

# ILLICIT DRUG MARKETS: SITUATION AND TRENDS

## A. EXTENT OF DRUG USE

### Overall drug use remains stable globally

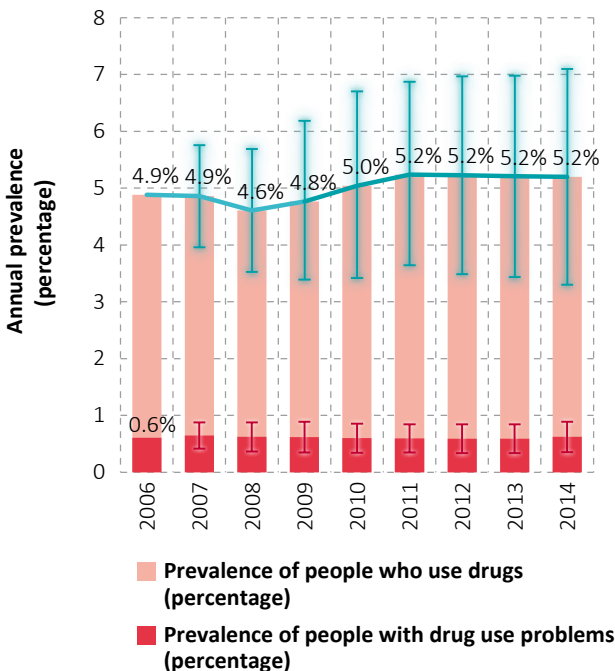
It is estimated that 1 in 20 adults, or a quarter of a billion people aged 15-64 years, used at least one drug in 2014. Although trends in drug use vary across regions, as does updated reporting on data, the extent of drug use among the world population has remained stable over the past four years. Almost 12 per cent of the total number of people who use drugs, or over 29 million people, are estimated to suffer from drug use disorders.

Cannabis remains the world's most widely used drug, with an estimated 183 million people having used the drug in 2014, and amphetamines remain the second most widely used drug. With an estimated 33 million users, the use of opiates and prescription opioids may not be as widespread as the use of cannabis, but opioids remain major drugs of potential harm and health consequences. Where updated data are available, as an overall trend, global use of cannabis has remained stable over the past three years, although in some subregions, particularly North America and Western

and Central Europe, cannabis use has increased. In the absence of recent survey data on drug use in Africa, experts in the region also perceive an increase in cannabis use. Moreover, the global trend in cocaine use, which was stable after 2010, has shown a recent trend, mainly as a result of an increase in cocaine use in South America. The global trend in the use of amphetamines is stable, although this may underplay the situation in regions where recent information on the extent of drug use is unavailable. This is particularly the case in Asia, where expert perceptions of trends and treatment admission reports suggest an increase in the use of amphetamines in the region, specifically in East and South-East Asia (see map 1).

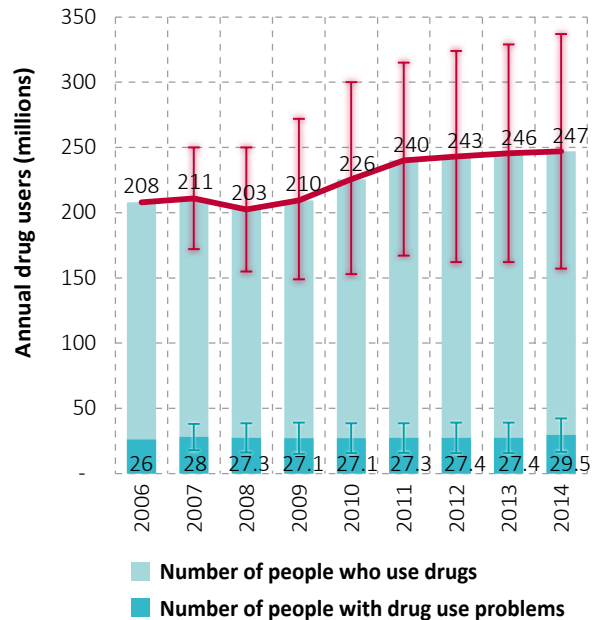
The global picture of drug use is compounded by the fact that many people who use drugs, both occasionally and regularly, tend to be polydrug users,<sup>1,2</sup> meaning that they use more than one substance concurrently or sequentially, usually with the intention of enhancing, potentiating or counteracting the effects of another drug.<sup>3</sup> The non-medical use of prescription drugs, synthetic stimulants and new psychoactive substances (NPS) in lieu of, or in combination with, conventional drugs gives a picture that blurs

**FIG. 1** Global trends in the estimated prevalence of drug use, 2006-2014



Source: Responses to the annual report questionnaire.  
 Note: Estimated percentage of adults (ages 15-64) who used drugs in the past year.

**FIG. 2** Global trends in the estimated number of people who use drugs, 2006-2014



Source: Responses to the annual report questionnaire.  
 Note: Estimates are for adults (ages 15-64), based on past-year use.

1 Wouter Vanderplasschen and others, *Poly Substance Use and Mental Health Among Individuals Presenting for Substance Abuse Treatment*, Science and Society Series (Gent, Belgium, Academia Press, 2012).

2 European Monitoring Centre for Drugs and Drug Addiction (EMCDDA), "Polydrug use: patterns and response" (Lisbon, November 2009).

3 World Health Organization (WHO), *Lexicon of Alcohol and Drug Terms* (Geneva, 1994).

## Estimates of the extent of drug use and problem drug use reflect the best information available in 2014

As in previous years, global estimates of the extent of drug use and problem drug use reflect the best available information in 2014, and changes compared with previous years largely reflect information updated by 20 countries, mostly in North America, South America and Western and Central Europe, for which new data on the extent of drug use or problem drug use were made available in 2014. The concept of problem drug use has been used in prior editions of the *World Drug Report* as a proxy for estimating the number of people with drug use disorders. In 2014, the estimated number of problem drug users increased by 2 million over the previous year, which reflects an increase in the estimated number of opiate users in North America and Western and Central Europe, as well as in the total number of users of cocaine, amphetamines and “ecstasy”.

the distinction between users of a particular drug, presenting an interlinked or cyclical epidemic of drug use and related health consequences in recent years. Additionally, such a pattern of drug use presents challenges to health professionals responding to emergencies related to drug use, as well as to those treating people with disorders related to the use of multiple drugs.

### Recent trends in polydrug use and substitution between drugs

Polydrug use encompasses wide variations in patterns of drug use, ranging from occasional alcohol and cannabis use to the daily use of a combination of heroin, cocaine, alcohol and benzodiazepines.<sup>4, 5</sup>

Within polydrug use, the concomitant use of opiates and stimulants such as cocaine and amphetamines is fairly common and has been widely reported.<sup>6, 7</sup> In the past decade, the use of amphetamine and methamphetamine has become quite widespread in different regions, while the number of NPS that are stimulants seems to be constantly increasing. Data on polydrug use are seldom systematically collected, but amphetamines and NPS seem to be reported increasingly in polydrug use patterns in different regions.

4 EMCDDA (see footnote 2).

5 Danielle Horyniak and others, “How do drug market changes affect characteristic of injecting initiation and subsequent patterns of drug use? Findings from a cohort of regular heroin and methamphetamine injectors in Melbourne, Australia”, *International Journal of Drug Policy*, vol. 26, No. 1 (2015), pp. 43-50.

6 Nancy M. Petry and Warren K. Bickert, “Poly drug use in heroin addicts: a behavioral economic analysis”, *Addiction*, vol. 93, No. 3 (1998), pp. 321-335.

7 Mim J. Landry, *Understanding Drugs of Abuse: The Processes of Addiction, Treatment and Recovery* (Arlington, Virginia, American Psychiatric Publishing, 1994).

### Tolerance, cross-tolerance and substitution: managing the effects of drugs

The interplay of individual, biological, cultural, social and environmental factors increases or attenuates the vulnerability of a person to use or to continue using drugs. Continuing to use a drug is considered a conditioned response to the positive reinforcement that the person receives as a result of using the drug.<sup>8</sup> However, in later stages a person continues to use drugs merely to maintain drug dependence, which is characterized by, among other things, the desire and compulsion to use drugs despite evidence of harmful consequences, the development of tolerance — by increasing the quantity of the drug or drugs to achieve the same effects and a state of withdrawal — and the negative consequences experienced when the person stops using the drug or drugs.<sup>9</sup>

Drugs taken together can have a cumulative or synergistic effect, which increases the overall psychoactive experience; that is one way in which drug users may address the development of tolerance.<sup>10</sup> A related phenomenon is “cross-tolerance” — the pharmacological ability of one drug to have generally the same effect on the nervous system as another drug. The phenomenon of cross-tolerance explains in part the frequent substitution of drugs that have a similar effect. Examples of such patterns of drug use include the use of alcohol with benzodiazepines, cannabis or cocaine; concurrent use of heroin, benzodiazepines and antihistamines; the use of alcohol or other opioids (methadone, fentanyl etc.); and the use of cocaine and other stimulants.<sup>11, 12, 13, 14</sup>

In other situations, people who use drugs may offset the negative effects of the drugs by concurrently or sequentially using additional drugs with opposite effects. One such pattern is “speedballing” — when cocaine is injected with heroin or other opioids or when heroin is used with methamphetamine or amphetamine.<sup>15</sup>

### Market dynamics: substitution and complementarity of drugs

Market dynamics, reflected by changes in availability, purity or price, can affect the choice of drugs. In such circumstances, people who use drugs can turn to substituting

8 WHO, *Neuroscience of Psychoactive Substance Use and Dependence* (Geneva, 2004).

9 WHO, *The ICD 10, Classification of Mental and Behavioural Disorders: Clinical Descriptions and Diagnostic Guidelines* (Geneva, 1992).

10 *Neuroscience of Psychoactive Substance Use* (see footnote 8).

11 Mim J. Landry (see footnote 7).

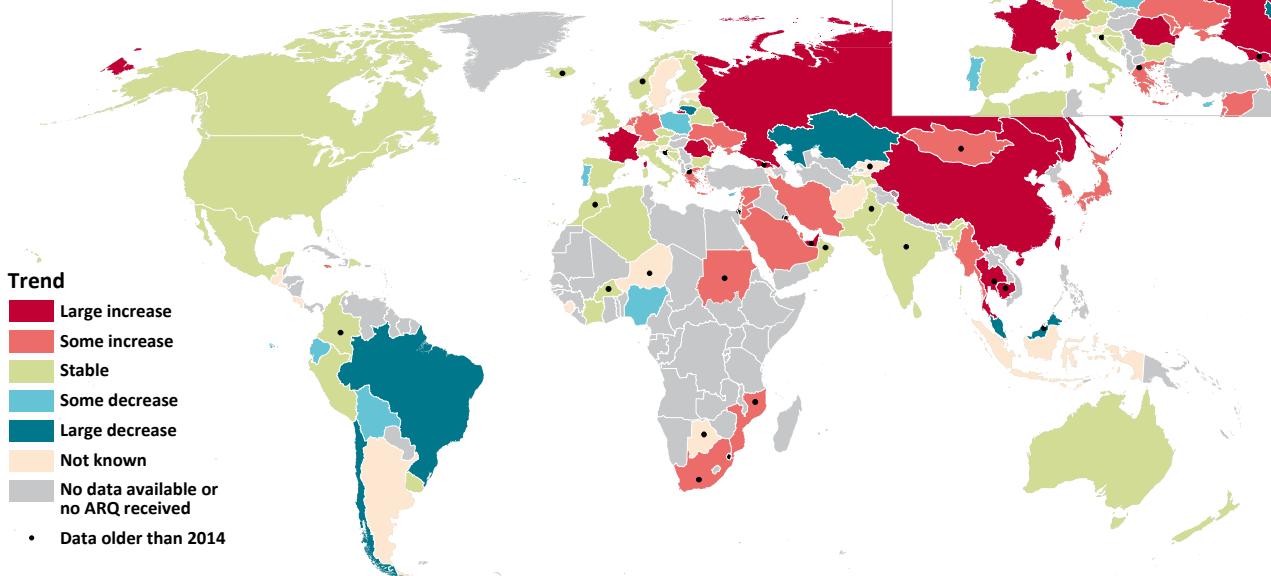
12 Charles P. O'Brien, “Benzodiazepine use, abuse and dependence”, *Journal of Clinical Psychiatry*, vol. 66, Suppl. 2 (2005), pp. 28-33.

13 Vanderplasschen and others, “Poly substance use and mental health” (see footnote 1).

14 “Polydrug use” (see footnote 2).

15 Francesco Leri, Jule Bruneau and Jane Stewart, “Understanding polydrug use: review of heroin and cocaine co-use” *Addiction*, vol. 98, No. 1 (2003), pp. 7-22.

**MAP 1** Expert perceptions of changes in trends in the use of amphetamines,\* 2014 or latest year available since 2010



Source: Responses to the annual report questionnaire.

Note: The information presented in the map is for 2014 or the latest year since 2010 for which the information is available. The boundaries and names shown and the designations used on this map do not imply official endorsement or acceptance by the United Nations. Dashed lines represent undetermined boundaries. The dotted line represents approximately the Line of Control in Jammu and Kashmir agreed upon by India and Pakistan. The final status of Jammu and Kashmir has not yet been agreed upon by the parties. The final boundary between the Sudan and South Sudan has not yet been determined. A dispute exists between the Governments of Argentina and the United Kingdom of Great Britain and Northern Ireland concerning sovereignty over the Falkland Islands (Malvinas).

\* Includes both amphetamine and methamphetamine.

with different drugs; transitioning to alternative routes of drug administration; decreasing their consumption of the drug; or deciding to enter treatment.<sup>16, 17</sup> Common examples are heroin being substituted by oxycodone, desomorphine or other opioids and vice versa, as reported in various regions.<sup>18</sup>

Economic factors and cross-price elasticity may also affect polydrug use.<sup>19</sup> An increase in the price of one drug may result in the use of another (substitution) or it may decrease the use of another, even though its price remains the same (complementarity). For example, a study showed that an increase in the price of heroin resulted in an increase in benzodiazepine and cocaine purchases.<sup>20</sup> In another study, cross-price elasticity analysis showed that in the case of heroin there was significant substitution with prescription

opioids and, to a lesser extent, benzodiazepines and methamphetamine.<sup>21</sup> The same study showed that there was limited substitution with other drugs as the price of methamphetamine increased.

#### Recent trends in the use of heroin and the non-medical use of prescription opioids in the United States

In the United States of America, over the past decade the non-medical use of prescription opioids and the use of heroin have continued to interplay in the market. Since the high prevalence and associated morbidity and mortality of the non-medical use of prescription opioids have become a major public health issue,<sup>22</sup> a recent increase in heroin use has triggered a sharp increase in heroin-related overdose deaths.<sup>23, 24</sup> Several aspects have driven this

16 Jenny Chalmers, Deborah Bradford and Craig Jones, "The effect of methamphetamine and heroin price on polydrug use: a behavioural economics analysis in Sydney, Australia", *International Journal of Drug Policy*, vol. 21, No. 5 (2010), pp. 381-389.

17 Horyniak and others, "How do drug market changes affect characteristics of injecting initiation and subsequent patterns of drug use?" (see footnote 5).

18 *World Drug Report 2014* (United Nations publication, Sales No. E.14.XI.7).

19 Jonathan P. Caulkins and Peter H. Reuter, "The meaning and utility of drug prices", *Addiction*, vol. 91, No. 9 (1996), pp. 1261-1264.

20 Petry and Bicket, "Poly drug use in heroin addicts: a behavioral economic analysis", (see footnote 6).

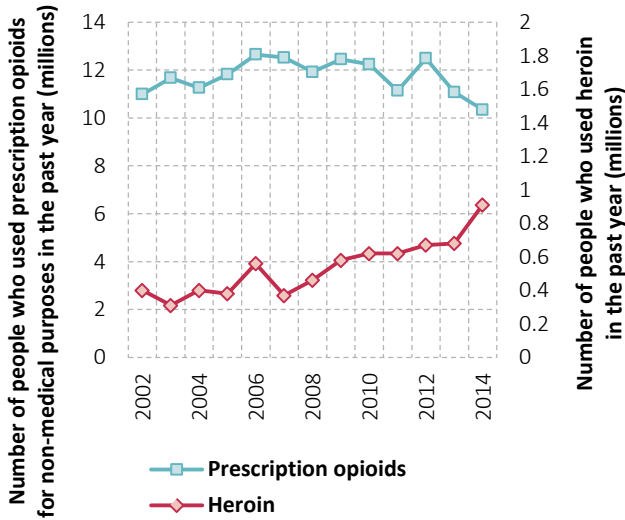
21 Chalmers and others, "The effect of methamphetamine and heroin price on poly drug use" (see footnote 16).

22 Wilson M. Compton, Christopher M. Jones and Grant T. Baldwin, "Relationship between nonmedical prescription-opioid use and heroin use", *New England Journal of Medicine*, vol. 374, No. 2 (2016), pp. 154-163.

23 United States, Center for Behavioral Health Statistics and Quality, *Behavioral Health Trends in the United States: Results from the 2014 National Survey on Drug Use and Health*, HHS Publication No. SMA 15-4927, NSDUH Series H-50 (Rockville, Maryland, 2015).

