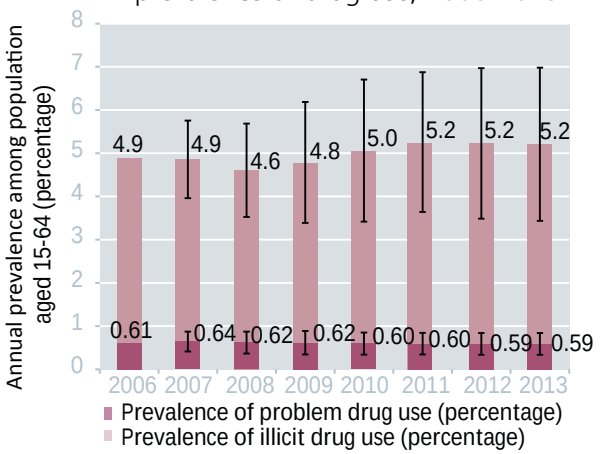
A. EXTENT OF DRUG USE

Overall drug use remains stable globally

It is estimated that almost a quarter of a billion people between the ages of 15 and 64 years used an illicit drug in 2013. This corresponds to a global prevalence of 5.2 per cent (range: 3.4-7.0 per cent), suggesting that drug use has remained stable in the past three years, although the estimated number of drug users has actually risen by 6 million to 246 million (range: 162 million-329 million) owing to the increase in the global population. With some 27 million people (range: 15.7 million-39 million), or 0.6 per cent of the population aged 15-64, estimated to suffer from problem drug use, including drug-use disorders or drug dependence, problem drug use seems to have remained somewhat stable over this three-year period.

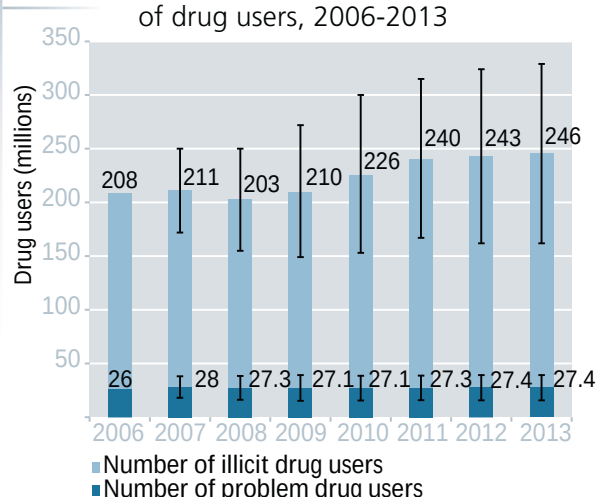
FIG. 2. Global trends in the estimated prevalence of drug use, 2006-2013



Source: UNODC, responses to annual report questionnaire.

Note: Estimated percentage of adults (aged 15-64) who have used drugs in the past year.

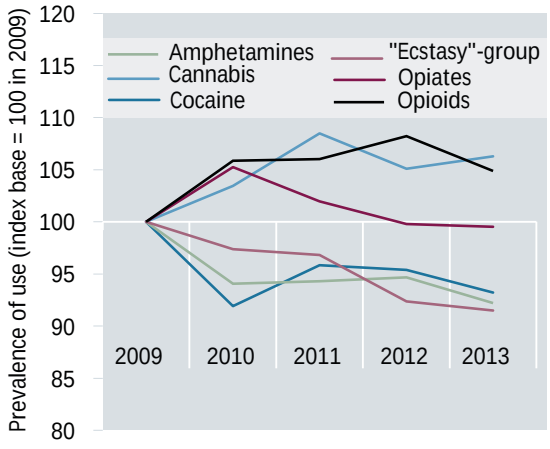
FIG. 1. Global trends in the estimated number of drug users, 2006-2013



Source: UNODC, responses to annual report questionnaire.

Note: Estimates are for adults (aged 15-64), based on past-year use.

FIG. 3. Global trends in the prevalence of use of various drugs, 2009-2013



Source: UNODC, responses to annual report questionnaire.

Note: Based on the estimated percentage of adults (aged 15-64) who have used the substance in the past year.

TABLE 1. Global estimates of the use of various drugs, 2013

	Percentage of population that has used the drug		Number of users (thousands)	
	low	high	low	high
Cannabis	2.7	4.9	128,480	232,070
Opioids	0.6	0.8	27,990	37,560
Opiates	0.3	0.4	12,920	20,460
Cocaine	0.3	0.4	13,800	20,730
Amphetamines	0.3	1.1	13,870	53,870
"Ecstasy"	0.2	0.6	9,340	28,390
All illicit drug use	3.4	7.0	162,000	329,000

Source: UNODC, responses to annual report questionnaire.

Note: Estimates for adults aged 15-64, based on past-year use.

UNDERSTANDING TRENDS IN DRUG USE

Global and regional trends in drug use are estimated from nationally representative surveys that include questions on drug use, as well as from information gathered through studies that use indirect methods to estimate the number of regular or high-risk users such as problem opioids users. Household surveys on drug use are expensive and are, at best, carried out every three to five years. Many countries do not conduct such surveys on a regular basis and many others, especially in Asia and Africa, do not conduct them at all. In these cases, estimates from the limited number of countries where data are available are used to compute regional and global estimates.[a]

Rather than real-time trends at the global and regional levels, year-on-year changes in drug-use estimates thus reflect updated information from countries where new data were made available. These changes may be especially misleading if updated information is available only in countries with large populations. Indeed, global and regional estimates of drug use, including by substance, are heavily shaped by countries with large populations because of the use of national drug-use data weighted by population size in the calculation of the estimates. The stable trend that can be calculated with existing data, may mask variations that are happening in large countries for which data are not available. In addition, the estimated number of drug users is further influenced by changes in estimates of the global population aged 15-64.

The global and regional estimates of the extent of drug use offered in the present report should be viewed as best estimates, noting that they reflect the best available information at the time of analysis. From a global policy perspective, it would be more prudent to look at long-term trends rather than year-on-year changes, which may be merely a reflection of changes in a few countries. Furthermore, particular caution is required when considering trends in problem drug-use estimates at the global level, as the extent of problem drug use is difficult to capture in general population surveys (which are used to estimate drug use), and indirect methods, which are often complex, are therefore used to obtain these estimates.

[a] *For further information, see the methodology section in the online version of this report.*

Notwithstanding both regional and national variations in trends in the use of different types of drug, cannabis use has continued to rise since 2009, while the use of opioids, including the use of heroin, opium and the non-medical use of pharmaceutical opioids, has stabilized at high levels (see figure 3). However, the use of cocaine and amphetamines has declined overall, although that is mainly a reflection of trends in the Americas and Europe.

Problem drug use as reflected in the demand for drug treatment

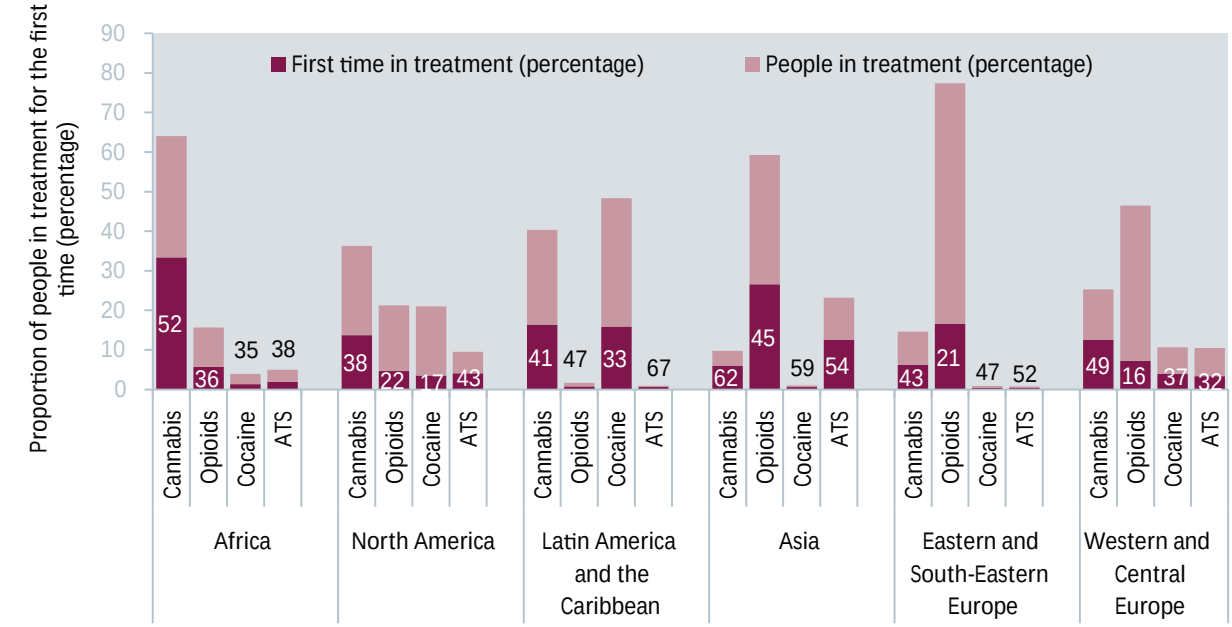
In the absence of data on patterns of problem drug use, data on drug users in treatment are taken as a proxy. Treatment demand for different substances varies by region, but almost half of the people who access treatment for drug use are first-time entrants. The proportion of first-time entrants in treatment for ATS and cannabis use disorders in 2013 was higher than for other substances in most regions, indicating that, compared with other substances, there is an expanding generation of ATS and cannabis users who need treatment (see figure 4). In Asia, the number of people accessing treatment for cannabis-use disorders is small, but the proportion of first-time entrants among them (62 per cent) is the largest. Compared with other regions where cannabis users in treatment are typically in their twenties, in Asia they are reported to be typically in their thirties. As observed elsewhere,[1,2] this may reflect a cohort of long-term regular users of cannabis who seek treatment for cannabis-related problems. In Europe, North America and Oceania, the proportion of first-time entrants for cannabis-use disorders is high, but they tend to be in their twenties. A large share of cannabis users in treatment may reflect cannabis users referred by the criminal justice system, whereas opioid users in treatment are relatively older (in their thirties). In Western and Central Europe, 16 per cent of first-time entrants were seeking treatment for opioid use, and overall treatment demand remains high, which reflects an ageing cohort of opioid users in treatment: of the estimated 1.5 million opioid users in Europe, 700,000 received opioid substitution therapy in 2012.[3] The high proportion of people in treatment for opioid use in Asia and Eastern Europe reflects the extent of problem opioid use in those regions, and ATS users form another group with a high proportion of first-time entrants in treatment in Asia.

1 Alan J. Budney and others, "Marijuana dependence and its treatment", *Addiction Science and Clinical Practice*, vol. 4, No. 1 (December 2007), pp. 4-16.

2 Flávia S. Jungerman and Ronaldo Laranjeira, "Characteristics of cannabis users seeking treatment in Sao Paulo, Brazil", *Rev Panam Salud Publica*, vol. 23, No. 6 (2008), pp. 384-393.

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

FIG. 4. Percentage distribution of people in treatment, by primary drug type, by region and share of first-time entrants for each drug type (2013 or latest available data)



Source: UNODC, responses to annual report questionnaire.

Prison is a high-risk environment for drug use

On any given day, more than 10.2 million people are held in penal institutions throughout the world, mostly as pretrial detainees or remand prisoners, or as sentenced prisoners.[4] However, because of the high transfer of people between prison and the wider community, the number of people who spend at least some time in prison each year is considerably greater. The rapid turnover of a large number of people between the prison environment and their wider communities outside prison means that prison health merits consideration as an integral part of public health.

Drug use, including heroin use, and drug injection are common in prisons

People who use drugs often have a history of incarceration. In the United States of America, for example, it is estimated that between 24 and 36 per cent of all people using heroin pass through the correctional system each year, representing more than 200,000 individuals.[5] Although data remain limited, studies have shown that drug use within prisons is common (see figure 5). Based on a review of 41 studies from 26 countries (mostly in Europe) and supplemented with data reported in responses from Member States to the annual report questionnaire, drug use in prisons was shown to be highly prevalent in many of these studies, although there is considerable variability.[6] Approximately one in three people held in prison have used drugs at least once while incarcerated, with approximately one in eight reporting use in the past month. Cannabis is the most commonly used drug, as it is in the wider community outside prison, but lifetime and recent (past-month) use of heroin in prison is more common than that of cocaine, amphetamines or "ecstasy". Based on these studies, the median estimate of the proportion of people held in prison who have used heroin at some time while incarcerated is 10.1 per cent (inter-quartile range: 2.5-13.4 per cent), while 5.0 per cent (inter-quartile range: 0.8-11.5 per cent) report use in the past year (which is approximately 14 times higher than in the general population, estimated at 0.35 per cent), and 2.4 per cent (inter-quartile range: 1.3-9.0 per cent) report recent use in the past month.

A number of studies report high levels of injecting drug use by prisoners, which may be a result of the high prevalence of heroin use.[7] In Europe, of the 12 countries reporting to EMCDDA on injecting drug use by prisoners at some time during incarceration, four countries report

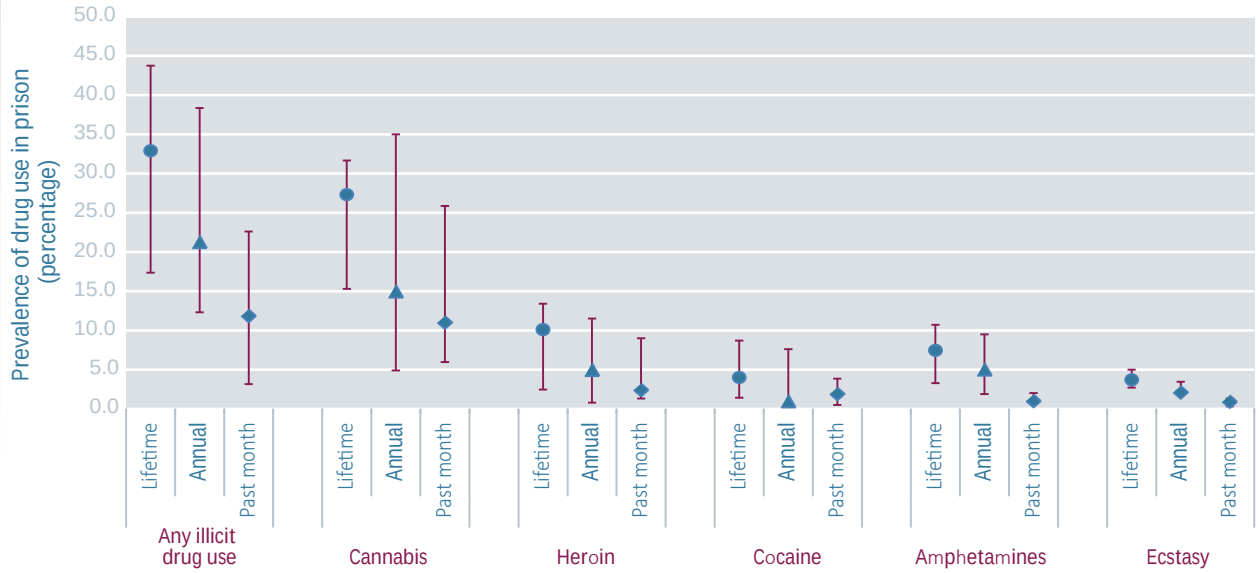
4 Roy Walmsley, "World Prison Population List", 10th ed. (London, International Centre for Prison Studies).

5 Amy E. Boutwell and others, "Arrested on heroin: a national opportunity", *Journal of Opioid Management*, vol. 3, No. 6 (2007), pp. 328-332.

6 Chloé Carpentier, Luis Royuela and Linda Montanari, "The global epidemiology of drug use in prison", in *Drug Use in Prisoners: Epidemiology, Implications and Policy Responses*, Stuart A. Kinner and Josiah Rich, eds. (forthcoming).

7 WHO, UNODC and UNAIDS, *Effectiveness of Interventions to Address HIV in Prisons*, Evidence for Action Technical Papers (Geneva, WHO, 2007).

FIG. 5. Lifetime, annual and past-month prevalence of drug use in prisons (based on 62 studies from 43 countries over the period 2000-2013)



Sources: UNODC, responses to annual report questionnaire; and C. Carpentier, L. Royuela and L. Montanari, "The global epidemiology of drug use in prison" (2015).

Note: Symbols represent median prevalence with vertical lines depicting inter-quartile range. Data on lifetime, annual and past-month use are not consistent across studies (this explains why the annual prevalence of cocaine use has a median value lower than the past-month use).

levels above 10 per cent (Luxembourg, 31 per cent; Germany, 22 per cent; Portugal, 11 per cent; and Latvia, 10 per cent).[8] Some small-scale surveys provide anecdotal information on high levels of injecting drugs in prison. For example, among a survey of female prisoners in British Columbia, Canada, 21 per cent reported injecting drugs while in prison;[9] a survey of prisoners in Australia revealed that 23 per cent had injected drugs at some time in prison;[10] and among male inmates in Bangkok, 39 per cent reported injecting drugs while in prison, with 12 per cent injecting for the first time while incarcerated.[11] These estimates are considerably higher than the prevalence of injecting drug use among the general population, which is estimated globally to be 0.26 per cent of those aged 15-64.

Unsafe injecting practices are a major risk factor for the transmission of blood-borne infections such as HIV and viral hepatitis B and C. Due to the difficulties of obtaining sterile needles and syringes, people held in prisons are more likely to share injecting equipment and this practice has been found to be extremely common among prisoners. Very high levels of sharing of needles and syringes have been documented among people who inject drugs (PWID) in prisons: 56 per cent in Pakistan, 66 per cent in the Russian Federation, 70-90 per cent in Australia, 78 per cent in Thailand and 83-92 per cent in Greece.[12]

B. HEALTH IMPACT OF DRUG USE

Millions of people inject drugs worldwide

Among people using drugs, PWID are one of the most vulnerable and marginalized groups. They experience a range of health, socioeconomic and legal challenges, often with poor outcomes, not least of which is the elevated risk of death compared with the general population (see also box 3). The joint UNODC/WHO/UNAIDS/World Bank estimate for the number of PWID worldwide for 2013 is 12.19 million (range: 8.48-21.46 million). This corresponds to 0.26 per cent (range: 0.18-0.46 per cent) of the adult population aged 15-64. This estimate is based on reporting of information on current injecting drug use from 93 countries covering 84 per cent of the global population aged 15-64.

