder amphetamine in many ways, including purity and appearance, and the two can be indistinguishable for both users and dealers. Most users of powder amphetamines snort or inject the drug. Crystal methamphetamine, in contrast, is often of very high purity. It comes in the form of white or translucent crystals, and users mostly smoke, snort, or inject it. Methamphetamine in tablet form is often mixed with other drugs, and sold as ‘ecstasy’. Methamphetamine base is an oily paste, which may be purified into methamphetamine hydrochloride salt or crystals. There is growing evidence that smoking crystal methamphetamine has more harmful psychological effects and a higher addictive potential than other forms of methamphetamine use — probably due to its considerably higher purity and route of administration. While use of crystal methamphetamine is increasingly prevalent in many parts of the world, in Europe, methamphetamine is almost exclusively found in powder form.

central Europe, extraction of ephedrine and pseudoephedrine from over-the-counter medical preparations appears to be the main source of these precursors for illicit methamphetamine production.

Large-scale methamphetamine trafficking operations, though reported to some extent in central Europe, especially in the Czech Republic, are more characteristic of a second hub of methamphetamine supply, centred round the Baltic Sea. This, probably, more recent supply source links the Baltic countries, especially Lithuania and Estonia, and possibly Poland, to Scandinavian countries, especially Sweden and Norway (but also Russia and Belarus), and is reported to involve players trafficking larger quantities of methamphetamine (EMCDDA–Europol, 2009). Although no methamphetamine production facilities have been seized in recent years, Lithuania and Estonia both report that methamphetamine is manufactured on their territories, most likely from P2P sourced from outside the European Union. Lithuanian nationals have been arrested at border crossings in Sweden and Norway smuggling methamphetamine shipments weighing about 10 kg, but sometimes as much as 50 kg at a time (EMCDDA–Europol, 2009). Lithuanian nationals were also involved in many of the seizures of P2P that took place in Europe in 2008 and, according to Lithuanian authorities, were arrested in connection with methamphetamine seizures in Ireland and the United Kingdom totalling 6 kg and 8 kg respectively.

Belgium, Portugal and the United Kingdom also reported methamphetamine production facilities in 2008, while the Netherlands reported the seizure of three storage facilities.

The INCB reports considerable decreases in world seizures in 2008 of two key precursors of methamphetamine: 13 tonnes of ephedrine in bulk form, down from 22 tonnes in 2007, and 5 tonnes of pseudoephedrine in bulk form, down from 25 tonnes in 2007. EU Member States accounted for 0.25 tonnes of ephedrine (mainly the Netherlands, Germany and Bulgaria), and over 0.5 tonnes of pseudoephedrine (almost all in France), but the amounts were small compared to the previous year. The INCB warns that global seizures of tablets containing ephedrine and pseudoephedrine, which are increasingly used to produce methamphetamine in Europe and elsewhere, are probably underreported (INCB, 2010).

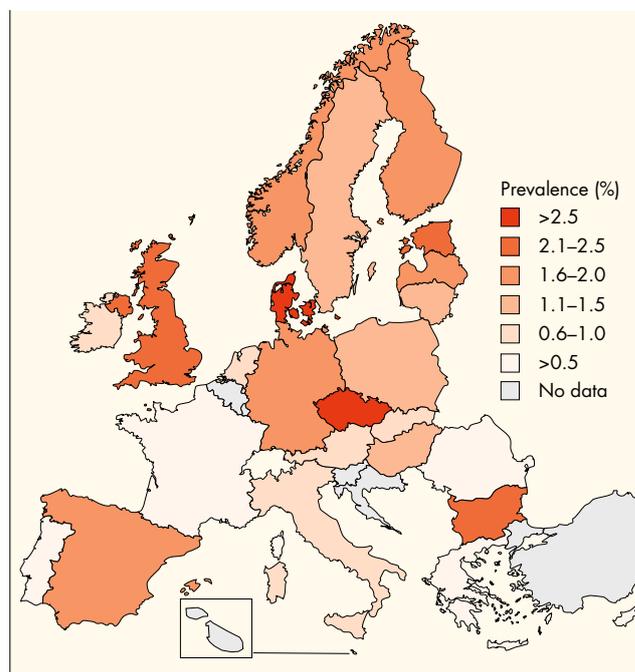
## Use of amphetamines in the general population

The overall prevalence of amphetamines use in Europe can be estimated from general population surveys. Surveys of schoolchildren, generally in their mid-teens, provide an insight into the use of these substances by young people at a vulnerable phase in their development. As levels of amphetamines use are low in most countries, targeted studies of settings or populations within which higher prevalence of amphetamines use can be expected are a complementary source of information.

It is estimated that, overall, around 12 million European adults aged 15–64 have tried amphetamines at least once in their lives <sup>(7)</sup> and 1.5 million (1.2 %) young Europeans (aged 15–34 years) have used amphetamines during the last year. At national level, last year use of amphetamines among young adults ranges from 0.1 % to 3.2 %. Prevalence levels of more than 2 % have been reported by the Czech Republic (3.2 %), Denmark (3.1 %), Estonia (2.5 %), the United Kingdom (England and Wales) (2.3 %) and Bulgaria (2.1 %) (Figure 2).

Population surveys suggest that the prevalence of amphetamines use across Europe is generally stable, with most countries reporting broadly constant levels since the 1990s <sup>(8)</sup>. Among countries reporting the highest last year prevalence levels of amphetamines use in the 15 to 34 age

**Figure 2:** Last year prevalence of amphetamines use among young adults (15–34 years) in Europe



NB: Data from population surveys, with year of survey are: Czech Republic (2008) 3.2 %, Denmark (2008) 3.1 %, Estonia (2008) 2.5 %, United Kingdom (England and Wales) (2008/09) 2.3 %, Bulgaria (2008) 2.1 %, Norway (2004) 2.0 %, Latvia (2007) 1.9 %, Finland (2006) 1.7 %, Spain (2007/08) 1.7 %, Germany (2006) 1.6 %, Sweden (2008) 1.5 %, Poland (2006) 1.3 %, Hungary (2007) 1.2 %, Lithuania (2008) 1.1 %, Austria (2008) 0.9 %, Ireland (2006/07) 0.8 %, Slovakia (2006) 0.7 %, Netherlands (2005) 0.7 %, Italy (2008) 0.6 %, Portugal (2007) 0.4 %, Cyprus (2006) 0.3 %, France (2005) 0.2 %, Greece (2004) 0.1 %, Romania (2007) 0.1 %. For more information, see Figure GPS-5 in the 2010 statistical bulletin. Sources: National focal points.

group, the United Kingdom has witnessed a long-term decline from a high of 6.2 % in 1998 to 2.3 % in 2008/09. Denmark, over a similar timescale, reports an increase from 0.5 % in 1994 to 3.1 % in both 2000 and 2008 <sup>(9)</sup>. Prevalence estimates for amphetamines are available since 2002 for the Czech Republic and 2005 for Bulgaria, the only countries to report a change of more than one percentage point during the last five years (Bulgaria, from 0.9 % in 2005 to 2.1 % in 2008; and the Czech Republic, from 1.5 % in 2004 to 3.2 % in 2008).

Lifetime prevalence of amphetamines use among 15- to 16-year-old school students is low across Europe. In 2007 or

<sup>(7)</sup> National prevalence data on amphetamines use presented here are based on general population surveys, which rarely include questions specifically about methamphetamine. Methamphetamine is included in the Czech questionnaire, but is not reported separately from amphetamine. In the United Kingdom, methamphetamine use was included in the questionnaire for the first time in the 2008/09 British Crime Survey.

<sup>(8)</sup> See Figure GPS-8 in the 2010 statistical bulletin.

<sup>(9)</sup> In Denmark, the 1994 information refers to 'problem drugs', which was considered mainly amphetamines.

2008, it ranged from 1 % to 5 % in 23 EU Member States, Norway and Croatia, with higher levels reported only in Bulgaria and Latvia (6 %) <sup>(10)</sup>. Stable trends between 2003 and 2007/08 can be observed in the lifetime use of amphetamines among this population in the majority of the countries. An increase by at least two percentage points was observed in eight countries, and a decrease of at least that amount only in Estonia.

## Use of amphetamines in recreational settings

Europe's recreational nightlife economy has grown rapidly over the past decades, particularly in electronic dance music settings. Young people in these settings report prevalence levels of stimulant drug use that are generally much higher than among the general population. However, the proportion of problem drug users may be relatively small, and prevalence estimates vary considerably between different settings and groups.

Studies from selected nightlife settings in nine countries in 2008 reported lifetime prevalence estimates for amphetamines use ranging from 5 % to 69 %. Some countries have suggested that amphetamines use in dance music settings has decreased during the last ten years, with the drug losing ground to ecstasy and cocaine powder use. An online survey of readers of the dance music magazine *Mixmag* <sup>(11)</sup> in the United Kingdom in 2009–2010 showed that although many of the 2 295 respondents reported having used amphetamine (72 % ever, 30 % in the past year and 15 % in the past month), other substances are more popular. Cocaine powder, for example, was used by more respondents to the survey (87 % reported ever use, 83 % past-year use and 47 % past-month use). The survey also found that while methamphetamine is also present in the UK club scene, its prevalence is relatively low, with 6 % reporting lifetime use, 1 % use in the last year and 0.3 % use in the last month. Viewed in the light of an earlier study (McCambridge et al., 2005), there appears to have been no change in the prevalence of methamphetamine use in this setting. Among men who have sex with men, though, the prevalence of methamphetamine use is much higher — a study found that about one in five used it in the past year, and this prevalence remained stable between 2003 and 2005 (Bolding et al., 2006).