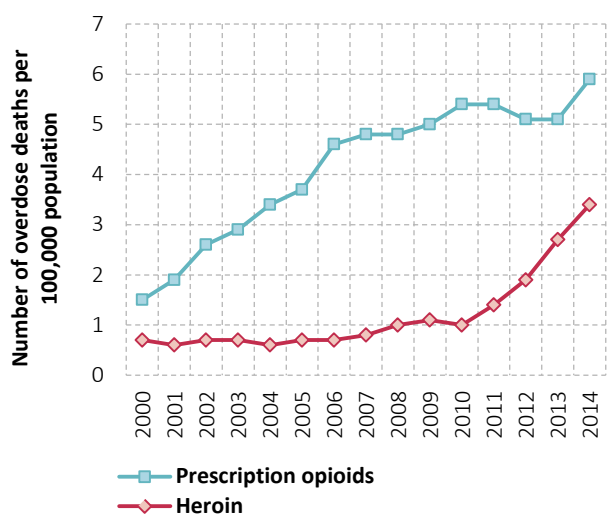
24 Christopher M. Jones, "Heroin use and heroin use risk behaviors among nonmedical users of prescription opioid pain relievers: United States, 2002-2004 and 2008-2010", *Drug and Alcohol Dependence*, vol. 132, Nos. 1 and 2 (2013), pp. 95-100.

**FIG. 3** Trends in the use of heroin and prescription opioids in the United States, 2002-2014



Source: Wilson M. Compton, Christopher M. Jones and Grant T. Baldwin, "Relationship between nonmedical prescription-opioid use and heroin use", *New England Journal of Medicine*, vol. 374, No. 2 (2016), pp. 154-163.

**FIG. 4** Age-adjusted rates of death related to prescription opioids and heroin in the United States, 2000-2014



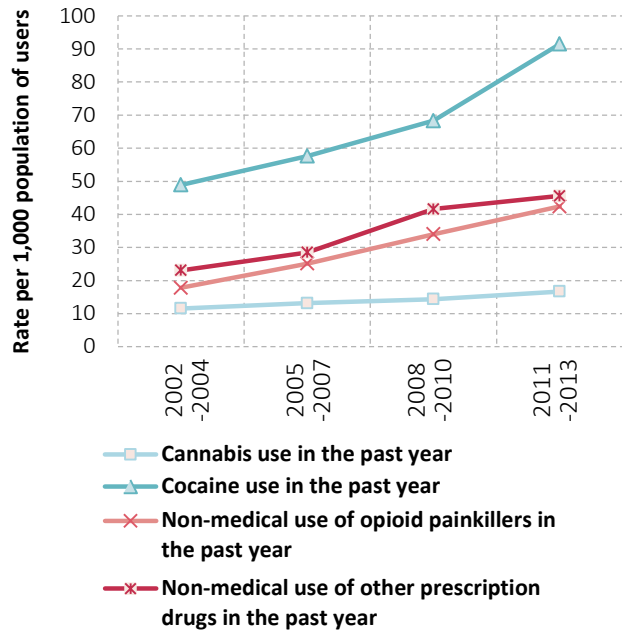
Source: Wilson M. Compton, Christopher M. Jones and Grant T. Baldwin, "Relationship between nonmedical prescription-opioid use and heroin use", *New England Journal of Medicine*, vol. 374, No. 2 (2016), pp. 154-163.

change: law enforcement and regulatory actions to address the irrational prescribing and reformulation of prescription opioids with abuse-deterrent technologies; implementation of programmes for monitoring prescription drugs and education of health-care professionals and the public about their appropriate use;<sup>25</sup> and increased accessibility, reduced prices and high purity of heroin in the United States.<sup>26</sup>

In 2014, an estimated 914,000 people aged 12 years or older had used heroin in the past year — a 145 per cent increase since 2007 — while mortality related to heroin use has increased fivefold since 2000.<sup>27, 28, 29, 30</sup>

From the period 2002-2004 to the period 2011-2013, there was an increase in heroin use, particularly among people who also reported the use of other substances. The highest rate of past-year heroin use was among cocaine users (91.5 per 1,000 users),<sup>31</sup> followed by those who reported non-medical use of prescription opioids. Nine out of 10 people who used heroin self-reported co-use of heroin with at least one other drug, and most used heroin

**FIG. 5** Trends in polydrug use among heroin users in the United States, 2002-2013



Source: Christopher M. Jones and others, "Vital signs: demographic and substance use trends among heroin users – United States, 2002-2013", *Morbidity and Mortality Weekly Report*, vol. 64, No. 26 (2015).

with at least three other drugs.<sup>32</sup> Moreover, the proportion of heroin users diagnosed with disorders related to non-medical use of prescription opioids more than doubled,

25 Ibid.

26 Compton and others, "Relationship between nonmedical prescription" (see footnote 22).

27 It is recognized that households surveys do not capture the full extent of heroin use and are an underestimation. Nevertheless, in the absence of other trend data, this is used to inform the trends in heroin use.

28 Jones, "Heroin use and heroin use risk behaviors" (see footnote 24).

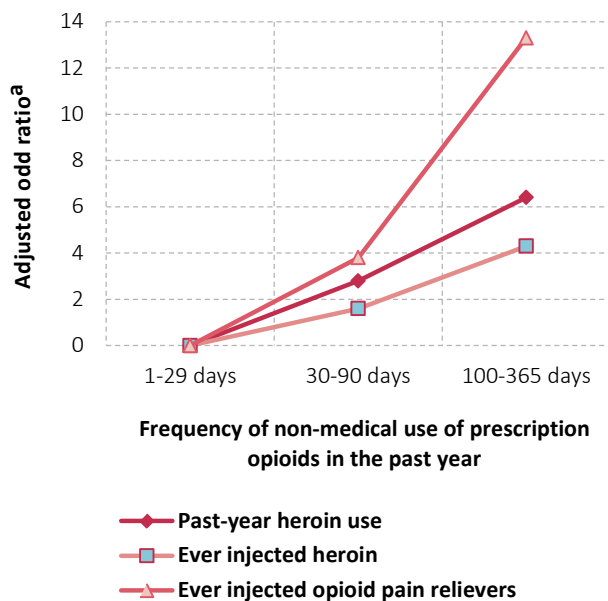
29 *World Drug Report 2014* (see footnote 18).

30 Many of the heroin-related deaths in the United States have also been attributed to the presence of fentanyl in certain parts of the country (United States, Drug Enforcement Administration, *National Drug Threat Assessment Summary* (October 2015)).

31 Ibid.

32 Christopher M. Jones and others, "Vital signs: demographic and substance use trends among heroin users – United States, 2002-2013", *Morbidity and Mortality Weekly Report*, vol. 64, No. 26 (2015).

**FIG. 6** Likelihood of past-year heroin use and other indicators depending on the frequency of non-medical use of prescription opioids in the past year



Source: Christopher M. Jones and others, "Vital signs: demographic and substance use trends among heroin users – United States, 2002-2013", *Morbidity and Mortality Weekly Report*, vol. 64, No. 26 (2015).

<sup>a</sup> Odds ratio adjusted for the influence of (confounders) other variables.

from 20.7 per cent in the period 2002-2004 to 45.2 per cent in the period 2011-2013.

The increase in heroin use in the United States has been more pronounced among a subgroup of people aged 18-25 who report a higher frequency of non-medical use of prescription opioids.<sup>33</sup> Among this group, the likelihood of using heroin in the past year, ever injecting prescription opioids or becoming dependent on heroin increased with the frequency of non-medical use of prescription opioids in the previous year. Those reporting non-medical use of prescription opioids for over 100 days in the past year were nearly eight times more likely to report dependence on heroin than those who reported less frequent non-medical use of prescription opioids.

It appears that the increase in heroin use in the United States had already begun around 2006 and had preceded the changes introduced in policies and practices related to prescription opioids. Nevertheless, given the large number of non-medical users of prescription opioids, even a small proportion who switch to heroin use has translated into a much higher number of people using heroin.

Analysis suggests that the problem of opioid use is not substance-specific and requires holistic approaches to address the interconnected epidemic through prevention

33 Jones, "Heroin use and heroin use risk behaviors" (see footnote 24).

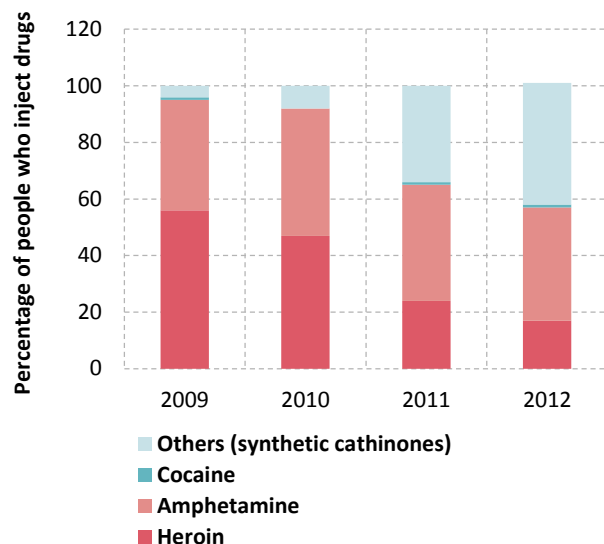
of initiation and treatment interventions for people with opioid use disorder.<sup>34</sup>

### Shift between injecting heroin, amphetamines and new psychoactive substances in Europe

In some European countries (Austria, Belgium, Czech Republic, France, Germany, Ireland, Poland, Spain and the United Kingdom), small, localized groups of high-risk drug users who are in contact with low-threshold services, psychiatric facilities and treatment centres for drug users and who used to inject heroin and amphetamines have switched to injecting NPS such as synthetic cathinones. Reports to the European Monitoring Centre for Drugs and Drug Addiction (EMCDDA) suggest that drug users who inject synthetic cathinones are primarily those who have been injecting heroin and amphetamines and have now either started injecting synthetic cathinones or included it in their drug use repertoire.<sup>35</sup> People who inject synthetic cathinones include those who are on opioid substitution treatment, as well as young people beginning their drug-injecting use.

In Hungary, in the period 2009-2012 a shortage of heroin and an increase in local availability of synthetic cathinones contributed to high-risk drug users switching to injecting NPS, primarily synthetic cathinones. A corresponding change in the patterns of injecting was reported both among clients of needle and syringe programmes (NSP) and those entering treatment. In 2009, the majority of

**FIG. 7** Trends in injecting drugs among clients of needle and syringe programmes in Hungary, 2009-2012



Source: Anna Péterfi and others, "Changes in patterns of injecting drug use in Hungary: a shift to synthetic cathinones", *Drug Test and Analysis*, vol. 6, Nos. 7 and 8 (2014), pp. 825-831.

34 Compton and others, "Relationship between nonmedical prescription opioids use" (see footnote 22).

35 EMCDDA, "Perspectives on drugs: injection of synthetic cathinones", 28 May 2015.

people who inject drugs (PWID) were injecting heroin or amphetamine, whereas by 2012 about 43 per cent of PWID were primarily injecting synthetic cathinones and another 40 per cent were injecting amphetamine.<sup>36</sup> This trend was self-reported, as well as confirmed through samples obtained from injecting equipment. Of the main synthetic cathinones injected by PWID, the predominant substance was pentedrone; the other substances reported were 3,4-methylenedioxypyrovalerone (MDPV), mephedrone and 4-methylethcathinone (4-MEC), all of which are stimulants.

There is evidence of similar trends in treatment settings, where the proportion of heroin users dropped considerably and the proportion of clients entering treatment for injecting amphetamine and other stimulants increased substantially in 2012.

In Hungary, the reduced availability of heroin did not change injecting practices but made users switch to other injecting substances (such as NPS and amphetamine) that were more affordable and readily available and also gave intense effects.<sup>37</sup>

#### Drug market changes and patterns of injecting drug use in Australia

In Australia, the heroin market changed considerably after 2000; heroin went from being highly accessible (cheap, high in purity and available) and the most commonly injected drug in Australia to being less accessible as a result of a heroin shortage.<sup>38</sup> The change resulted in a decrease in the prevalence and frequency of injecting heroin, as well as a decline in adverse health consequences related to heroin use.<sup>39</sup>

The subsequent years (2001-2004) saw a sustained decrease in the availability and use of heroin in Australia. During the same period, methamphetamine emerged on the market at a relatively low price per gram of pure methamphetamine, which was readily available, and that led to an increase in methamphetamine use.<sup>40</sup> In the years from 2004 onwards, the illicit markets for both heroin and methamphetamine continued to be very dynamic, with the price and purity of both drugs fluctuating. In the same period, the increased practice of prescribing opioids and their non-medical use (among PWID) was also observed.<sup>41</sup>

36 Anna Péterfi and others, "Changes in patterns of injecting drug use in Hungary: a shift to synthetic cathinones", *Drug Test and Analysis*, vol. 6, Nos. 7 and 8 (2014), pp. 825-831.

37 Ibid.

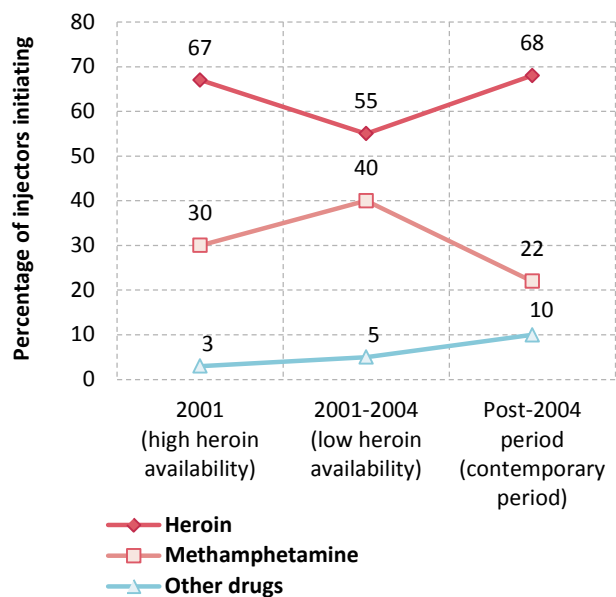
38 Horyniak and others, "How do drug market changes affect characteristics of injecting initiation and subsequent patterns of drug use?" (see footnote 5).

39 Louisa Dagenhardt and others, "Effects of a sustained heroin shortage in three Australian States", *Addiction*, vol. 100, No. 7 (2005), pp. 908-920.

40 Louisa Dagehardt and others, "The epidemiology of methamphetamine use and harm in Australia", *Drug and Alcohol Review*, vol. 27, No. 3 (2008), pp. 243-252.

41 Horyniak and others, "How do drug market changes affect charac-

**FIG. 8** Trends in the initiation of injecting drug use, by substance, in Melbourne, Australia, 2001, 2001-2004 and since 2004



Source: Danielle Horyniak and others, "How do drug market changes affect characteristics of injecting initiation and subsequent patterns of drug use? Findings from a cohort of regular heroin and methamphetamine injectors in Melbourne, Australia", *International Journal of Drug Policy*, vol. 26, No. 1 (2015), pp. 43-50.

A cohort study of PWID in Melbourne, who were recruited between November 2008 and March 2010, examined the impact that the changing market dynamics might have had on drug use patterns.<sup>42</sup> Among the participants in the study, initiation with injecting heroin remained the most common practice in all three of the periods examined, although it declined in the period when heroin availability was low. In that period, the proportion of PWID who initiated injecting methamphetamine increased. In the later period (from 2004 onwards), the proportion of PWID initiating injecting with methamphetamine decreased, counterbalancing an increase in initiating injecting with heroin and other drugs, primarily prescription opioids.

In 2013, most of the participants in the study were polydrug users (44 per cent) or users primarily injecting heroin (41 per cent). Among current PWID, the practice of primarily injecting methamphetamine was not common, but the participants who initiated injecting during the period when heroin availability was low were almost twice as likely to be current polydrug injectors. Also, a combination of heroin and methamphetamine was more commonly used by current PWID, and drugs such as heroin were often used to counter the "comedown effects" of methamphetamine.<sup>43</sup>

teristics of injecting initiation and subsequent patterns of drug use?" (see footnote 5).

42 Ibid.

43 Brendan Quinn and others, "Methamphetamine use in Melbourne, Australia: baseline characteristics of a prospective meth-

The findings of the study suggest that the first drug injected reflects the characteristics of the drug market at the time, while later patterns of drug use, including polydrug use, appear to be the result of compensation or substitution mechanisms brought on by market dynamics. These patterns may reflect the cyclical nature of drug epidemics and may continue to change as drug markets evolve.

### **Methamphetamine smoking among heroin users and polydrug users in Greece**

In recent years in Greece, both low-threshold services and treatment agencies have reported the smoking of crystal-line methamphetamine on a regular basis among injecting opioid users. This practice has been reported particularly among marginalized migrant subpopulations of persons who inject opioids in Athens.<sup>44</sup>

Polydrug use in Greece is common among drug users in treatment. In 2013, almost 71 per cent of clients in treatment reported having used more than one substance, with polydrug use being more common among cocaine (80 per cent) and opioid users (77 per cent). Misuse of prescription drugs and use of cannabis and cocaine were most frequently reported among users of opioids, while primary cocaine users more frequently reported use of cannabis and opioids.<sup>45</sup>

### **Emerging methamphetamine use among opiate users in the Islamic Republic of Iran**

In the Islamic Republic of Iran, where opiates remain the main drug consumed by problem drug users, methamphetamine use has emerged as another drug of concern in recent years. Methamphetamine use has also been described as a new form of polydrug use among opiate users.<sup>46</sup> Many local studies of opiate users in methadone treatment have reported the use of methamphetamine among the clients of treatment centres. For example, a study at an opioid substitution treatment clinic in Zahedan Province showed that methamphetamine use among opioid users in treatment increased from 6 per cent in 2009 to almost 20 per cent in 2011.<sup>47</sup> Another study of 378 people seeking treatment at a therapeutic community centre found that the urine samples of nearly 7 per cent of those people had tested positive for methampheta-

mine.<sup>48, 49</sup> Methamphetamine use has reportedly had a negative influence on opioid-dependent patients in treatment who wrongly believed that methamphetamine use could help control their opiate dependence and associated problems such as depression and poor sexual performance and increase their physical energy, attention and concentration and improve social relationships.<sup>50</sup> Methamphetamine use among heroin users has also been reported in other parts of Asia.<sup>51</sup>

### **Problem drug use as reflected in demand for treatment for drug use**

Information about people in treatment for drug use disorders can be taken as a proxy for understanding the nature, as well as a latent indicator, of trends in drug use resulting in severe health consequences.