8 EMCDDA, *Statistical Bulletin 2014*. Available at www.emcdda.europa.eu/.

9 R. 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.

10 Stuart A. Kinner and others, "High-risk drug-use practices among a large sample of Australian prisoners", *Drug and Alcohol Dependence*, vol. 126, Nos. 1 and 2 (November 2012), pp. 156-160.

11 Hansa Thaisri and others, "HIV infection and risk factors among Bangkok prisoners, Thailand: a prospective cohort study", *BMC Infectious Diseases*, vol. 3 (2003).

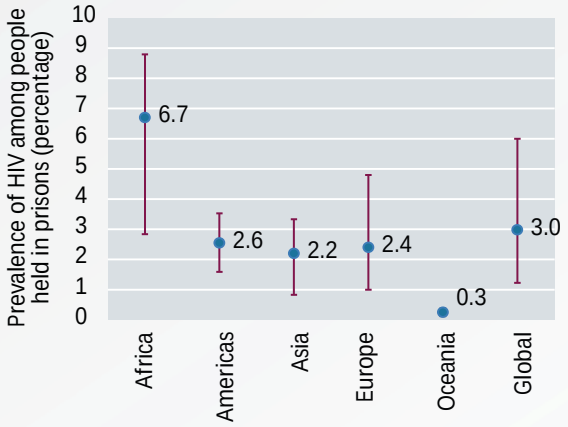
12 Kate Dolan and others, "People who inject drugs in prison: HIV prevalence, transmission and prevention", *International Journal of Drug Policy*, vol. 26 (2015), pp. S12-S15.

HIGH RATES OF HIV, TUBERCULOSIS AND HEPATITIS C ARE OFTEN FOUND IN PRISONS

Prisons pose a high-risk environment for the transmission of infectious diseases, particularly HIV and tuberculosis. In many countries, PWID, who are at increased risk of contracting HIV and other bloodborne infections, compared with the population in the community, are overrepresented in prison populations.[a] The global median prevalence of HIV among people living in prisons is estimated at 3.0 per cent, which is five times higher than the global median prevalence of HIV of 0.6 per cent among the general population aged 15-49.[b]

Prison settings are often characterized by overcrowding, inadequate ventilation, poor nutrition and limited medical facilities for diagnosis and treatment, all of which contribute to the spread of tuberculosis among prisoners. In some countries, the incidence rates of tuberculosis in prisons were found to be 8-35 times higher than among the general population.[c] Combined infections of HIV and tuberculosis are particularly serious, with each infection speeding up the progress of the other. The risk of developing tuberculosis is 20-37 times greater in people living with HIV compared with those not infected with HIV.[d] In addition, the prevalence of hepatitis C is far higher among people held in prison, particularly among those in prison with a history of injecting drug use.[e]

Prevalence of HIV among people held in prison, by region (2013, or latest year available after 2008)



Source: UNODC, responses to annual report questionnaire; and Dolan and others, "HIV/AIDS in prison" (2014).

Notes: Symbols represent median prevalence with vertical lines depicting inter-quartile range. Only two studies were identified from Oceania (Australia and New Zealand).

a Kate Dolan and others, "HIV/AIDS in prison: A global systematic review of prevalence, incidence, AIDS related mortality and HIV and related interventions", presented at the 20th International Conference on AIDS, held in Melbourne, Australia, from 20 to 25 July 2014.

b UNAIDS, AIDSinfo database.

c A. Aerts and others, "Tuberculosis and tuberculosis control in European prisons", *International Journal of Tuberculosis and Lung Disease*, vol. 10, No. 11 (2006), pp. 1215-1223.

d Masoud Dara, Dato Chorgoliani and Pierpaolo de Colombani, "TB prevention and control care in prisons", in *Prisons and Health*, S. Enggist and others, eds. (Copenhagen, WHO Regional Office for Europe, 2014).

e S. Larney and others, "The 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.

The updated global total number of PWID is slightly different from the 12.69 million (for 2012) published in the *World Drug Report 2014*. Although new or more recent information on PWID from 22 countries are included, the revision primarily reflects new estimates for Poland and the United Republic of Tanzania, which were not previously reported, and lower estimates for the numbers of PWID in Brazil and Viet Nam. The global prevalence of PWID among the population aged 15-64 is essentially unchanged from the *World Drug Report 2014*.

By far the highest prevalence of PWID continues to be found in Eastern and South-Eastern Europe, where 1.27 per cent of the general population aged 15-64 is estimated to be injecting drugs, a rate nearly five times the global average. The estimate for this subregion is heavily influenced by the high prevalence of injecting drug use experienced in the Russian Federation (2.29 per cent of the population aged 15-64). However, in terms of the actual numbers of PWID, the largest proportion continues to reside in East and South-East Asia, with an estimated 3.15 million, accounting for approximately one in four PWID worldwide. Large numbers of PWID also reside in Eastern and South-Eastern Europe (2.91 million, representing 24 per cent of the global total number of PWID) and North America (2.07 million, representing 17 per cent of the global total number of PWID). Three countries, the Russian Federation, China and the United States, when combined, account for nearly half (48 per cent) of the global total number of PWID.

TABLE 2. Estimated number and prevalence (percentage) of people who currently inject drugs among the general population aged 15-64, 2013

Region	Subregion	People who inject drugs					
		Estimated number			Prevalence (percentage)		
		low	best	high	low	best	high
Africa		**330,000**	**1,000,000**	**5,590,000**	**0.05**	**0.16**	**0.91**
America		**2,150,000**	**2,820,000**	**3,970,000**	**0.34**	**0.44**	**0.62**
	North America	1,780,000	2,070,000	2,380,000	0.56	0.65	0.75
	Latin America and the Caribbean	370,000	750,000	1,590,000	0.11	0.23	0.49
Asia		**3,380,000**	**4,560,000**	**6,110,000**	**0.12**	**0.16**	**0.21**
	Central Asia and Transcaucasia	360,000	410,000	470,000	0.66	0.75	0.87
	East and South-East Asia	2,330,000	3,150,000	4,300,000	0.15	0.20	0.27
	South-West Asia	400,000	670,000	940,000	0.22	0.37	0.51
	Near and Middle East	30,000	70,000	130,000	0.03	0.08	0.13
	South Asia	250,000	260,000	260,000	0.03	0.03	0.03
Europe		**2,500,000**	**3,680,000**	**5,630,000**	**0.45**	**0.67**	**1.02**
	Eastern and South-Eastern Europe	1,790,000	2,910,000	4,780,000	0.78	1.27	2.09
	Western and Central Europe	710,000	770,000	850,000	0.22	0.24	0.26
Oceania		**120,000**	**130,000**	**160,000**	**0.49**	**0.53**	**0.66**
GLOBAL		**8,480,000**	**12,190,000**	**21,460,000**	**0.18**	**0.26**	**0.46**

Sources: UNODC, responses to 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 national government reports.

Note: Numbers are rounded to the nearest 10,000.

The burden of HIV among people who inject drugs continues to be high in many regions

The burden of HIV among PWID is high, with PWID accounting for an estimated 30 per cent of new HIV infections outside sub-Saharan Africa.[13] About 1.65 million (range: 0.92-4.42 million) PWID were estimated to be living with HIV worldwide in 2013, which would correspond to 13.5 per cent of PWID being HIV positive. This joint UNODC/WHO/UNAIDS/World Bank estimate is based on information on the prevalence of HIV among PWID from 114 countries, covering 93 per cent of the estimated global number of PWID.

Although estimates of the prevalence of HIV among PWID have been updated for 52 countries (none with large numbers of PWID living with HIV), the global total number of PWID living with HIV is essentially unchanged from the information provided in the *World Drug Report 2014*. However, the small downward revision to the total number of PWID globally has resulted in the global prevalence of HIV among PWID being revised upwards to 13.5 per cent (from the 13.1 per cent presented in the *World Drug Report 2014*).

Two subregions stand out as having particularly high rates of HIV infection among PWID. An estimated 29 per cent of PWID are living with HIV in South-West Asia and some 23 per cent of PWID are living with HIV in Eastern and South-Eastern Europe. In the remaining regions, the average prevalence of HIV infection among PWID is much lower, ranging from 1 per cent in Oceania to 11 per cent in Africa (although for Africa this estimate may not be reliable as monitoring systems may not be adequate).

Approximately 40 per cent of the estimated global total number of PWID living with HIV reside in Eastern and South-Eastern Europe, mostly in the Russian Federation and Ukraine. East and South-East Asia contribute a further 20 per cent to the global total number of PWID living with HIV, although both the prevalence of injecting drug use and the prevalence of HIV among PWID are below their respective global averages. It is the large population aged 15-64 residing in this region that translates into the relatively large number of PWID living with HIV. South-West Asia, the region with the highest prevalence of HIV among PWID, contributes 12 per cent to the total global number of PWID living with HIV, with a large proportion of these residing in Pakistan. Four countries, the Russian Federation, China, Pakistan and the United States (in descending order), when combined account for nearly two thirds (63 per cent) of the total global estimated number of PWID living with HIV.

13 UNAIDS, *The Gap Report* (Geneva, 2014).

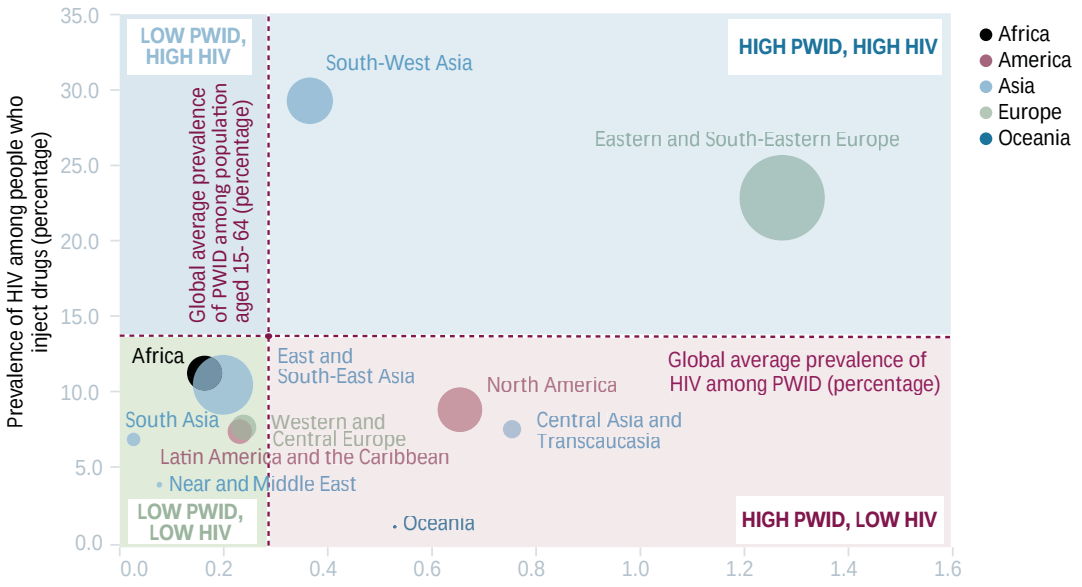
TABLE 3. Estimated number and prevalence (percentage) of HIV among people who inject drugs, 2013

Region	Subregion	HIV among people who inject drugs			
		Estimated number			Prevalence (percentage)
		low	best	high	Best estimate
Africa		**30,000**	**112,000**	**1,582,000**	**11.2**
America		**167,000**	**237,000**	**416,000**	**8.4**
	North America	141,000	182,000	248,000	8.8
	Latin America and the Caribbean	26,000	55,000	168,000	7.3
Asia		**344,000**	**576,000**	**993,000**	**12.6**
	Central Asia and Transcaucasia	26,000	31,000	40,000	7.5
	East and South-East Asia	211,000	329,000	612,000	10.5
	South-West Asia	90,000	196,000	314,000	29.3
	Near and Middle East	1,000	3,000	9,000	3.8
	South Asia	17,000	17,000	18,000	6.8
Europe		**373,000**	**724,000**	**1,428,000**	**19.7**
	Eastern and South-Eastern Europe	322,000	665,000	1,359,000	22.8
	Western and Central Europe	51,000	59,000	69,000	7.6
Oceania		**1,000**	**1,000**	**2,000**	**1.0**
GLOBAL		**915,000**	**1,651,000**	**4,421,000**	**13.5**

Sources: UNODC, responses to 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; estimates based on UNODC data; and national government reports.

Note: Numbers are rounded to the nearest 10,000.

FIG. 6. People who inject drugs living with HIV, in relation to the prevalence (percentage) of people who inject drugs and the prevalence (percentage) of HIV among this group, by region, 2013



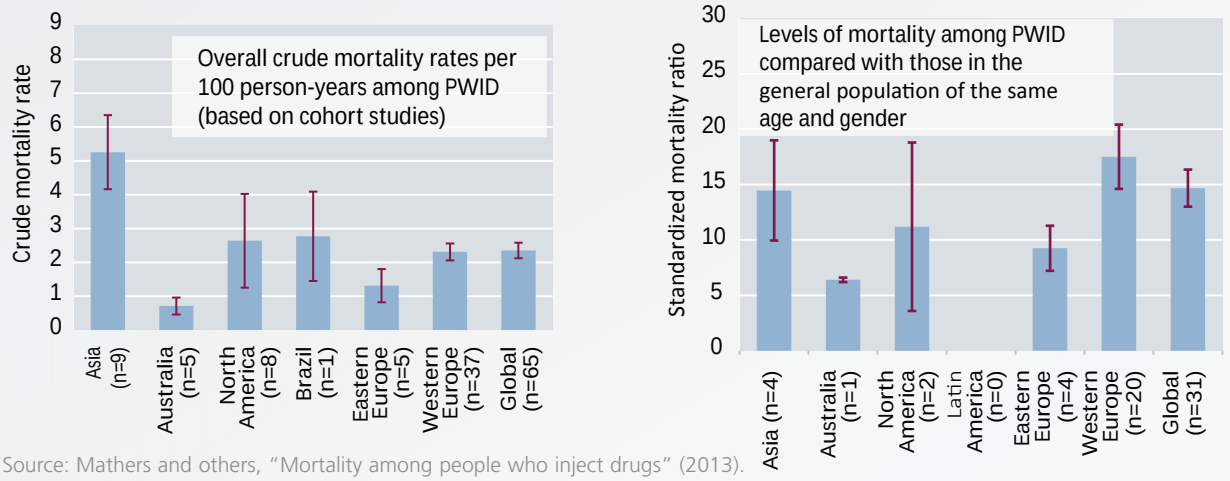
Sources: UNODC, responses to annual report questionnaire; progress reports of UNAIDS on the global AIDS response (various years); the former Reference Group to the United Nations on HIV and Injecting Drug Use; and national government reports.

Notes: The number of PWID living with HIV is represented for each region as both a proportion of PWID in the general population aged 15-64 (horizontal axis) and as a proportion of PWID living with HIV (vertical axis). The areas of the circles are proportional to the number of PWID living with HIV. The orange dot and dashed lines represent the global average prevalence of PWID and the global average prevalence of PWID living with HIV.

PREMATURE DEATH IS COMMON AMONG PEOPLE WHO INJECT DRUGS

Compared with the general population, PWID are at an elevated risk of dying, primarily as a result of the transmission of infectious diseases, in particular HIV, and of fatal drug overdoses. A recent systematic review of cohort studies that followed PWID over time[a] suggests that they experience a high mortality rate. The overall (pooled) mortality rate across the 65 cohort studies from 25 countries estimated a mortality rate of 2.35 deaths per 100 person-years (if 100 PWID were followed over one year, two to three deaths would be expected to occur among this group). This is a much higher level of mortality than among those of comparable age and gender among the general population (standardized mortality ratio = 14.68).

Mortality rates among people who inject drugs and the increase in mortality among people who inject drugs compared with the general population



Source: Mathers and others, "Mortality among people who inject drugs" (2013).

Note: The numbers within brackets on the horizontal axis represent the number of cohort studies.

Asia is the region with the largest estimated population of PWID, accounting for more than one in three PWID globally. Albeit based on a very limited number of studies, at 5.25 deaths per 100 person-years, the region also experiences a high mortality rate from injecting drugs. By contrast, findings from five other studies in Australia suggest that the level of mortality among PWID is low in Australia, at 0.71 deaths per 100 person-years.

The mortality rate was observed to be higher among males who inject drugs (MWID). Based on 37 studies, MWID were found to have a mortality rate 1.32 times that of females who inject drugs (FWID). However, based on 19 studies, FWID had a greater excess mortality than MWID when compared with similar age groups in the general population. Across 43 studies, the crude mortality rate among PWID from overdose was estimated at 0.62 deaths per 100 person-years.

Continuity of treatment and the length of time spent in treatment can have an impact in reducing overdoses among PWID. Data from six studies showed a risk of dying some 2.5 times higher for PWID during off-treatment periods compared with in-treatment time periods.

Effective evidence-based interventions can now be identified for prevention, treatment and care of HIV for PWID,[b] including needle and syringe programmes, opioid substitution therapy, antiretroviral therapy and the availability of naloxone. For example, a recent systematic review[c] highlighted the importance of opioid substitution therapy, finding that it is associated with an average 54 per cent reduction in the risk of new HIV infection among PWID, largely by reducing the frequency of unsafe injecting; this is ultimately very likely to reduce the number of deaths among PWID. However, the availability of evidence-based interventions targeting PWID, including opioid substitution therapy, varies considerably across countries and is generally limited even in countries with a high prevalence of PWID and high proportions of PWID who are living with HIV.[d]

a Bradley M. Mathers 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.

b *WHO, UNODC, UNAIDS Technical Guide for Countries to Set Targets for Universal Access to HIV Prevention, Treatment and Care for Injecting Drug Users: 2012 Revision* (Geneva, WHO, 2012).

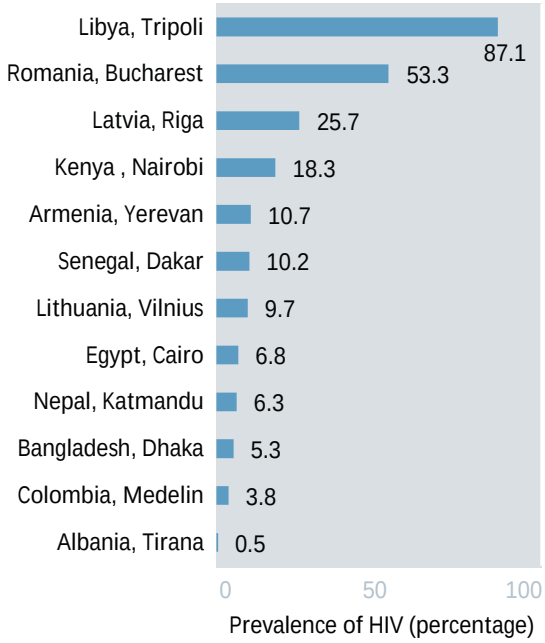
c Georgie J. MacArthur and others, "Opiate substitution treatment and HIV transmission in people who inject drugs: a systematic review and meta-analysis", *BMJ*, vol. 345 (4 October 2012), pp. 1-16.

d UNODC, *World Drug Report 2014*.