Antenna studies among young people in Amsterdam show that last month prevalence of amphetamine use among

## Prevention of amphetamines use

Most universal prevention programmes focus on health threats related to tobacco, alcohol and cannabis, and they rarely address the use of stimulants such as amphetamines. Selective prevention interventions addressing amphetamines or stimulants use, however, are available in recreational settings. Most of these interventions provide information in brochures or print materials, or on the Internet, and have not yet been shown to be effective. The few evidence-based interventions that are available include direct and intensive personal counselling, mainly to individuals who may be vulnerable based on behavioural factors. While these individuals may not approach regular drug treatment services, they may benefit from motivational interventions that address their consumption patterns. Other types of interventions aim not at drug use itself but at its consequences, such as accidents, intoxications and acute health problems. These structural interventions, which are available in some western European countries (Belgium, Denmark, Germany, Spain, Luxembourg, Netherlands, Austria, United Kingdom), target nightlife settings, and provide transport, chill-out zones, alcohol tests and crisis interventions.

club-goers peaked at 13 % in 1998, and have since then decreased to a level lower than that in 1995 (6 % in 2008). Among those reporting use of amphetamine in the last year, most use the drug seldom or occasionally (91 %), and often together with alcohol (78 %). In contrast to some decades ago, in Amsterdam, amphetamine is nowadays almost never used in public recreational settings such as bars or clubs. The drug is reported to be more commonly used during after-parties, for example when cocaine is not available, and people usually use less of it compared to cocaine or ecstasy. Findings from qualitative studies suggest that amphetamine use has been stable for years in some specific music scenes (underground, rock, punk, techno, hard style) and in rural areas. Its low price makes it attractive for users who cannot afford more expensive drugs, such as cocaine. Although its popularity is growing among young people living in the country or in smaller cities, amphetamine has a negative image as a drug of 'losers' who cannot afford good quality drugs. The popularity of methamphetamine seems to be even lower than that of amphetamine, though it might be growing among specific populations, such as men who have sex

<sup>(10)</sup> A higher level of lifetime prevalence (8 %) was estimated for Austria, though qualitative follow-up work suggests that some students may have misunderstood the question, leading to an overestimation. The real prevalence is believed to be less than 8 %.

<sup>(11)</sup> Personal communication, Adam Winstock, King's College London.

with men and people who experiment with a wide variety of substances. In a survey carried out in 2008, 2.8 % of club-goers reported ever use of methamphetamine and 0.5 % reported last month use of the drug. An internet survey targeting students of higher vocational schools and universities found 0.43 % lifetime prevalence.

In Czech nightlife settings, the prevalence of pervitin (methamphetamine) use is reported to have increased between 2000 and 2007. In 2007, almost half of dance partygoers reported having used methamphetamine at least once in their lives, 28 % in the last 12 months and 16 % in the last 30 days. However, in contrast to problem methamphetamine users, partygoers in the Czech Republic use the drug mostly by snorting or orally, and very few inject it. Studies in recreational settings in Slovakia also found methamphetamine to be a popular drug. A survey conducted in 2005 among attendees of music festivals and a big dance music event found that, in the age group 15–29 years, 27 % had ever used methamphetamine, 19 % in the past year and 10 % in the past month.

## Health consequences of amphetamines use

Research on the health consequences of amphetamines use has largely been conducted in countries such as Australia and the United States, where methamphetamine use, notably crystal methamphetamine smoking, has become an important problem. While the findings of these research efforts may sometimes be more specific to drug use patterns that are uncommon in Europe, in many instances they are applicable to users of powder amphetamines, including injectors. In addition to reports in the international literature, results from recent, sometimes smaller-scale, studies reported by European countries are included in this overview.

Medical use of amphetamines has been associated with a number of side-effects including anorexia, insomnia and headaches, but illicit amphetamines use is associated with a broader set of negative consequences (Darke et al., 2008), including psychosis, cardiovascular and cerebrovascular problems, dependence, psychological and psychiatric problems, infectious diseases and death. For example, in the Czech Republic, a survey assessing hospitalisations among patients who had been admitted at least once for drug use disorders found that for pervitin (methamphetamine) users, the three most common diagnostic groups — apart from dependency-related conditions — included mental and behavioural disorders; injury, poisoning, other consequences of external causes; and infectious diseases.

Polydrug use, particularly with drugs that potentiate the cardiovascular effects of amphetamines, such as alcohol, opioids and cocaine, increases the toxicity of amphetamines.

## Short-term negative effects of amphetamines

Amphetamines use, particularly at higher doses, may bring about restlessness, tremor, anxiety, dizziness, tension, irritability, insomnia, confusion, aggression, and, in some individuals, psychotic symptoms and panic states. As intensive amphetamines use often occurs in binges, a 'crash' or coming down is a common after-effect among users. A crash may last from several hours to several days, with symptoms such as depression, fatigue and sleeping difficulties. Suicidal behaviour is a significant risk during the crash period (Pates and Riley, 2010).

## Psychological and psychiatric effects of long-term amphetamines use

Causal links between amphetamines use and psychiatric symptoms are difficult to establish, as some symptoms and conditions may pre-exist in the user or other factors, such as HIV infection or polydrug use, may act as cofounders. Studies have found, however, that pre-existing psychotic symptoms can be greatly exacerbated by subsequent amphetamines use. For example, a Swedish study among prisoners (Håkansson et al., 2009) revealed that users of amphetamines were more likely to exhibit psychiatric symptoms than were heroin or cocaine users. They also found that many stimulant users had had other psychiatric problems as well, and drug use exacerbated these problems.

The most serious psychopathological harms associated with amphetamines use include psychosis, depression, suicidal behaviour, anxiety and violent behaviour (Darke et al., 2008). Psychosis induced by amphetamines is typically transient, involves delusions and hallucinations, and is similar to paranoid schizophrenia. It lasts for hours to days, and in severe cases may require hospitalisation and medication. Regular users of amphetamines commonly experience various psychotic symptoms, including feelings of persecution and auditory, visual and tactile hallucinations (such as a perception of parasites in the skin). In contrast to early studies, which attributed the onset of psychosis to pre-existing conditions, recent research shows that amphetamines use may cause psychosis. Psychosis, however, is not an inevitable consequence of amphetamines use, but its likelihood is dramatically increased by heavy use of the drug (Darke et al., 2008;

Pates and Riley, 2010). Amphetamines users often suffer from depression and have high rates of suicidal ideation and attempted suicides.

In Slovakia, specialised dependence centres treating methamphetamine users reported a high occurrence of psychotic disorders of a schizophrenic character among their clients. These disorders were predominantly short-term drug-induced psychoses with hallucinations and delusions of persecution, which quickly resolved with abstinence. In a few cases, however, long-term treatment with neuroleptic medication was necessary. Furthermore, at admission, 46 % of clients were found to have symptoms of depression according to the Beck Depression Inventory. Czech experts looked into routine data collected on psychiatric diagnoses and found a higher prevalence of psychosis among methamphetamine users than among users of other drugs. A survey among addiction specialists also suggested the need for specific treatment procedures in users who experience psychosis or certain psychotic symptoms. Many methamphetamine users report having experienced anxiety symptoms before starting to use the drug, and still more report severe anxiety symptoms since commencing use. Users, though, might mistake the symptoms of anxiety for methamphetamine-induced hyperarousal (Darke et al., 2008). Self-mutilation after amphetamines use sometimes happens in both humans and animals, but is it less common among women than among men (Pates and Riley, 2010). Violent behaviours are also common among psychostimulant users, especially among chronic users and those with acute intoxication. Such behaviours might also accompany psychosis (Darke et al., 2008). Establishing a causal relationship between methamphetamine use and violence may, however, be unfounded because most evidence comes from cross-sectional studies (Tyner and Fremouw, 2008).

Another important mental health consequence of amphetamines use is dependence. Amphetamines withdrawal symptoms are different from those of depressant drugs, such as opioids or alcohol, where the symptoms are the opposite of the acute pharmacological effects of these drugs. On the contrary, some features of psychostimulant withdrawal symptoms, particularly agitation and hyperarousal, mimic those of intoxication. Other symptoms of amphetamines withdrawal include fatigue and inertia, hypersomnia followed by protracted insomnia, and an onset of agitation with mood disturbances that range from dysphoria to severe clinical depression (Jenner and Saunders, 2004). Central nervous system recovery after hyperstimulation by these drugs is characterised by excessive sleeping, eating and irritability (Pates and Riley, 2010).

## Neurocognitive damage and its consequences

Underlying the effects of amphetamine and methamphetamine are the similarities in chemical structure they share with the brain's natural neurotransmitters dopamine and norepinephrine (Melichar and Nutt, 2010). In the brain, amphetamines affect the monoamine neurotransmitter systems (dopaminergic, serotonergic, noradrenergic and glutamatergic) (Nordahl et al., 2003). Amphetamines are, however, neurotoxic and can cause damages that may last for months after cessation of use. Many core behavioural and psychiatric symptoms, including withdrawal, that occur in heavy users of the drug are likely to be related to altered monoamine regulation (Darke et al., 2008). Moreover, cognitive deficits in methamphetamine users are well-documented: these mainly involve impairments in episodic memory, executive functions, information processing speed and small impairments in motor skills, language and visuoconstructional abilities (Scott et al., 2007). Neurological and cognitive impairment can reduce users' independence in daily life, for example in preparing meals or managing money. This is further associated with depressive symptoms. In addition, as many treatment interventions available for amphetamines users are cognitive-based, neuropsychological deficits in substance users may result in poor treatment outcomes, such as higher rates of programme rule violation, poor cognitive skill acquisition and dropping out (Scott et al., 2007). Social-cognitive functioning may also be impaired, possibly as a result of damage to the frontal lobes. In methamphetamine users, impaired social functioning is linked with other symptoms such as paranoid ideation, depression, aggression, and a need to hide, all of which can eventually lead to social isolation. This is in contrast to the original intention of the users to enhance their social interaction. In animal experiments, rats and monkeys display similar social withdrawal, which suggests a physiological basis rather than a wish to hide because of the social undesirability of drug use (Homer et al., 2008).