According to global estimates, nearly one in six people with drug use disorders access treatment services each year. Opioids stand out as a major drug of concern in North America, Europe (particularly Eastern and South-Eastern Europe) and Asia. In Eastern and South-Eastern Europe, nearly three out of every four people in treatment for drug use disorders are treated for opioid use. The number of people in treatment for cocaine use disorders remains quite high in Latin America and the Caribbean, where nearly half of people in treatment for drug use disorders are treated for cocaine use. Treatment related to cannabis use disorders is more prominent in Africa and Oceania than in other regions. This may be related to the limited treatment options for users of other drugs in Africa, where nearly half of all admissions to treatment for drug use disorders are for the use of non-specified substances, which masks the true extent of the use of drugs of concern other than cannabis. Amphetamines remain a problem primarily in East and South-East Asia and to some extent in North America; while the number of people in treatment for disorders related to the use of amphetamines has been increasing in Asia, half of the people in treatment for drug use in the region are treated for opioid use disorders.

The number and characteristics of people seeking treatment for the first time are indirect indicators of trends in health consequences caused by the use of different substances in a region. At the global level, the proportion of

amphetamine-using cohort and correlates of methamphetamine dependence", *Journal of Substance Use*, vol. 18, No. 5 (2013), pp. 349-362.

44 EMCDDA, "Perspectives on drugs: health and social responses for methamphetamine users in Europe", 27 May 2014.

45 EMCDDA, *2014 National Report to the EMCDDA (2013 Data) by the Reitox Greek National Focal Point: Greece – New Developments, Trends* (Athens, 2014).

46 Zahra A. Mehrjerdi, Alasdair M. Barr and Alireza Noroozi, "Methamphetamine-associated psychosis: a new health challenge in Iran", *DARU Journal of Pharmaceutical Sciences* (2013).

47 Zahra A. Mehrjerdi, "Crystal in Iran: methamphetamine or heroin kerack", *DARU Journal of Pharmaceutical Sciences*, 2013.

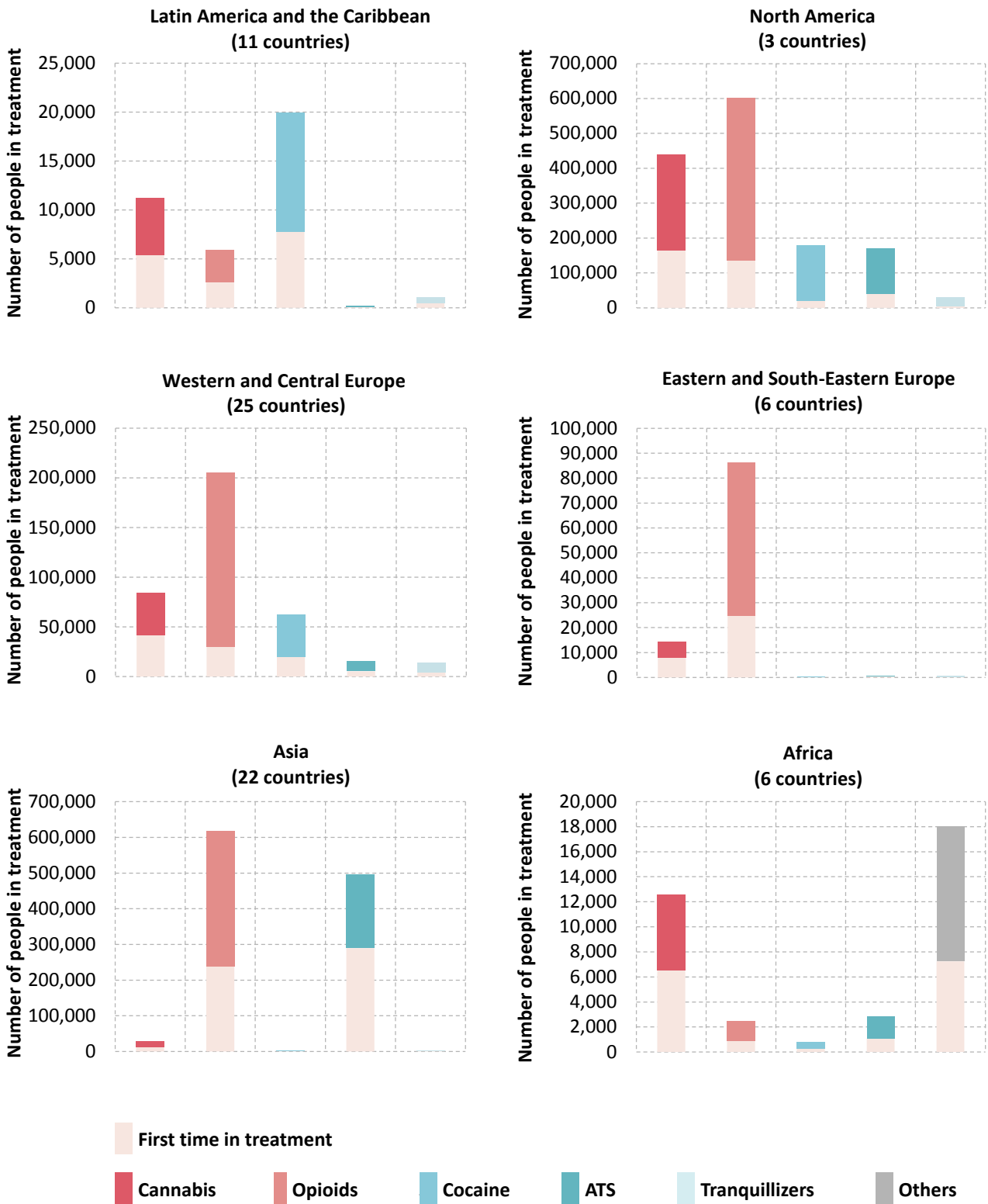
48 Zahra Alam-Mehrjerdi, Azarakhsh Mokri and Kate Dolan, "Methamphetamine use and treatment in Iran: a systematic review from the most populated Persian Gulf country", *Asian Journal of Psychiatry*, vol. 16, 2015, pp. 17-25.

49 Nasrindokht Sadir and others, "Outcome evaluation of therapeutic community model in Iran", *International Journal of Health Policy and Management*, vol. 1, No. 2 (2013), pp. 131-135.

50 Schwann Shariatirad, Masoomeh Maarefvand and Hamed Ekhiari, "Methamphetamine use and methadone maintenance treatment: an emerging problem in the drug addiction treatment network in Iran", *International Journal of Drug Policy*, vol. 24, No. 6 (2013), pp. e115 and e116.

51 Darshan Singh and others, "Substance abuse and HIV situation in Malaysia", *Journal of Food and Drug Analysis*, vol. 21, Suppl. No. 4 (2013), pp. S46-S51.

**FIG. 9** Total number of people in treatment for drug use, including people in treatment for the first time, by drug type and region, 2014

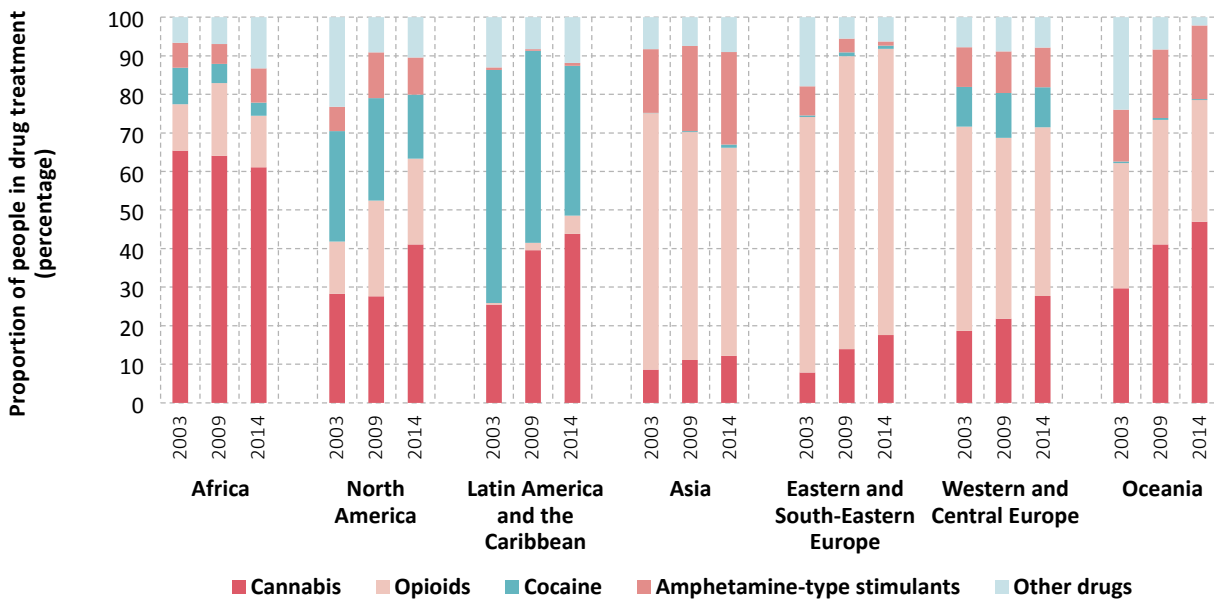


Source: Responses to the annual report questionnaire.

Note: The figures are based on data for 2014 or the latest year since 2010 for which data are available. For each region, the number of people in treatment for the use of different drugs in the region is weighted by the total number of people treated in a country. Member States in Oceania (in particular, Australia and New Zealand) do not provide information on the proportion of people in treatment for the first time, and therefore information for Oceania is not reflected in the figures.



FIG. 10 Primary drug used among people in drug treatment, by region, 2003, 2009 and 2014



Source: Responses to the annual report questionnaire.

Note: Data used for each point in time are based on reporting from countries in each region for the year cited or the latest year for which data are available.

people seeking treatment for cannabis use disorders for the first time remains high — nearly 50 per cent. In Asia, among those being treated for disorders related to the use of amphetamines, nearly 60 per cent are reported to be in treatment for the first time; in Europe and Latin America, nearly 40 per cent of those being treated for cocaine use disorders are reported to be in treatment for the first time. People seeking treatment for disorders related to the use of cannabis and amphetamines are younger (on average, 24 and 25 years of age, respectively) than people seeking treatment for disorders related to the use of other drugs, including those seeking such treatment for the first time. This reflects increasing trends in the use of cannabis and amphetamines and the resulting increase in people seeking treatment for disorders related to the use of those drugs. Fewer people are in treatment for the first time for opioid or cocaine use disorders; however, they are typically in their thirties and, in many subregions, reflect an ageing cohort of users in treatment<sup>52</sup> and show an overall decrease in the proportion of treatment demand.

Moreover, based on data reported by Member States, it is estimated that between 40 and 80 per cent of people in treatment for drug use are diagnosed with polydrug use, which reflects the complexity of drug use patterns and the challenges of treating people with drug use disorders effectively.

Trends in treatment demand over the past decade also corroborate the changing patterns of drug use observed in

different regions and subregions. While demand for treatment for cannabis use disorders has increased in all regions since 2003, it has done so to a much greater extent in the Americas, Western and Central Europe and Oceania. At the same time, in the Americas, the proportion of people in treatment for cocaine use has decreased over the past decade. In Asia, there has been a substantial increase in treatment for the use of amphetamine-type stimulants (ATS) and a decrease in treatment for disorders related to opioid use. In Eastern and South-Eastern Europe, treatment for opioid use disorders has been a matter of concern over the past decade.

The increase in treatment demand related to cannabis use in some regions warrants special attention.<sup>53</sup> There is great variability in the definition and practice of what constitutes treatment of cannabis use disorders. Treatment at present consists of behavioural or psychosocial interventions that may vary from a one-time online contact, or a brief intervention in an outpatient setting, to a more comprehensive treatment plan including treatment of other co-morbidities in an outpatient or inpatient setting.<sup>54</sup>

53 Wayne Hall, Maria Renström and Vladimir Poznyak, eds., *The Health and Social Effects of Nonmedical Cannabis Use* (Geneva, WHO, 2016).

54 Jan Copeland, Amie Frewen and Kathryn Elkins, *Management of Cannabis Use Disorder and Related Issues: A Clinician's Guide* (Sydney, National Cannabis Prevention and Information Centre, University of New South Wales, 2009); Divya Ramesh and Margaret Haney, "Treatment of cannabis use disorders", in *Textbook of Addiction Treatment: International Perspectives*, N. El-Guebaly, G. Carrà and M. Galanter, eds. (Milan, Italy, Springer, 2015); and Alan J. Budney and others, "Marijuana dependence and its treatment", *Addiction Science and Clinical Practice*, vol. 4, No. 1 (2004), pp. 4-16.

52 Joseph Gfroerer and others, "Substance abuse treatment need among older adults in 2020: the impact of the aging baby-boom cohort", *Drug and Alcohol Dependence*, vol. 69, No. 2 (2003), pp. 127-135.

## What are the potential driving forces behind changes in the number of people in treatment for cannabis use?

The nature and extent of the potential health risks and harms associated with cannabis use are continually under debate.<sup>55</sup> Cannabis use can be perceived to be relatively harmless<sup>56, 57</sup> when compared with the use of other controlled psychoactive substances and also in relation to the use of tobacco or alcohol. However, lower risk does not mean no risk: there are harmful health effects associated with a higher frequency of cannabis use and initiation at a very young age, especially among adolescents during the time of their cognitive and emotional development.<sup>58</sup>

Adverse health effects of cannabis use associated with cognitive impairments or psychiatric symptoms are well documented in the scientific literature.<sup>59, 60, 61</sup> Hence, cannabis use disorders require clinically significant treatment interventions. The transition from drug use to drug dependence occurs for a much smaller proportion of cannabis users than for opioid, amphetamine or cocaine users.<sup>62</sup> However, because so many people use cannabis, this translates into a large number who experience cannabis use disorders; for example, in the United States, of the 22.2 million current cannabis users in 2014, 4.2 million people aged 12 or older had a cannabis use disorder diagnosed in the previous year.<sup>63</sup>

Cannabis use disorders are estimated to occur in approximately 1 out of every 11 persons (9 per cent) who have

ever used cannabis,<sup>64</sup> and the proportion increases significantly to one out of every six persons (17 per cent) who started using cannabis in their teens<sup>65</sup> and to 25-50 per cent of daily cannabis users.<sup>66, 67</sup>

Factors that may influence the number of people in treatment when cannabis is the primary drug of concern<sup>68</sup> include: changes in the number of people who actually need treatment; changes in referrals to treatment; changes in awareness of potential problems associated with cannabis use; and changes in the availability of treatment for cannabis. Unfortunately, detailed information on trends in the number of people in treatment and on potential driving forces is sparse, and consequently the analysis presented below is limited to the situation in the United States and in European countries.

## Are changing patterns of treatment for cannabis use a result of more harmful consumption patterns?

The risk of adverse health effects increases with harmful patterns of cannabis use that include high-frequency (daily or near-daily) use, an earlier age of initiation and consumption of higher-potency cannabis.

In the United States, the number of daily (or near-daily) cannabis users, measured by the number using cannabis on 20 or more days in the past month and the number using cannabis on 300 or more days in the past year, rose significantly after 2006, by 58 and 74 per cent, respectively. However, this increase in daily (or near-daily) cannabis use has not translated into an increased number of people seeking treatment, even when those in treatment referred by the criminal justice system are excluded.

In Europe, where treatment for cannabis use disorders has been on the increase, approximately 1 per cent of the population aged 15-64 are daily (or near-daily) cannabis users; although data on daily use are sparse, there is little evidence

55 Nora D. Volkow and others, "Adverse health effects of marijuana use", *New England Journal of Medicine*, vol. 370, No. 23 (2014), pp. 2219-2227.

56 David Nutt and others, "Development of a rational scale to assess the harm of drugs of potential misuse", *The Lancet*, vol. 369, No. 9566 (2007), pp. 1047-1053.

57 Dirk W. Lachenmeier and Jürgen Rehm, "Comparative risk assessment of alcohol, tobacco, cannabis and other illicit drugs using the margin of exposure approach", *Scientific Reports*, vol. 5, No. 8126 (2015).

58 Wayne Hall, "The adverse health effects of cannabis use: what are they, and what are their implications for policy?", *International Journal of Drug Policy*, vol. 20, No. 6 (2009), pp. 458-466; Robin Room and others, *Cannabis Policy: Moving Beyond Stalemate* (Oxford, Oxford University Press, 2010); and Dan I. Lubman, Ali Cheetham and Murat Yücel, "Cannabis and adolescent brain development", *Pharmacology and Therapeutics*, vol. 148 (2015), pp. 1-16.