The Russian Federation is affected by a concentrated HIV epidemic among PWID. Approximately one in three PWID living with HIV worldwide are estimated to reside in the Russian Federation, which experiences both a high prevalence and a high incidence[14] (new cases) of HIV among PWID. However, across cities in the Russian Federation there is a very large variation in the HIV prevalence among PWID. A study carried out in eight cities in the period 2007-2009 showed percentages of PWID living with HIV ranging from levels below 10 per cent in Voronezh (3 per cent) and Omsk (9 per cent), to around 15 per cent in Naberezhnye Chelny (13 per cent), Chelyabinsk and Orel (both 15 per cent), to around 60 per cent in Irkutsk (57 per cent), Saint Petersburg (59 per cent) and Yekaterinburg (64 per cent).[15]

The prevalence of HIV among PWID can vary markedly between cities (see figure 7) and certain cities and settings around the world that carry a large proportion of the global burden of HIV are becoming a focus of attention in the global response to the HIV epidemic,[16] with the geographically localized nature of HIV epidemics and the role of cities and settings, such as prisons, increasingly being seen as critical considerations.

FIG. 7. Prevalence of HIV among people who inject drugs in selected cities



Sources: UNODC, responses to 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 national government reports.

14 Federal Research and Methodological Centre for Prevention and Control of AIDS, *HIV Infection: Newsletter No. 38* (Moscow, 2013).

15 K. Eritsyan and others, "Individual level, network-level and city-level factors associated with HIV prevalence among people who inject drugs in eight Russian cities: a cross-sectional study", *BMJ*, vol. 3, No. 6 (2013).

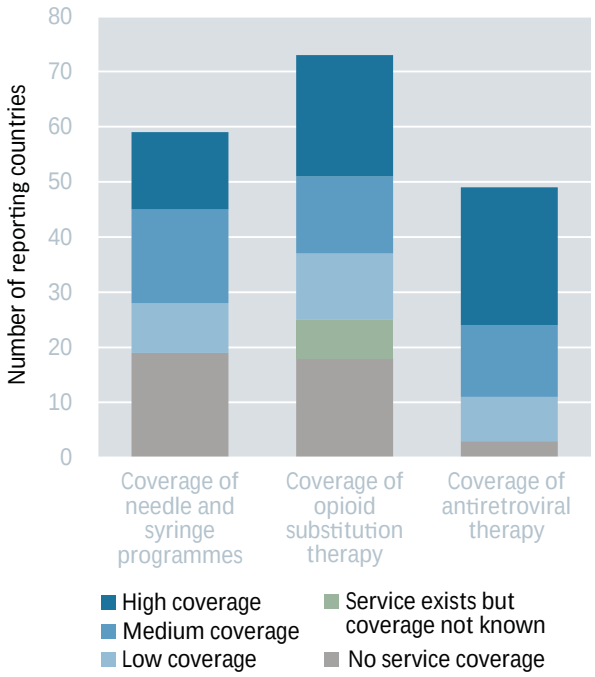
16 UNAIDS, *The Cities Report* (Geneva, 2014).

Availability of harm reduction services remains low

In many countries, the levels of service coverage for needle and syringe programmes, opioid substitution therapy and antiretroviral therapy remain low, as defined according to targets set by WHO, UNODC and UNAIDS (see figure 8).[17] The proportion of countries reporting these services as either not available or at low levels of coverage are 47 per cent, 41 per cent and 22 per cent, respectively. Most of the countries reporting information on service coverage are in Europe where the levels of service coverage are relatively high. Outside Europe the level of access to these services is much lower.[18]

A recent review[19] of the global coverage of services for needle and syringe programmes, opioid substitution therapy and antiretroviral therapy shows that 91 countries include the provision of harm reduction programmes in

FIG. 8. Levels of service coverage for people who inject drugs and those among them living with HIV (2013, or latest year available)



Source: UNODC, responses to annual report questionnaire.

Note: For further information, see the methodology section in the online version of this report.

17 The *WHO, UNODC, UNAIDS Technical Guide for Countries to Set Targets for Universal Access to HIV Prevention, Treatment and Care for Injecting Drug Users: 2012 Revision* recommends a comprehensive package of nine interventions, aimed at reducing the risk of acquiring, and improving the treatment and care of HIV, hepatitis and tuberculosis in people who inject drugs, commonly referred to as a "harm reduction approach" to injecting drug use.

18 UNODC, *World Drug Report 2014.*

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

their national policies, but that at the global level, harm reduction responses related to unsafe injecting remain poor. Needle and syringe programmes were available in 90 countries in 2014 (out of the 158 countries where injecting drug use has been documented), an increase of five since 2012, although the nature of these programmes varies considerably. In many low- and middle-income countries, however, they do not provide an adequate coverage to be fully effective. Since 2012, there has been a scale-up of needle and syringe services in 29 countries, but in 13 others the provision of services has actually decreased. Opioid substitution therapy was available in 80 countries in 2014, an increase of two since 2012. In many countries, however, opioid substitution therapy programmes remain at levels below international minimum guidelines. Since 2012, 25 countries have seen a scale-up of opioid substitution therapy, but in five others services have declined.

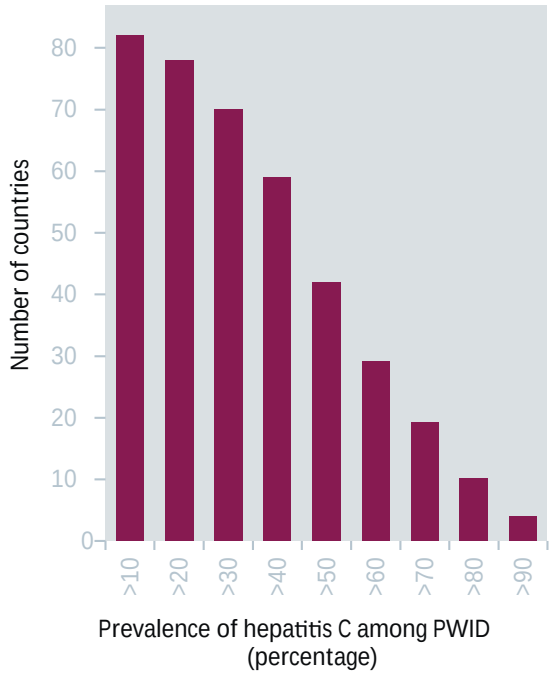
Progress towards realizing the commitments made in the Political Declaration on HIV and AIDS

The Political Declaration on HIV and AIDS[20] adopted by the General Assembly in its resolution 60/262 in 2011 included a commitment by Member States to work towards reducing the transmission of HIV among PWID by 50 per cent by 2015. Some progress towards realizing this commitment can be noted. Globally, new HIV infections among PWID have declined slightly (by around 10 per cent) from an estimated 110,000 (range: 97,000-123,000) in 2010 to 98,000 (range: 85,000-111,000) in 2013.[21] Although the accumulated evidence collected over the past 30 years points to the effectiveness of harm reduction measures,[22] the implementation of such programmes remains at very low levels of coverage in many regions of the world.[23]

Globally, every other person who injects drugs is living with hepatitis C

Hepatitis C has the potential to pose serious health problems for those infected, with the possibility of liver failure, liver cancer and premature death. While an estimated 2.2 per cent of the global population are infected with hepatitis C,[24] this proportion is 25 times higher among PWID, estimated at 52 per cent for 2013, or 6.3 million PWID worldwide. This joint UNODC/WHO/UNAIDS/World Bank estimate is based on information from 88 countries. Although new or updated information from 36 countries has been included, the global estimate is essentially unchanged from that presented in the *World Drug Report 2014*.

FIG. 9. Number of countries, by prevalence of hepatitis C among people who inject drugs



Sources: UNODC, responses to 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 national government reports.

Note: Total number of countries with data on hepatitis C prevalence among PWID is 88.

In some countries, the prevalence of hepatitis C among PWID is considerably higher, including in countries with large PWID populations (see figure 9). Of these 88 countries, the prevalence of hepatitis C among PWID is 60 per cent or higher in 29 countries (33 per cent), including in China, where there were an estimated 1.93 million PWID in 2012,[25] 70 per cent or higher in 19 countries (22 per cent), including the United States, where there were an estimated 1.52 million PWID in 2007,[26] and 80 per cent or higher in 10 countries (11 per cent).

20 Political Declaration on HIV and AIDS: Intensifying Our Efforts to Eliminate HIV and AIDS (General Assembly resolution 65/277, annex).

21 UNAIDS Programme Coordinating Board, "Halving HIV transmission among people who inject drugs: background note", UNAIDS/PCB (35)/14.27, 25 November 2014.

22 David P. Wilson and others, "The cost-effectiveness of harm reduction", *International Journal of Drug Policy*, vol. 26, Suppl. No. 1 (2015), pp. S5-S11.

23 Bradley M. Mathers and others "HIV prevention, treatment, and care services for people who inject drugs: a systematic review of global, regional, and national coverage", *The Lancet*, vol. 375, No. 9719 (2010), pp. 1014-1028.

24 The Global Burden of Hepatitis C Working Group, "Global burden of disease (GBD) for hepatitis C", *Journal of Clinical Pharmacology*, vol. 44, No. 1 (2004), pp. 20-29.

25 China National Centre for AIDS/STD Control and Prevention, 2012.

26 Barbara Tempalski and others, "Trends in the population prevalence of people who inject drugs in US metropolitan areas 1992-2007", *PLOS ONE*, vol. 8, No. 6 (2013).

TABLE 4. Estimated number of drug-related deaths and drug-related mortality rates, 2013

Region	Number of drug-related deaths			Mortality rate per million aged 15-64			Availability of mortality data (percentage of total population in region)
	best estimate	lower estimate	upper estimate	best estimate	lower estimate	upper estimate	
Africa	37,800	18,000	57,700	61.9	29.4	94.3	
North America	43,300	43,300	43,300	136.8	136.8	136.8	100.0
Latin America and the Caribbean	6,000	4,900	10,900	18.4	14.9	33.4	80.0
Asia	81,100	13,600	100,700	28.2	4.7	35.0	9.0
Western and Central Europe	7,300	7,300	7,300	22.5	22.5	22.5	100.0
Eastern and South-Eastern Europe	9,500	9,500	9,500	41.5	41.5	41.5	92.0
Oceania	2,000	1,700	2,100	82.3	69.9	83.3	75.0
GLOBAL	**187,100**	**98,300**	**231,400**	**40.8**	**21.5**	**50.5**	

Sources: UNODC, responses to annual report questionnaire; Inter-American Drug Abuse Control Commission; Louisa Degenhardt and others, "Illicit drug use", *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, World Health Organization, 2004), p.1109.

Note: For further information, see the methodology section in the online version of this report.

Being aware of one's hepatitis C status is important for access to treatment and also in preventing transmission of the infection to others. As shown in a recent systematic review, a high proportion of PWID are unaware that they are living with hepatitis C and, among those known to be infected, there is a low uptake of antiviral treatment in many European countries.[27] The study indicated that the level of undiagnosed infection of hepatitis C among PWID was high, with a median of 49 per cent (range: 24-76 per cent), while among PWID diagnosed with hepatitis C, the proportion that had started antiviral treatment was generally low, ranging from 1 to 19 per cent with a median of 9.5 per cent. The burden of disease from hepatitis C infection (such as liver disease and mortality), where assessed, was high and the authors of the study concluded that it would rise in the decade from 2014.

Drug-related deaths are predominantly related to opioid overdose

With regard to the most serious outcome that can result from illicit drug use, UNODC estimates that in 2013 there were 187,100 (range: 98,300-231,400) drug-related deaths[28] worldwide, corresponding to a mortality rate of 40.8 (range: 21.5-50.5) drug-related deaths per million people aged 15-64.

Overdose is the primary cause of drug-related deaths worldwide and opioids (heroin and non-medical use of prescription opioids) are the main drug type implicated in these deaths. Drug overdoses, with opioids present in about three quarters of the cases, are estimated to account for 3.5 per cent of all deaths among Europeans aged 15-39.[29]

In Europe, the highest drug-related mortality rates are found in the most northerly countries and territories with (in descending order of mortality rates and considering only countries and territories with a population aged 15-64 of 500,000 or greater) Estonia, Scotland, Finland, Sweden, Northern Ireland, the Russian Federation, Norway and Ireland all experiencing mortality rates of over 70 drug-related deaths per million of the population aged 15-64. In all of these countries, opioids were the drug type most frequently mentioned as the primary cause of death.

Contributing an estimated 23 per cent to the global number of drug-related deaths, North America experiences the highest drug-related mortality rate by far. Within the region, the United States reports one of the highest drug-related mortality rates worldwide at 4.6 times the global average and, with 40,239 drug-related deaths recorded in 2013, accounts for approximately one in five drug-related deaths globally. The high mortality rate in North America in part reflects better monitoring and reporting of drug-related deaths than in most other regions.

27 L. Wiessing and others, "Hepatitis C virus infection epidemiology among people who inject drugs in Europe: a systematic review of data for scaling up treatment and prevention", *PLOS ONE*, vol. 9, No. 7 (2014).

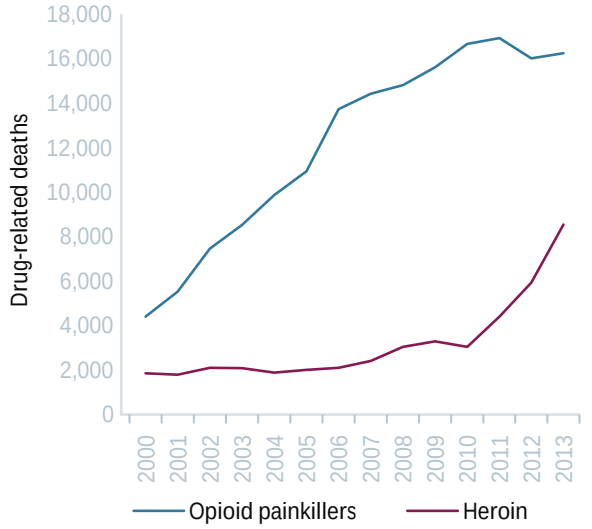
28 The definition of drug-related deaths varies between Member States but includes some or all of the following: fatal drug overdoses; deaths due to HIV acquired through injecting drug use; suicide; and unintentional deaths and trauma due to illicit drug use.

29 EMCDDA, *European Drug Report 2014*.

Heroin-related overdoses show recent increases in the United States

Substantial increases have recently been reported in the number of heroin overdoses in the United States (see figure 12). Mortality rates have nearly tripled from 1.0 to 2.7 heroin overdose deaths per 100,000 of the population between 2010 and 2013; this reflects an increase in the number of heroin-related deaths from 3,036 to 8,527[30] (see also section on opiates).

FIG. 10. Deaths related to heroin and opioid painkillers in the United States, 2000-2013



Source: H. Hedegaard, L. H. Chen and M. Warner, "Drug poisoning deaths involving heroin", *NCHS Data Brief No. 190* (2015).

Deaths related to new psychoactive substances are on the rise in the United Kingdom of Great Britain and Northern Ireland

In the United Kingdom of Great Britain and Northern Ireland, there has been much recent media attention over deaths relating to the use of new psychoactive substances (NPS). Over the past few years in England and Wales, the number of drug-related deaths in which NPS or so-called "legal highs" (predominantly methcathinones such as mephedrone, which has been controlled as a Class B drug under the United Kingdom Misuse of Drugs Act 1971 since April 2010) have been mentioned on death certificates has continually increased, from nine deaths in 2007 to 60 deaths in 2013.[31] There is very limited information available on the toxicology of NPS and the overdose risk from the use of these substances, alone or in combination with other drugs (including alcohol), is largely unknown.

Non-fatal overdoses are a common experience among drug users

While there has been a focus on overdose fatalities, non-fatal overdose among illicit drug users remains fairly common yet relatively undocumented. A number of studies have been conducted to understand the extent, patterns, determinants and correlates of non-fatal overdose, especially among regular opioid users and those injecting drugs; these studies suggest that between 30 and 80 per cent of the study participants have experienced an overdose in their drug-using career, nearly half of whom had experienced multiple overdoses in recent months.[32,33,34,35,36] While the absence of specific assistance is largely at play, it would seem that in some cases victims of such incidents may fear the consequences of revealing their illicit drug use or may lack confidence in the health-care system.[37,38] A number of studies have estimated that 1 in 20 or 25 overdose cases are fatal, with a cumulative risk of death increasing with each successive overdose.[39,40,41]

Non-fatal overdose remains of public health significance because of its related morbidity and serious consequences, including pulmonary oedema, bronchopneumonia, peripheral neuropathy, renal failure, cognitive impairment and traumatic injuries sustained during overdose.[42,43] Repeated

30 H. Hedegaard, L. H. Chen and M. Warner, "Drug poisoning deaths involving heroin: United States, 2000-2013", NCHS Data Brief No. 190 (Hyattsville, Maryland, National Center for Health Statistics, March 2015).

31 United Kingdom, Office for National Statistics, "Deaths related to drug poisoning in England and Wales, 2013", Statistical Bulletin (September 2014).

32 S. Darke, J. Ross and W. Hall, "Overdose among heroin users in Sydney, Australia: I. Prevalence and correlates of non-fatal overdose", *Addiction*, vol. 91, No. 3 (1996), pp. 405-411.

33 M. Karbakhsh and N. Salehian Zandi, "Acute opiate overdose in Tehran: the forgotten role of opium", *Addictive Behaviors*, vol. 32, No. 9 (2007), pp. 1835-1842.

34 A. Bergenstrom and others, "A cross-sectional study on prevalence of non-fatal drug overdose and associated risk characteristics among out-of-treatment injecting drug users in North Vietnam", *Substance Use and Misuse*, vol. 43, No. 1 (2008), pp. 77-84.

35 P. Davidson and others, "Witnessing heroin-related overdoses: the experiences of young injectors in San Francisco", *Addiction*, vol. 97, No. 12 (2002), pp. 1511-1516.

36 L. Yin and others, "Nonfatal overdose among heroin uses in southwestern China", *The American Journal of Drug and Alcohol Abuse*, vol. 33, No. 4 (2007), pp. 505-516.

37 B. Fischer and others, "Determinants of overdose incidents among illicit opioid users in 5 Canadian cities", *Canadian Medical Association Journal*, vol. 171, No. 3 (2004), pp. 235-239.