A Latvian study investigated the severity of dependence among amphetamines and opioid users, using the Severity of Dependence Scale, which focuses on the psychological components of dependence. The study showed that heroin users experienced a higher level of severity of dependence than amphetamines users.

Both the occurrence and the severity of mental health problems among amphetamines users are associated with longer duration of use, more frequent use, dependence and injecting (Pates and Riley, 2010). Mental health problems are further associated with schizoid personality

prior to the onset of use, or with a family history of schizophrenia, especially in the non-transient, psychotic condition. Violent behaviours may occur more frequently in people with an existing propensity to violence (Darke et al., 2008).

### Cardiovascular and cerebrovascular effects

A review by Kaye et al. (2007) summarises the acute and chronic cardiovascular pathology associated with amphetamines use. The most common cardiovascular effects of amphetamines use are an acute increase in heart rate and blood pressure, which may abate without further consequences in the majority of cases. Nevertheless, in the context of chronic use or pre-existing cardiovascular pathology, these changes in cardiovascular functioning may trigger serious and potentially fatal events.

Amphetamines users are at elevated risk of cardiac pathology, including serious events such as unstable angina, and myocardial ischaemia and infarction. The risk is not likely to be limited to the duration of drug use, because the chronic cardiovascular pathology associated with amphetamines use may make the side-effects of the drug use more long-lasting. The risks are greatest among chronic amphetamines users, and pre-existing cardiac pathology, due to amphetamines use itself or to other factors, increases the risk of an acute cardiac event.

Psychostimulant-induced cerebrovascular problems are also well recognised. Studies report an increase in the risk of ischaemic and haemorrhagic stroke, and a substantially higher associated risk of death linked to such events (Darke et al., 2008).

It is impossible to assess the risk of serious cardiac events solely on the basis of dose and level of use, as other factors may also play an important role. For this reason, information on potential cardiovascular complications related to amphetamines should be targeted to all users, not just dependent and chronic users.

### Other health effects

Other health effects and risks include neurotoxicity<sup>(12)</sup>, risks associated with driving, dental disease, and maybe foetal growth restriction associated with amphetamines use during pregnancy. Alterations in brain structure and chemistry have been documented in heavy users of illicit amphetamines, although the clinical implications of these

findings remain uncertain (Chang et al., 2007).

Epidemiological data on the risks associated with the use of amphetamines when driving are rare and inconsistent (EMCDDA, 2008). Methamphetamine use has been associated with poor oral hygiene, including severe tooth decay and tooth wear (Hamamoto and Rhodus, 2009). Methamphetamine use causes xerostomia (dry mouth) and bruxism (teeth clenching and grinding), leading to rampant caries as users neglect their dental hygiene while frequently consuming carbonated sugary beverages. While some studies on amphetamines and pregnancy found insufficient evidence to evaluate the developmental toxicity of therapeutic amphetamines (Golub et al., 2005), another study found a 3.5 fold increased risk of foetal growth restriction among babies of women using methamphetamine during pregnancy (Smith et al., 2006).

### Infectious diseases among amphetamines users

Little is known about the prevalence of infectious diseases among groups that use different types of drugs. It has been shown, though, that high levels of sexual risk-taking among amphetamines users (both injectors and non-injectors) may contribute to an increased risk of HIV and sexually transmitted infections (Degenhardt et al., 2010).

Infectious diseases such as HIV and hepatitis B or C are more prevalent among injecting drug users than among the general population or among non-injecting drug users (Mathers et al., 2008; Wiessing et al., 2008a, b). In contrast to some countries further east (Russia, Ukraine), in the central and western parts of the European Union amphetamines are almost exclusively purchased in powder form, associated with lower injecting risks compared to drugs acquired in liquid form (Hartnoll et al., 2010). Amphetamines injectors may be a group where injecting risk is combined with elevated sexual risk behaviour. However, this risk combination is not always reflected in the seroprevalence of infections, as the predominance of injection-related versus sex-related infection risks may be different in different populations.

Most European studies of infectious diseases among users of amphetamines have been conducted on injectors using amphetamines as their main or only drug. These studies show a mixed picture: while some found no difference in infection prevalence, others found a lower prevalence of both risk behaviours and HIV and hepatitis infection among amphetamines injectors than among heroin injectors. Differences in infection prevalence are not

<sup>(12)</sup> See the box 'Neurocognitive damage and its consequences'.

necessarily due to the drugs as such, but may be due to other factors, such as isolated networks of lower-risk drug injecting groups within the injecting population (Shaw et al., 2010).

In the Czech Republic, a national hepatitis C virus (HCV) study found no difference in the estimated incidence of HCV infection between 'pervitin' (methamphetamine) users and opioid users, after adjustment for the period of injecting drug use. Routine infectious disease testing data from low-threshold facilities, however, as well as the data available from the register of treatment demands, suggest that pervitin users may have a lower incidence of HCV. This difference, though, may be attributable to the younger average age and shorter history of injecting drug use of pervitin users in those samples. In comparison to the general population and to opioid users, pervitin users report a higher rate of sexual risk behaviour, making them more vulnerable to sexually transmitted infections.

Slovakia reported that there is a significantly lower prevalence of HCV (likely also reflecting different incidence) among users injecting methamphetamines (26 % testing antibody positive) compared with those injecting opioids (59 % positive), although the data were not adjusted for the length of use. Furthermore, the lower frequency of injecting by amphetamines users compared to heroin users results, on average, in a significantly lower risk of bloodborne transmission among amphetamines injectors over a given period of injecting. In the opinion of the Slovak experts, this difference in injecting frequency might explain a large part of the difference in HCV prevalence.

A study in Estonia compared 256 primary opioid (fentanyl) injectors with 75 primary amphetamines injectors (Talu et al., 2010). One of the main findings was that the prevalence of HIV among those who injected amphetamines (27 %) was less than half that among those who injected fentanyl (62 %). Self-reported risk behaviours were consistent with the seroprevalence findings and less common among amphetamines users than among fentanyl users. Fentanyl users had injected almost five times more frequently in the last four weeks, they had shared needles or syringes with persons who were known to be HIV-positive four times more often, and they filled their syringes from other used syringes almost three times more often. While levels of unprotected sex were not statistically different among amphetamines and fentanyl users, amphetamines injectors had more sexual partners in the past 12 months.

A study in Latvia found also lower levels of prevalence of HIV, HCV and hepatitis B virus among amphetamines injectors than among opioid injectors.

In the United Kingdom's unlinked anonymous surveillance system, where injecting drug users in contact with services are sampled in repeated surveys, injectors of crack cocaine, cocaine powder and amphetamines were more likely than injectors of other drugs to self-report having shared needles in the past four weeks (HPA, 2009). As HIV prevalence in this study was very low (around 1 %), this difference in risk behaviours did not translate into a difference in HIV infections.

### Preventing and reducing harms related to amphetamines injecting

Interventions to reduce drug-related health harms among amphetamines injectors focus on preventing injecting-related infections. However, few amphetamines-specific measures exist, and responses rely mainly on what is known from HIV prevention among opioid users. Interventions offered to injecting amphetamines users are similar to those provided for injectors of other drugs and are delivered in the same settings. In general, these interventions include the distribution of leaflets describing the risks of infectious diseases and other health problems; practical skills in connection with safer drug use; needle and syringe programmes; safer sex education and condom promotion; referral to voluntary counselling and testing for infections; and referral to drug treatment as well as other health care as needed (Grund et al., 2010a).

Interventions may also reflect local amphetamines use patterns. For example, a new intervention developed and tested at low-threshold agencies in the Czech Republic supports non-injecting and less harmful patterns of stimulant use by distributing empty gelatine capsules to pervitin (methamphetamine) users. The users may fill the capsules with pervitin powder and swallow them. Taken orally, amphetamines have a high bioavailability, and the capsules enable the user to avoid the bitter taste of pervitin. Clients perceived preparing the capsules easy and showed increasing interest in this alternative route of administration. More research is still needed to evaluate its benefits and potential harms.

Risk behaviours are also associated with the characteristics of the drug users' social networks and their environments. To prevent and reduce harms related to amphetamines injecting, a combination of interventions may be required, aiming at reducing personal risk behaviours, changing social network norms (about risk boundaries or equipment sharing) through peer education, addressing the injecting process (e.g. by promoting the use of one-piece instead of two-piece syringes) and structural factors (e.g. by increasing the availability of sterile syringes or providing hygienic injecting environments as an alternative to public injecting).

## Deaths related to amphetamines

Little is known about deaths related directly (acute poisoning) or indirectly to amphetamines. A recent systematic review suggests that investigating the morbidity and mortality associated with amphetamines use should be a research priority and that cohort studies with long-term follow-up and data that are linked to mortality statistics are needed (Singleton et al., 2009). This is particularly important for countries where problematic amphetamines use is prevalent or increasing.

A comprehensive review of studies on mortality among dependent and problematic amphetamines users included eight cohort studies in Australia, Thailand, Sweden, Finland, Netherlands, Czech Republic (Singleton et al., 2009). The estimated crude mortality ratio ranged from zero in Australia to 2.95 per 1 000 person years in Thailand, and, among the European countries, from 0.49 to 2.89 per 1 000 person years. The standardised mortality ratio (the ratio of observed deaths to the expected deaths in the general population) was estimated in the Czech cohort study only (6.22 overall). A study in the Czech Republic also found that the overall mortality rate of pervitin users was approximately half that among heroin users (4.9 cases versus 8.6 cases per 1 000 person year, respectively).