59 Wayne Hall, "What has research over the past two decades revealed about the adverse health effects of recreational cannabis use?", *Addiction*, vol. 114, No. 1 (2015), pp. 19-35; and Wayne Hall and Louisa Degenhardt, "Adverse health effects of non-medical cannabis use", *The Lancet*, vol. 374, No. 9698 (October 2009), pp. 1383-1391.

60 *World Drug Report 2014*, footnotes 180 and 181, p. 44.

61 Wayne Hall and others, *The Health and Social Effects of Nonmedical Cannabis Use* (see footnote 53).

62 James C. Anthony, Lynn A. Warner and Ronald C. Kessler, "Comparative epidemiology of dependence on tobacco, alcohol, controlled substances, and inhalants: basic findings from the National Comorbidity Survey", *Experimental and Clinical Psychopharmacology*, vol. 2, No. 3 (1994), pp. 244-268.

63 *Behavioral Health Trends in the United States: Results from the 2014 National Survey on Drug Use and Health* (see footnote 23).

64 C. Lopez-Quintero and others, "Probability and predictors of transition from first use to dependence on nicotine, alcohol, cannabis, and cocaine: results of the National Epidemiologic Survey on Alcohol and Related Conditions (NESARC)", *Drug and Alcohol Dependence*, vol. 115, Nos. 1 and 2 (2011), pp. 120-130.

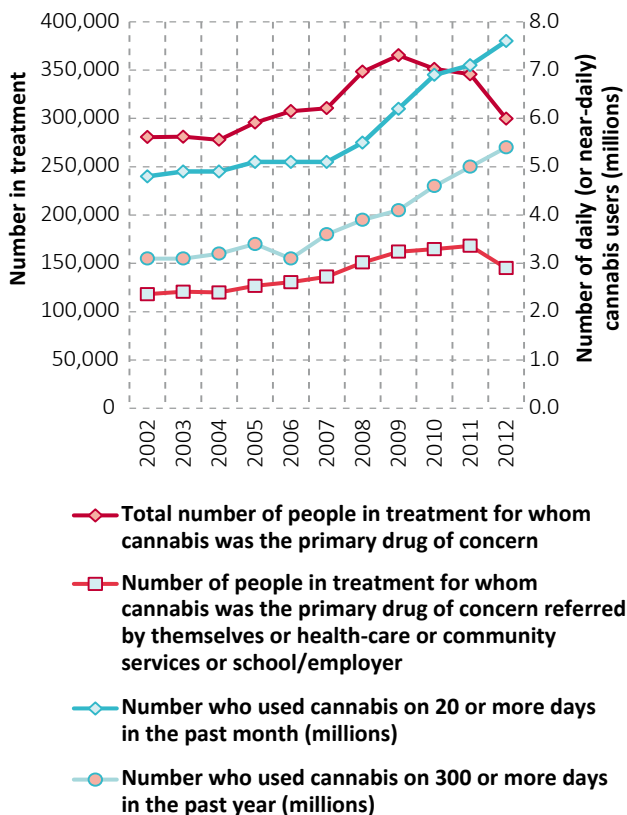
65 James C. Anthony, "The epidemiology of cannabis dependence", in *Cannabis Dependence: Its Nature, Consequences and Treatment*, Roger A. Roffman and Robert S. Stephens, eds. (Cambridge, Cambridge University Press, 2006), pp. 58-105.

66 Wayne Hall and Rosalie L. Pacula, *Cannabis Use and Dependence: Public Health and Public Policy* (Cambridge, Cambridge University Press, 2003).

67 EMCDDA, *Prevalence of Daily Cannabis Use in the European Union and Norway* (Luxembourg: Publications Office of the European Union, 2012).

68 In the context of this section of the present report, cannabis treatment refers to the situation where cannabis was the primary drug of concern. People in treatment when other drugs were the primary drug of concern might be treated for their cannabis use at the same time. Therefore, the total number of people receiving who use cannabis is actually far greater than the number presented here, especially since the use of cannabis is frequent among users of other drugs.

**FIG. 11** Number of daily (or near-daily) users of cannabis and number of people in treatment for cannabis use in the United States, 2002-2012



Sources: United States, Department of Health and Human Services, Substance Abuse and Mental Health Services Administration (SAMHSA), *Results from the 2013 National Survey on Drug Use and Health: Summary of National Findings*, NSDUH Series H-48, HHS Publication No. (SMA) 14-4863 (Rockville, Maryland, SAMHSA, 2014); United States, Department of Health and Human Services, SAMHSA, Center for Behavioral Health Statistics and Quality, *Treatment Episode Data Set: Admissions (TEDS-A) – Concatenated, 1992 to 2012*, ICPSR25221 (Ann Arbor, Michigan, Inter-university Consortium for Political and Social Research, 2015).  
Note: The data presented in the figure are for people aged 12 years and older; persons in treatment are those for whom cannabis was the primary drug of concern.

that this rate has changed over the past decade.<sup>69</sup> In several countries in Europe with some of the highest numbers of people in treatment for cannabis use (Germany, Spain and the United Kingdom of Great Britain and Northern Ireland), the prevalence of past-month cannabis use has been stable or declining in the past decade, although the number of persons in treatment for cannabis use has risen continually.

One factor that could explain increased negative health effects of cannabis use could be decreasing age of initiation, but there is little evidence that cannabis users are now starting at an earlier age. The age of initiation of cannabis use reported by those in treatment has changed little

over time in the United States and has followed no clear trend in Europe; therefore, it has probably not been an important factor influencing the trends observed in the number of persons in treatment.<sup>70, 71</sup>

Increases in the potency of cannabis products (the *delta-9*-tetrahydrocannabinol or tetrahydrocannabinol (THC) content), including in the ratio of THC to cannabidiol (a cannabinoid with anti-psychotic properties that may partially counterbalance the harm caused by THC), have received considerable attention in relation to possible increases in adverse health effects. There is evidence in some countries that there is now a large variety of cannabis products on the market and that high-potency preparations have become more widely available.<sup>72, 73</sup> Nevertheless, the interplay between high-potency cannabis products and dosage and how it translates into harm for users is not well understood. Users may adjust (titrate) the amounts of cannabis they consume to achieve the desired psychoactive effect, although this has been shown to be more difficult for inexperienced users<sup>74</sup> and users of high-potency cannabis.<sup>75</sup>

### Are changing patterns of treatment for cannabis use a result of changes in referrals from the criminal justice system?

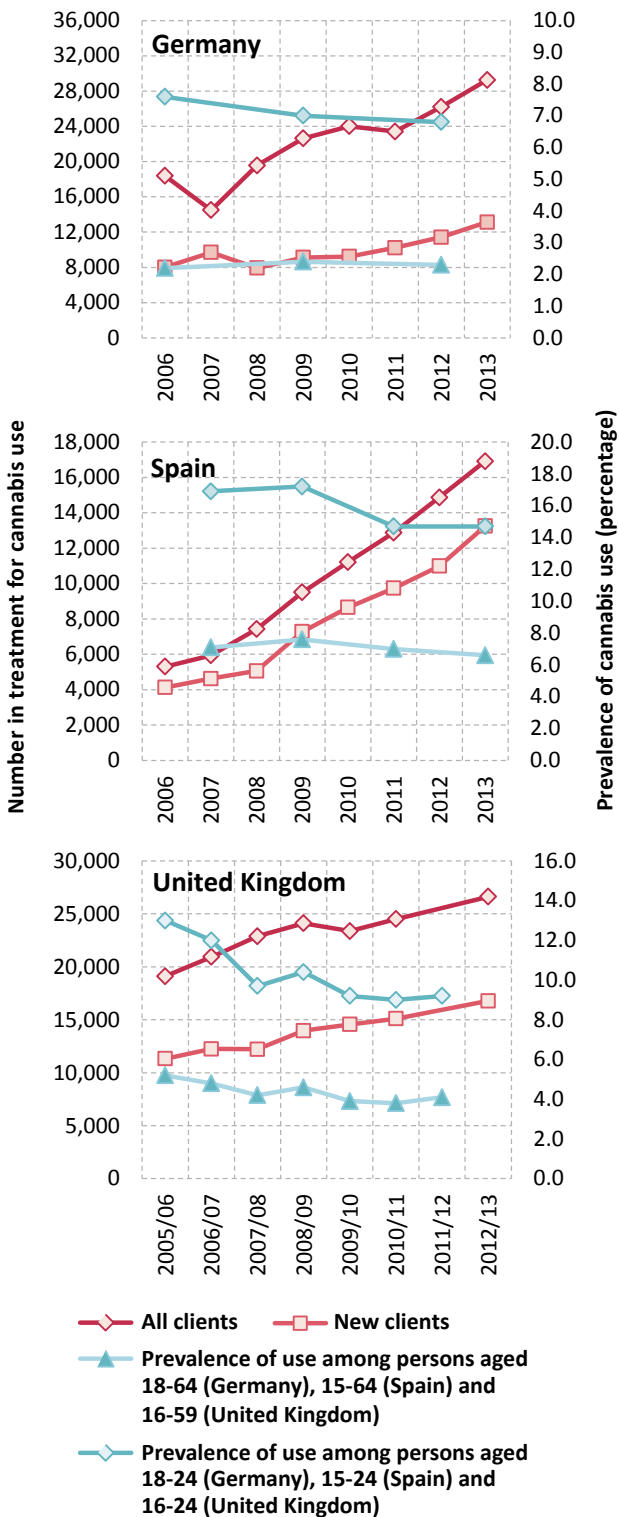
Several countries have adopted alternative measures to incarceration in minor cases involving possession of cannabis for personal consumption without aggravating circumstances (for example, fines, warnings, probation, counselling or even exemption from punishment). In the United States and the majority of countries in Europe, there is the option of referral or diversion away from criminal sanctions and into treatment. Thus, the criminal justice response to cases involving possession of cannabis for personal use can have an impact on the number of persons in treatment for cannabis use.

In the United States, persons referred to treatment from the criminal justice system constitute a significant proportion (47-58 per cent in the period 1992-2012) of those in

69 Prevalence of Daily Cannabis Use (see footnote 67).

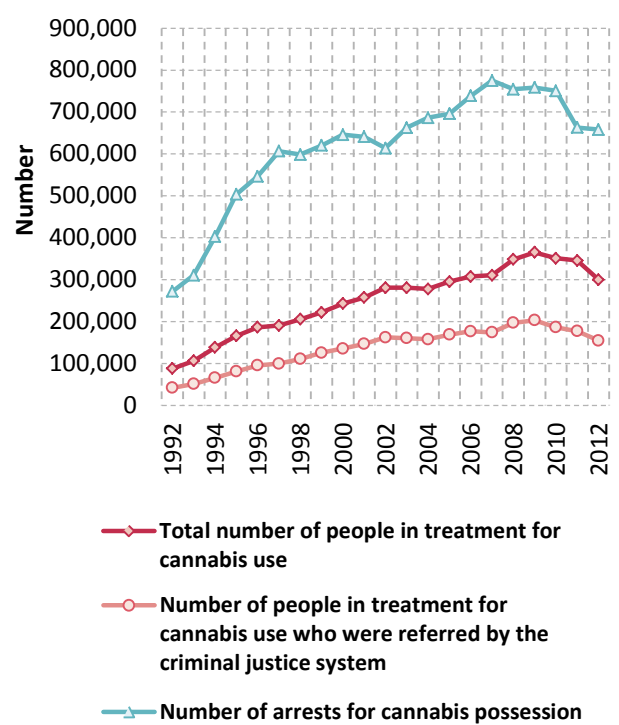
70 United States, Department of Health and Human Services, Substance Abuse and Mental Health Services Administration (SAMHSA), Center for Behavioral Health Statistics and Quality, *Treatment Episode Data Set: Admissions (TEDS-A) Concatenated, 1992 to 2012*, ICPSR 25221 (Ann Arbor, Michigan, Inter-university Consortium for Political and Social Research, 2015).  
71 EMCDDA, *Statistical Bulletin*, various years.  
72 For more details, see *World Drug Report 2015* (United Nations publication, Sales No. E.15.XI.6), pp. 62-64.  
73 James R. Burgdorf, Beau Kilmer and Rosalie L. Pacula, "Heterogeneity in the composition of marijuana seized in California", *Drug and Alcohol Dependence*, vol. 117, No. 1 (2011), pp. 59-61.  
74 Tom P. Freeman and others, "Just say 'know': how do cannabinoid concentrations influence users' estimates of cannabis potency and the amount they roll in joints?", *Addiction*, vol. 109, No. 10 (2014), pp. 1686-1694.  
75 Peggy van der Pol and others, "Cross-sectional and prospective relation of cannabis potency, dosing and smoking behaviour with cannabis dependence: an ecological study", *Addiction*, vol. 109, No. 7 (2014), pp. 1101-1109.

**FIG. 12** Number of people in treatment for cannabis use and the prevalence of past-month cannabis use in Germany, Spain and the United Kingdom, 2006-2013



Source: Responses to the annual report questionnaire; and EMCDDA, *Statistical Bulletin*, 2015.  
 Note: The data presented in the figures are for persons in treatment for whom cannabis was the primary drug of concern; for the United Kingdom, the treatment data refer to the second year in the range given and are for the whole country, but the prevalence rates refer to England and Wales only; for Spain, the prevalence rate given for 2007 refers to the years 2007/08.

**FIG. 13** Number of people in treatment for cannabis use and number of arrests for possession of cannabis in the United States, 1992-2012



Sources: United States, Department of Health and Human Services, SAMHSA, Center for Behavioral Health Statistics and Quality, *Treatment Episode Data Set: Admissions (TEDS-A) – Concatenated, 1992 to 2012*, ICPSR25221 (Ann Arbor, Michigan, Inter-university Consortium for Political and Social Research, 2015); United States, Executive Office of the President, *National Drug Control Strategy: Data Supplement 2014* (Washington, D.C., 2014).  
 Note: The data on treatment presented in the figure are for people aged 12 years and older for whom cannabis was the primary drug of concern.

treatment for cannabis use.<sup>76</sup> However, over the same 20-year period, 40 per cent of those referred from the criminal justice system reported that they had not used cannabis in the month prior to entering treatment, and only 22 per cent reported daily use of cannabis. The number of arrests for cannabis possession follows a pattern that is for the most part similar to the number of people in treatment for cannabis, suggesting that changes in treatment for cannabis use in the United States are possibly a reflection of changes in arrests for cannabis possession.

In Europe, referrals from the criminal justice system (from the police, the courts and probation services) also make an important contribution to the number of persons in treatment as a result of their cannabis use. Typically, one in five persons who are in treatment and for whom cannabis was the primary drug of concern were referred from the criminal justice system,<sup>77</sup> with the proportion ranging

76 *Treatment Episode Data Set: Admissions (TEDS-A) – Concatenated, 1992 to 2012* (see footnote 70).  
 77 Median of 21 per cent from 26 reporting countries using data for 2013 or the most recent year available.

from 3.9 per cent in the Netherlands to 80.6 per cent in Hungary.<sup>78</sup> Unfortunately, information is not available with regard to changes over time.

### Have barriers and facilitators of access to treatment influenced the trend in treatment for cannabis use?

Given that persons who are dependent on cannabis are often reluctant to seek treatment,<sup>79</sup> an awareness and understanding, particularly among youth, of the potential harm associated with cannabis use may encourage users to seek help. In the United States there has been a continuous decline in the perception among youth that cannabis use is harmful. The proportion of secondary school students who see a “great risk” from regular cannabis use has declined since the early 1990s and there has been a particularly rapid decline since the mid-2000s. In 2014, less than 40 per cent of twelfth-grade students (ages 17-18) perceived a “great risk” from regular cannabis use, down from nearly 80 per cent in the early 1990s.<sup>80</sup> In Europe, the perception of harm from cannabis use is higher among youth than in the United States and has not shown a decline. According to European surveys conducted in 2003, 2007 and 2011, the percentage of students perceiving “great risk” of harm from regular cannabis use has been maintained at 70-72 per cent.<sup>81</sup> The greater perception of risk from cannabis use observed in Europe may have been a factor in the increasing numbers in treatment.

There could be considerable unmet demand for treatment for cannabis use in Europe. It is estimated that there are 3 million daily (or near-daily) cannabis users (persons who used cannabis 20 or more days in the previous month) in the region.<sup>82</sup> Based on a number of studies, cannabis dependence has been estimated to occur in 25-50 per cent of daily users.<sup>83, 84</sup> In Europe, a total number of approximately 206,000 persons received treatment in 2010 for which cannabis was either the primary or secondary reason for entering treatment,<sup>85</sup> suggesting that 10-30 per cent of all daily dependent cannabis users were receiving treatment.