38 M. Warner-Smith, S. Darke and C. Day, "Morbidity associated with non-fatal heroin overdose", *Addiction*, vol. 97, No. 8 (2002), pp. 963-967.

39 EMCDDA, *Annual Report 2010* (Lisbon, November 2010).

40 A. Tokar and T. Andreeva, "Estimate of the extent of opiate overdose in Ukraine", *Tobacco Control and Public Health in Eastern Europe*, vol. 2, No. 3 (2012).

41 S. Darke, R. P. Mattick and L. Degenhardt, "The ratio of non-fatal to fatal overdose", *Addiction*, vol. 98, No. 8 (2003), pp. 1169-1170.

42 Warner-Smith, Darke and Day, "Morbidity associated with non-fatal heroin overdose" (see footnote 38).

43 Shane Darke and Wayne Hall, "Heroin overdose: research and evidence-based intervention", *Journal of Urban Health*, vol. 80, No. 2 (2003), pp. 189-200.

overdoses also place the person at a greater risk of long-term physical and cognitive damage, while survivors of a non-fatal overdose have a higher risk of suffering further overdose and death.[44]

The risk of overdose varies depending on different factors.[45] Overdoses are reported in users with longer opioid use or long-term injecting, who are older, who are more likely to have been treated for drug dependence and who have a higher level of dependence on the severity of dependence scale.[46,47] Overdoses are associated with higher drug purity; higher frequency of use — almost daily use or binge use of drugs;[48] and polydrug use, particularly the use of amphetamines, cocaine, alcohol or benzodiazepines in conjunction with opioids, especially while injecting. The role of polydrug use in opioid overdose, for instance with benzodiazepines, essentially reflects a pharmacological interaction in the form of an additive respiratory depressant effect.[49]

Temporary cessation of drug use following periods of drug detoxification, hospitalization, arrest or imprisonment leads to decreased drug tolerance. When drug use is reinitiated, there is an increased risk of overdose. Importantly, enrolment in opioid substitution therapy would seem to protect from non-fatal overdose: in a study among PWID conducted between 1996 and 2004 in Vancouver, Canada, it was the only variable that was shown to be inversely associated with non-fatal overdose.[50] Similarly, social marginalization or homelessness, together with living with HIV, have also been associated with overdose episodes, though evidence of a causal association has not been established.[51]

Overdose is preventable

Despite the high prevalence of non-fatal overdoses and the associated morbidity, scant attention has been given internationally to overdose reduction interventions. Overdose-related deaths are preventable. Along with long-term opioid agonist (substitution) treatment, the availability and accessibility of naloxone is another important intervention in cases of overdose. Naloxone is an opioid antagonist that can immediately reverse the effects of opioid overdose.[52] As many overdoses occur in the presence of the drug user's family members or peers, empowering these people with the skills to administer naloxone can be a lifesaving intervention.

C. GENDER, DRUG USE AND HEALTH CONSEQUENCES

Use of drugs, except tranquillizers, is more prevalent in men than in women

Compared with drug use among men, overall drug use remains low among women. At the global level, men are three times more likely than women to use cannabis, cocaine or amphetamines. By contrast, women are more likely than men to misuse prescription drugs, particularly prescription opioids and tranquillizers.[53,54] This mainly reflects differences in opportunities to use drugs due to the influence of the social or cultural environment rather than intrinsic gender vulnerability.[55]

A large body of evidence has shown that processes of drug-use initiation, social factors and characteristics related to substance use, biological responses and progression to the development of problems related to substance use vary considerably between men and women.[56] Women with substance-use disorders tend to have a history of over-responsibility in their families of origin and have experienced more disruptions and report more interpersonal conflicts in the family than their male counterparts, particularly issues related to parenting and exposure to childhood and adult trauma. Women with substance-use disorders may come from families where one or more family members is also drug dependent and may have suffered victimization and injury. Many women identify relationship problems as a cause for their substance use. In addition, psychiatric co-morbidities, especially mood and anxiety disorders, are reported to be higher among

44 S. Darke and others, "Patterns of nonfatal heroin overdose over a 3-year period: findings from the Australian Treatment Outcome Study", *Journal of Urban Health*, vol. 84, No. 2 (2007), pp. 283-291.

45 A. R. Bazazi and others, "High prevalence of non-fatal overdose among people who inject drugs in Malaysia: correlates of overdose and implications for overdose prevention from a cross-sectional study", *International Journal of Drug Policy* (2014).

46 Darke, Ross and Hall, "Overdose among heroin users in Sydney" (see footnote 32).

47 Bergenstrom and others, "A cross-sectional study on prevalence of non-fatal drug overdose" (see footnote 34).

48 Bazazi and others, "High prevalence of non-fatal overdose among people who inject drugs in Malaysia" (see footnote 45).

49 EMCDDA, *Annual Report 2010*.

50 T. Kerr and others, "Predictors of non-fatal overdose among a cohort of polysubstance-using injection drug users", *Drug and Alcohol Dependence*, vol. 87, No. 1 (2007), pp. 39-45.

51 Traci G. Green and others, "HIV infection and risk of overdose: a systematic review and meta-analysis", *AIDS*, vol. 26, No. 4 (20 February 2012), pp. 403-417.

52 See also UNODC, *World Drug Report 2014*.

53 UNODC, *World Drug Report 2014*.

54 Christine E. Grella, "From generic to gender-responsive treatment: changes in social policies, treatment services, and outcomes of women in substance abuse treatment", *Journal of Psychoactive Drugs*, vol. 40, SARC Suppl. No. 5 (2008), pp. 327-343.

55 Michelle L. Van Etten and J. 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 Health and Gender Based Medicine*, vol. 10, No. 8 (2001), pp. 797-804.

56 Ellen Tuchman, "Women and addiction: the importance of gender issues in substance abuse research", *Journal of Addictive Diseases*, vol. 29, No. 2 (2010), pp. 127-138.

women[57,58] and these disorders typically predate the onset of substance-use problems.[59]

Literature on gender differences published over the past three decades has shown that women typically begin using substances later than men and that substance use by women is strongly influenced by intimate partners who also use drugs.[60] Women overall may be less likely than men to develop drug-use disorders and dependence. Nevertheless, once they have initiated substance use, women tend to increase their rate of consumption of alcohol, cannabis, opioids and cocaine more rapidly than men[61] and may progress more quickly than men to the development of drug-use disorders and dependence.[62,63] In the United States, for instance, males were reported to be 2.33 and 2.25 times more likely to have had drug-use disorders and drug dependence, respectively, than females in the previous year.[64,65]

In most surveys among the general population, a greater misuse of prescription drugs is reported among women than among men, with the difference in the use of sedatives and tranquillizers being more marked than in the use of prescription opioids or painkillers. Thus, women are twice as likely as men to use tranquillizers, but both have roughly equal levels of use of prescription opioids. Survey data from South America, Western and Central Europe and North America indicate that, in comparison with the use of most illicit substances, the extent of the misuse of tranquillizers at all levels, whether lifetime, annual or current (past 30 days), remains at a higher level among women than among men: for example, the aggregated past-year misuse of tranquillizers by women in Western and Central Europe is nearly twice that of cannabis use, while the use of other substances such as amphetamine, cocaine and opioids remains at very low levels (see figure 11).

57 Ibid.

58 D. Stewart and others, "Similarities in outcomes for men and women after drug misuse treatment: Results from the National Treatment Outcome Research Study (NTORS)", *Drug and Alcohol Review*, vol. 22, No. 1 (2003), pp. 35-41.

59 Kathleen T. Brady and Carrie L. Randall, "Gender differences in substance use disorders", *Psychiatric Clinics of North America*, vol. 22, No. 2 (1999), pp. 241-252.

60 Ibid.

61 Jill B. Becker and Ming Hu, "Sex differences in drug abuse", *Frontiers in Neuroendocrinology*, vol. 29, No. 1 (2008), pp. 36-47.

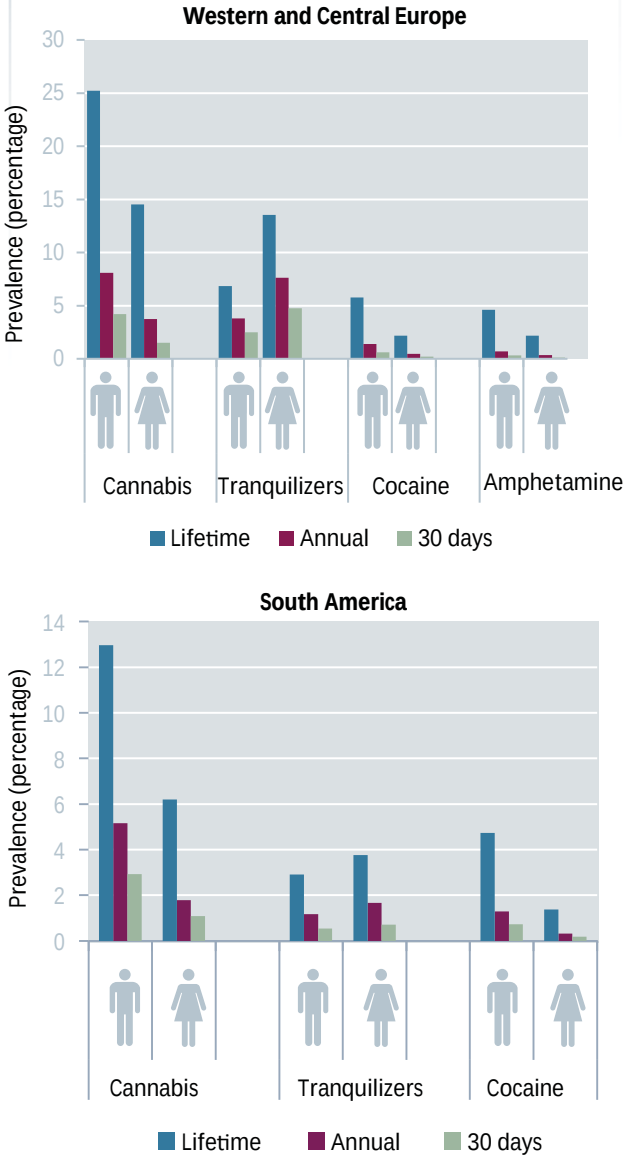
62 Carla A. Green, "Gender and use of substance abuse treatment services", *Alcohol Research and Health*, vol. 29, No. 1 (2006), pp. 55-62.

63 Grella, "From generic to gender-responsive treatment" (see footnote 54).

64 W. M. Compton and others, "Prevalence, correlates, disability, and comorbidity of DSM-IV drug abuse and dependence in the United States: results from the National Epidemiologic Survey on Alcohol and Related Conditions", *Archives of General Psychiatry*, vol. 64, No. 5 (2007), pp. 566-576.

65 Dorte Hecksher and Morten Hesse, "Women and substance use disorders", *Mens Sana Monographs*, vol. 7, No. 1 (2009), pp. 50-62.

FIG. 11. Gender differences in the use of selected drugs, 2013 (or latest available data)



Source: UNODC, responses to annual report questionnaire.

Note: Unweighted average of lifetime, past-year and past-month prevalence in adults (aged 15-64), based on 28 countries in Western and Central Europe and six countries in South America.

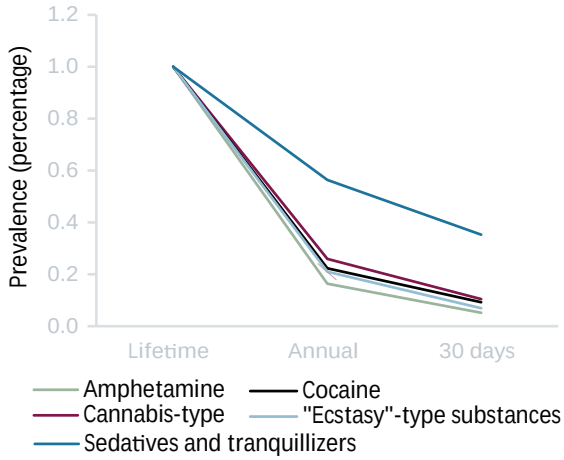
Research has shown that while many people experiment with drug use, not many will repeat the experience on more than a limited number of occasions and even fewer of them will continue into more regular drug use. This is illustrated by the sharp decline observed when comparing lifetime with annual and current (past month) drug use. In the case of the misuse of sedatives and tranquillizers, this rate of attrition seems to be much lower than for other substances. Data from general population surveys in Western and Central Europe show that more than a third of men and women who initiate the misuse of tranquillizers continue to be regular or current users, whereas 17 per cent of men and 10 per cent of women may continue to

be regular cannabis users. Considering the high prevalence of the misuse of tranquillizers among women, this remains a significant problem.

Women who inject drugs are often more vulnerable to HIV than their male counterparts

The available data on gender disaggregated HIV prevalence among PWID point to the existence of gender disparities that are quite large in some countries (see figure 13). Data reported to UNAIDS[66] show that FWID experience a higher prevalence of HIV in many countries with large populations of PWID (over 120,000), including India, Italy, Malaysia, Mexico, the Russian Federation and Ukraine. Additionally, in some other countries with a high prevalence of HIV among PWID, such as Indonesia, Kenya, Mauritius and Thailand, the prevalence of HIV is also higher among FWID. Females constitute sizeable minorities of the PWID populations in many countries, where, for example, 33 per cent of PWID in Canada are female, while this figure is 30 per cent in the Russian Federation, 26 per cent in Ukraine, 20 per cent in China and

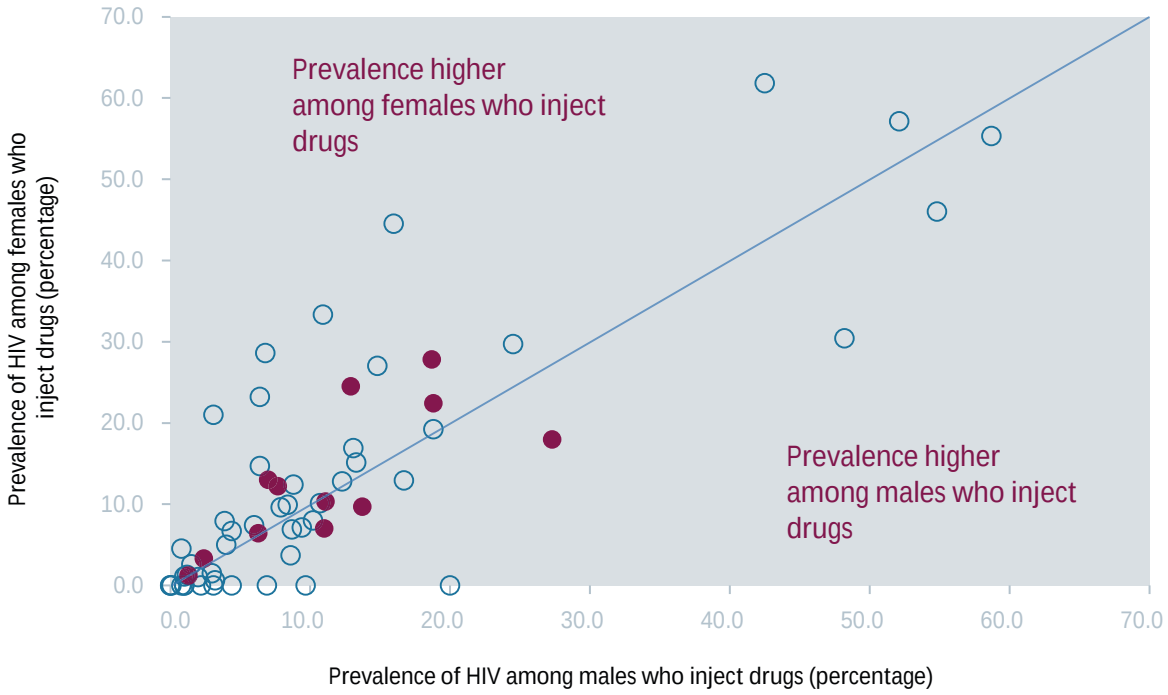
FIG. 12. Ratio of annual and past-month prevalence to lifetime prevalence of drug use among women in Western and Central Europe, 2013 (or latest year available)



Source: UNODC, responses to annual report questionnaire.

Note: Unweighted average of lifetime, past-year and past-month prevalence in adult females (aged 15-64), based on 28 countries in Western and Central Europe.

FIG. 13. Prevalence of HIV among females who inject drugs compared with prevalence of HIV among males who inject drugs (latest year available)



Source: UNAIDS, progress reports on the global AIDS response.

Note: Each circle represents a country. The solid circles are those countries with large numbers (over 120,000) of people who inject drugs. Data were available for 61 countries across all global regions.

66 UNAIDS, AIDSinfo database.

10 per cent in Malaysia.[67,68] Furthermore, in many countries the prevalence of HIV among females in prison is higher than among male prisoners.[69]

A review of 117 studies from 14 countries with a high prevalence of HIV among PWID (greater than 20 per cent) found an overall higher prevalence of HIV among FWID compared with MWID, although the difference was quite modest.[70] There was also a very wide variation across the studies. In all 10 studies with the largest differences in HIV prevalence between FWID and MWID, the original authors point to sexual transmission as the reason for the difference. Similarly, combined data for nine countries in Europe found an overall prevalence of HIV among FWID of 21.5 per cent compared with 13.6 per cent among MWID.[71] Again the differences across the countries were marked. In countries in sub-Saharan Africa, where in the general population females are more affected by HIV than males, HIV among FWID is particularly high compared with MWID: in Kenya, although FWID were few in number, the HIV prevalence is almost three times higher (44.5 per cent) than among MWID (16.0 per cent);[72] in the United Republic of Tanzania, HIV among FWID (66.7 per cent) is more than double that among MWID (29.9 per cent);[73] in Senegal, HIV among FWID (21.1 per cent) is three times higher than among MWID (7.5 per cent);[74] in South Africa, HIV among FWID (17 per cent) is slightly higher than among MWID (14 per cent);[75] and in Nigeria HIV among FWID (21.0 per cent) is seven times higher than among MWID (3.1 per cent).[76] By contrast, a review of 11 studies from five countries in Central Asia found no overall gender differences in the HIV prevalence among PWID, but again there was considerable variation among the studies.[77]

There have been multiple reasons proposed why FWID may be at greater risk of becoming infected with HIV than their male counterparts.[78,79] Females are more likely to be stigmatized and marginalized by society and are more likely to hide their injecting drug-use behaviour. Unsafe injecting practices may be more common among females given the greater difficultly in accessing needle and syringe programmes or treatment for drug dependence and the lack of services tailored to women's needs.[80] Surveys have documented high rates of sex work among FWID (often to support their own, as well as their sexual partner's, drug use), and of inconsistent condom use, as well as higher rates of sharing of needles and syringes than among FWID who are not involved in sex work.[81,82,83] The combined risks of unsafe injecting and unprotected sex work substantially elevates the risks of acquiring HIV for females.