In Latvia, a mortality cohort study enrolled 551 patients who entered treatment for amphetamines use between 1999 and 2006. For the cohort, the crude mortality rate was 5.69 per 1 000 person years, and the standardised mortality rate was 3.28 per 1 000 person years. These rates have to be

interpreted with caution because of the very low number (nine) of deaths reported during the follow-up period.

Only three of the studies reviewed by Singleton et al. described the specific causes of death. These mainly included heroin overdose and accidents or injuries. In the Czech Republic, pervitin users appear to show a higher rate of deaths caused by external factors, especially suicides, when compared to opioid users. A study among drug users from the Netherlands found higher mortality rates among injectors than among non-injectors, and among those who had used amphetamines for five years or longer (van Haastrecht et al., 1996). Estimating the mortality directly associated with amphetamines is complicated by polydrug use (i.e. concurrent use of mainly heroin and cocaine).

An overview of drug-related deaths in the United Kingdom between 1997 and 2007 identified 832 deaths with positive tests for amphetamine or methamphetamine (Schifano et al., 2010). Only in 13 % of these fatalities was just one drug found at post mortem or implicated. In these cases, the most common causes of death were due to well-known medical consequences of amphetamines use such as cerebral haemorrhage and acute hypertensive crisis (70 %), pre-existing cardiovascular and cardiopulmonary conditions (17 %) and risky behaviour while intoxicated with amphetamines (8 %). In the other cases, the drugs mentioned in addition to amphetamines included heroin or morphine (39 %), alcohol (20 %), methadone (17 %), cocaine (13 %). Methamphetamine was identified in only 14 out of the 832 cases.

## Part 2: Problem amphetamines use in Europe

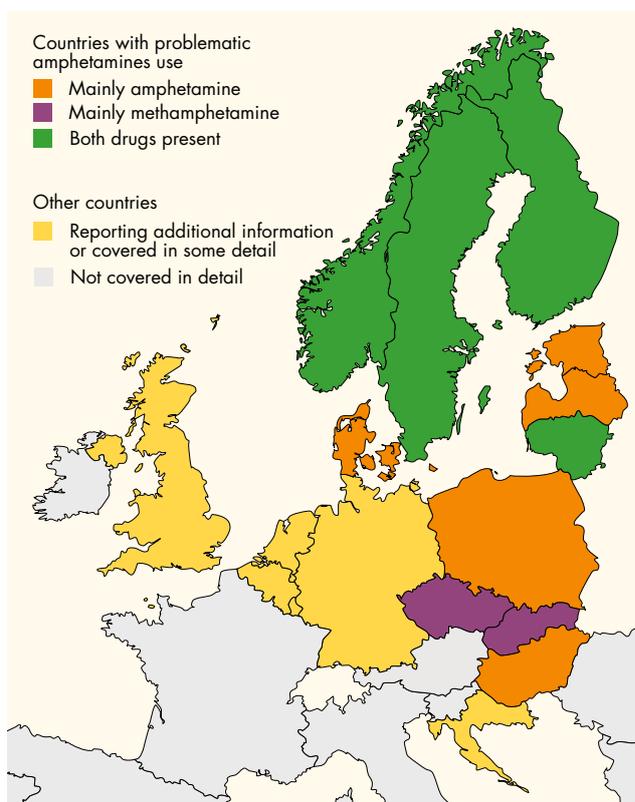
Amphetamines use exists to some extent in all European countries, but only in a few is it reported as a major component of the drug problem (Figure 3). This section of the report reviews the available information regarding problem amphetamines use and the related treatment responses in four geographical regions and sub-regions of Europe: western and southern Europe, where, in many countries, amphetamines users account for a small fraction of problem drug users; northern Europe, where amphetamines use is sometimes a long-established problem and is still today a key element of the drug situation; eastern and central Europe, where there are very different levels of amphetamines problems, but with increasing trends in several countries, with a special focus on the Czech Republic and Slovakia, as countries that have a specific historical context and comparable amphetamines problems.

### Western and southern Europe

There is no single history of amphetamines use in western and southern Europe, as during the twentieth century it developed along different timelines across these regions. In addition, historical information is available only for a few of these countries. In the absence of information on southern European countries, reports of past amphetamines use in the Netherlands and the United Kingdom must serve to illustrate the history of amphetamines in western Europe <sup>(13)</sup>.

During World War II, amphetamine and methamphetamine tablets were widely distributed to members of the armed forces on both sides of the conflict. The literature specifically mentions German soldiers, but servicemen of other nations also received amphetamines pills. Three-milligram methamphetamine pills under the name pervitin were already available in Germany from 1938, and appear to have been widely distributed among the armed forces. In 1941, this substance became more controlled in that country, due to the long recovery periods that soldiers needed after its use and some cases of abuse. Thereafter, German military doctors prescribed it more cautiously.

**Figure 3:** Problematic use of amphetamines in Europe



NB: This map highlights those countries with significant problem amphetamines use, grouped according to the relative levels of amphetamine and methamphetamine use by a multi-indicator approach. Other countries contributing to the special data collection (or in the case of Germany, showing significant treatment demand related to these drugs) are also indicated.

In the United Kingdom, after the war, amphetamines were liberally prescribed, with ready availability of over-the-counter preparations. This policy was later changed, and the substances became subject to prescription control in 1957. The 1960s saw an increase in amphetamines use in Europe, as the drugs were taken up by new groups of recreational users. A Dutch ethnographic study on problem

<sup>(13)</sup> With further information on the use of amphetamines by armed forces in the Second World War, available on Wikipedia.

drug users suggests that amphetamine and methamphetamine were used in specific drug scenes, together with other drugs, in the Netherlands since 1962. In the United Kingdom, recreational use of diverted amphetamines is said to have 'reached epidemic proportions' in the 1960s, and towards the end of the decade there were some reports of methamphetamine injecting on the London drug scene.

During the 1970s, many countries imposed or tightened their control on amphetamines possession and/or use. In 1971, the United Kingdom scheduled non-injectable amphetamines as class B and injectable amphetamines as class A under its Drug Misuse Act. However, due to the focus on heroin use during the 1970s and 1980s, information about amphetamines use in the United Kingdom at that time is scarce. It is known, though, that amphetamine remained popular in the nightlife scene, and pills were replaced by amphetamine powder. In 1976, the Netherlands issued its 'Amphetamine Decree', placing amphetamine and methamphetamine under the Opium Act as illegal drugs. As in the United Kingdom, amphetamines were 'not a priority of drugs combat', partly as they were not perceived to cause serious problems and partly because of the focus on opioids.

In these countries, the available information suggests that though amphetamines use continued during the 1970s and 1980s, it was overshadowed by the rising use of heroin. In the 1990s, however, with the development of the electronic music scenes and the diffusion of synthetic drugs, amphetamines use surged.

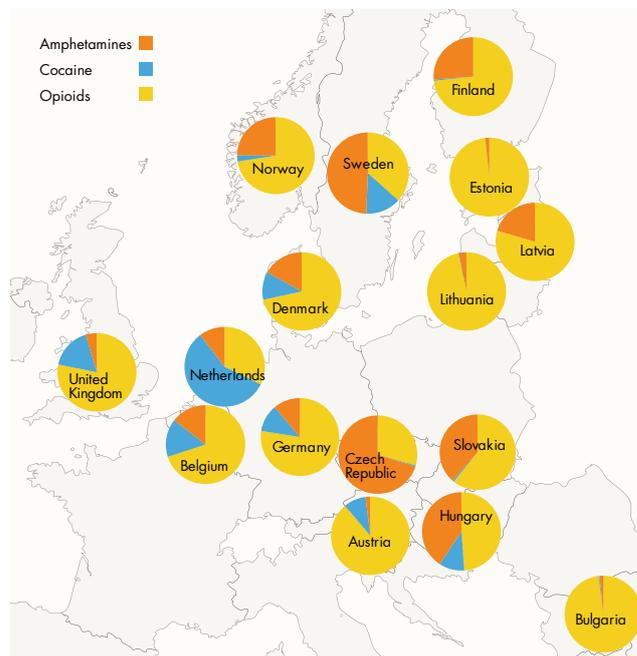
### Problem amphetamines use today

In the majority of western and southern European countries, problem amphetamines use represents a small fraction of problem drug use and primary amphetamines users account for less than 5 % of those who enter treatment for opioids, cocaine or amphetamines problems in most countries of this region<sup>(14)</sup>. The figure is higher only in Belgium (14 %), Germany (13 %) and the Netherlands (10 %) (Figure 4). Most amphetamines clients enter treatment in outpatient services. Their mean age is 29.1 years, and they started using amphetamines at an average age of 19.3 years. The male to female ratio among amphetamines users in this group is about 2:1. Among amphetamines users in these countries, injecting ranges from zero (Ireland, Italy, Cyprus, Luxembourg, Austria) to 24 % (United Kingdom). Between 2003 and 2008, the number and proportion of clients

entering treatment for primary use of amphetamines remained mainly stable in most western and southern European countries.