At the health-care policy level and in international research, treatment for cannabis use has been receiving a relatively high level of visibility and public funding in Europe.<sup>86</sup> Since 2008, the number of persons in treatment for cannabis use has been increasing in Europe, which in part is a reflection of the expansion in the provision of treatment.<sup>87</sup> In many countries in Europe, important strides have been made in the provision of treatment with programmes that have been implemented, expanded or modified to address the needs of cannabis users, some having adolescents and young adults as their target groups.<sup>88, 89</sup>

### Gender and drug use

Men are considered to be three times more likely than women to use cannabis, cocaine or amphetamines, whereas women are more likely than men to engage in the non-medical use of prescription opioids and tranquillizers. Gender disparities in drug use are more attributable to opportunities to use drugs in a social environment than to either gender being more or less susceptible or vulnerable to the use of drugs.<sup>90</sup> Men are considered to have more opportunities than women to use drugs, but both genders are equally likely to use drugs once an opportunity to do so occurs.<sup>91, 92</sup>

### Gender divide in drug use is narrowing among the younger generation

In most surveys, the prevalence of drug use is reportedly higher among young people than among adults and the gender divide in drug use is narrower among young people than among adults.<sup>93</sup> In Europe, for every two girls who use cannabis there are three boys, whereas the prevalence of cannabis use among adults is nearly twice as high among men than among women.<sup>94</sup> In the United States, the use

78 EMCDDA, Data and statistics, Statistical Bulletin 2015, table TDI-0291. Available at [www.emcdda.europa.eu/](http://www.emcdda.europa.eu/).

79 Peter Gates and others, “Barriers and facilitators to cannabis treatment”, *Drug and Alcohol Review*, vol. 31, No. 3 (2012), pp. 311-319.

80 Richard A. Miech and others, *Monitoring the Future National Survey Results on Drug Use: 1975-2014*, vol. 1, *Secondary school students* (Ann Arbor, Michigan, University of Michigan Institute for Social Research, 2015), chap. 2.

81 Bjorn Hibell and others, *The 2011 ESPAD Report: Substance Use among Students in 36 European Countries; The 2007 ESPAD Report: Substance Use Among Students in 35 European Countries; and The 2003 ESPAD Report: Alcohol and other Drug Use among Students in 35 European Countries* (Stockholm, Swedish Council for Information on Alcohol and Other Drugs, 2012, 2009 and 2004).

82 *Prevalence of Daily Cannabis Use* (see footnote 67).

83 Hall and Pacula, “Cannabis use and dependence” (see footnote 66).

84 *Prevalence of Daily Cannabis Use* (see footnote 67).

85 Ibid.

86 Sharon R. Sznitman, “Cannabis treatment in Europe: a survey of services”, in *A Cannabis Reader: Global Issues and Local Experiences – Perspectives on Cannabis Controversies, Treatment and Regulation in Europe*, vol. 2, S. R. Sznitman, B. Olsson and R. Room, eds., EMCDDA Monograph Series No. 8, (EMCDDA, Lisbon, 2008).

87 J. Schettino and others, *Treatment of Cannabis-related Disorders in Europe*, EMCDDA Insights Series (Lisbon, EMCDDA, 2015).

88 Eva Hoch and others, “CANDIS treatment program for cannabis use disorders: findings from a randomized multi-site translational trial”, *Drug and Alcohol Dependence*, vol. 134 (2014), pp. 185-193.

89 *Treatment of Cannabis-related Disorders in Europe* (see footnote 87).

90 See *World Drug Report 2015*.

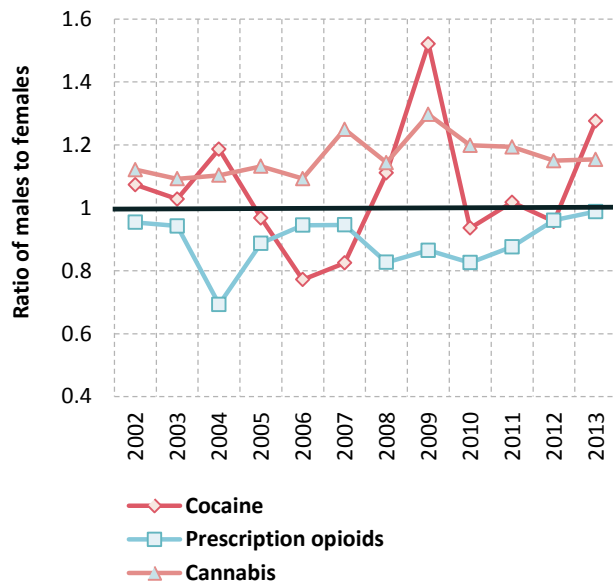
91 Michelle L. van Etten and James C. Anthony, “Male-female differences in transitions from first drug opportunity to first use: searching for subgroup variation by age, race, region, and urban status”, *Journal of Women’s Health and Gender-based Medicine*, vol. 10, No. 8 (2001).

92 Michelle L. van Etten, Yehuda D. Neumark and James C. Anthony, “Male-female differences in the earliest stages of drug involvement”, *Addiction*, vol. 94, No. 9 (1999), pp. 1413-1419.

93 Jessica H. Cotto and others, “Gender effects on drug use, abuse, and dependence: a special analysis of results from the National Survey on Drug Use and Health”, *Gender Medicine*, vol. 7, No. 5 (2010), pp. 402-413.

94 *The 2011 ESPAD Report*; and the unweighted average of the prevalence of past-year drug use for European Union member States reported by EMCDDA.

**FIG. 14** Ratio of males to females among young people (ages 12-17) who use cocaine, prescription opioids and cannabis in the United States, 2002-2013



Source: United States, SAMHSA, Center for Behavioral Health Statistics and Quality, *Results from the 2013 National Survey on Drug Use and Health: Mental Health Detailed Tables* (Rockville, Maryland, 2014).

of cannabis, cocaine and prescription opioids among young people (ages 12-17) was fluctuating over the past decade but overall the gender gap has remained similar.

### Gender divide in drug use is changing

In recent years, in countries with established drug use, the gender divide in drug use has also been changing in the adult population, partly reflecting increasing opportunities to use a particular substance. In the United States, among the population aged 12 and older, heroin use remains higher among men than among women. However, over the past decade more women than men have started using heroin: the prevalence of past-year heroin use among women was 0.8 per cent in the period 2002-2004 and twice that figure (1.6 per cent) in the period 2011-2013, whereas the prevalence of past-year heroin use among men increased by half in the same period. The increase in heroin use was significantly higher among men and women who were younger (18-25 years old) and more frequent users of prescription opioids.<sup>95</sup>

In the United Kingdom, overall drug use in the adult population declined between 1996 and the period 2013-2014. However, this decline was more marked among women (-30 per cent) than men (-13 per cent). While the prevalence of amphetamine use declined by 75 per cent

for both men and women, the decline in cannabis use was greater among women (-40 per cent) than among men (-20 per cent).<sup>96</sup>

## B. HEALTH IMPACT OF DRUG USE

### Almost 12 million people inject drugs worldwide

The joint UNODC/WHO/UNAIDS/World Bank estimate for the number of people who inject drugs (PWID) for 2014 is 11.7 million (range: from 8.4 to 19.0 million), or 0.25 per cent (range: 0.18-0.40 per cent) of the population aged 15-64. PWID experience some of the most severe health-related harms associated with unsafe drug use, overall poor health outcomes, including a high risk for non-fatal and fatal overdoses, and a greater chance of premature death.<sup>97</sup> This is exacerbated by poor access to evidence-informed services for the prevention and treatment of infections, particularly HIV, hepatitis C and tuberculosis.<sup>98</sup>

Eastern and South-Eastern Europe is the subregion with by far the highest prevalence of injecting drug use: 1.27 per cent of the population aged 15-64. The subregion accounts for almost one in four (24 per cent) of the total number of PWID worldwide; almost all PWID in the subregion reside in the Russian Federation and Ukraine. In Central Asia and Transcaucasia and in North America, the prevalence of injecting drug use is also high: 0.72 per cent of the population aged 15-64 in Central Asia and Transcaucasia; and 0.65 per cent in North America. Those three subregions combined account for 46 per cent of the total number of PWID worldwide. Although the prevalence of injecting drug use in East and South-East Asia is at a level below the global average, a large number of PWID (27 per cent of the total number of PWID in the world) reside in the subregion, given that it is the most populated subregion. Three countries (China, Russian Federation and United States) together account for nearly half of the total number of PWID worldwide.

### Drug use is a major risk factor for the transmission of infectious diseases

Among people who inject drugs, one in seven is living with HIV and one in two is living with hepatitis C

PWID represent a key at-risk population for HIV and hepatitis infections, with almost a third of new HIV infections outside sub-Saharan Africa occurring among

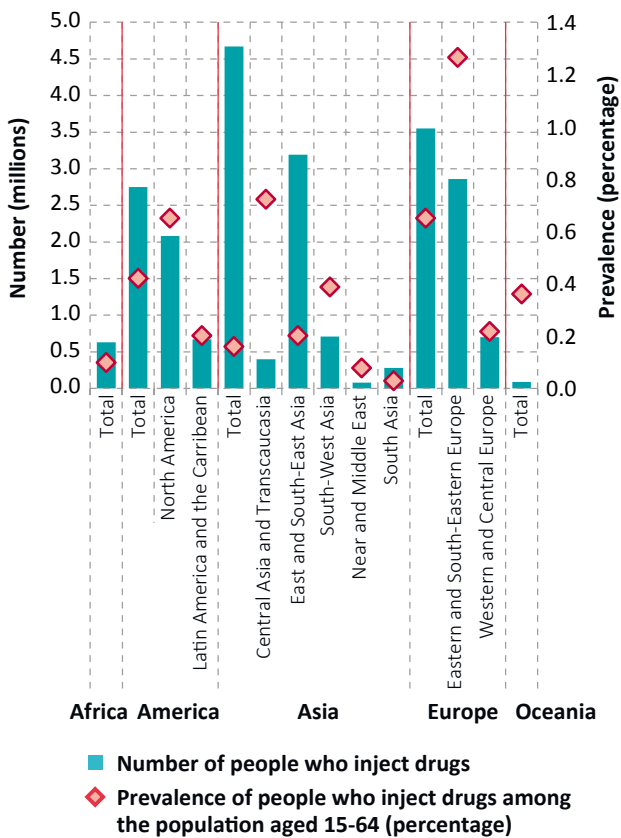
<sup>95</sup> Christopher M. Jones and others, "Vital signs: demographic and substance use trends among heroin users – United States, 2002-2013," *Morbidity and Mortality Weekly Report*, vol. 64, No. 26 (2015), pp. 719-725.

<sup>96</sup> United Kingdom, Home Office, *Drug Misuse: Findings for the 2013/14 Crime Survey for England and Wales* (July 2014).

<sup>97</sup> Mathers M. Bradley and others, "Mortality among people who inject drugs: a systematic review and meta-analysis," *Bulletin of the World Health Organization*, vol. 91, No. 2 (2013), pp. 102-123.

<sup>98</sup> Joint United Nations Programme on HIV/AIDS (UNAIDS), *The GAP Report 2014* (Geneva, 2014).

**FIG. 15** Estimated number and prevalence of people who inject drugs among the general population, by region, 2014



Sources: Responses to the annual report questionnaire; progress reports of the Joint United Nations Programme on HIV/AIDS (UNAIDS) on the global AIDS response (various years); the former Reference Group to the United Nations on HIV and Injecting Drug Use; and government reports.

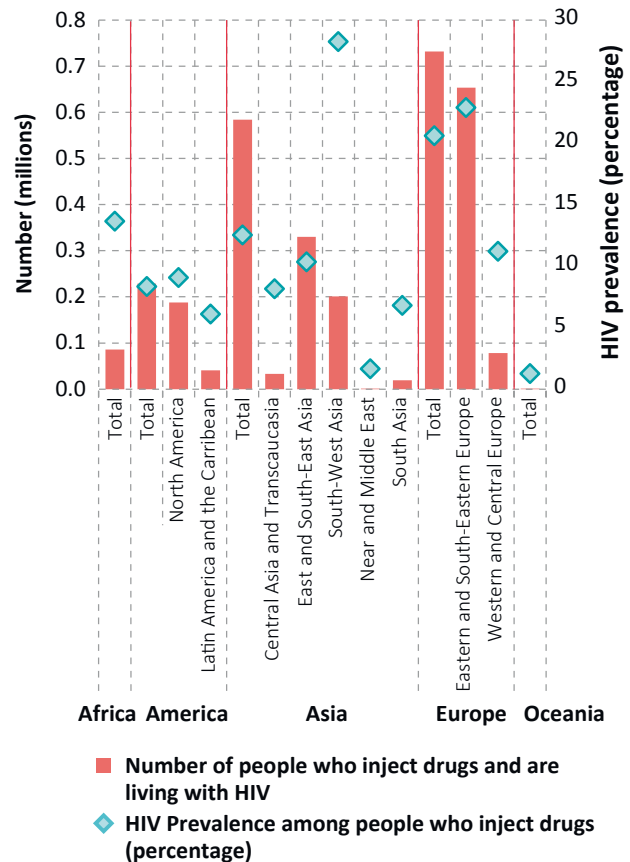
Note: The 2014 estimate of the total number of PWID worldwide (11.7 million) is slightly lower than the estimate published in the World Drug Report 2015 (12.2 million), although the prevalence of injecting drug use among the population aged 15-64 remains stable. In particular, estimates are now included for five countries in Africa (including for highly populated countries such as Nigeria) for which no data were previously available. This has led to an increase in the coverage of PWID estimates among the population aged 15-64 for Africa, from 29 to 50 per cent, and an improved overall estimate for PWID in Africa, with a corresponding reduction in the level of uncertainty of the regional estimate.

PWID.<sup>99</sup> Compared with non-injecting drug users, PWID are approximately three times more likely to acquire HIV,<sup>100</sup> as the sharing of contaminated needles and syringes is a major risk for the transmission of HIV and viral hepatitis. According to joint UNODC/WHO/UNAIDS/World Bank estimates for 2014, 14.0 per cent (or 1.6 million) of PWID are living with HIV, 52 per cent (or 6.0 million) of PWID are infected with hepatitis C and 9.0 per cent (or 1.1 million) are infected with hepatitis B.

99 Ibid.

100 Isabel Tavitian-Exley and others, "Influence of different drugs on HIV risk in people who inject: systematic review and meta-analysis", *Addiction*, vol. 110, No. 4, pp. 572-584.

**FIG. 16** Estimated number of people who inject drugs living with HIV and prevalence of HIV among people who inject drugs, by region, 2014



Sources: Responses to the annual report questionnaire; progress reports of UNAIDS on the global AIDS response (various years); the former Reference Group to the United Nations on HIV and Injecting Drug Use; and government reports.

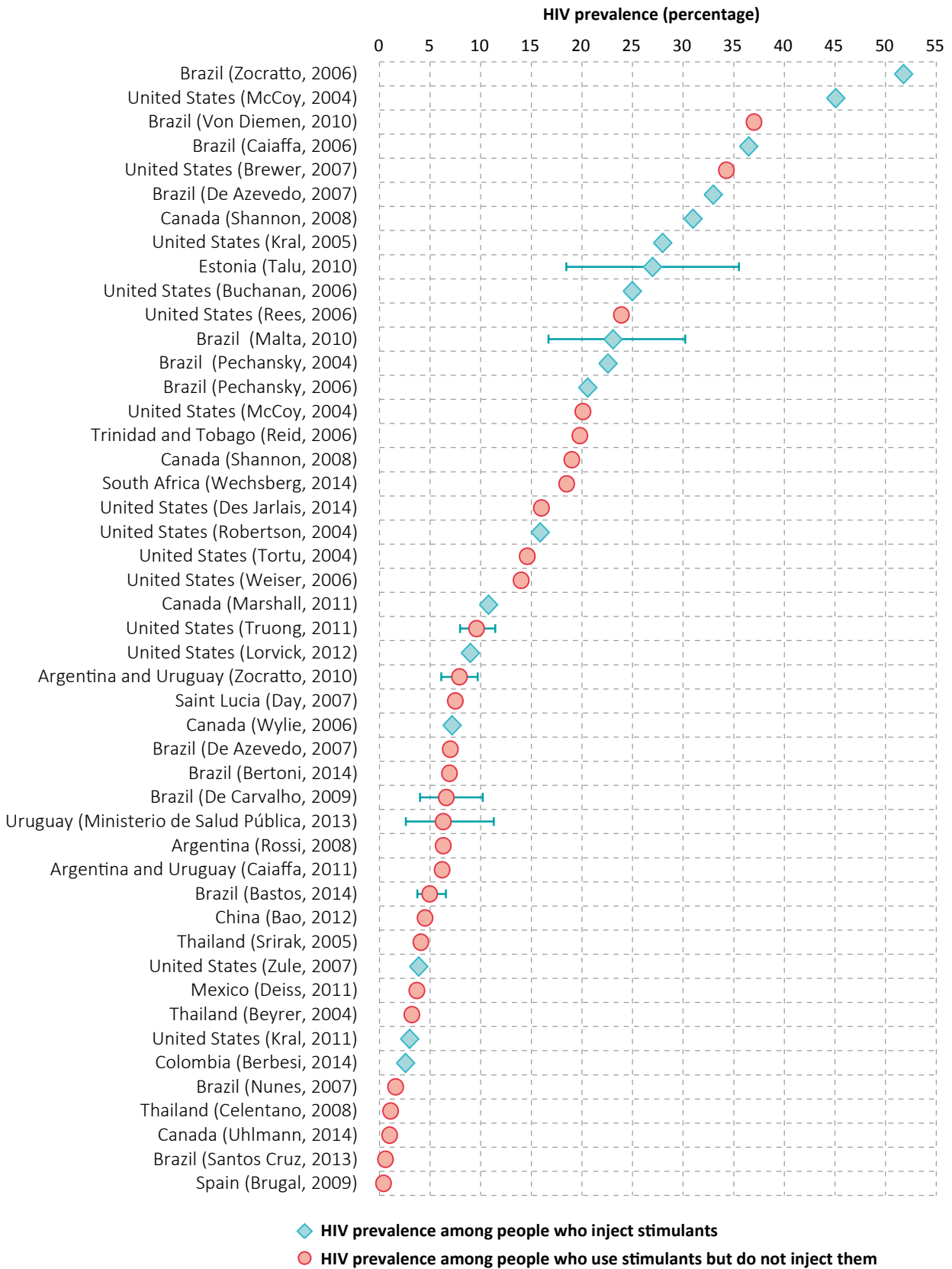
Note: The prevalence of HIV among PWID in Western and Central Europe has been updated from 7.6 per cent (World Drug Report 2015) to 11.2 per cent. This is the result of updated information supplied by Italy, where nationally representative information became available to replace previously reported subnational data.