One common feature that emerges from the different reviews and is seen in the data from UNAIDS is that the gender differences observed in individual surveys show a very wide variability. This highlights that local context is very important in the implementation of prevention programmes that are targeted and gender sensitive to cater for the separate needs of males and females where these needs are different.

67 Richard H. Needle and Lin Zhao, *HIV Prevention among Injecting Drug Users: Strengthening U.S. Support for Core Interventions*, a report of the CSIS Global Health Policy Center (Washington, D.C., Center for Strategic and International Studies Global Health Policy Center, 2010).

68 S. Pinkham, B. Myers and C. Stoicescu, "Developing effective harm reduction services for women who inject drugs", *The Global State of Harm Reduction: Towards an Integrated Response*, Claudia Stoicescu, ed. (London, Harm Reduction International, 2012).

69 WHO, UNODC and UNAIDS, *Effectiveness of Interventions to Address HIV in Prisons*, Evidence for Action Technical Papers (Geneva, WHO, 2007).

70 Don C. Des Jarlais and others, "Are females who inject drugs at higher risk for HIV infection than males who inject drugs: an international systematic review of high seroprevalence areas", *Drug and Alcohol Dependence*, vol. 124, Nos. 1 and 2 (2012), pp. 95-107.

71 EMCDDA, *Annual Report 2006: The State of the Drugs Problem in Europe* (Lisbon, November 2006).

72 UNODC/ICHIRA, "Rapid situational assessment of HIV prevalence and risky behaviours among injecting drug users in Kenya" (Nairobi, July 2012).

73 Anna Bowring and others, *Assessment of Risk Practices and Infectious Disease among Drug Users in Temeke District, Dar es Salaam, Tanzania: A Rapid Assessment and Response*, prepared for Médecins du Monde — France (Melbourne, Australia, Centre for Population Health, Burnet Institute, 2011).

74 *Enquête de prévalence et de pratiques à risques d'infection à VIH, VHB, et VHC chez les usagers de drogues dans la région de Dakar (Senegal)*, Étude ANRS 1224, rapport final (Paris, Agence Nationale de Recherche sur le Sida et les hépatites virales (ANRS), février 2014).

75 Andrew Scheibe, Ben Brown and Monika dos Santos, *Rapid Assessment of HIV Prevalence and HIV-related Risks among People Who Inject Drugs in Five South African Cities: Final Report* (February 2015).

76 Nigeria, Federal Ministry of Health, *HIV Integrated Biological and Behavioural Surveillance Survey (IBBSS) 2010* (Abuja, 2010).

77 Don C. Des Jarlais and others, "Gender disparities in HIV infection among persons who inject drugs in Central Asia: a systematic review and meta-analysis", *Drug and Alcohol Dependence*, vol. 132, Suppl. No. 1 (2013), pp. S7-S12.

78 UNODC, "HIV/AIDS prevention and care for female injecting drug users" (Vienna, July 2006).

79 Sophie Pinkham, Claudia Stoicescu and Bronwyn Myers, "Developing effective health interventions for women who inject drugs: key areas and recommendations for program development and policy", *Advances in Preventive Medicine*, vol. 2012 (2012).

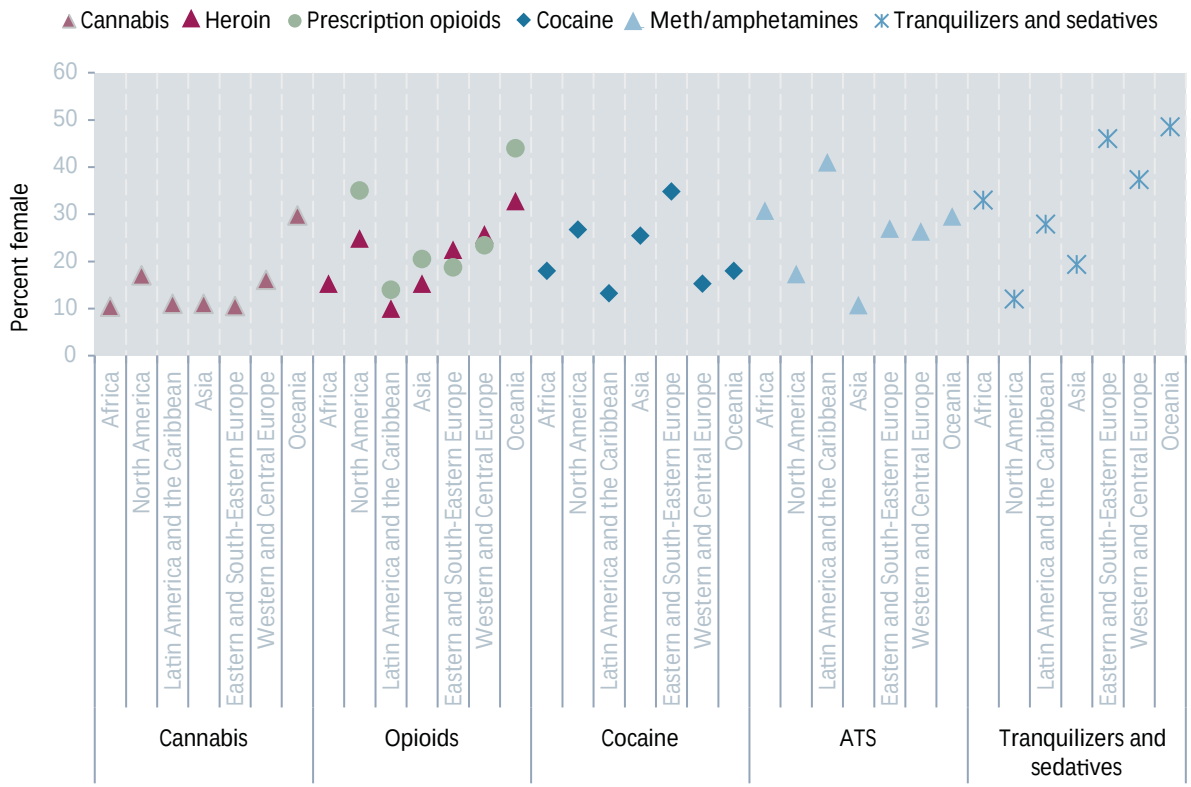
80 UNODC/UN-Women/WHO/International Network of People who Use Drugs, policy brief on "Women who inject drugs and HIV: addressing specific needs" (Vienna, 2014).

81 Jing Gu and others, "Prevalence and factors related to syringe sharing behaviours among female injecting drug users who are also sex workers in China", *International Journal of Drug Policy*, vol. 22, No. 1 (2011), pp. 26-33.

82 Sara Croxford and others, "Sex work amongst people who inject drugs in England, Wales and Northern Ireland: findings from a National Survey of Health Harms and Behaviours", *International Journal of Drug Policy*, vol. 26, No. 4 (2015), pp. 429-433.

83 A. Roberts, B. Mathers and L. Degenhardt, *Women Who Inject Drugs: A Review of Their Risks, Experiences and Needs* (Sydney, National Drug and Alcohol Research Centre, University of New South Wales, 2010).

FIG. 14. Proportion of women in treatment for various substances, by region (2013 or latest available data)



Source: UNODC, responses to annual report questionnaire.

Note: Unweighted average of proportion of women in all drug treatment per primary substance of use.

Women are less likely than men to access drug treatment

The problems that women experience as a result of drug use may interfere in more areas of their life than in men's. The severity of the medical consequences of substance use and psychiatric co-morbidities are also reportedly higher among women. However, a convergence of evidence suggests that women with substance use disorders are less likely, over their lifetime, to enter treatment than their male counterparts, as they are more likely to face barriers that affect their access and entry to drug treatment.[84,85] Globally, one out of three drug users is a woman yet only one out of five drug users in treatment is a woman, although this ratio is higher in Europe and Oceania (mainly reflecting Australia) than elsewhere. A higher proportion of women is, however, reported in the case of treatment for the misuse of tranquillizers and prescription opioids than other substances. Approximately one third of those in treatment for the use of tranquillizers are women, compared with approximately 10 per cent in the case of cannabis. This is most likely a reflection of the comparatively higher prevalence of use of tranquillizers among women than among men.

Gender disparities in access to substance-use treatment have mainly been associated with the limited availability of services tailored to meet the specific needs of women in treatment. As there remains limited information about women with substance-use problems, there is still a general lack of appropriate evidence-based treatment models for women, especially in resource-constrained countries.[86]

Women encounter significant systemic, structural, social, cultural and personal barriers in accessing substance abuse treatment.[87,88] At the structural level, the most significant obstacles include lack of child care and punitive attitudes to parenting and pregnant women with substance abuse problems. This makes women fear losing custody of their children or having to relinquish their children as a condition of treatment, and prevents them from seeking treat-

84 Shelly F. Greenfield and others, "Substance abuse treatment entry, retention, and outcome in women: a review of the literature", *Drug and Alcohol Dependence*, vol. 86, No. 1 (2007), pp. 1-21.

85 Tuchman, "Women and addiction" (see footnote 56).

86 *Substance Abuse Treatment and Care for Women: Case Studies and Lessons Learned* (United Nations publication, Sales No. E.04.XI.24).

87 Erick G. Guerrero and others, "Barriers to accessing substance abuse treatment in Mexico: national comparative analysis by migration status", *Substance Abuse Treatment Prevention and Policy*, vol. 9 (July 2014).

88 United Kingdom, National Treatment Agency for Substance Misuse, "Women in drug treatment: what the latest figures reveal" (London, 2010).

ment in residential settings. Treatment programmes may also be located far from where women live and may have inflexible admission requirements and schedules that may not suit the needs of women.[89,90] Moreover, women with children may still need to secure child care to participate in outpatient treatment programmes as they may not have enough money to pay for child-care costs, transportation or treatment itself. Although men may be referred for treatment by their family, an employer or the criminal justice system, treatment history among women is more associated with and triggered by other problems, such as a diagnosis of antisocial personality disorder, or sex work, and could be referred by the social services system, mental health facilities or self-initiated, rather than solely due to substance abuse.[91]

In many societies, substance use both in general and among women is heavily stigmatized and cultural norms may make it difficult for women to acknowledge such a problem or leave their homes and families to undergo treatment. Since many women with substance-use problems also live with a partner or other family members with a substance-use problem, relationship issues and the role of substance use within the relationship dynamic remain central issues in women obtaining support to undergo treatment.[92] A growing body of evidence suggests that drug treatment services that attend to social needs and other gender-specific needs as well as those of ethnic groups can contribute to engagement, retention in treatment and improved treatment outcomes.[93]

D. DRUG USE PREVENTION

What works in drug use prevention?

Prevention of drug use is one of the key provisions of international drug control systems. Aimed at protecting the health of people from harm caused by the non-medical use of controlled substances while ensuring availability of those substances for medical and scientific purposes,[94] drug use prevention encompasses any activity focused on preventing or delaying the initiation of drug use and the potential transition to problem drug use.

89 Erick G. Guerrero and others, "Gender disparities in utilization and outcome of comprehensive substance abuse treatment among racial/ethnic groups", *Journal of Substance Abuse Treatment*, vol. 46, No. 5 (2014), pp. 584-591.

90 Grella, "From generic to gender-responsive treatment" (see footnote 54).

91 See, for example, United Kingdom, "Women in drug treatment: what the latest figures reveal" (see footnote 88), and Tuchman, "Women and addiction" (see footnote 56).

92 Grella, "From generic to gender-responsive treatment" (see footnote 54).

93 See footnotes 54, 88 and 89.

94 Article 4, paragraph (c), and article 38, paragraph 1, of the Single Convention on Narcotic Drugs of 1961 and articles 5 and 20 of the Convention on Psychotropic Substances of 1971.

Compared with treatment for drug dependence, for example, the science behind drug use prevention started to develop only relatively recently. In 2013, UNODC published the International Standards on Drug Use Prevention, which summarize the scientific evidence on the effectiveness of drug use prevention efforts. Notwithstanding some notable gaps in the base of evidence, UNODC was able to identify a series of interventions and policies that are effective in preventing drug use, substance abuse and other risky behaviours.[95] Building on the International Standards, including recent reviews of the evidence[96] and relevant single studies, this section outlines the possibilities and opportunities for success in preventing drug use that reside in the implementation of evidence-based interventions.

In this section, general conclusions about the effectiveness of prevention programmes are drawn from reviews that summarise the results of numerous single studies. To demonstrate the potential impact of specific effective prevention interventions, the results of high-quality single efficacy studies are presented. The selection criteria were that the studies utilized research methods to eliminate alternative explanations of intervention effects (using intervention and control groups that were randomized) and had long-term follow-up of the intervention and control groups.

Basics of prevention

There is no single cause of drug use and addiction. Drug use should be seen as an unhealthy behaviour linked to the developmental process. Although most drug use starts in adolescence, at least half of adolescents never experiment with drugs and some 20 per cent of them report past-month use of cannabis.[97] In this context, it is important to note that what occurs during adolescence very much depends on what happened earlier on in an individual's development, during childhood and early adolescence. For this reason, as shown below, drug prevention efforts can and should be targeted at earlier ages than adolescence.

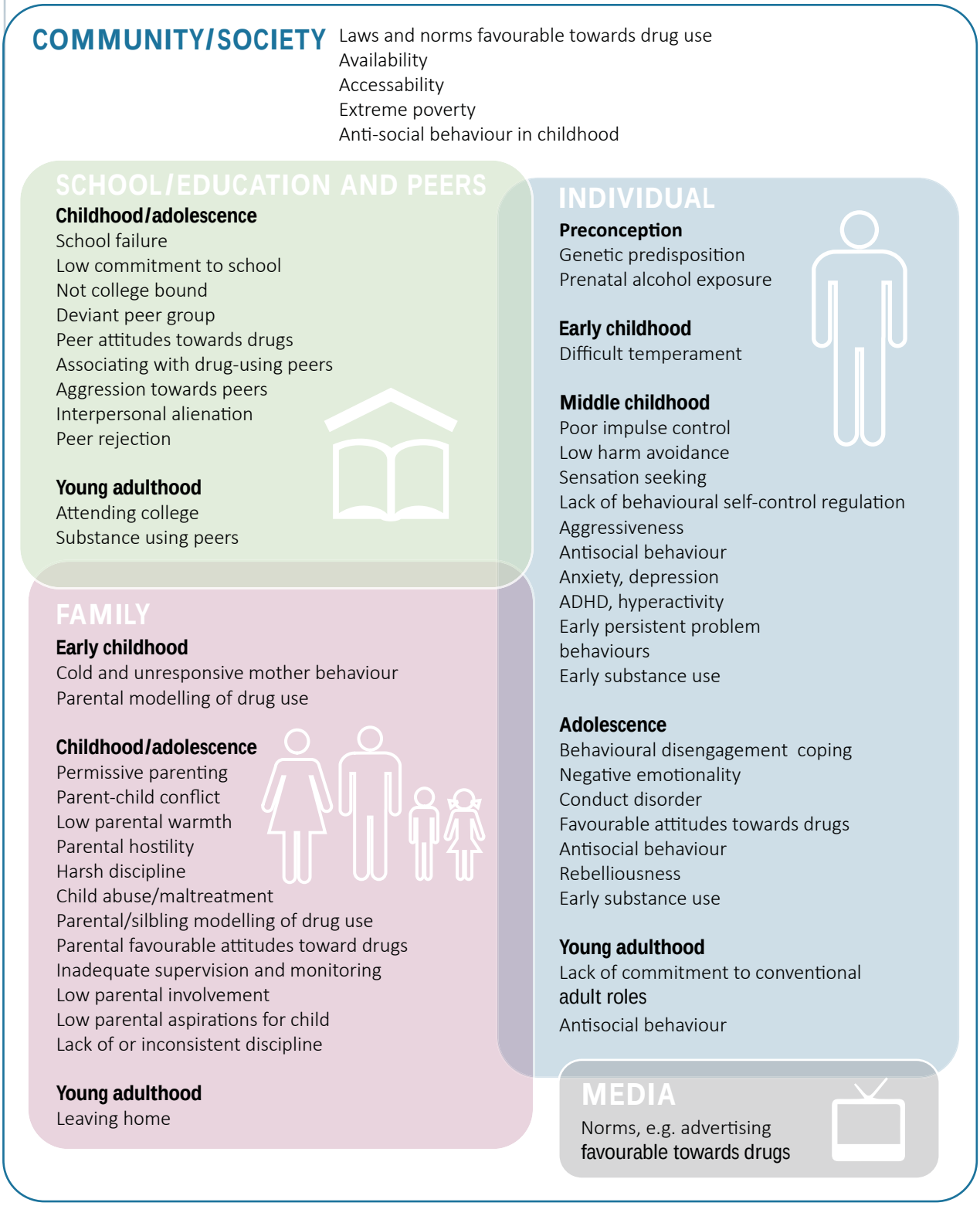
In addition, vulnerability to drug use is due to a variety of factors, whether stemming from the individual or from developmental contexts (see figure 15). The interplay between these factors ultimately either increases or attenuates an individual's vulnerability to substance use. This is

95 UNODC, International Standards on Drug Use Prevention, 2013.

96 A. Bühler and J. Thrul, *Expertise zur Suchtprävention: Aktualisierte und erweiterte Neuauflage der Expertise zur Prävention des Substanzmissbrauchs*, Forschung und Praxis der Gesundheitsförderung, Band 46 (Cologne, Germany, Bundeszentrale für gesundheitliche Aufklärung, 2013).

97 UNODC, *World Drug Report 2014*.

FIG. 15. Factors increasing vulnerability to drug use



Drug use is a developmental, multi-causal process influenced by the interplay of many risk and protective factors from different developmental contexts. The more distinct the risk factor, the greater the likelihood of drug use. In contrast, protective factors buffer the impact of risk factors.

Source: National Research Council and Institute of Medicine of the National Academies, *Preventing Mental, Emotional, and Behavioral Disorders among Young People: Progress and Possibilities* (Washington, D.C., The National Academies Press, 2009).

why there is no "silver bullet" remedy for prevention, although multi-causality also offers many starting points for preventive activity. Evidence of different prevention interventions in settings significant to the target group — family, school, workplace, community, media and leisure settings — are presented in this section. These contexts are embedded in the wider society, where cultural norms and drug policies may also facilitate or discourage drug use. Indeed, as factors that promote drug use (such as availability of the drug or poor parenting and neglect) are often beyond the control of the individual, prevention works best if it acts both at the individual level and on the developmental contexts within which individuals evolve.