Low prevalence of amphetamines use among problem drug users has also been reported in various national and local studies. The Dutch 'Amsterdam Cohort Study' revealed that neither amphetamines alone (around 1 %) nor the combination of amphetamines with heroin or cocaine (about 8 %) was prevalent among the studied population of problem drug users. Similarly, in Wales, a study in 2008 among the users of a needle exchange programme found that 8 % of clients used amphetamines, while Luxembourg reports that only 1 % of problem drug users sampled in various treatment and non-treatment settings consider amphetamines as their main drug. Compared with the low levels of amphetamines use reported by problem drug users in this part of Europe, a survey carried out in 2004 stands out as an exception, with almost half the injectors (48 %)

**Figure 4:** Relative importance of amphetamines, opioids and cocaine clients entering treatment in selected European countries



NB: The pie charts show the number of amphetamines, opioids and cocaine users entering specialised drug treatment as a proportion of the total number of those reporting one of these three drugs as their primary substance. Data are shown only for countries where amphetamines (or non-cocaine stimulants in the case of Germany and Lithuania) account for at least 2 % of those entering treatment for these three drugs. Based on Table TDI-5 (part ii) in the 2010 statistical bulletin and non-TDI data for Norway. Source: National focal points.

<sup>(14)</sup> Data on treatment prevalence — on all drug users in treatment — may yield a slightly different breakdown by primary drug: see Table TDI-38 in the 2010 statistical bulletin.

attending a needle and syringe programme in Antwerp, Belgium, reporting use of amphetamines.

A study conducted in Luxembourg showed that amphetamines use may have been part of problem drug users' consumption careers in the past, but is less often part of their current drug use patterns. Among sampled participants, both from treatment and other settings (low-threshold facilities and prisons), 57 % had ever taken amphetamines, but less than 5 % — mostly participants under the age of 30 — reported taking the drug in the past two months. Among respondents from prisons who reported having used amphetamines, 86 % had not used the substance in the last two years.

### Treatment options for problem amphetamines use

In western and southern European countries, specific treatment programmes for amphetamines users are rare and treatment systems have specialised in responding to the needs of opioid users, especially with opioid substitution

treatment. In some cases, amphetamines users, especially socially integrated ones, may regard these treatment services as suitable only for users of 'problem drugs' such as heroin (EMCDDA, 2009). They may also believe that treatment facilities are unable to adequately deal with the complexities of amphetamines dependence (e.g. Vincent et al., 1999; Wright et al., 1999). For these reasons, they may be reluctant to seek treatment for their drug problems.

Besides the general outpatient psychosocial interventions, residential treatment or referral to psychiatric services are available for serious psychiatric comorbidity associated with problematic amphetamines use. The United Kingdom is the only country where substitution therapy with dexamphetamine is available. Dexamphetamine has long been available for the treatment of highly problematic users of amphetamines in England and Wales, where it may be prescribed by any doctor. Information on this practice is limited. A survey of pharmacy services conducted over 10 years ago estimated that 900 to 1 000 clients were receiving this treatment (Strang and Sheridan, 1997). Most

### Treatment for amphetamines problems

The number of drug users reported entering treatment for primary amphetamines use in Europe is relatively small <sup>(1)</sup>, amounting to about 19 000 across 28 countries in 2008, half of them entering drug treatment for the first time in their lives. In addition, amphetamines are reported as a secondary drug, often in combination with opioids, by around 36 000 treatment entrants who report other primary drugs.

Amphetamines withdrawal is not considered life-threatening, and successful detoxification is possible (Jenner and Saunders, 2004). Apart from a few studies showing some effectiveness for fluoxetine (an antidepressant) and imipramine (an adrenergic uptake inhibitor; Shoptaw et al., 2009a, b; Srisurapanont et al., 2001), most pharmacological approaches for treating amphetamines problems are still under development and evaluation. Contingency management <sup>(2)</sup>, however, has been shown to result in a reduction of use while in treatment and in abstinence at short-term follow-up (Roll et al., 2006).

Despite the lack of effective pharmacological treatment options for amphetamines users to reduce use or maintain abstinence, some Member States have developed specific interventions targeting problem amphetamines users.

Short-term detoxification and a range of outpatient psychosocial interventions, such as cognitive behavioural therapy, are provided, and pharmacological treatment of symptoms, as well as long-term residential treatment, is available for the more severe cases. Unfortunately, as reported by professionals, psychiatric problems are frequent and difficult to handle within the therapeutic context.

Specific quality assessment measures for the treatment of amphetamines users have been reported by a number of Member States. In countries where problem amphetamine use has been widespread for a long time, quality assurance is integrated in general drug treatment programmes.

Research on treatment options for drug dependence has historically focused on the needs of opioid users, but research in the field of amphetamine and methamphetamine is growing, especially regarding potential substitution therapy. Such research is urgently needed, as professionals report experiencing therapeutic difficulties with amphetamines users. Sharing of best practice can also play an important role in improving care, particularly in countries lacking specialised treatment services for stimulant users.

<sup>(1)</sup> In a small number of countries, it is not possible to distinguish amphetamines users in the treatment data, as these are reported as users of 'stimulants other than cocaine'. Data from the other countries indicate, however, that amphetamines users may represent the vast majority (86 %) of this category, and they are included in the amphetamines data for analysis.

<sup>(2)</sup> Contingency management typically aims to reduce the reinforcing effects of drugs by rewarding abstinence with vouchers or other incentives that increase progressively, but may also decrease or be lost.

prescriptions were issued by doctors working in hospitals or clinics, almost all of whom were in the National Health Service (NHS). A survey of 265 NHS specialist services, carried out in 2000, revealed that dexamphetamine prescribing was available in about a third of the services surveyed (Rosenberg et al., 2002). Due to a lack of demonstrated effectiveness, however, the United Kingdom guidelines on clinical management of drug dependence recommend against substitute prescribing of dexamphetamine (NTA, 2007).

## Northern Europe

Problem amphetamines use lies at the heart of the drug problem in Sweden and Finland, while in the neighbouring countries of Denmark and Norway, levels of use of these substances in the general population are above the European average. Amphetamines use in northern Europe has some specific historical characteristics, which can be described in some detail for Sweden (Goldberg, 1968) and Finland.

Amphetamine drugs were introduced in Sweden in 1938 under the names benzedrine (amphetamine) and pervitin (methamphetamine). In the following two to three years, the substances were widely recommended in the Swedish mass media as a 'pep pill' for all sorts of people from students to tired housewives, and soon reached their broadest public. Sweden was probably the first country in Europe to conduct representative surveys of students' drug use. In studies carried out in 1938–1941, about 70–80 % of students reported lifetime prevalence of amphetamines use. From 1939, amphetamines were no longer available in Sweden without a doctor's prescription; which stabilised levels of use for one year, before they started to rise again. In 1942/43, the number of amphetamine users was estimated to be 200 000, or 3 % of the adult population, most of whom were occasional users, though 7 200 were estimated to use at least once a week, with about 1 % (200) of all amphetamine users using between 10 and 100 pills a day. In 1943, as awareness increased about the negative side-effects of amphetamines, a warning was issued to Swedish physicians, and the mass media started to point out the risks of uncontrolled use. This led to sales decreasing by 40–60 %. The following year, Sweden placed amphetamine on its National Narcotic Drugs List. In spite of this, widespread use of these substances continued until the early 1950s, when it became more closely associated with certain social groups such as artists and criminals.

In 1960, Sweden estimated that there were 1 000 amphetamine injectors in the country. The spread of amphetamine use in Sweden continued afterwards at

reportedly higher rates. The user groups expanded beyond artists and criminals, and the drug gained ground in recreational settings as well — young people in parties and persons wishing to improve their sexual performance.

Finland, in 1941, received a large supply of methamphetamine pills from Germany in support of the Continuation War against the Soviet Union (1941–44). When the ensuing offensive was at its height, 850 000 pervitin pills were available to Finnish front-line soldiers, commanders and reconnaissance patrols as well as medical crops. Pervitin was used to reduce the need for sleep and sensitivity to hunger, and to improve the physical performance of soldiers. It also dulled their sensitivity to pain, while heightening their alertness, increasing their self-confidence and concentration, and lowering their threshold to taking risks. However, the side-effects of this drug soon became obvious. Sleeplessness due to pervitin use could induce paranoia, hallucinations and aggressive behaviour, while long-term use increased the likelihood of substance addiction and could even lead to fatalities.

During and after the war, many Finnish families used various prescription amphetamine and methamphetamine products (benzedrine, stimulan, pervitin and beramin). Amphetamines were particularly popular among drivers and students. The substances were readily prescribed, and as methamphetamine was not considered a narcotic, it was not monitored. Problem drug use, at that time, was equated mainly with the use of opioids in Finland. However, in the mid-1950s, as opioid use decreased, amphetamine use began to increase, possibly as a result of the influence of Sweden on the post-war Finnish generation. Amphetamine, even at that time, was often used intravenously, and the first cases of problem amphetamines use in Finland were documented. Postulated reasons for this include relatively easy access to liquid amphetamine and Finnish drug use practice's history of favouring intravenous drug use in order to experience the strongest effects. However, it was not until the late 1960s, that amphetamine became more widely known in Finland, and amphetamine began to be smuggled into Finland.

In 1974–75, Sweden witnessed the arrival of heroin in the Stockholm area, where it became displaced amphetamine as the drug of choice among injectors. Outside the capital, however, amphetamine retained its popularity. In the 1990s, some countries in the region experienced a further increase in amphetamines use, both in recreational settings and among problem drug users. In Finland, amphetamine use has outstripped opioid use since 1997, with use and drug-related harm probably peaking in the mid-2000s.

## Problem amphetamines use today

Finland has produced an estimate of 14 500–19 000 problem drug users in 2005 <sup>(15)</sup>. Of these, 75–80 % used amphetamine as their primary drug, corresponding to 16 296 (12 000–22 000) problem amphetamine users, or 4.7 (3.4–6.3) per 1 000 inhabitants aged 15–64. Although subnational studies suggest lower prevalence levels of problem drug use in eastern and northern Finland, the proportion of amphetamine users is roughly the same across the country. In the greater Helsinki area, the estimated number of problem amphetamine users was 4 000–6 000 in 2005. The estimated prevalence of problem amphetamine use in Finland increased steadily between 1997 and 2005.