HIV prevalence is particularly high among PWID in South-West Asia and in Eastern and South-Eastern Europe, where 28.2 and 22.9 per cent of PWID, respectively, are living with HIV. The two subregions combined account for 53 per cent of the total number of PWID living with HIV worldwide. Although both the prevalence of injecting drug use and the prevalence of HIV among PWID in East and South-East Asia are below the global averages, a large number of PWID living with HIV (330,000, or 21 per cent of the world total) reside in the subregion. Four countries combined (China, Pakistan, Russian Federation and United States) account for 64 per cent of the total number of PWID living with HIV.

### Risk behaviour and HIV among users of stimulants remain high

Studies have found that people who inject stimulants engage in higher-risk sexual behaviours and have higher HIV prevalence than people who inject opiates. People

**FIG. 17** HIV prevalence among people who inject stimulants and among people who use stimulants but do not inject them



Note: Based on a comprehensive review of studies commissioned by UNODC. (For details on the studies, see the relevant table in the online Statistical Annex to the World Drug Report.) Where available, the upper and lower bounds of 95 per cent confidence intervals are shown.



## Sustainable Development Goals related to the prevention and treatment of drug use and HIV

The General Assembly at its seventieth session adopted the outcome document of the United Nations summit for the adoption of the post-2015 development agenda, containing the 2030 Agenda for Sustainable Development and the Sustainable Development Goals.<sup>a</sup> The 17 Goals address the different dimensions of sustainable development. Many of the Sustainable Development Goals and their targets are related to the intersection between drugs, peace and justice, but only those related to health and well-being are mentioned here. For a broader discussion on the Sustainable Development Goals and the world drug problem see chapter II of the present report.

Under Goal 3 (“Ensure healthy lives and promote well-being for all at all ages”), global leaders have, for the first time, addressed issues related to the prevention and treatment of substance use. Target 3.5 is to strengthen the prevention and treatment of substance abuse, including narcotic drug abuse and harmful use of alcohol. Achieving that target requires, inter alia, expanding the coverage and quality of a range of evidence-based and gender-responsive interventions for the prevention of drug use, as well as for the

care, treatment and rehabilitation of drug use disorders. In this context, UNODC has developed the International Standards on Drug Use Prevention and the International Standards on the Treatment of Drug Use Disorders that have already been recognised by Member States as useful guides to improving their services in numerous Resolutions, as well as in the Outcome document of the special session of the General Assembly. Measuring access to treatment for substance use requires, at the national level, reliable estimates of the number of people in need of treatment for, or those suffering from, drug use disorders and a reliable estimate of the number of people provided with treatment interventions for the use of different drugs.

The second main target under Goal 3, namely target 3.3, is to end, by 2030, the epidemics of AIDS, tuberculosis, malaria and neglected tropical diseases and combat hepatitis, water-borne diseases and other communicable diseases. Other Goals related to addressing HIV and AIDS include those on achieving gender equality (Goal 5); reducing inequality (Goal 10); promoting inclusive societies and providing access to justice (Goal 16); and revitalizing the Global

Partnership for Sustainable Development (Goal 17). The UNAIDS Strategy 2016-2021 mirrors these Sustainable Development Goals, setting the following targets for HIV and AIDS treatment and prevention:<sup>b</sup>

1. The 90-90-90 treatment targets (and by 2030, the 95-95-95 treatment targets): by 2020:
  - (i) 90 per cent of people (children, adolescents and adults) living with HIV know their status;
  - (ii) 90 per cent of people living with HIV who know their status are receiving treatment;
  - (iii) 90 per cent of people in treatment have suppressed viral loads;
2. The prevention target is to reduce the number of new HIV infections to fewer than 500,000 per year by 2020 (and to fewer than 200,000 per year by 2030);
3. Zero discrimination (overcoming human rights, gender-related and legal barriers to HIV services).

a General Assembly resolution 70/1.

b UNAIDS, UNAIDS 2016–2021 Strategy: On the Fast-Track to End AIDS (2015).

who inject stimulants (cocaine and amphetamines) have been found to have more sexual partners and more frequent intercourse with casual partners and regular partners than PWID who inject other drugs. Moreover, a systematic review found that the risk of acquiring HIV was 3.6 times greater among people who injected cocaine than among non-injecting users of cocaine, and 3.0 times greater among people who injected ATS than among non-injecting users of ATS.<sup>101</sup>

The use of stimulants (particularly methamphetamine and amphetamine) to enhance and prolong sexual activity is well documented, particularly among men who have sex with men (MSM).<sup>102</sup> There is strong evidence of higher-risk sexual behaviours and higher HIV prevalence among MSM who use methamphetamine or amphetamine than among those who use other drugs.<sup>103</sup> These high-risk sexual behaviours include unprotected sex (or inconsistent condom use) and the selling of sex (in exchange for money

or drugs), as well as a higher frequency of sexual activity and an increased number of sexual partners.<sup>104, 105, 106</sup>

As many stimulants (particularly NPS that are stimulants) have a shorter duration of action, compared with users of opiates, users of stimulants report a high frequency of injecting, with compulsive re-injecting and a greater likelihood to report the sharing and reuse of needles and syringes that might be contaminated.<sup>107, 108</sup>

101 Ibid.

102 Lydia N. Drumright and others, “Unprotected anal intercourse and substance use among men who have sex with men with recent HIV infection”, *Journal of Acquired Immune Deficiency Syndromes*, vol. 43, No. 3 (2006), pp. 344-350.

103 Nga Thi Thu Vu, Lisa Maher, and Iryna Zablotska, “Amphetamine-type stimulants and HIV infection among men who have sex with men: implications on HIV research and prevention from a systematic review and meta-analysis”, *Journal of the International AIDS Society*, vol. 18, No. 1 (2015).

104 Francisco I. Bastos and Neilane Bertoni, *Pesquisa Nacional sobre o uso de crack: quem são os usuários de crack e/ou similares do Brasil? Quantos são nas capitais brasileiras?* (Rio de Janeiro, ICICT/FIOCRUZ, 2014).

105 Tavitian-Exley and others, “Influence of different drugs on HIV risk in people who inject” (see footnote 100).

106 John S. Atkinson and others, “Multiple sexual partnerships in a sample of African-American crack smokers”, *AIDS and Behavior*, vol. 14, No. 1 (2010), pp. 48-58; and J. A. Inciardi and others, “The effect of serostatus on HIV risk behaviour change among women sex workers in Miami, Florida”, *AIDS Care: Psychological and Socio-Medical Aspects of AIDS/HIV*, vol. 17, Suppl. No. 1 (2005), pp. S88-S101.

107 Marie C. Van Hout and Tim Bingham, “A costly turn on”: patterns of use and perceived consequences of mephedrone based head shop products amongst Irish injectors”, *International Journal of Drug Policy*, vol. 23, No. 3 (2012), pp. 188-197.

108 United Kingdom, Public Health England, Health Protection Scotland, Public Health Wales, and Public Health Agency Northern Ireland, “Shooting up: infections among people who inject drugs in the United Kingdom” (London, November 2015).

It is difficult to quantify the contribution of stimulant use in increasing HIV infection rates but, compared with use of other drugs, the preponderance of evidence points towards a positive association between stimulant use, higher-risk sexual and injecting behaviours and HIV infections.<sup>109, 110</sup>

Outbreaks of HIV among people who use drugs, especially PWID, are a particular concern because HIV can spread very rapidly among PWID when appropriate harm reduction services are not available, discontinued or scaled down.<sup>111</sup> In 2011, such outbreaks occurred among PWID in Greece (Athens) and Romania, where a significant increase in the number of new HIV cases among PWID was reported to be attributable, in part, to the increased use of stimulants (NPS in Romania and mostly cocaine in Greece, as a replacement for opioids in both cases), which was associated with a higher frequency of injecting and an increase in the sharing of needles and syringes among new and young PWID.<sup>112, 113</sup>

### Drug-related deaths remain unacceptably high

#### Number of drug-related deaths worldwide remains stable

In 2014, there were an estimated 207,400 (range: 113,700-250,100) drug-related deaths<sup>114</sup> worldwide, corresponding to 43.5 (range: 23.8-52.5) deaths per million people aged 15-64. Overdose deaths account for between approximately one third and one half of all drug-related deaths worldwide, and in most cases those overdose deaths involved opioids.<sup>115, 116</sup>

The highest drug-related mortality rate continues to be in North America, which accounts for approximately one in four (25 per cent of) drug-related deaths worldwide. The high mortality rate in North America is attributable in part to better monitoring and reporting of drug-related deaths and to the comparatively higher rates of opioid use in that subregion. In the United States, nearly half a million people are estimated to have died from drug overdoses

109 Louisa Degenhardt and others, "Meth/amphetamine use and associated HIV: implications for global policy and public health", *International Journal of Drug Policy*, vol. 21, No. 5 (2010), pp. 347-358.

110 Tavitian-Exley and others, "Influence of different drugs on HIV risk in people who inject" (see footnote 100).

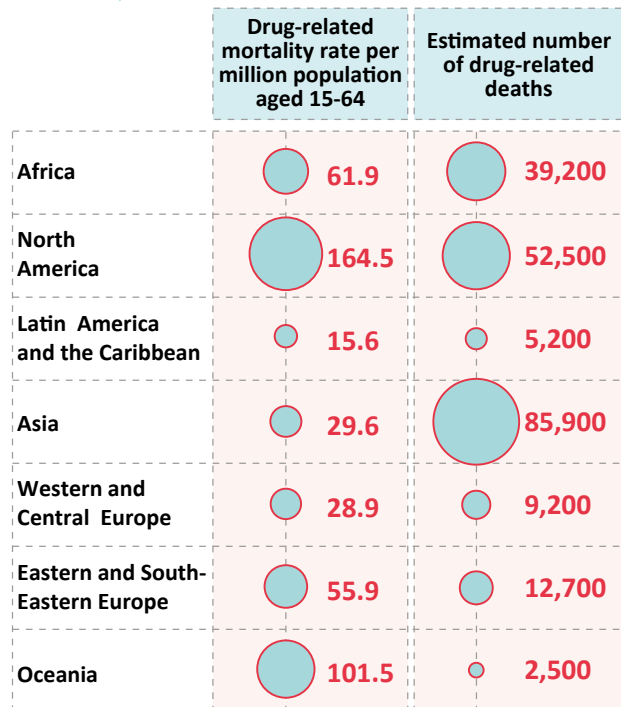
111 For the purpose of the present report, harm reduction is understood to refer to the set of the measures defined by WHO, UNODC and UNAIDS to prevent HIV and other blood-borne infections among people who inject drugs (also referred to in the Commission for Narcotic Drugs resolution 56/6) for the provision of comprehensive HIV prevention, treatment and care services among people who inject drugs'. See also the discussion in WHO "Community management of opioid overdose" 2014.

112 EMCDDA, "HIV outbreak among injecting drug users in Greece" (Lisbon, November 2012).

113 Andrei Botescu and others, "HIV/AIDS among injecting drug users in Romania: report of a recent outbreak and initial response policies" (Lisbon, EMCDDA, 2012).

114 The definition of drug-related deaths varies between Member States but includes some or all of the following: fatal drug overdoses;

**FIG. 18** Drug-related mortality rate and number of drug-related deaths, by region, 2014



Sources: responses to the annual report questionnaire; Inter-American Drug Abuse Control Commission; and Louisa Degenhardt and others, "Illicit drug use", in *Comparative Quantification of Health Risks: Global and Regional Burden of Disease Attributable to Selected Major Risk Factors*, vol. 1, Majid Ezzati and others, eds. (Geneva, World Health Organization (WHO), 2004), p. 1,109.

since 2004; the country experienced a record number of fatal drug overdoses in 2014, 61 per cent of which were associated with prescription opioids and heroin.<sup>117</sup>

#### Fentanyl-related overdose deaths reported in many countries

Fentanyl,<sup>118</sup> a synthetic opioid, has recently been implicated in a significant and increasing number of deaths in a number of countries. Recent concerns have been raised in a number of European countries, especially in Estonia, which has one of the highest drug-related mortality rates in Europe (127 drug-related deaths per million people aged 15-64 in 2013), and where overdoses are mostly associated with the use of fentanyl.<sup>119, 120</sup> In Canada, during the six-year period 2009-2014 there were at least 655

deaths due to HIV acquired through injecting drug use; suicide; and unintentional deaths and trauma due to drug use.

115 Louisa Degenhardt and others, "Illicit drug use", in *Comparative Quantification of Health Risks: Global and Regional Burden of Disease Attributable to Selected Major Risk Factors*, vol. 1, M. Ezzati and others, eds. (Geneva, WHO, 2004).

116 EMCDDA, *Mortality related to Drug Use in Europe: Public Health Implications* (Luxembourg, Publications Office of the European Union, 2011).

117 Rose A. Rudd and others, "Increases in drug and opioid overdose deaths: United States, 2000-2014", *Morbidity and Mortality Weekly Report*, vol. 64, No. 50 (2016), pp. 1378-1382.

118 EMCDDA, "Fentanyl drug profile". Available at [www.emcdda.europa.eu/publications/drug-profiles/fentanyl](http://www.emcdda.europa.eu/publications/drug-profiles/fentanyl).

## Are we underestimating the number of drug-related deaths?

Accurate estimates of the extent and patterns of drug-related deaths are vital for monitoring the most extreme form of harm that can result from drug use and for evaluating the effectiveness of interventions put in place to reduce drug-related mortality.

The definition of drug-related deaths varies from country to country, but could include all, or at least some, of the following: fatal drug overdoses; deaths due to AIDS acquired through injecting drug use; intentional self-poisoning by exposure to psychotropic substances (suicide); and unintentional deaths and trauma (motor vehicle accidents and other forms of accidental death) due to drug use. However, many countries only report overdose deaths. This definition is framed from a health perspective, considering drug-related deaths in the context of the burden of disease. However, a broader perspective could also include deaths resulting from the functioning of illicit drug markets and could include, for example, deaths as a result of violence associated with the illicit supply of and trafficking in drugs.

Ascertaining the cause of death can be complicated in cases where drug use

is suspected of playing a part or in the absence of information surrounding the circumstances of the death or the environment in which the death occurred. The process for determining the cause of death may vary from country to country and even within the same country. Depending on the discretion of the certifying physician and the available information about the deceased person's prior medical history and/or circumstances of death, more comprehensive, investigative procedures, including post-mortem toxicological investigations, may or may not be initiated. Although procedures may be well established for identifying overdose deaths resulting from the use of drugs such as heroin, the process may become complex if multiple drugs are involved, as in many fatal overdose cases. Also, the role of NPS in fatal overdose cases may be more difficult to determine, given the unknown toxicology of many NPS, particularly when they are used in combination with other drugs (including alcohol), in which case the risk of overdose can be higher. Mortality registers often contain a significant number of deaths classified as unknown or ill-defined or cases in which the true underlying cause of death may be miscoded, depending on the coding

practices and information available to the responsible physician. Thus, drug-related deaths are likely to be underreported.

Very few studies have attempted to estimate the level of underreporting of drug-related deaths. In France, for example, significant differences were apparent in official numbers from three different institutions with a very low rate of overlapping cases; there was underreporting of approximately a third of the total drug-related deaths.<sup>a</sup> In a study conducted in Italy, using an approach that examined multiple causes of death (the analysis of all conditions reported on the death certificate), it was estimated that there were 60 per cent more drug-related deaths than determined from traditional reporting on a single underlying cause of death.<sup>b</sup>

<sup>a</sup> Eric Janssen, "Drug-related deaths in France in 2007: estimates and implications", *Substance Use and Misuse*, vol. 46, No. 12 (2011), pp. 1495-1501.

<sup>b</sup> Francesco Grippo and others, "Drug induced mortality: a multiple cause approach on Italian causes of death Register", *Epidemiology Biostatistics and Public Health*, vol. 12, No. 1 (2015).

deaths in which fentanyl was determined to be the cause or a contributing cause of death, the number of deaths increasing markedly in the four largest provinces.<sup>121</sup> In the United States, there were more than 700 deaths related to fentanyl use between late 2013 and late 2014. One matter of concern is that heroin is often laced with fentanyl before being sold, and so heroin users have no knowledge of having consumed fentanyl. That situation could be exacerbated by the recent increase in heroin use in the United States.<sup>122</sup>

## Prisons are a high-risk environment for infectious diseases

Among vulnerable people who use drugs, particularly PWID, imprisonment is a common outcome. According to studies conducted in a large number of countries, between 56 and 90 per cent of PWID have been imprisoned at some stage.<sup>123</sup> Initiation and use of drugs are also

reported by many prisons and other closed settings.<sup>124</sup> According to the limited data made available to UNODC, recent use of drugs (drug use in the previous 12 months) is reported to be around 23 per cent among the prison population, with cannabis use at around 19 per cent and heroin or amphetamine use among approximately 5 per cent. Similarly, a large number of studies in countries throughout the world have found high levels of injecting drug use among both male and female prisoners.<sup>125</sup>

Collaborative Group (WHO/PSA/94.4); Chris Beyrer and others, "Drug use, increasing incarceration rates, and prison-associated HIV risks in Thailand", *AIDS and Behavior*, vol. 7, No. 2 (2003), pp. 153-161; and Sheila M. Gore and others, "Drug injection and HIV prevalence in inmates of Glenochil prison", *British Medical Journal*, vol. 310, No. 6975 (1995), pp. 293-296.