Individuals and groups vary in their risk of developing drug use because of its multi-causal nature. Groups with a higher risk, such as children with a substance dependent parent, should be approached in a different manner to population groups in which the majority does not tend to use psychoactive substances, such as school pupils. Prevention programming takes this into account by providing strategies for the population at large (universal prevention), for groups that are particularly at risk (selective prevention) and for individuals that are particularly at risk (indicated prevention, which also includes individuals that might have started experimenting and are therefore at particular risk of progressing to disorders). The impact of an intervention or policy depends on its effectiveness and how well it reaches the target group.

In many individuals, drug use is often only one of a number of risky behaviours that share several vulnerability factors. For example, many of the risk factors linked to substance use are also linked to outcomes such as violence, dropping out of school and risky sexual behaviour. Drug prevention addressing these common risk factors is thus also effective in preventing other risk behaviours.[98] Similarly, preventing other problem behaviour may yield positive results in preventing substance use.[99]

Although problem behaviour and drug use peak in adolescence[100,101] they can be linked to very different developmental pathways. If it starts at all, problem behaviour starts during adolescence in the majority of youths, who then grow out of it during early adulthood. In such cases, drug use can be seen in the context of an unhealthy means of coping with developmental tasks and pressures specific to adolescence. By contrast, for a minority problem behaviour starts early and, if not addressed, is highly likely to persist throughout their lifetime. Such individuals are often characterized by a difficult temperament and externalizing or internalizing behaviours during childhood. Their drug use, which often begins in early adolescence, may be perceived as an expression of yet another facet of unhealthy behaviour that will change its characteristics over their lifetime.

The same behaviour (drug use in adolescence) thus has different sources — an observation to be considered when planning a prevention intervention. Figure 16 depicts different developmental pathways of cannabis use among students in the United States,[102] among whom a minority of early and persistent frequent users was identified (chronic users), whereas the majority only rarely or temporarily used cannabis or did not use cannabis at all. To test the differential perspective, researchers compared the early and chronic users to the remaining sample with regard to problems in other substance use (i.e. other than cannabis), problem behaviours and well-being. Chronic users were different in several ways, which supports the idea that they experience more (and ongoing) difficulties than other youths. In particular, during their high school years they achieved lower grades and had lower college aspirations, and had lower school attendance rates and worked more hours. Later, in early adulthood, they were less likely to be married, have children or have graduated from college, and were more likely to experience unemployment.

The developmental notion of drug use behaviour implies that prevention should incorporate not only drug-specific components, but also skills that help individuals to deal effectively with the challenges of each phase of life, such as relationship skills for adolescents or parenting skills for parents. In fact, drug prevention is aimed at supporting the safe and healthy development of children and youth, but may also include, when relevant, additional aspects specifically related to drugs around the age of drug use initiation.

Drug-specific prevention in younger population groups often targets tobacco and alcohol rather than other drugs. An understanding of drug use from a developmental perspective also explains why this kind of early prevention is a way to prevent substance use in young adulthood, including illicit drug use (such as cannabis or other drugs). First of all, epidemiological research indicates that one rarely finds a drug user without previous or concurrent use of tobacco or alcohol.[103,104] Secondly, a large number

98 UNODC, International Standards on Drug Use Prevention (2013).

99 P. Rohde and others, "Reduced substance use as a secondary benefit of an indicated cognitive-behavioral adolescent depression prevention program", *Psychology of Addictive Behaviors*, vol. 26, No. 3 (2012), pp. 599-608.

100 A. L. Stone and others, "Review of risk and protective factors of substance use and problem use in emerging adulthood", *Addictive Behaviors*, vol. 37, No. 7 (2012), pp. 747-775.

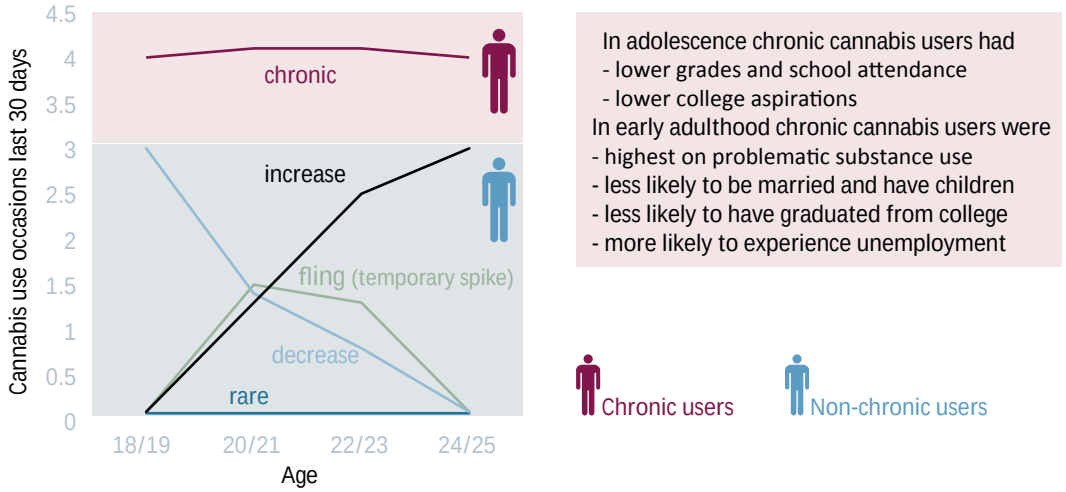
101 H. U. Wittchen and others, "Cannabis use and cannabis use disorders and their relationship to mental disorders: a 10-year prospective-longitudinal community sample of adolescents", *Drug and Alcohol Dependence*, vol. 88, Suppl. No. 1 (2007), pp. S60-S70.

102 J. Schulenberg and others, "Trajectories of marijuana use during the transition to adulthood: the big picture based on national panel data", *Journal of Drug Issues*, vol. 35, No. 2 (2005), pp. 255-280.

103 EMCDDA, "Polydrug use: patterns and responses", Selected issue 2009 (Lisbon, November 2009).

104 K. M. Keyes, S. S. Martin and D. S. Hasin, "Past 12-month and lifetime comorbidity and poly-drug use of ecstasy users among

FIG. 16. Different trajectories of cannabis use in late adolescence and young adulthood



Source: Schulenberg and others, "Trajectories of marijuana use" (2005).

of studies have shown that the earlier the use of a specific substance is initiated, the more likely it is that substance use disorders related to the specific substance are developed. Cross-substance analyses are rare, but in a high-quality study, a younger age at first alcohol and nicotine use was directly relevant for later initiation of cannabis use.[105] Thirdly, prevention effectiveness studies show that long-term preventive effects on use of cannabis, opioids, cocaine, "ecstasy", methamphetamines, non-prescription medicine or LSD in young adulthood can be explained by the fact that the participants of the programme initiated any substance use less often or less intensively in adolescence.[106,107] Figure 17 illustrates a simplified model of long-term effectiveness in which participants in a family programme stayed on a less progressive track of drug use.

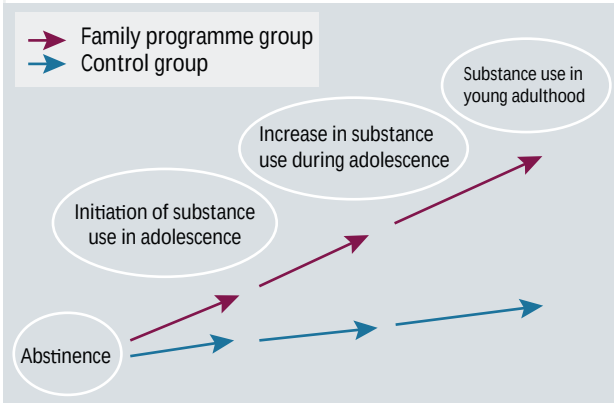
Settings for drug prevention and specific approaches that work

Family

The family-oriented prevention approach targets the setting that is most influential on the development of children and adolescents in general. Similarly, long-term observational studies tell us how important parental behaviour and attitudes are with regard to drug use, from pregnancy to young adulthood.

Examples of effective drug prevention efforts show that they start by providing adequate support to future parents who are burdened by their own drug use disorder, other mental health conditions or a socioeconomically disadvantaged life situation. Pregnancy is experienced as a time of uncertainty, but is also seen as a potential turning point towards a healthier lifestyle. Thus, prevention can take advantage of this special situation and (a) offer help with the various issues that these vulnerable groups are concerned with, and (b) motivate them to change their drug use behaviour. Positive preventive outcomes have been observed among children whose mothers were treated for substance use disorder and received parenting training

FIG. 17. Model of long-term effectiveness of developmental drug prevention programmes



Sources: Spoth and others, "Universal intervention effects on substance use" (2009); and Spoth and others, "Replication RCT" (2014).

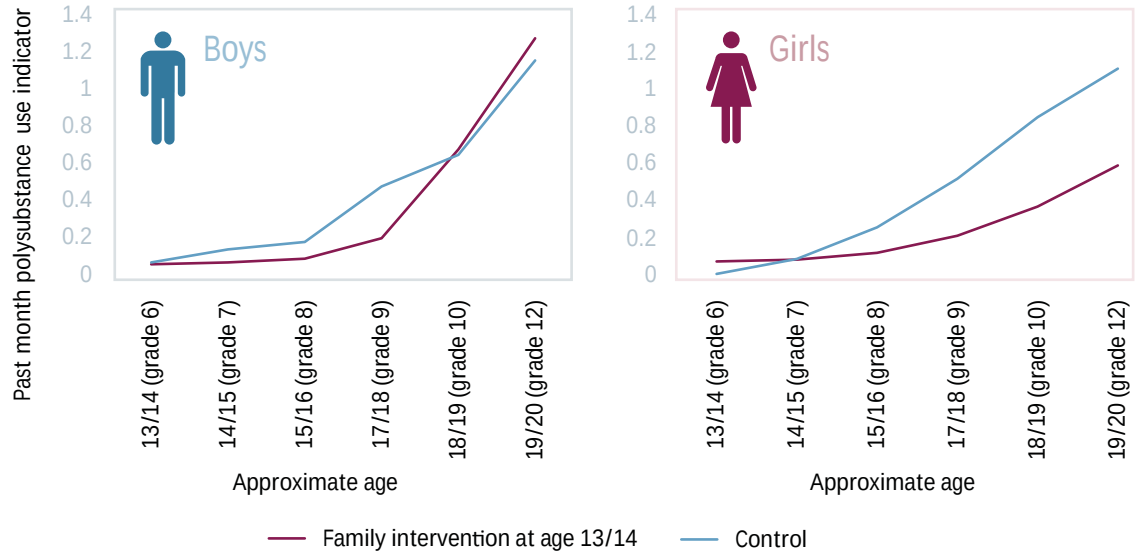
young adults in the United States: results from the National Epidemiologic Survey on Alcohol and Related Conditions", *Drug and Alcohol Dependence*, vol. 97, Nos. 1 and 2 (2008), pp. 139-149.

105 S. Behrendt and others, "The relevance of age at first alcohol and nicotine use for initiation of cannabis use and progression to cannabis use disorders", *Drug Alcohol Dependence*, vol. 123, Nos. 1-3 (2012), pp. 48-56.

106 R. L. Spoth and others, "Universal intervention effects on substance use among young adults mediated by delayed adolescent substance initiation", *Journal of Consulting and Clinical Psychology*, vol. 77, No. 4 (2009), pp. 620-632.

107 R. L. Spoth and others, "Replication RCT of early universal prevention effects on young adult substance misuse", *Journal of Consulting Clinical Psychology*, vol. 82, No. 6 (2014), pp. 949-963.

FIG. 18. Concurrent use of substances among adolescents in the United States who participated in a family programme



Source: Trudeau and others "Longitudinal effects of a universal family-focused intervention" (2007).

during pregnancy.[108] Similarly, prenatal and infancy visits during which a trained nurse or social worker supports parents in need of help with health, housing, employment or legal issues, in addition to parenting challenges, have proved to be effective in improving the child's behaviour when it reaches adolescence.[109]

Training programmes focused on parenting skills are a powerful tool, not only for populations at risk but also in the general population. In these programmes all parents are encouraged to raise their children in a warm and responsive manner and to become involved in their children's lives and learn how to communicate effectively with their children and enforce rules and limits. Drug-specific content in these programmes pertains to the parents' own substance use and, depending on the child in question's developmental stage, the expectations the parents have about the child's substance use and how to communicate about drug issues. Such interventions achieve positive preventive outcomes in the short and long run with regard to drug use and other problem behaviour.[110,111]

Family programmes go one step further, by adding a child and family component to the parenting training. While parents are working on parenting skills, their children or adolescents learn how to improve their social and resistance skills, coping strategies, problem solving and decision-making. Specific to drugs, perceptions of the risks associated with use of drugs and social norms and attitudes towards drugs are discussed. Unique to this type of intervention is a subsequent family session, during which families are asked to communicate about controversial issues or resolve typical conflicts while organizing family leisure time. Family bonding activities are also part of the session. These programmes are expected to significantly lower the chance of initiating alcohol use (by roughly 30 per cent) and to reduce the frequency of alcohol use among participating adolescents.[112] Rare long-term studies reveal that four years after the start of an intervention, participants had a 25 per cent less chance of alcohol use than if they had not participated in the family programme. With regard to other drugs, one programme produced an effect on the methamphetamine use of students in the twelfth grade.[113] Although intervention effects are valid for girls and boys, as figure 18 indicates, the benefits appear to be even longer lasting for girls.[114]

108 A. Niccols and others, "Integrated programs for mothers with substance abuse issues and their children: a systematic review of studies reporting on child outcomes", *Journal of Child Abuse and Neglect*, vol. 36, No. 4 (2012), pp. 308-322.

109 Richard L. Spoth, Mark Greenberg and Robert Turrisi, "Preventive interventions addressing underage drinking: state of the evidence and steps toward public health impact", *Pediatrics*, vol. 121, Suppl. No. 4 (2008), pp. S311-S336.

110 Jane Petrie, Frances Bunn and Geraldine Byrne, "Parenting programmes for preventing tobacco, alcohol or drugs misuse in children <18: a systematic review", *Health Education Research*, vol. 22, No. 2 (2007), pp. 177-191.

111 E. Smit and others, "Family interventions and their effect on adolescent alcohol use in general populations: a meta-analysis of randomized controlled trials", *Drug and Alcohol Dependence*, vol. 97, No. 3 (2008), pp. 195-206.

112 Ibid.

113 R. L. Spoth and others, "Long-term effects of universal preventive interventions on methamphetamine use among adolescents", *Archives of Pediatrics and Adolescent Medicine*, vol. 160, No. 9 (2006), pp. 876-882.

114 L. Trudeau and others, "Longitudinal effects of a universal family-focused intervention on growth patterns of adolescent internalizing symptoms and polysubstance use: gender comparisons", *Journal of Youth Adolescence*, vol. 36, No. 6 (2007), pp. 725-740.

These interventions may appear to require considerable resources in their implementation, yet they are worthwhile according to cost-effectiveness estimations in the United States.[115] Moreover, less intensive family-oriented efforts have also been shown to initiate preventive changes, though on a smaller scale. Such efforts should actively involve parents as much as possible and include developmental as well as drug-specific topics.[116]

School and education

In drug prevention, the school setting serves as an access path for measures promoting knowledge and personal and social skills of individuals to attenuate individual risk factors of drug use (see figure 15). However, targeting the school system itself also has preventive potential, if it succeeds in promoting school bonding as well as drug-free norms.

Pre-school development programmes not only improve cognitive skills and school readiness among children from underprivileged backgrounds, they also have an impact on tobacco and cannabis consumption during later adolescent years. Reducing cannabis consumption by between 7 and 23 per cent has been achieved when providing these kinds of interventions to children at risk in kindergarten or pre-school programmes.[117] Figure 19 illustrates the results of a study in the United States,[118] in which, at age 21, the rate of current cannabis use was lower among young adults who had participated in a pre-school development programme than among a group of young adults who had a similar childhood but were not involved in the programme.

At elementary school children benefit from a series of sessions during which they learn and practise a wide range of personal and social skills to improve mental and emotional well-being, as well as to help them cope with difficult situations.[119,120] Due to the young age of this non-using, universal population, drugs are not yet mentioned, although preventive effects can be observed on aggressive behaviour and early smoking initiation, which

115 T. Miller and D. Hendrie, *Substance Abuse Prevention Dollars and Cents: A Cost-Benefit Analysis*, DHHS publication No. (SMA) 07-4298 (Rockville, Maryland, Center for Substance Abuse Prevention, Substance Abuse and Mental Health Services Administration, 2008).

116 Petrie, Bunn and Byrne, "Parenting programmes for preventing tobacco, alcohol or drugs misuse in children <18" (see footnote 110).

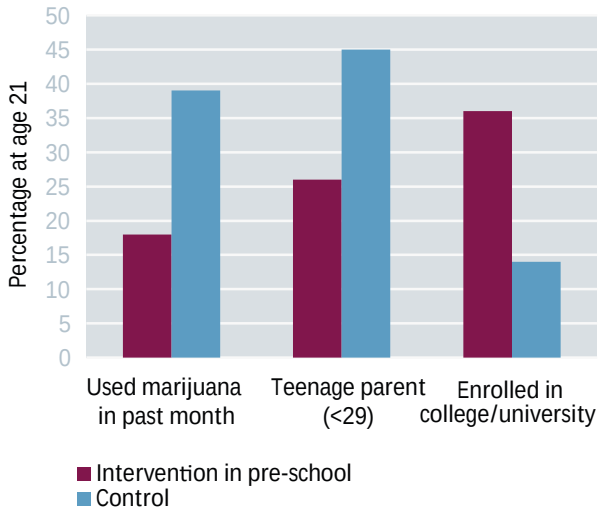
117 K. D'Onise, R. A. McDermott and J. W. Lynch, "Does attendance at preschool affect adult health? A systematic review", *Public Health*, vol. 124, No. 9 (2010), pp. 500-511.

118 F. A. Campbell and others, "Early childhood education: young adult outcomes from the abecedarian project", *Applied Developmental Science*, vol. 6, No. 1 (2002), pp. 42-57.

119 A. R. Piquero and others, *Effects of Early Family/Parent Training Programs on Antisocial Behavior and Delinquency: A Systematic Review*, Campbell Systematic Reviews (Oslo, The Campbell Collaboration, (2008)).

120 Spoth, Greenberg and Turrisi, "Preventive interventions addressing underage drinking" (see footnote 109).

FIG. 19. Cannabis use, teenage pregnancy and tertiary education among young adults who participated in a pre-school intervention



Source: Campbell and others, "Early childhood education" (2002).

are important predictors of later drug use. Participation in personal and social skills training during elementary school leads to a significant reduction in both these dimensions of childhood problem behaviour[121] compared with students in the control group.