Primary users of amphetamines mostly enter treatment in outpatient centres, although in Finland and Sweden, inpatient centres play an important role <sup>(16)</sup>. Amphetamine users represent less than a fifth of treatment entrants citing opioids, cocaine or amphetamines as their primary drug in Denmark (17 %), around a quarter in Norway (25 %) <sup>(17)</sup> and Finland (26 %) and almost half in Sweden (49 %) (Figure 4). Injecting drug use is reported by a clear majority of amphetamines clients attending outpatient centres in Finland (82 %) and Sweden (67 %), but not in Denmark (4 %), thereby highlighting differences in patterns of amphetamines use between these countries.

While the number of amphetamines users entering treatment for the first time has remained relatively stable between 2003 and 2008 in Sweden and Denmark, Finland reports a decrease in both the number and the proportion of new amphetamines clients <sup>(18)</sup>.

Sweden reports the highest average age of amphetamines clients in Europe (35 years), followed by Finland (30 years), while in Denmark clients for this drug are younger (26 years). Sweden (1.5:1) and Finland (1.6:1) report two of the lowest male to female ratios among amphetamines clients in Europe. Overall, female amphetamines clients are younger than their male counterparts. In Sweden, 37 % and in Finland 25 % of all women entering outpatient treatment use amphetamines as their primary drug, compared to 27 % and 17 % of men, respectively. In these two countries, especially among women in Sweden, the duration between first use and first treatment is long compared to the rest of Europe <sup>(19)</sup>.

Of the 6 350 drug users who entered prison in Sweden in 2006, 4 750 were diagnosed with a severe drug dependence problem. Most of them (73 %) were primary amphetamines users, which is a much higher proportion than is found among drug using populations outside prison. These amphetamines users exhibited an intensive use pattern: 61 % were daily users, with an average 23 days of use in the past 30 days, and most of them (70 %) injected the drug. Many of them reported also using other drugs in the past 30 days (38 %), mainly cannabis (36 %) and tranquillisers (22 %), or were binge alcohol drinkers (12 %). The use of opioids, cocaine or hallucinogens was rare. Amphetamines users were older, came from a more rural and non-immigrant background, and reported psychiatric symptoms and problems more often and previous inpatient detoxification less often than users of heroin or other drugs.

A Norwegian study interviewing clients of a needle distribution facility in Oslo found that in the period between 1999 and 2008, 63 % of the interviewees used amphetamines on 14.5 days on average during the last month. The distinction between amphetamine and methamphetamine was not possible, as the users were unable to distinguish between the two. A trend analysis revealed an increase both in the proportion reporting amphetamines use during this period (from 59 % to 68 %) and in the number of days of amphetamines injecting (from 12.5 to 16.6 days). High proportions of amphetamines users reported polydrug use, with 77 % having also used cannabis and 20 % cocaine; 75 % having injected heroin in the last month.

Polydrug use appears to be a common pattern among problem amphetamines users. A Finnish study found that amphetamines users usually engage in polydrug use to achieve specific pharmacological effects. Alcohol, cannabis, medications or buprenorphine were often used either to boost or alter the effects of amphetamines or to enable sleep following extended hours of hyperactivity and wakefulness. Moreover, amphetamines and opioids may be used intermittently, either when the other drug is not available or to 'treat' dependence on one drug by the other drug. Among injecting drug users attending a needle exchange programme in Malmo (Sweden), 57 % of the clients considered amphetamines to be their main drug. The study, which focused mainly on illicit buprenorphine, also found that amphetamines users used buprenorphine

<sup>(15)</sup> The problem drug use estimate in Finland must be interpreted with caution when comparing it with figures from other countries. This is because the Finnish estimates may be based on a broader definition than that of the EMCDDA (and of other countries) and may include some occasional users as well.

<sup>(16)</sup> See Table TDI-19 (part ii) and (part iv) in the 2010 statistical bulletin.

<sup>(17)</sup> Based on non-TDI data for Norway.

<sup>(18)</sup> See Table TDI-3 in the 2010 statistical bulletin.

<sup>(19)</sup> See Table TDI-103 (part iii) in the 2010 statistical bulletin.

more often than heroin users. In another Swedish study carried out in 2007/08 among injecting drug users recruited from public settings in Stockholm, 47 % of respondents identified amphetamines as the drug they had used most frequently in the last 12 months. Polydrug use was common and some primary users of other drugs used amphetamines too.

Norwegian emergency psychiatry data from 2003 and 2006, mainly on people with acute psychosis characterised by uncontrolled behaviour and suicidality, showed that of those who tested positive for amphetamines, most (in 2003) or all (in 2006) were positive for methamphetamine. While this may suggest that methamphetamine plays more of a role in psychosis than amphetamine, it may also reflect the underlying prevalence of use of the two drugs. Toxicological data from the National Institute of Public Health provides evidence of the increasing presence of methamphetamine in Norway. Over the period 2000–08, amphetamines were detected in 3–5 % of urine samples from correctional facilities 18–28 % of blood samples from drivers suspected of driving under the influence, and 5–8 % of autopsy samples, with data from all three sources pointing to the same changes in the stimulants market. For all categories, as a proportion of all cases involving amphetamines, those with methamphetamine have risen from being almost zero around the turn of the millennium to 54 % (prisoners), 69 % (drivers), and 80 % (autopsies) of all tests in 2008. These laboratory results are mirrored by the number of seizures of these two substances. In 2000, methamphetamine only accounted for 6 % of the total seizures of the two drugs, rising to 44 % in 2008, and as high as 68 % in the first six months of 2009.

In Sweden, analysis of biological samples taken from people suspected of minor drug offences in 2009 showed that methamphetamine was found in about 1 % of the tests, 16 % of the tests revealed amphetamine alone, and both drugs were detected in a further 13 % of tests. The prevalence of any amphetamines among those tested also declined from 44 % in 2006 to 34 % in 2009. However, between 2007 and 2008, the proportion with both drugs present increased about three-fold to 12 %. While this appears to indicate an increase in the use of methamphetamine at the expense of amphetamine, further interpretation is difficult, as amphetamine is a metabolic breakdown product of methamphetamine (Schepers et al., 2003). Other data from the police and customs in Sweden also show an increase in methamphetamine use in most parts of the country. Many users in Sweden are reported to find methamphetamine interchangeable with amphetamine, but some view methamphetamine as stronger and better. The two substances probably cost about the same and are distributed

by the same criminal groups. Methamphetamine smoking has not been reported in Sweden.

A series of Finnish studies found that amphetamines users usually take 0.5 to 5 grams of the drug per day, depending on the purity and individual tolerance levels. As the price of a gram of amphetamines is around EUR 30, problem amphetamines use can be costly and is often associated with petty theft.

### Treatment options for problem amphetamines use

In Sweden, amphetamine is the drug historically most commonly associated with problem drug use and treatment of drug dependence has been developed to cater for the needs of amphetamine users. The main treatment approach is residential treatment using the 12-step Minnesota model. Problem amphetamine users attend a 6 month 12-step programme, and then attend Narcotics Anonymous meetings for several years. Residential treatment is usually provided by private organisations, but is covered by the national health insurance. Clients with less problematic use receive psychosocial treatment, namely cognitive behavioural treatment and motivational interviewing, on an outpatient basis. A clinical trial with naltrexone, a non-selective opioid antagonist, to reduce craving for and use of amphetamines has been conducted with positive outcomes reported.

In Finland, problem amphetamines users are sometimes admitted to psychiatric hospitals to receive treatment for amphetamine psychosis. However, no long-term psychiatric care is available for such users. Psychosocial interventions and short-term detoxification are available, but access to continued treatment is much more limited. When seeking treatment, some amphetamines users are thought to emphasise their use of opioids in order to receive long-term opioid substitution treatment.

Norway reports that problem amphetamines users are often difficult to reach with therapeutic measures and many of them do not seek help. However, this group still constitutes a large proportion of those admitted to emergency psychiatric treatment.

### Eastern and central Europe

In several eastern and central European countries, various data sources suggest that the use of amphetamines represents a significant part of overall problem drug use. This section focuses on five countries: Estonia, Hungary, Latvia, Lithuania and Poland in this region; the Czech Republic and Slovakia are discussed later. Unfortunately,

little has been reported regarding the social history of amphetamines use in these five countries. Available studies mostly place the first appearance of amphetamines use in the 1990s. For example, a Polish study looked at the emergence of amphetamines use in Gdansk (Sękiewicz, 2001), a city that has been characterized as being the first to be influenced by new 'western lifestyle' trends. It found that the Polish drug scene was dominated by 'kompot' (also known as Polish heroin) in the 1970s and 1980s. The early 1990s saw the rise of problems related to the use of amphetamines. Although the number of amphetamines users in Gdansk in contact with treatment agencies increased greatly in the 1990s, a snowball survey suggested that only 4 % of all amphetamines users had contact with the treatment system, as opposed to about half of the heroin users. Amphetamines users were also more socially integrated than heroin users.

### Problem amphetamines use today

Primary use of amphetamines was reported by between 3 % (Lithuania) and 41 % (Hungary) of treatment entrants declaring opioids, cocaine or amphetamines as their primary drug (Figure 4). The number and proportion of amphetamines clients entering treatment for the first time in their lives increased rapidly in Latvia (from 1 % in 2000, to 16 % in 2003 and 38 % in 2008); the percentage also increased in Hungary, but with decreasing absolute numbers.