124 Rhidian Hughes and Meg Huby, "Life in prison: perspectives of drug injectors", *Deviant Behavior*, vol. 21, No. 5 (2000), pp. 451-479; and S. Chu and K. Peddle, *Under the Skin: A People's Case for Prison Needle and Syringe Programs* (Toronto, Canadian HIV/AIDS Legal Network, 2010).

125 Anne Marie DiCenso, Giselle Dias and Jacqueline Gahagan, *Unlocking Our Futures: A National Study on Women, Prisons HIV, and Hepatitis C* (Toronto, Prisoners'HIV/AIDS Support Action Network (PASAN), 2003); Ruth E. Martin and others, "Drug use and risk of bloodborne infections: a survey of female prisoners in British Columbia", *Canadian Journal of Public Health*, vol. 96, No. 2 (2005), pp. 97-101; and Kate Dolan and others, "People who inject drugs in prison: HIV prevalence, transmission and prevention", *International Journal of Drug Policy*, vol. 26, Suppl. No. 1 (2015), pp. S12-S15; Chloé Carpentier and others, "Ten Years of Monitoring Illicit Drug Use in Prison Populations in Europe: Issues and Challenges", *The Howard Journal of Criminal Justice*, 51: 37-66. doi: 10.1111/j.1468-2311.2011.00677.x (2012).

119 EMCDDA, *European Drug Report 2014: Trends and Developments* (Luxembourg, Publications Office of the European Union, 2014).

120 Jane Mounteney and others, "Fentanyls: are we missing the signs? Highly potent and on the rise in Europe", *International Journal on Drug Policy*, vol. 26, No. 7 (2015), pp. 626-631.

121 Canadian Centre on Substance Abuse, "Canadian Community Epidemiology Network on Drug Use (CCENDU) Bulletin: deaths involving fentanyl in Canada, 2009-2014" (August 2015).

122 *2015 National Drug Threat Assessment Summary*.

123 WHO, Multi-city study on drug injecting and risk of HIV infection: a report prepared on behalf of the WHO International

**TABLE 1** Ratio of drug-related mortality rates among ex-prisoners to all-cause mortality rates among the general population

Country or area	Time since release from prison							
	1 week	2 weeks	45 days	1 year	3 years	4-5 years	7-8 years	15 years
United Kingdom <sup>a</sup>	37.1	12.4						
United States		129						
Denmark		61.9						
Switzerland			50					
Taiwan Province of China					29.3			
United States <sup>b</sup>						10.3		
United States								3.5
United Kingdom <sup>a</sup> Males	28.9	15.8						
Females	68.9	56.3						
Australia <sup>c</sup> Males							14.5	
Females							50.3	
France Males aged 15-34				124.1				
Males aged 35-54				274.2				

Source: WHO, *Preventing Overdose Deaths in the Criminal Justice System* (Copenhagen, 2014).

Note: The numbers presented are standardized mortality ratios. They express the ratio of deaths from drug-related causes observed among ex-prisoners compared to the number of deaths from all causes that would be expected among people of comparable age and gender in the general population.

<sup>a</sup> First and second weeks calculated separately. <sup>b</sup> Not time-limited (median = 4.4 years). <sup>c</sup> Not time-limited (median = 7.7 years).

The risk of HIV, hepatitis and tuberculosis infection in prisons continues to be a matter of significant concern. In some settings, the burden of HIV among prisoners may be up to 50 times higher than among the general population,<sup>126</sup> the incidence of tuberculosis is, on average, 23 times higher than among the general population<sup>127</sup> and an estimated two out of every three prisoners with a history of injecting drug use are living with hepatitis C.<sup>128</sup>

Despite the high-risk environment and the scientific evidence of the effectiveness of interventions for the treatment of drug use disorders, and the prevention and treatment of HIV, hepatitis C and tuberculosis,<sup>129</sup> there are significant gaps in the provision of these services in most prisons throughout the world. Prisons and other closed settings often lack adequate health services, confidentiality and privacy; furthermore, mandatory (non-voluntary) HIV testing remains a common practice.<sup>130</sup>

Available evidence indicates that drug dependence treatment and harm reduction interventions can be effectively implemented within prisons without compromising security or increasing drug use.<sup>131</sup> In a number of countries, however, there are political, legal and regulatory barriers

to introducing or expanding those services in prisons. In 2014, opioid substitution therapy was available in prisons in only 43 countries, whereas 80 countries reported the availability of such therapy in the community. The availability of needle and syringe programmes in prisons was reported in only 8 countries, whereas 90 countries reported the availability of such programmes in the community. Most of the above-mentioned 8 countries are in Europe and Central Asia, and such interventions are not available in all prison settings.<sup>132</sup>

### Substantially higher risk of drug-related death soon after release from prison

The period shortly after release from prison is associated with a substantially increased risk of drug-related death (primarily fatal overdose), with a mortality rate much higher than from all causes of death among the general population.<sup>133</sup> The first two weeks after release from prison is a period of particular vulnerability, with a risk of drug-related death 3-8 times higher than in the subsequent 10 weeks.<sup>134</sup> Moreover, the drug-related mortality rate after release from prison has been found to be 50-100 times higher than the mortality rate of the general population. According to the very limited data available, female ex-prisoners appear to experience poorer outcomes than male ex-prisoners, and older ex-prisoners experience poorer outcomes than younger ex-prisoners. This may reflect different histories and patterns of drug use depending on the gender and age of ex-prisoners.

126 *The Gap Report*, 2014 (see footnote 98).

127 Iacopo Baussano and others, "Tuberculosis incidence in prisons: a systematic review", *PLoS Medicine*, vol. 7, No. 12 (2010).

128 Sarah Larney and others, "Incidence and prevalence of hepatitis C in prisons and other closed settings: results of a systematic review and meta-analysis", *Hepatology*, vol. 58, No. 4 (2013), pp. 1215-1224.

129 UNODC/ILO/UNDP/WHO/UNAIDS policy brief entitled "HIV prevention, treatment and care in prisons and other closed settings: a comprehensive package of interventions" (2013).

130 UNAIDS, *UNAIDS 2016-2021 Strategy: On the Fast-Track to End AIDS* (2015).

131 Thomas Kerr and others, "Harm reduction in prisons: a 'rights based analysis'", *Critical Public Health*, vol. 14, No. 4 (2004), pp. 4-16.

132 Harm Reduction International, *The Global State of Harm Reduction 2014*, Katie Stone, ed. (London, 2014).

133 WHO, *Preventing Overdose Deaths in the Criminal Justice System* (Copenhagen, 2014).

134 Elizabeth L. C. Merrill and others, "Meta-analysis of drug-related deaths soon after release from prison", *Addiction*, vol. 105, No. 9 (2010), pp. 1545-1554.

The increased risk of drug-related death after release from prison is principally attributable to two causes: first, decreased tolerance to drugs, especially heroin, after a period of relative abstinence that occurs in prison, where drug use may be more infrequent and the purity of drugs lower than outside of prison; and second, the use of multiple drugs after release from prison, particularly the combination of depressants (such as benzodiazepines and alcohol) with heroin, which can considerably increase the risk of fatal overdose.<sup>135</sup>

### C. EXTENT OF DRUG SUPPLY

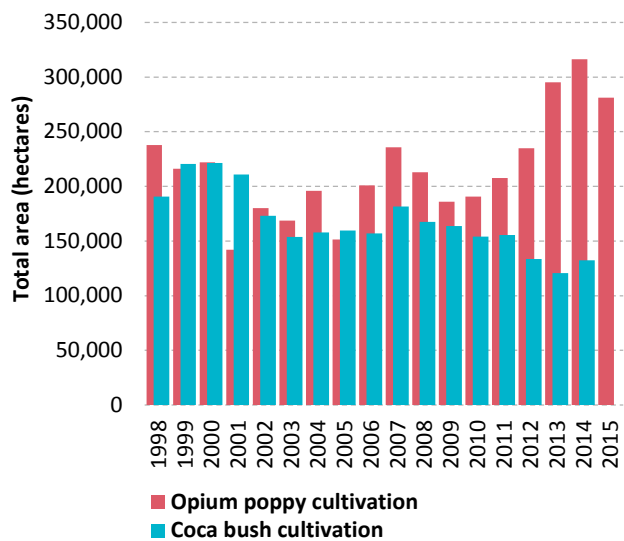
Over the period 2009-2014, the cultivation of cannabis plants was reported to UNODC by 129 countries, far more than the 49 countries (mostly in Asia and the Americas) that reported opium poppy cultivation and the 7 countries (in the Americas) that reported coca bush cultivation.<sup>136</sup> According to the latest UNODC estimates, in terms of area, cannabis is also the most extensively grown drug crop,<sup>137</sup> particularly if wild growth is included.<sup>138</sup> The extent of, and trends in, cannabis cultivation and production are, however, difficult to assess, given that systematic measurements do not exist.

#### Despite diverging trends in opium poppy and coca bush cultivation, the production of opium and cocaine has returned to the levels of the late 1990s

Information relating to the area under illicit cultivation is more reliable in the case of coca bush and opium poppy cultivation than in the case of cannabis plant cultivation, as it is largely based on scientifically validated surveys. Although fluctuating, the total area under opium poppy cultivation in 2015 was higher than in 1998 (18 per cent), the year in which the General Assembly held its previous special session dedicated to the world drug problem; and the total area under opium poppy cultivation has increased sharply (by 51 per cent) since 2009 (the year of adoption of the Political Declaration and Plan of Action on International Cooperation towards an Integrated and Balanced Strategy to Counter the World Drug Problem) largely as a result of increased cultivation in Afghanistan. In contrast, the total area under coca bush cultivation has followed a downward trend, falling by 31 per cent since 1998 and by 19 per cent since 2009.

135 *Preventing Overdose Deaths* (see footnote 133).  
 136 Based on reports from countries on the cultivation, eradication and seizure of cannabis, opium poppy and coca plants, the main source of the seizures being domestic drug production.  
 137 *World Drug Report 2009* (United Nations publication Sales No. E.09.XI.12).  
 138 United Nations International Drug Control Programme, Research Section, "Cannabis as an illicit narcotic crop: a review of the global situation of cannabis consumption, trafficking and production", *Bulletin on Narcotics*, vol. XLIX, Nos. 1 and 2 (1997), and vol. L, Nos. 1 and 2 (1998) (United Nations publication), pp. 45-83.

FIG. 19 Estimated total area under opium poppy and coca bush cultivation, 1998-2015



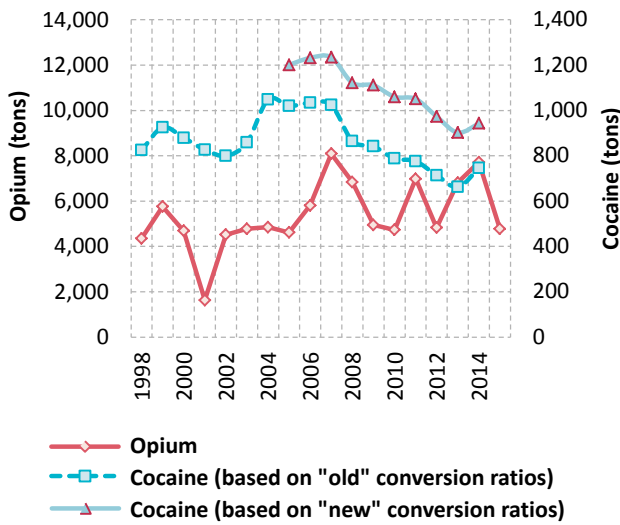
Sources: UNODC coca and opium surveys in various countries; responses to the annual report questionnaire; and United States, Department of State, *International Narcotics Control Strategy Report*, various years.

#### "Old" versus "new" conversion ratios for estimating cocaine production

The last step in calculating cocaine production requires each producing country to estimate factors for converting coca leaf to cocaine hydrochloride. In the present report, two conversion factors are used for global estimates: (i) an "old" conversion ratio, as estimated by the United States Drug Enforcement Administration (DEA), for the Plurinational State of Bolivia and Peru in the 1990s, and a study by the Government of Colombia and UNODC, for Colombia; (ii) a "new" conversion ratio, based on studies undertaken by DEA in Peru in 2005, and in the Plurinational State of Bolivia in 2007-2008. However, these ratios have not been reconfirmed in national studies. The "new" ratio also considers the conversion factor for Colombia established in 2004. (For more details, see *World Drug Report 2010* (United Nations publication, Sales No. E.10.XI.13, pp. 251 and 252) and the online methodology section of the present report).

Global estimates show that illicit opium production declined sharply in 2015 (by 38 per cent) to 4,770 tons, the level of the late 1990s. Of that amount, the part estimated to have been transformed into heroin would result in an output of 327 tons of heroin of export purity, largely from heroin manufacture in Afghanistan. Cocaine production, estimated at 746 tons (based on the "old" conversion ratio) or 943 tons (based on the "new" conversion ratio) of pure cocaine hydrochloride in 2014, also declined in the period 2007-2014, returning to its 1998 level. Thus, despite a significant decline in coca bush cultivation, cocaine production has not fallen in relation to its 1998 level, mainly because of increases in the efficiency of cocaine-processing laboratories in the Andean subregion.

**FIG. 20** Global production of opium and cocaine, 1998-2015



Sources: UNODC coca and opium surveys in various countries; responses to the annual report questionnaire; and United States, Department of State, *International Narcotics Control Strategy Report*, various years.

### Strong increase in trafficking in synthetic drugs at the global level

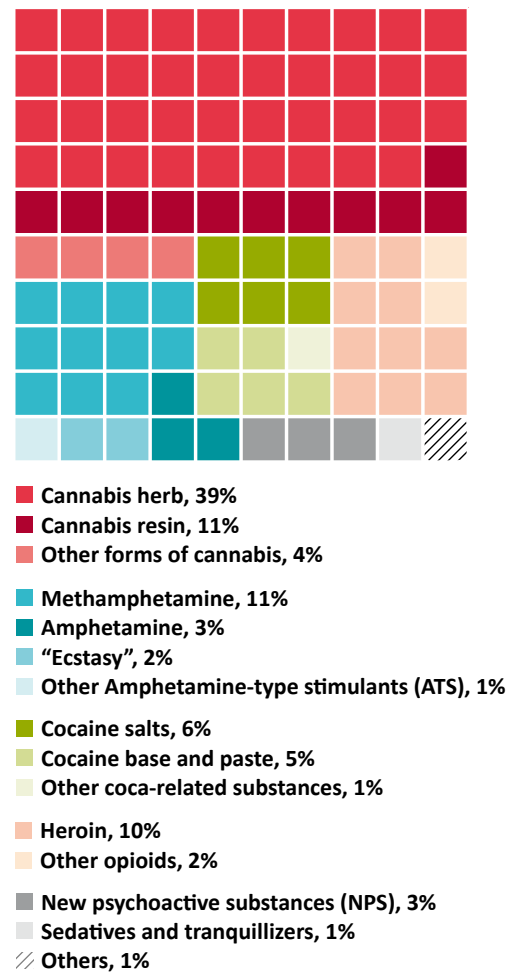
Although there were 234 substances under international control in 2014 (244 in January 2016), seizure data indicate that the bulk of the trafficking involved a far smaller number of substances. Cannabis in its various forms continued to be the most widely trafficked drug in 2014 (as cannabis was seized in 95 per cent of the reporting countries in 2014 and cannabis seizure cases accounted for over half of the 2.2 million drug seizure cases reported to UNODC that year); it was followed by ATS (16 per cent), opioids and coca-related substances (accounting for 12 per cent each).

Global quantities of cannabis, cocaine, heroin and morphine seized almost doubled over the period 1998-2008 but have remained largely stable since then. In contrast, ATS seizures have risen more than seven-fold since 1998, suggesting that growth in drug trafficking has been more in synthetic stimulants than in the usual plant-based drugs. Growth has been particularly strong in the case of methamphetamine seizures and, to a lesser extent, amphetamine

#### Interpreting drug seizures

A direct indicator of drug law enforcement activity, drug seizures are the result of those successful operations that end in drug interceptions and are thus influenced by law enforcement capacity and priorities. At the same time, drug seizures are one of the key elements in understanding illicit drug market dynamics, drug availability and drug trafficking patterns and trends, particularly if broad geographical entities are considered and long periods are analysed.