Similarly, programmes that focus on improving the classroom environment yield positive drug-specific preventive outcomes, even if the primary focus is on academic and socio-emotional learning as well as addressing misbehaviour. Teachers are required to implement non-instructional classroom procedures in daily practices with all students, who in turn are rewarded for appropriate classroom behaviour.[122] Figure 21 illustrates that among young male adults from the United States the probability of substance-related disorders in early adulthood was significantly reduced by participation in a classroom behaviour management programme in first grade, particularly if they behaved aggressively at that time.[123] There was no such effect in the case of females.

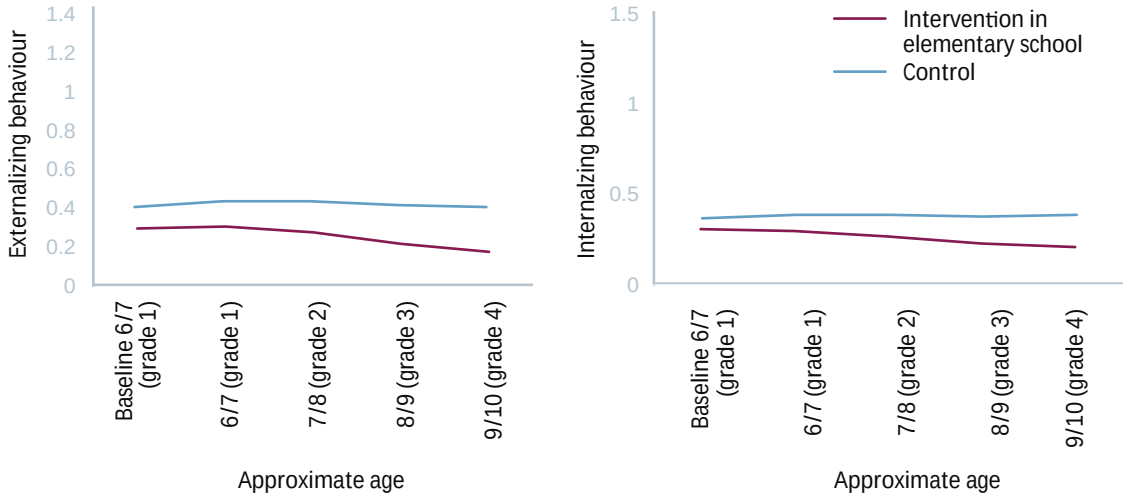
Psychosocial life-skills education in early and middle adolescence is a prevention approach for a wide range of problem behaviours initiated in adolescence, including drug

121 K. Maruska and others, "Influencing antecedents of adolescent risk-taking behaviour in elementary school: results of a 4-year quasi-experimental controlled trial", *Health Education Research*, vol. 25, No. 6 (2010), pp. 1021-1030.

122 David R. Foxcroft and Alexander Tsertsvadze, "Universal school-based prevention programs for alcohol misuse in young people", *Cochrane Database of Systematic Reviews*, No. 5, 2011.

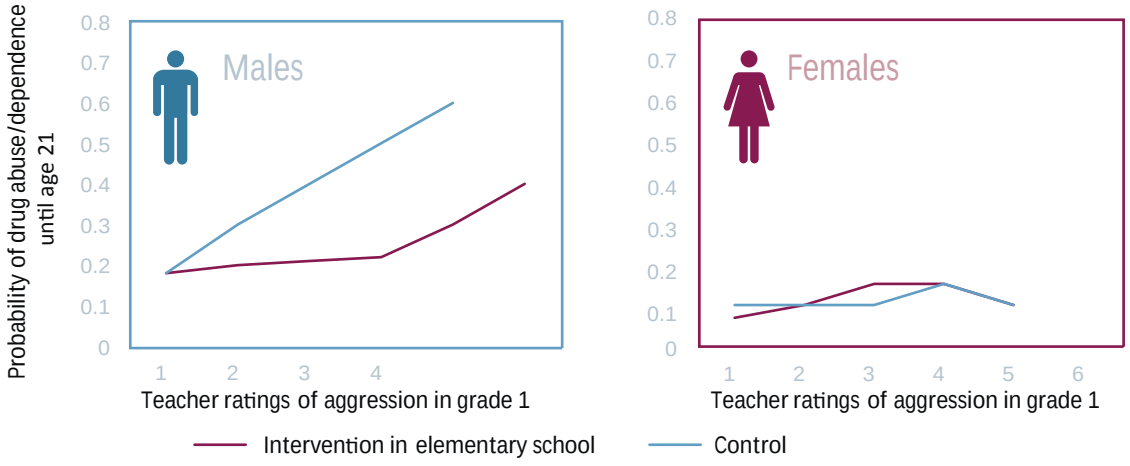
123 S. G. Kellam and others, "Effects of a universal classroom behavior management program in first and second grades on young adult behavioral, psychiatric, and social outcomes", *Drug and Alcohol Dependence*, vol. 95, Suppl. No. 1 (2008), pp. S5-S28.

FIG. 20. Trajectories of internalizing and externalizing problem behaviour among students in Germany who received ongoing personal and social skills training in elementary school



Source: Maruska and others, "Influencing antecedents of adolescent risk-taking behaviour in elementary school" (2011).

FIG. 21. Probability of subsequent development of a drug-related disorder depending on participation in a classroom behaviour management programme in first grade



Source: Kellam and others, "Effects of a universal classroom behavior management program" (2008).

use.[124,125,126] Most programmes include interactive exercises to improve several personal or social skills, such as self-awareness, creative thinking, relationship skills, problem solving, decision-making and coping with stress and emotions. Specifically with regard to substances, awareness of social influences on drug use is enhanced through critical thinking exercises. Creative thinking is used to identify functional alternatives to drug use and communication skills are built so as to increase assertiveness in resisting offers of drugs. Drug information focuses on short-term negative consequences and on normative education (that is, addressing the often exaggerated perception that adolescents have with regard to prevalence of drug use among their peers). Analysis combining the results of studies (meta-analysis calculations) on the effects of school-based illicit drug use prevention programmes estimated 28 per cent less cannabis use as a result of prevention programmes.[127] Greater effects were obtained when programmes targeted adolescents aged 14 or older, included elements from various prevention models incorporating social learning, information and value-clarification, used

124 F. Faggiano and others, "School-based prevention for illicit drugs use: a systematic review", *Preventive Medicine*, vol. 46, No. 5 (2008), pp. 385-396.

125 Amy J. Porath-Waller, Erin Basley and Douglas J. Beirnes, "A meta-analytic review of school-based prevention for cannabis use", *Health Education and Behavior*, vol. 37, No. 5 (2010), pp. 709-723.

126 Foxcroft and Tsertsvadze, "Universal School-Based Prevention Programs for Alcohol Misuse in Young People" (see footnote 122).

127 Porath-Waller, Basley and Beirnes, "A meta-analytic review of school-based prevention for cannabis use" (see footnote 125).

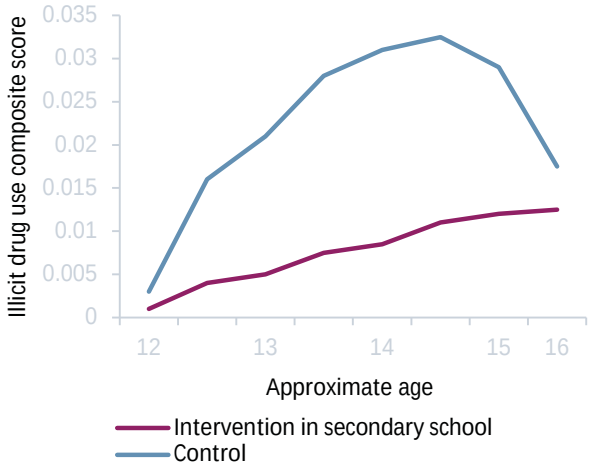
interactive methods, had more sessions, were of longer duration and were mediated by persons other than teachers. The life-skills approach also serves as an effective drug prevention tool for older adolescents with higher vulnerability for substance use, such as students who are considered at-risk of not graduating at the normal pace.[128]

These results corroborate the qualitative conclusion of a systematic review suggesting that "programs which develop individual social skills are the most effective form of school-level intervention for the prevention of early drug use" (cannabis and other drug use).[129] In contrast, presenting children with fear-arousing information is ineffective in this particular age group, as is focusing only on building self-esteem or emotional education.[130] It has been estimated that if adolescents aged 10 to 15 years receive a comprehensive programme, per month they drink alcohol on 12 days less and use cannabis on 7 days less than if they receive drug information only.[131] Figure 22 illustrates how a comprehensive positive development programme shaped illegal drug use among participants in Hong Kong, China.[132]

Computer-based universal prevention programmes without any teacher involvement have also been implemented in the school setting and have yielded effects in terms of less smoking and less alcohol use among participants.[133] Fully automated software leads students through a series of sessions in which they identify social influences and are animated to correct their false perceptions of social norms. Internet-based programmes of this kind may work outside the school context as well, but reaching the target group may be a challenge.

In a study in the United Kingdom, middle-school students with an elevated risk level due to certain personality factors benefited from personal and social skills training tailored to the specific developmental challenges caused by their behavioural tendencies.[134] Figure 23 shows how substance use developed for ninth graders with elevated scores in anxiety sensitivity, hopelessness, impulsivity and sensation seeking and therefore with elevated risk for drug use,

FIG. 22. Extent of illicit drug use among adolescents who participated in a school-based positive youth development programme at age 12



Source: Shek and Yu, "Longitudinal impact of the project PATHS on adolescent risk behavior" (2012).

Note: Graph shows the extent of illicit drug use among adolescents in Hong Kong, China, who participated at age 12 in a school-based positive youth development programme compared with the extent of illicit drug use among those who did not participate.

depending on whether they were offered a tailored intervention or not. The two-session programme included goal-setting exercises, education about coping strategies typical for those personality traits and healthy alternatives, behavioural management and changing dysfunctional beliefs that often accompany such traits. Although alcohol and drug use were only a minor focus of the intervention, problem drinking was less probable among participants after the intervention.

Apart from implementing individual-oriented interventions, preventive effects can also be achieved by targeting the general climate and drug-specific rules of schools. Feeling left out motivates people to act against conventional norms. As a major socializing agent, the school system has the potential to integrate marginalized students and facilitate positive development. With children at risk, school-bonding activities to improve school attendance and attachment to school, in addition to promoting learning of age-appropriate language and numeracy skills, may have a positive influence in terms of developing important protective factors for students in middle childhood.[135,136] Overall, interventions that promote a positive school ethos and enhance student participation and commitment to school, conjointly with rules that strongly discourage drug

128 Spoth, Greenberg and Turrisi, "Preventive interventions addressing underage drinking" (see footnote 109).

129 Faggiano and others, "School-based prevention for illicit drugs use: a systematic review" (see footnote 124).

130 Ibid.

131 M. Lemstra and others, "A systematic review of school-based marijuana and alcohol prevention programs targeting adolescents aged 10-15", *Addiction Research and Theory*, vol. 18, No. 1 (2010), pp. 84-96.

132 Daniel T. L. Shek and Lu Yu, "Longitudinal impact of the project PATHS on adolescent risk behavior: what happened after five years?", *The Scientific World Journal*, vol. 2012 (2012).

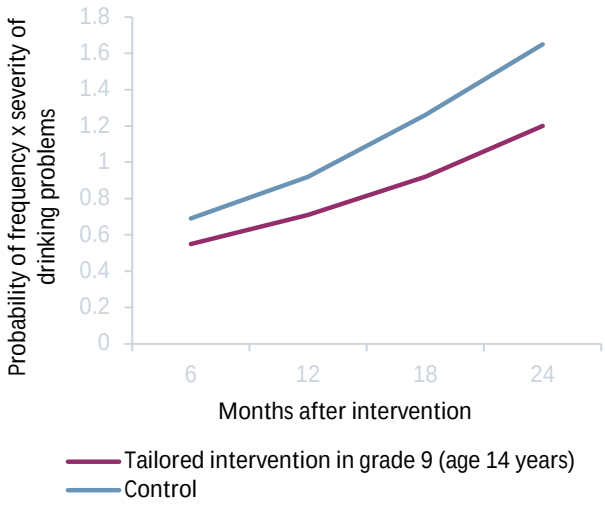
133 K. E. Champion and others, "A systematic review of school-based alcohol and other drug prevention programs facilitated by computers or the Internet", *Drug and Alcohol Review*, vol. 32, No. 2 (2012), pp. 115-123.

134 P. J. Conrod and others, "Effectiveness of a selective, personality-targeted prevention program for adolescent alcohol use and misuse", *JAMA Psychiatry*, vol. 70, No. 3 (2013), pp. 334-342.

135 P. Lucas and others, "Financial benefits for child health and well-being in low income or socially disadvantaged families in developed world countries", *Cochrane Database of Systematic Reviews*, No. 2 (2008).

136 A. Petrosino and others, *Interventions in Developing Nations for Improving Primary and Secondary School Enrollment of Children: A Systematic Review*, Campbell Systematic Reviews, No. 19 (2012).

FIG. 23. Problem drinking among students with a risk of drug use who participated in a short, tailored skills-based prevention programme



Source: Conrod and others, "Effectiveness of a selective, personality-targeted prevention program" (2013).

use, may be an effective complement to drug prevention interventions addressing individual knowledge, attitudes and skills. The few existing studies show that this seems to work, especially for boys and for early adolescents.[137,138] The consistent implementation of jointly developed behavioural standards with regard to drug use for all groups involved in school life, shapes social norms among students. By contrast, there is no evidence of preventive effects from random drug-testing at schools.[139,140]

A significant number of young adults (the age group with the highest drug use rates in high income countries) can be reached in tertiary education settings. Moving away from home to college is often paralleled by increased substance use (see figure 15). Alcohol prevention measures, which are effective with this at-risk group of young people, are brief interventions. These interventions encourage a person to document and reflect on his or her own consumption patterns and provide feedback on the person's status relative to use of substances by peers. Brief interventions are effective when they are implemented in a face-to-face or computer-assisted format, as well as in individual or group formats.[141,142,143,144] Interventions that challenge expectations of alcohol use are effective, especially with gender-homogeneous groups of college students.[145]

Workplace

Prevention programmes in the workplace typically have multiple components, including drug prevention elements and policies, as well as counselling and referral to treatment. Rigorous prevention effectiveness studies are rare in this setting; some have assessed individual interventions but none have evaluated comprehensive approaches aimed at changing the entire system.[146] Evidence from single studies is available with regard to alcohol use and suggests that alcohol education and stress management interventions, as well as personal or computer-based brief interventions, affect alcohol use or alcohol-related problems among employees. Availability of alcohol in the workplace is associated with alcohol use, so restricting access to alcohol and setting strict and unambiguous alcohol policies may prevent the drinking of alcohol before going to work, on the job and during breaks.

Community

The community can provide a preventive developmental context by setting clear standards with regard to the use of drugs, along with providing opportunities for adolescents to learn skills and to contribute to community life and be recognized for their contribution. Opportunities, skills and recognition strengthen bonding with family, school and community. Tight bonds motivate young people to adopt healthy standards of behaviour.

Community-wide interventions for the general population

Preventive effects were evidenced in programmes that incorporate multiple components in the community, especially when relating to alcohol but less consistently when

137 C. Bonell and A. Fletcher, "Improving school ethos may reduce substance misuse and teenage pregnancy", *BMJ*, No. 334 (2007), pp. 614-616.

138 A. Fletcher, C. Bonell and J. Hargreaves, "School effects on young people's drug use: a systematic review of intervention and observational studies", *Journal of Adolescent Health*, vol. 42, No. 3 (2008), pp. 209-220.

139 A. M. Roche and others, "Drug testing in Australian schools: policy implications and considerations of punitive, deterrence and/or prevention measures", *International Journal of Drug Policy*, vol. 20, No. 6 (2009), pp. 521-528.

140 Daniel T. L. Shek, "School drug testing: a critical review of the literature", *Scientific World Journal*, vol. 10 (2010), pp. 356-365.

141 J. M. Cronce and M. E. Larimer, "Individual-focused approaches to the prevention of college student drinking", *Alcohol Research and Health*, vol. 34, No. 2 (2011), pp. 210-221.

142 M. T. Moreira, L. A. Smith and D. Foxcroft, "Social norms interventions to reduce alcohol misuse in university or college students", *Cochrane Database of Systematic Reviews*, No. 3 (2009).

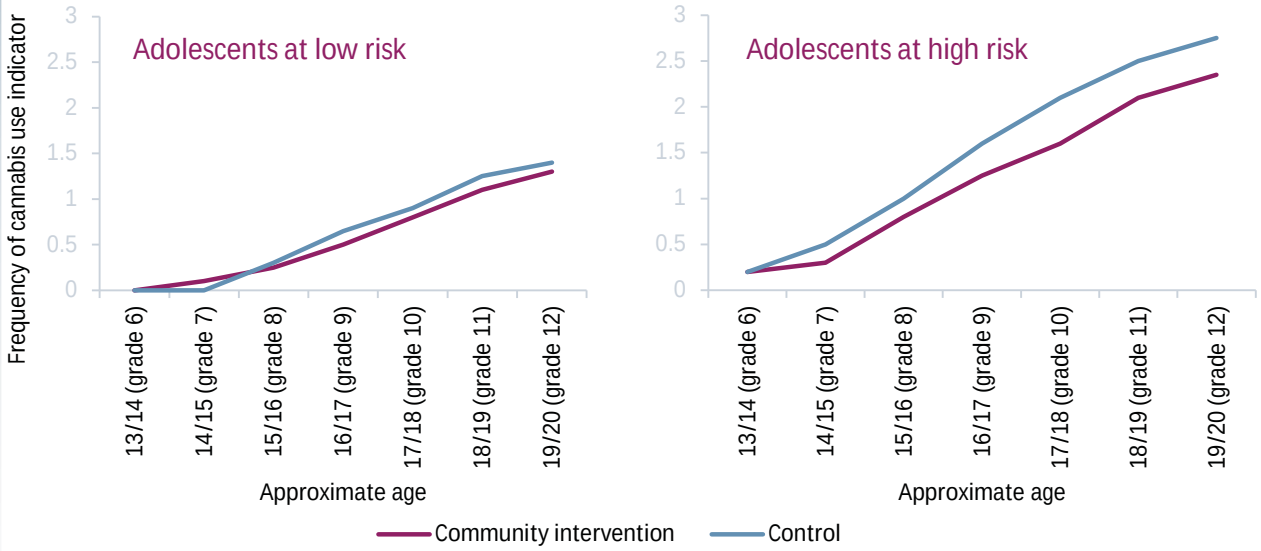
143 K. B. Carey and others, "Computer-delivered interventions to reduce college student drinking: a meta-analysis", *Addiction*, vol. 104, No. 11 (2009), pp. 1807-1819.