Most primary users of amphetamines entering treatment do so in outpatient settings. In Hungary, most amphetamines clients are sent to treatment by the criminal justice system as diversion from punishment. In Latvia, most are self-referred or referred by medical services.

The average age of amphetamines users entering treatment in these countries is low compared to other countries: between 22 (Estonia) and 28 years old (Hungary) depending on the country. Overall, female amphetamines clients are younger than their male counterparts<sup>(20)</sup>. On average, primary amphetamines clients report their first use of the drug at between 17.4 years (Estonia) and 21.5 years (Hungary).

Females account for about a third of those entering treatment for primary amphetamines use, a higher proportion than among opioid or cocaine clients. In Estonia, Lithuania and Latvia, more than 60 % of amphetamines

clients report injecting the drug, while 23 % do so in Hungary.

Annual surveys have been conducted since 2006 among drug users recruited from non-treatment settings in Riga, the capital of Latvia. In 2009, the most commonly used drug was amphetamines: 65 % of the respondents reported using it in the past 30 days, almost all (98 %) by injection. The prevalence of amphetamines use decreased with age. Amphetamines users were less likely than heroin users to switch to other drugs.

In Latvia, amphetamine has been detected in various biological samples from police sources, first in 1991 and increasingly since 1998. Methamphetamine was first detected in 1999 and increasingly since then. Evidence of polydrug use is common among amphetamines users tested, with almost 80 % of the samples showing signs of amphetamine or methamphetamine use testing positive for at least one other substance. The drugs most commonly detected in the presence of amphetamines are opioids, cannabis and benzodiazepines and/or barbiturates.

An Estonian study among injecting drug users in two cities found amphetamine injecting quite widespread. In 2007, half of the injecting drug users in Tallinn and a quarter of those in Kohtla-Järve reported injecting amphetamine in the past four weeks and a third and 16 %, respectively, considered amphetamine as their primary drug. A survey carried out in 2008 among clients of syringe exchange services found that over half of them had injected amphetamine in the past four weeks. Another study found that 63 % of amphetamine injectors had injected only this drug within the last four weeks, while the remainder had also injected other drugs. Among prison inmates, more than two-thirds reported using amphetamine while incarcerated in 2006 and 2008.

A third study in Estonia used respondent-driven sampling (Talu et al., 2010) to compare HIV-related risks among amphetamine versus opioid (fentanyl) injectors<sup>(21)</sup>. The study found that primary amphetamine users were more likely than fentanyl users to be Estonian, to have a shorter injecting career, and to have health insurance, and they were less likely to be daily injectors in the past four weeks and to have been arrested in the past 12 months. The study also found that, in the past four weeks, almost half of the primary fentanyl users had also used amphetamine, while a quarter of primary amphetamine users had also used fentanyl.

<sup>(20)</sup> See Table TDI-103 (part iii) in the 2010 statistical bulletin.

<sup>(21)</sup> See 'Infectious diseases among amphetamines users'.

A Hungarian study on out-of-treatment injecting drug users in Budapest, self-identified either as Roma or non-Roma, found that amphetamine had the highest levels of both lifetime and past-30-day prevalence in this group: in the past 30 days, 83 % of Roma and 61 % of non-Roma injectors had used amphetamine, mostly with other substances. Another Hungarian survey conducted between 2006 and 2008 among clients of a syringe exchange programme in Budapest showed that amphetamine was the most frequently reported primary substance, namely by 58 % of males and 64 % of females. Amphetamine was used more frequently by younger participants and women. A third study, conducted in 2005/06 among injecting drug users recruited in a different area of Budapest, found that in the past 30 days, 52 % injected heroin only, 20 % amphetamine only, and 27 % both heroin and amphetamine (Gyarmathy et al., 2009b). None of those interviewed reported using methamphetamine or tested positive for its metabolites (Gyarmathy et al., 2009a).

A 2008 survey in various Polish low-threshold facilities revealed that in the past 30 days, 76 % of the respondents (who were mainly in their twenties) had used opioids and 61 % had used amphetamines. Over two-thirds of amphetamines users reported using the drug at least once a week, and 11 % used it daily. The most prevalent route of administration of amphetamines was injecting (85 %), while 20 % snorted it, 7 % used it orally and 1 % smoked the drug. Altogether, 17 % of respondents identified amphetamines as the drug causing them the most problems.

In a 2007 survey among Polish prison inmates, 39 % of respondents reported ever in lifetime use of amphetamines, 15 % use in the last year and 5 % use in the last 30 days. Last year prevalence of amphetamines use decreased considerably with age.

### Treatment options for problem amphetamines use

Many countries in this group have experienced surges of problem amphetamines use only recently. Thus, their treatment systems are still largely organised to serve the needs of problem opioid users, and they appear to experience difficulties and shortcomings in addressing the needs of amphetamines users.

In Estonia, treatment options for problem amphetamines users are also reported to be relatively limited. However, with a planned update of the national drug strategy in 2010, more attention will be given to this group. In Hungary the first professional protocol dealing specifically with the treatment of amphetamines users was published by the Ministry of Health at the beginning of 2008. The protocol

### Amphetamine injection in countries bordering the European Union

In Ukraine, reports indicate a high prevalence of both methamphetamine and methcathinone (a stimulant drug manufactured from pseudoephedrine) use among injecting drug users and a growing concern about it among professionals (Grund et al., 2010a). Stimulants were reported as the second most popular drug in a study by Balakireva et al. (2006), and there was a 69 % prevalence of past-month use among out-of treatment injecting drug users in a study by Booth et al. (2008). A worrying trend was found in case of methcathinone (called locally 'boltushka'), which seemed to be increasing in popularity among very young and poor users in the city of Odessa. Manufactured from phenylpropanolamine in the absence of ephedrine or pseudoephedrine, it might have many negative health impacts, including haemorrhagic stroke (Chintalova-Dallas et al., 2009; Horwitz et al., 2000).

Most injecting drug users in Russia inject only heroin, but amphetamines are reported to be the second most frequently injected drug. In a study involving injecting drug users from 11 Russian cities, depending on location between 15 % and 89 % of the participants reported having injected stimulants at some point in their lives, with from zero to 43 % of them doing so in the past 30 days. Altogether, 90 % of the participants reported having injected heroin in the past 30 days (Borodkina et al., 2005). Few injectors seem to use amphetamines only (e.g. less than 5 % of injecting drug users in St Petersburg; Grund et al., 2010b).

covers diagnosis, the indicated structure of medically assisted and drug-free treatment, and other therapies and rehabilitation.

### Czech Republic and Slovakia

Methamphetamine use, including use of crystal methamphetamine, has developed as a major problem in several regions of the world, but has had up to now limited diffusion in Europe. A different methamphetamine problem, however, developed in the former Czechoslovakia, and is still central to the drugs problem of the Czech Republic and Slovakia (Grund et al., 2010b; ACMD, 2005).

In the former Czechoslovakia, non-alcohol drug use consisted mainly of diverted medications, both stimulants and depressants. In the 1950s, benzedrine problem use and dependence was considered the most serious non-alcohol substance dependence problem. At about this time,

non-medical use of other preparations containing amphetamines or amphetamines precursors was also reported, including yastil (an asthma medication containing ephedrine). Sometimes, benzedrine and yastil were used together. As yastil's non-medical use was also linked to psychotic symptomatology, the drug was soon made prescription-only.

Towards the end of the 1950s, a Czechoslovak factory started to produce the amphetamines-based medicines phenmetrazine (preludin) and dexphenmetrazine. Although these drugs were intended for weight loss and the treatment of fatigue, depression and narcolepsy, their non-medical use is reported in the late 1950s. Consumption of the drugs increased greatly between 1959 and 1960, especially among students and professional drivers. By 1963–65, phenmetrazine dependence accounted for around 40 % of drug users treated in inpatient psychiatric facilities.

As a response to the increasing number of reported cases of dependence in the 1970s, Czechoslovakia made the first steps to regulate phenmetrazine and dexphenmetrazine by requiring a prescription for their purchase. During the same period, manufacturing of methamphetamine in kitchen labs and injecting of the drug emerged. Patterns of amphetamines use began to diverge between what is now the Czech Republic and Slovakia, though the two countries were united until 1993. In what is now Slovakia, only a few small groups, mainly artists and university students, were known to use amphetamines, among several other drugs. In what is now the Czech Republic, small closed groups of users organised around methamphetamine producers, and by the late 1980s an estimated 25 000–30 000 users were dependent on non-alcohol drugs, principally pervitin. This figure is comparable to the most recent estimates of problem drug use in the Czech Republic.

With the emergence of a pervitin black market in recreational settings, the period since 2000 has seen pervitin use in the Czech Republic expand beyond small closed user groups. At the same time, recreational pervitin use spread in Slovakia, where problem methamphetamine use became extensive around 2004.

## Problem amphetamines use today

The number of problem methamphetamine users in the Czech Republic in 2008 was estimated to be 21 200

(20 700–21 800), corresponding to a prevalence of 2.87 per 1 000 inhabitants aged 15–64 years (2.79–2.94 per 1 000), and showing no significant change during the period 2001 to 2008 <sup>(22)</sup>. Methamphetamine users constitute about two-thirds of the problem drug users in the country, with the remainder using opioids as their principal drug. Most problem drug users in the Czech Republic inject their drug. The prevalence of problem drug use is highest in the capital city Prague. However, the estimated 4 300 problem methamphetamine users make up only about a third of problem drug users in the city, whereas in the rest of the country they account for 80 % of problem drug users.