**FIG. 21** Breakdown of drug seizure cases reported worldwide, by type of drug, 2014

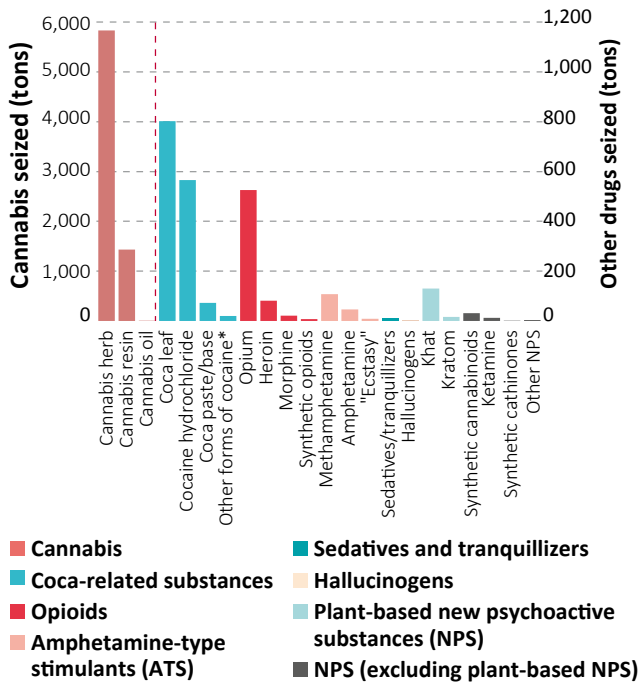


Source: Responses to the annual report questionnaire.  
 Note: Information presented in the figure is based on 2.2 million seizure cases reported to UNODC by 63 countries.

seizures. Improvements in precursor control brought the quantities of intercepted “ecstasy” down from the 2008 level to a low in 2011, but recent innovations in the manufacture of “ecstasy” (in particular, the use of pre-precursor chemicals not under international control) can already be seen on the market, as suggested by a doubling of the amounts seized between 2011 and 2014.

Increases in trafficking have been even greater in the group of NPS in recent years. Accounting for 3 per cent of all drug seizure cases in 2014, seizures of NPS are still comparatively small (up from 1 per cent in 2009 and 0.1 per cent in 1998). In terms of the quantity seized, seizures of NPS (excluding plant-based NPS such as khat (*Catha edulis*) and kratom (*Mitragyna speciosa*)) rose 15-fold between 1998 and 2014. Ketamine and synthetic cannabinoids have been seized the most; the total quantity of ketamine seized worldwide increased from an annual average of 3 tons in the period 1998-2008 to 10 tons in the period 2009-2014.

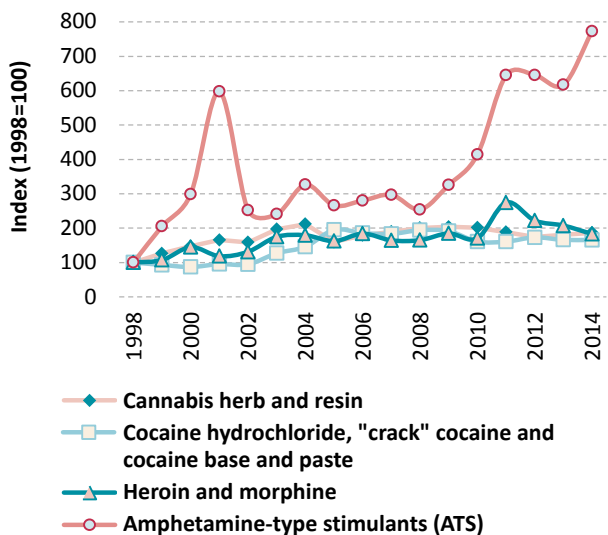
**FIG. 22** Quantities of drugs seized worldwide, by type of drug, 2014



\* Including "crack".

Source: Responses to the annual report questionnaire.  
Note: Based on information from 120 countries.

**FIG. 23** Trends in the quantities of drugs seized worldwide, 1998-2014

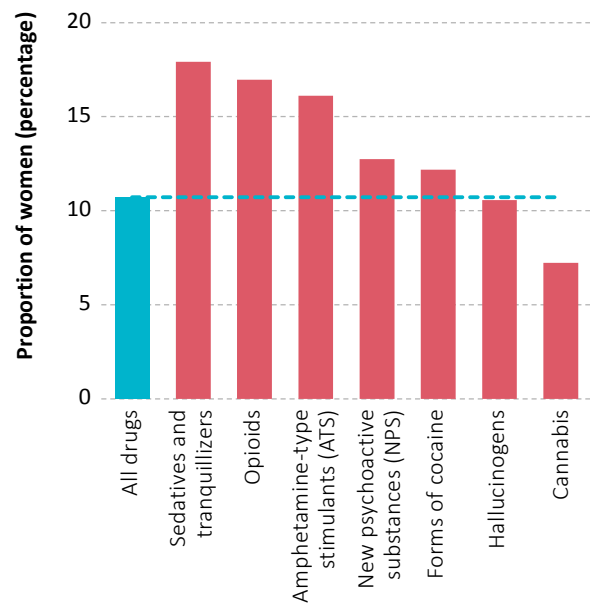


Source: Responses to the annual report questionnaire.

### Drug offences, cultivation and gender Men are more involved than women in drug-related crime

In all countries, more men than women are brought into formal contact with the criminal justice system for possession of drugs for personal use and for trafficking in drugs. In the period 1998-2014, the number of women

**FIG. 24** Proportion of women brought into formal contact with the criminal justice system for drug trafficking, by type of drug, 2010-2014



Source: Responses to the annual report questionnaire.

reported to have been arrested for drug-related offences increased in absolute terms (as did the number of countries providing to UNODC a breakdown of arrests by gender), whereas the proportion of women in drug-related cases, while fluctuating, followed a downward trend, particularly for offences related to drug trafficking.

According to information from 100 countries, during the period 2010-2014, women accounted for around 10 per cent of all cases in which people were brought into formal contact with the criminal justice system for drug-related offences. The proportion was slightly lower for the possession of drugs for personal use (9 per cent) and slightly higher for drug trafficking (11 per cent); however, those proportions are substantially lower than the proportion of women who use drugs (about a third of the total number of people who use drugs).

The proportion of women brought into formal contact with the criminal justice system in drug trafficking cases is clearly above the global average (12 per cent) in Oceania (19 per cent) and in the Americas (15 per cent) and below average in Africa (2 per cent). Data for Asia show a proportion above the global average in East and South-East Asia (13 per cent), while in other Asian subregions the proportion is below the global average (less than 1 per cent in the Near and Middle East and in South Asia). Data for Europe show a below-average proportion of women brought into formal contact with the criminal justice system (10 per cent), with the proportion being above average in Eastern Europe (12 per cent) and below average in Western and Central Europe (9 per cent) and in South-Eastern Europe (6 per cent).

### Women in opium poppy cultivation: attitudes, perceptions and practices

While women play only a limited role in drug trafficking in countries in the Near and Middle East (less than 1 per cent), they are involved in the illicit cultivation of drug crops, particularly opium poppy in Afghanistan. As part of the annual opium survey conducted by UNODC and the Government of Afghanistan, in 2015 focus group discussions were held for the first time with women in four northern provinces in order to learn more about their attitudes and participation in opium poppy cultivation and production.

The discussions revealed that women in Afghanistan took part in many of the labour-intensive processes in opium poppy production, such as weeding and clearing fields, as well as lancing and later (indoors) breaking opium poppy capsules, removing and cleaning seeds, preparing opium gum for sale and processing by-products such as oil and soap. Men were mainly involved in ploughing fields, cultivating and, at times, lancing capsules.

In most rural communities in Afghanistan, women were less empowered than men and had only a limited role in decision-making. Decisions about opium poppy cultivation were thus primarily taken by men, although it appeared that women were increasingly being consulted, including about the decision to cultivate opium poppy.

In the absence of access to adequate health-care facilities in rural areas, opium had been used for generations by women in northern Afghanistan as a remedy for the most common ailments among children, such as coughs, colic, aches and pains, restlessness and diarrhoea. Self-medication with opium continued to be a common practice for the treatment of ailments among adults, such as aches and pains, sleeplessness and chest pains, which were probably due to respiratory illnesses. Older women may have been more regular or dependent users of opium, but younger women were becoming increasingly aware that regular opium use could cause dependence and thus tended to rely more on “modern medicines”, when available, for the treatment of common illnesses.

The discussions also revealed that women in Afghanistan were generally aware that opium could produce dependence and that its use for non-medicinal purposes was forbidden by their religion. They were also concerned that the next generation could become dependent on opium, although resolving their economic problems continued to be their main concern. In the absence of economic opportunities or alternatives, women considered that income generated from opium poppy production could be used to pay household expenses, enabling them to buy essentials such as food, as well as furniture, clothes and jewellery, and it enabled families to repay their debts and to pay for their children’s education and marriages. The production of opium poppy not only brought cash income to house

holds, but it was also a mainstay in rural areas, as poppy seeds were used to extract oil for cooking and poppy straw was used for fuel in the kitchen, as well as for preparing soap and making poppy tea.

### Drug purchases via the “dark net” are gaining in importance

The purchasing of drugs via the Internet, particularly the “dark net”, may have increased in recent years. This trend raises concerns in terms of the potential of the “dark net” to attract new populations of users by facilitating access to drugs in a setting that, although illegal, allows users to avoid direct contact with criminals and law enforcement authorities. As the “dark net” cannot be accessed through traditional web searches, buyers and sellers access it through the “Onion Router” (TOR) to ensure that their identities remain concealed. Products are typically paid for in bitcoins or in other crypto-currencies and are most often delivered via postal services.

A number of successful law enforcement operations worldwide have taken place in recent years to shut down trading platforms on the “dark net”, such as “Silk Road” in October 2013 or “Silk Road 2.0” in November 2014, as part of Operation Onymous, coordinated by the European Police Office (Europol), which also led to the closure of other sites on the “dark net”, including 33 high-profile marketplaces. Law enforcement pressure also prompted some “voluntary” temporary shutdowns, such as “Agora” in August 2015. However, as one marketplace closes, the next most credible marketplace tends to absorb the bulk of the displaced business.<sup>139</sup>

A global survey<sup>140</sup> of more than 100,000 Internet users (three quarters of whom had taken illegal drugs) in 50 countries in late 2014 suggested that the proportion of drug users purchasing drugs via the Internet had increased from 1.2 per cent in 2000 to 4.9 per cent in 2009, 16.4 per cent in 2013 and 25.3 per cent in 2014. The proportion of Internet users making use of the “dark net” for drug purchases had also increased, reaching 6.4 per cent (lifetime) in 2014, including 4.5 per cent (70 per cent of 6.4 per cent) who had purchased drugs over the “dark net” in the previous 12 months (ranging from less than 1 per cent to 18 per cent).

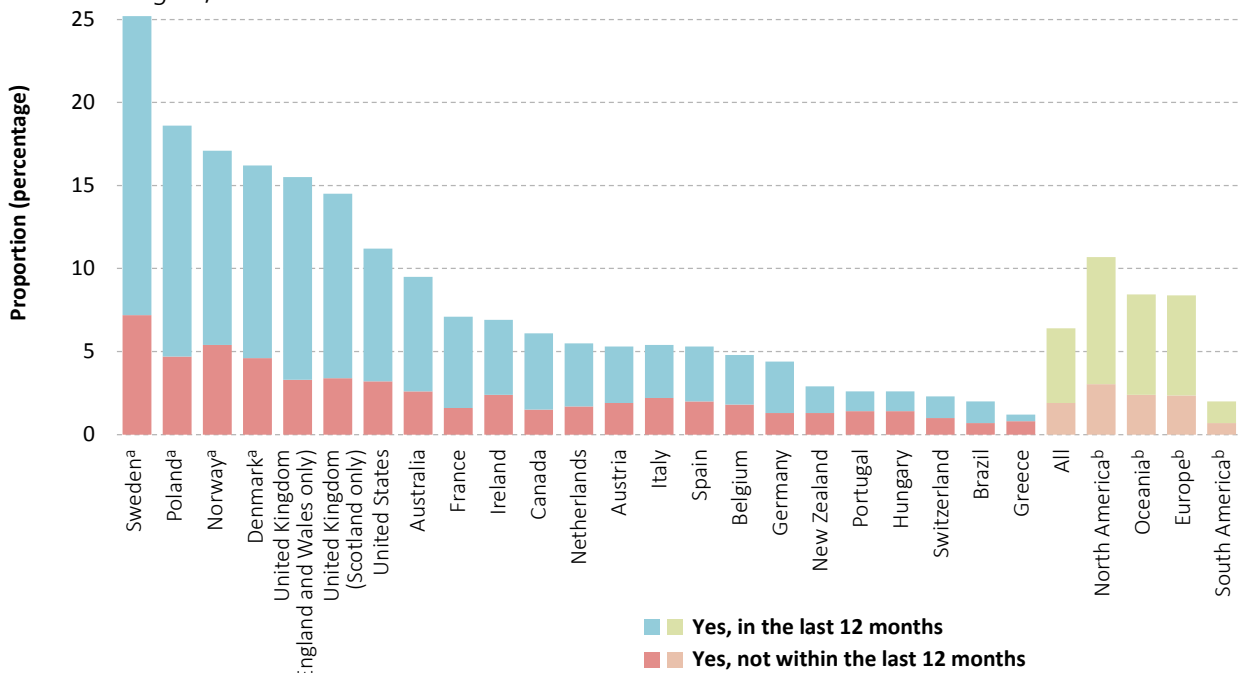
Among “recent” drug users, the proportion rose by more than 25 per cent from 2013 to 2014 (from 4.6 to 5.8 per cent). In the period 2012–2014, the proportion doubled in Australia (from 4.3 to 10.4 per cent) and in the United Kingdom (from 8.0 to 15.1 per cent), and in the period 2013–2014, the proportion also increased among “recent” users in the United States (from 7.7 per cent in 2013 to 9.6 per cent in 2014).

<sup>139</sup> Based on the findings of an international conference on joint investigations to combat drug trafficking via the virtual market (“dark net”) in the European Union, Bad Erlach, Austria, 10–12 November 2015.

<sup>140</sup> Global Drug Survey 2015 findings ([www.globaldrugsurvey.com](http://www.globaldrugsurvey.com)).



**FIG. 25** Proportion of survey respondents who had purchased drugs on the “dark net”, by country and region, 2014



Source: Global Drug Survey 2015 (www.globaldrugsurvey.com).

Note: The figure shows the proportion of people participating in the Global Drug Survey who bought drugs via the “dark net” between November and December 2014. <sup>a</sup> Based on the replies of fewer than 600 respondents. <sup>b</sup> Regional results show the national (and subnational) results weighted by population.

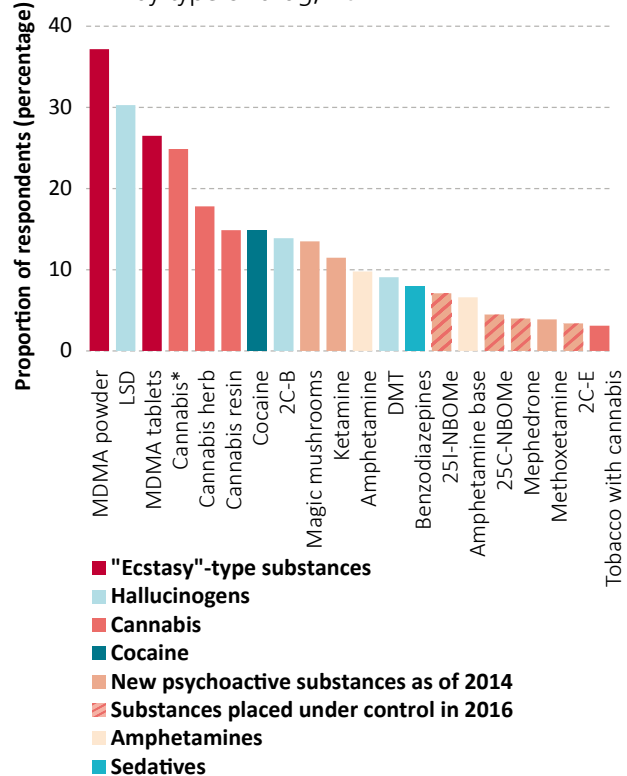
Survey respondents reported a number of advantages to purchasing drugs on the “dark net”. Some of those advantages were related to the drug products themselves, which were reported to be generally of better quality and more readily available. Other advantages included the fact that the purchaser’s interactions were virtual, thus decreasing the risk to personal safety during transactions, including through the absence of exposure to physical violence; in addition, there was a perceived decrease in the risk of being apprehended by law enforcement authorities.<sup>141</sup> This may help explain why, in general, drug users seem ready to pay a premium for drugs purchased via the “dark net”<sup>142</sup> and why people who have never previously used drugs may be tempted to purchase them online: the survey showed that around 4 per cent of “dark net” drug users had not used any drugs prior to accessing them through the “dark net”.<sup>143</sup> At the same time, 30 per cent of people who purchased drugs via the “dark net” reported having consumed a wider range of drugs than they did before they began purchasing drugs via the “dark net”.

141 Ibid.

142 International conference on joint investigations to combat drug trafficking via the virtual market (“dark net”) in the European Union, Bad Erlach, Austria, 10-12 November 2015.

143 Global Drug Survey 2015 (see footnote 140).

**FIG. 26** Drugs purchased on the “dark net”, by type of drug, 2014



\* Hydroponically grown cannabis.

Source: Global Drug Survey 2015 (www.globaldrugsurvey.com).

Note: Proportion of survey respondents who bought each drug on the “dark net” among participants in the Global Drug Survey between November and December 2014.