The most recent national estimate for Slovakia put the number of problem drug users in 2007 at 8 083 (5 783–15 742), corresponding to 2.1 (1.5–4.0) cases per 1 000 inhabitants aged 15–64. This represents a stable situation since 2005, which recent data suggests may have continued in 2008. Subnational estimates by substance are not available, but analysis of treatment demand indicator data suggests that outside the capital city, Bratislava, methamphetamine users make up a higher proportion of all problem drug users entering treatment.

Methamphetamine is reported as the primary drug by a large number and proportion of clients entering treatment in the Czech Republic (4 700 clients, or 70 % of those entering treatment for amphetamines, cocaine or opioids) and Slovakia (545 clients, 39 %) (Figure 4). Among those entering treatment for the first time in their lives, the proportions are higher <sup>(23)</sup>. Between 2003 and 2008, the number of first-time treatment entrants for problems relating to methamphetamine use increased in the Czech Republic and, especially, in Slovakia <sup>(24)</sup>.

A large proportion of methamphetamine users in the Czech Republic enter treatment in low-threshold services or in psychiatric outpatient and inpatient services <sup>(25)</sup>. Considerable differences are reported between the different regions in the two countries. This may reflect differences not only in the extent of the drug problem, but also in the availability of treatment and other factors.

Methamphetamine users entering treatment in the Czech Republic and Slovakia are, on average, younger (25–26 years) than opioid clients (29 years). The male to female ratio of methamphetamines clients is close to unity in the Czech Republic (1.3:1), whereas in Slovakia male clients

<sup>(22)</sup> See Table PDU-102 in the 2010 statistical bulletin.

<sup>(23)</sup> See Table TDI-5 (part i) and (part ii) in the 2010 statistical bulletin.

<sup>(24)</sup> See Table TDI-3 in the 2010 statistical bulletin.

<sup>(25)</sup> See also 'Treatment options for problem amphetamines use', below.

outnumber females by 3.4 to one. The number of women entering treatment for primary methamphetamine use in the Czech Republic is reported to be increasing, especially among the younger age groups <sup>(26)</sup>.

Injecting is reported as the main route of drug administration by 80 % of methamphetamine clients in the Czech Republic and by 36 % in Slovakia, though it is less frequently reported among those entering treatment for the first time in their lives <sup>(27)</sup>. Of methamphetamine outpatient clients in the Czech Republic, 43 % report using the drug occasionally, 39 % 1–6 times a week, and 18 % daily <sup>(28)</sup>, while in Slovakia, 8 % report using it occasionally, 61 % 1–6 times a week, and 31 % daily <sup>(29)</sup>. Use of other drugs, mainly heroin, cannabis and alcohol, is also often reported by primary users of methamphetamine. In addition, both countries report that the use of methamphetamine as a secondary substance is common, especially among heroin users in substitution treatment.

Methamphetamine users form the largest group of clients (53 %) of low-threshold facilities in the Czech Republic. Polydrug use is also common among these clients, with a sizeable proportion (16 %) using pervitin in combination with opioids. In Slovakia, a high proportion of drug users in contact with low-threshold programmes in 2008 reported using methamphetamine, either as their sole drug (35.4 %) or in combination with heroin (14.7 %).

### Treatment options for problem amphetamines use

In the Czech Republic, which has a long history of problem methamphetamine use, detoxification is the primary treatment for methamphetamine dependence. In most cases, it is covered by universal health insurance. Detoxification is provided in inpatient treatment units associated with psychiatric departments within drug treatment or medical facilities that are either public or run by a non-governmental organisation. Unless severe physical withdrawal symptoms are observed, detoxification does not require specific pharmacological treatment. Symptomatic therapy with antipsychotics is only recommended in indicated cases. Detoxified patients can be referred to either outpatient services or residential rehabilitation, which include a wide range of psychosocial interventions from cognitive behavioural therapies to therapeutic communities.

In order to investigate whether certain aspects of treatment services are adapted to meet specific characteristics of methamphetamine users, a series of surveys among nearly 30 psychiatric, counselling and drug treatment facilities were conducted. The surveyed health professionals considered that the therapeutic process related to methamphetamine dependence does not differ much from that of other substance-related dependencies. According to respondents from outpatient treatment centres, pervitin users tend to underestimate the severity of their drug problem, and thus lack the motivation to change. First contacts are often associated with a crisis and crisis interventions. Pervitin users tend to drop out of treatment soon after admission or a few contacts. Professionals also reported that most pervitin users are relatively young and often have family-related problems, so it is common to work within a family therapy context. Older pervitin users are reported to have a more problematic polydrug use patterns and their conditions are often complicated by psychotic symptomatology, which worsens the therapeutic prognosis.

Staff surveyed from detoxification centres reported similar experiences. According to them, pervitin users are often referred to the detoxification centres involuntarily (for example, through criminal justice referrals) in a state of acute toxic psychosis, which is typically accompanied by aggressiveness towards both themselves and their environment. Patients often need to be restrained; communication with them is difficult, and they usually reject any care.

In Slovakia, the relatively recent upsurge of methamphetamine use negatively affected opioid users' methadone maintenance treatment, as a considerable proportion of clients were also methamphetamine dependent when they entered the treatment. Being dependent on two drugs may counteract the effects of methadone on illicit opioid use. Many stabilised or abstinent patients also started using methamphetamine. As a consequence of these two elements, 12-month retention in methadone treatment dropped from 77 % in 1999 to 46 % in 2003 — the period that corresponds to the upsurge of the methamphetamine epidemic in Slovakia. In response, the methadone maintenance programme in Bratislava developed a new harm reduction modality, to complement the therapeutic one. In the former, clients using methamphetamine were not excluded from treatment, but received a maximum daily dose of 40 mg of methadone and were not required to

<sup>(26)</sup> See Tables TDI-21 (part ii) and TDI-103 (part i) and (part iii) in the 2010 statistical bulletin.

<sup>(27)</sup> See Table TDI-5 (part iii) and (part iv) in the 2010 statistical bulletin.

<sup>(28)</sup> According to the TDI Protocol, occasional use means that the drug was not used in the month prior to entering treatment.

<sup>(29)</sup> See Table TDI-111 (part v) and (part vi) in the 2010 statistical bulletin.

become abstinent. The introduction of this new modality appears to have halted the drop in retention, which in 2008 improved to 54 %. About three to four times as many patients are enrolled in the therapeutic modality as in the harm reduction one, and only a few want to be transferred to the latter. On the other hand, patients of the harm reduction modality may be referred to the therapeutic modality based on their condition and motivation.

## Conclusions

Focusing on countries where amphetamine or methamphetamine is an important part of the drug problem, this Selected issue has attempted to trace the historical development of amphetamines use since the introduction of these substances as medicines in the 1930s. The history of the use of these substances is the result of an interplay of global forces, such as the rapid spread of recreational drug use in the 1960s and the arrival of heroin on the European drug scene in the 1970s, and local events such as the rise of small-scale pervitin (methamphetamine) production in what was then Czechoslovakia. The outcome of this is that the present day amphetamines situation across Europe is marked by strong national characteristics, possibly more so than any other of the major illicit drugs.

Production of amphetamine in Europe appears to be situated primarily in the Netherlands, Poland and Belgium, and to a lesser extent in Estonia, Lithuania and Germany. By global standards, illicit supply of methamphetamine in Europe is from local small-scale 'kitchen labs' to limited international trafficking, and is centred around two regions: central Europe (especially the Czech Republic) and the Baltic Sea.

It is important to note that while crystal methamphetamine and meth smoking are increasingly prevalent in many parts of the world, methamphetamine in Europe is available almost exclusively in powder form, and thus is virtually indistinguishable from amphetamine in appearance and effect. Recent data from countries in the north of Europe show that amphetamine could be increasingly replaced by methamphetamine on the markets of some Scandinavian and Baltic countries.

General population surveys and surveys among school students show a relatively low prevalence of amphetamines use in most European countries, but in at least five countries it is estimated that more than 2 % of young people (15–34) have used the drug in the last year. Much of the less problematic use of amphetamines takes place in recreational settings, particularly around dance music events, where use of the drug appears to be more closely associated with certain music genres. Ever in lifetime use of amphetamines

among young people in such settings varies considerably, with levels of up to 30–70 % recorded in some studies in the Czech Republic, Hungary, Slovakia and the United Kingdom. Over the long term, there are signs that, at least in some countries, amphetamines may have lost ground in nightlife settings to cocaine or ecstasy, or new substances such as mephedrone.

In western and southern European countries, problem amphetamines use is rare but can reach a certain level of importance in some countries and among specific populations of problem drug users. Contrastingly, in many northern, eastern and central European countries, amphetamines users, often injecting, make up a sizeable proportion of the problem drug using population. In this wide geographical area, several distinct sub-patterns emerge. The most obvious are the enduring amphetamine problem in Sweden and Finland and the historical methamphetamine problem in the Czech Republic, which is also affecting Slovakia. Other countries in these regions are also affected, including Estonia, Lithuania, Latvia and Norway, where amphetamines are often injected, and Denmark where the drug is reported to be mainly snorted.

Withdrawal from amphetamines is not considered life-threatening, and successful detoxification is possible. Across Europe, the treatment options available for amphetamines users often reflect the national patterns and history of problem amphetamines use. In western and southern European countries, treatment systems have specialised in responding mainly to the needs of opioid users, especially with opioid substitution treatment. In northern and central European countries with a long history of treating amphetamines use, some programmes are directed towards the needs of amphetamines users. In some other central and eastern European countries, significant problem amphetamines use is more recent. Thus, treatment systems in this area have primarily developed services for problem opioid users and appear to experience difficulties and shortcomings in addressing the needs of amphetamines users.

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