144 Robert J. Tait and Helen Christensen, "Internet-based interventions for young people with problematic substance use: a systematic review", *Medical Journal of Australia*, vol. 192, No. 11 (2010), pp. S15-S21.

145 Allison K. Labbe and Stephen A. Maisto, "Alcohol expectancy challenges for college students: a narrative review", *Clinical Psychology Review*, vol. 31, No. 4 (2011), pp. 673-683.

146 G. Webb and others, "A systematic review of work-place interventions for alcohol-related problems", *Addiction*, vol. 104, No. 3 (2009), pp. 365-377.

FIG. 24. Cannabis use among at-risk students from school districts implementing a family programme in sixth grade and life skills programme in seventh grade



Source: Spoth and others, "PROSPER community-university partnership delivery system effects on substance misuse" (2013).

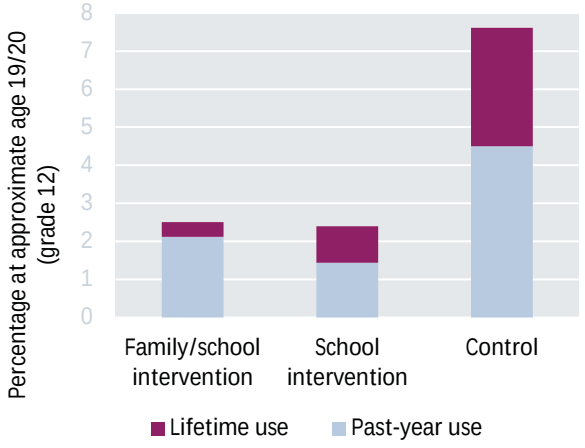
Note: High risk among adolescents was initiation of alcohol, cigarette or cannabis use prior to baseline; low risk meant no initiation of substance use at baseline.

relating to tobacco and cannabis use.[147,148,149] The minimum set-up is a combined approach of a school and a family intervention embedded in the structure of an organized community coalition. The coalition decides which evidence-based programmes to implement in the community. Some programmes do this on the basis of assessing a need that has been indicated by a student survey on risk and protective factors.

A universal community prevention model that originated in the United States and has since become international, supports and trains local coalitions of stakeholders to select and implement evidence-based prevention programmes targeting community-specific elevated risks for problem behaviours among adolescents. Six and a half years after the project had begun, youths exposed to this community initiative were 31 per cent less likely to have ever used alcohol, cigarettes or cannabis.[150]

Figure 24 indicates that cannabis use expands less and later during adolescence in university-school-community partnership districts in the United States. These districts provide a family programme in the sixth grade (13 to 14 year-olds) and a life skills, social influence or normative school programme in the seventh grade (14 to 15 year-olds) delivered in the framework of a university-community-school partnership.[151] Figure 25 shows the difference in methamphetamine use in twelfth graders aged 19 to 20 years depending on whether they were involved in both the family and the school programmes or only in the school programme within the community partnership, or were in a school district that was part of the control group.

FIG. 25. Extent of methamphetamine use among young adults who participated in a family and a life-skills training programme



Source: Spoth and others, "Long-term effects of universal preventive interventions on methamphetamine use among adolescents" (2006).

147 Foxcroft and Tsertsvadze, "Universal School-Based Prevention Programs for Alcohol Misuse in Young People" (see footnote 122).

148 K. V. Carson and others, "Community interventions for preventing smoking in young people", *Cochrane Database of Systematic Reviews*, No. 7 (2011).

149 S. Gates and others, "Interventions for prevention of drug use by young people delivered in non-school settings", *Cochrane Database of Systematic Reviews*, No. 1. (2009).

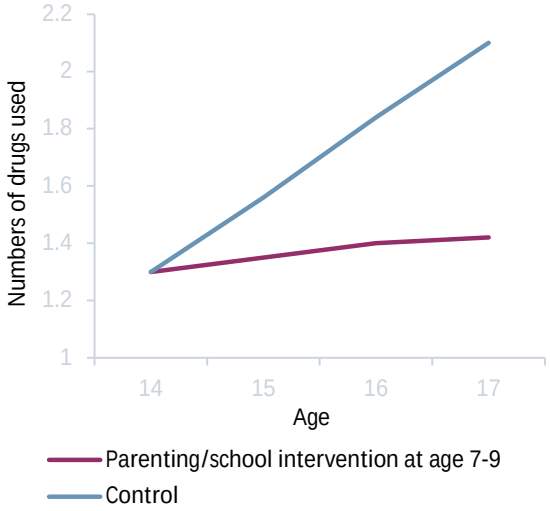
150 J. D. Hawkins and others, "Youth problem behaviors 8 years after implementing the communities that care prevention system: a community-randomized trial", *JAMA Pediatrics*, vol. 168, No. 2 (2014), pp. 122-129.

151 R. Spoth, and others, "PROSPER community-university partnership delivery system effects on substance misuse through 6 1/2 years past baseline from a cluster randomized controlled intervention trial", *Preventive Medicine*, vol. 56, Nos. 3 and 4 (2013), pp. 190-196.

Multi-sectorial interventions for vulnerable populations

Family-school approaches without a community component that are specifically designed for children at risk are also effective. The most prominent individual predictor of later substance use disorders in childhood is disruptive behaviour facilitated, inter alia, by poor impulse- and self-control and aggressiveness (see figure 26). From a developmental point of view, these characteristics hamper rewarding situations and relationships at school, in the family and with friends, and thus elevate the risk of alienation from conventional contexts. Alienated adolescents may have a tendency to turn to peers with deviant norms, which then facilitates maladaptive behaviour, including drug use. Therefore, targeting externalization of problems or disorders during childhood represents an important strategy for prevention not only of drug use but also of disruptive, antisocial and delinquent behaviours, as well as for addressing problems related to academic performance and dropping out of school. These training programmes or treatments allow parental or even familial involvement to be effective. Figure 26 shows the effect of social skills training at school with boys aged 7 to 9 years that was combined with parenting training during family visits in late adolescence. Further results of the study suggest that participants reported less drug use because of the programme's support in lessening their impulsivity and antisocial behaviour and promoting making friends with less deviant peers. In addition, increased parental supervision contributed to the preventive effect of the programme.

FIG. 26. Differences in drug use among vulnerable boys who participated in a skills training programme for students and their parents



Source: N. Castellanos-Ryan and others, "Impact of a 2-year multimodal intervention for disruptive 6-year-olds on substance use in adolescence: randomised controlled trial", The *British Journal of Psychiatry*, vol. 203, No. 3 (2013), pp. 188-195.

Alcohol and tobacco policies

As mentioned in the preceding sections, a younger age at first alcohol and nicotine use was related with later initiation of cannabis use; thus, the prevention of alcohol and tobacco use is also relevant to the prevention of drug use. In this context, policies that increase prices (and thus manipulate affordability) and restrict access to these substances have been found to be very effective. From a tobacco price increase of 10 per cent, a reduction of 4 per cent in tobacco consumption can be expected.[152] Similarly, a 10 per cent price increase is estimated to decrease heavy alcohol consumption by 5 per cent among older adolescents and even decrease binge drinking among young adults by between 9 and 35 per cent.[153] In addition, study results in the United States consistently show that raising the minimum legal drinking age and enforcing its regulation reduces alcohol consumption and alcohol-related accidents while lowering the legal drinking age increases use and related problems.[154]

Leisure, sports and entertainment venues

Unlike school and family settings, recommendations for interventions in other areas of community life cannot be made based on the same level of evidence. The effectiveness of specific drug prevention efforts in leisure settings, for example peer education programmes at festivals or activities in sports clubs, has not yet been studied in depth. This may be surprising as peer education programmes are widely used in drug prevention and other prevention domains.[155] Sports clubs have been described as both a setting with great potential for promoting good health and a risk environment for drug use,[156] but effectiveness studies are not available. Furthermore, providing low-resource-intensive leisure activities to children and youths is a popular non-drug-specific prevention intervention, but these activities have not been empirically studied with regard to their effect in attenuating substance use or risk factors of substance use. Theoretically, they may in fact constitute an element of a healthy developmental context. Nevertheless, whether they yield drug use preventive effects remains unknown. Research on the effectiveness of

152 D. P. Hopkins and others, "Reviews of evidence regarding interventions to reduce tobacco use and exposure to environmental tobacco smoke", *American Journal of Preventive Medicine*, vol. 20, No. 2, Suppl. No. 1 (2001), pp. 16-66.

153 R. W. Elder and others, "The effectiveness of tax policy interventions for reducing excessive alcohol consumption and related harms", *American Journal of Preventive Medicine*, vol. 38, No. 2 (2010), pp. 217-229.

154 Alexander C. Wagenaar and Traci L. Toomey, "Effects of minimum drinking age laws: review and analyses of the literature from 1960 to 2000", *Journal of Studies on Alcohol*, Suppl. No. 14 (2002), pp. 206-225.

155 A. Calafat, J. Montse and M. A. Duch, "Preventive interventions in nightlife: a review", *Adicciones*, vol. 21, No. 4 (2009), pp. 387-414.

156 S. Geidne, M. Quennerstedt and C. Eriksson, "The youth sports club as a health-promoting setting: an integrative review of research", *Scandinavian Journal of Public Health*, vol. 41, No. 3 (2013), pp. 269-283.

after-school programmes that aim to promote personal and social skills points to the fact that risky behaviours in general, including drug use, can be prevented but only under certain conditions, that is, if they use a connected and coordinated set of activities, as well as interactive methods, have at least one component devoted to developing personal or social skills and explicitly target the skill in question.[157] In this scenario, after-school programmes are more of a setting to deliver life skills education than a separate programme.

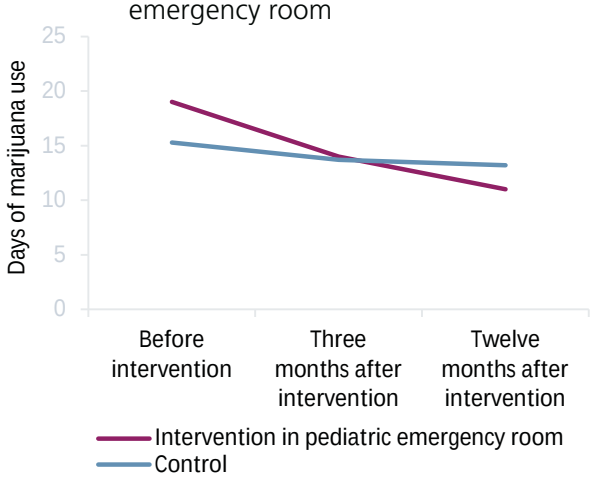
Mentoring programmes are another approach among after-school programmes. Lay adults spend structured leisure time with a child or adolescent on a weekly basis. With adolescents at average risk, modest preventive effects were observed for general risk behaviour, including drug use.[158] Mentoring programmes for groups with a high proportion of minority and underprivileged adolescents can be expected to reduce the risk of alcohol use initiation among the mentees by 29 per cent, whereas effects on other drug use are rare.[159]

Most prevention programmes utilizing entertainment venues have multiple components, including different combinations of training of staff and managers on responsible beverage service and management of intoxicated patrons; changes in laws and policies, for example with regard to serving alcohol to minors or to intoxicated persons or with regard to drinking and driving; high visibility enforcement of existing laws and policies; communication to raise awareness and acceptance of the programme and to change attitudes and norms; and offering treatment to managers and staff. Training of staff, policy interventions and enforcement may reduce intoxication.[160,161] Although community support through training servers of beverages in nightlife settings or of vendors of cigarettes may succeed in educating commercial suppliers of alcohol and tobacco, preventive effects at the community level can only be expected to be successful if regulations are enforced, that is controlled and sanctioned.[162,163,164]

Health sector

The community health sector can prevent progression to substance use disorders (when it is in touch with individuals already using drugs) by providing brief interventions. In the few, short and structured sessions of these interventions, trained health or social workers first identify whether there is a problem of substance use and then provide basic counselling or referral to additional treatment. Brief interventions work in many settings (school or medical or community-based treatment centres) if they target cannabis use and follow the motivational enhancement approach.[165,166] It differs from other treatment interventions in that its purpose is not to impart information or skills; rather, it picks the client's general and drug-specific goals as a central theme for promoting ambivalence and readiness to change while supporting the person's autonomy. Figure 27 demonstrates the effectiveness of a brief motivational intervention after 12 months, conducted in the United States by peer educators during a visit to a paediatric emergency department, to negotiate abstinence or reductions in cannabis use and its related consequences among 14 to 21 year olds.[167] Adolescents and young adults used cannabis less frequently if they received the brief motivational intervention.

FIG. 27. Frequency of cannabis use by adolescents and young adults after receipt of a brief intervention in a paediatric emergency room



Source: Bernstein and others, "Screening and brief intervention to reduce marijuana use among youth and young adults in a pediatric emergency department" (2009).

157 Joseph A. Durlak, Roger P. Weissberg and Molly Pachan, "A meta-analysis of after-school programs that seek to promote personal and social skills in children and adolescents", *American Journal of Community Psychology*, vol. 45, Nos. 3 and 4 (2010), pp. 294-309.

158 D. L. DuBois and others, "Effectiveness of mentoring programs for youth: a meta-analytic review", *American Journal of Community Psychology*, vol. 30, No. 2 (2002), pp. 157-197.

159 R. E. Thomas, D. Lorenzetti and W. Spragins, "Mentoring adolescents to prevent drug and alcohol use", *Cochrane Database of Systematic Reviews*, No. 2 (2011).

160 L. Bolier and others, "Alcohol and drug prevention in nightlife settings: a review of experimental studies", *Substance Use and Misuse*, vol. 46, No. 13 (2011), pp. 1569-1591.

161 I. Brennan and others, "Interventions for disorder and severe intoxication in and around licensed premises, 1989-2009", *Addiction*, vol. 106, No. 4 (2011), pp. 706-713.

162 Bolier and others, "Alcohol and drug prevention in nightlife settings" (see footnote 160)

163 Lindsay F. Stead and Tim Lancaster, "Interventions for preventing tobacco sales to minors", *Cochrane Database of Systematic Reviews*, No. 1 (2005).

164 Joseph R. DiFranza, "Which interventions against the sale of tobacco to minors can be expected to reduce smoking?", *Tobacco Control*, vol. 21, No. 4 (2012), pp. 436-442.

165 T. Carney and others, "Brief school-based interventions and behavioural outcomes for substance-using adolescents", *Cochrane Database of Systematic Reviews*, No. 2 (2014).

166 E. Barnett and others, "Motivational interviewing for adolescent substance use: a review of the literature", *Addictive Behaviors*, vol. 37, No. 2 (2012), pp. 1325-1334.

167 E. Bernstein and others, "Screening and brief intervention to reduce marijuana use among youth and young adults in a pediatric emergency department", *Academic Emergency Medicine*, vol. 16, No. 11 (2009), pp. 1174-1185.

Media

On a societal level, besides availability and affordability, norms favourable to drug use constitute a risk factor for drug use (see figure 15). As already described, affordability and availability may be influenced by enforcement of laws and regulations. Laws and regulations may also be understood as formal expressions of social norms. Children, adolescents and young adults face norms of drug use informally by means of approval or disapproval expressed by peers, parents, teachers, neighbours and other community members. Media campaigns are a way to influence these informal social norms. Awareness campaigns or expanding media coverage to increase awareness of and focus on drug-related issues are often one component of state or community programmes and there are positive indications regarding their effect on tobacco consumption.[168] Nevertheless, campaigns cannot be expected to influence drug use behaviour directly. Although observational data suggest that methamphetamine deterrence campaigns in the United States are paralleled by a reduction in current drug use in the teenager cohort, these results are not corroborated by rigorous studies.[169] Anti-illicit-drug public-service announcements in traditional and new media demonstrated no significant effect on drug use in high quality effectiveness studies and may even be harmful by weakening anti-cannabis norms among young target groups.[170]

The way forward

The scientific evidence reviewed and presented in this section illustrates that effective and feasible interventions and policies are available for drug prevention. However, the gaps in both evidence and effectiveness research point to the fact that more evaluation of impact is needed. Reaching those groups with heightened vulnerability remains a challenge, while the question of how to adapt interventions developed in optimal conditions to real-life, local contexts has not yet been fully answered.

Many activities labelled as drug prevention are not evidence-based, their coverage is limited and their quality unknown at best. Among other international organizations, UNODC has tried to fill this evidence gap through its International Standards on Drug Prevention, which clearly identify interventions and policies that work and the characteristics that are linked to positive prevention outcomes. In addition, the EMCDDA European Quality Standards of Drug Prevention provide support in how to implement quality interventions and other remarkable tools have also been developed.

In summary, countries need to move away from a model in which prevention of drug use is delivered by isolated but well-intentioned individuals who improvise in delivering interventions. Based on the specific situation, interventions should employ and expand the use of evidence-based tools systematically, supporting practitioners and policymakers in developing their knowledge, skills and competencies and building a critical mass of genuine prevention specialists capable of promoting the safe and healthy development of children, youth, families and communities through effective prevention of drug use.

E. TREATMENT OF DRUG USE

Treatment of drug use disorders and dependence

With an estimated global average of one in six people who suffer from drug-use disorders or drug dependence receiving treatment each year, it is clear that the accessibility and availability of services for such conditions are limited in most countries.[171] The fact that this figure is approximately 1 in 18 in Africa, compared with 1 in 5 in Western and Central Europe, however, points to large disparities between regions. Not included in these figures is the large proportion of drug users who may not be dependent but may still require interventions to prevent an escalation in their disability and comorbidity related to drug use.

Disparities between regions also exist in the principal drugs for which drug users receive treatment, with cannabis being the principal drug reported in Africa, cannabis, cocaine and to a lesser extent opioids in North America, and cocaine and cannabis in Latin America. In Asia, opioids remain the principal drug type for which drug users receive treatment, followed by ATS and cannabis. In Europe, opioids are followed by cannabis, cocaine and ATS, while in Oceania cannabis is followed by opioids and ATS. It should be noted, however, that while treatment demand highlights the main substances of concern, it also reflects the nature of available drug treatment services.

Although regional differences in the availability of different interventions exist, psychosocial interventions, particularly counselling and social assistance services, are more readily accessible and available globally than other interventions. Indeed, more than a third of countries reported the availability of psychosocial, rehabilitation and aftercare services whereas less than a quarter reported the availability of pharmacological interventions (see figures 28-30).

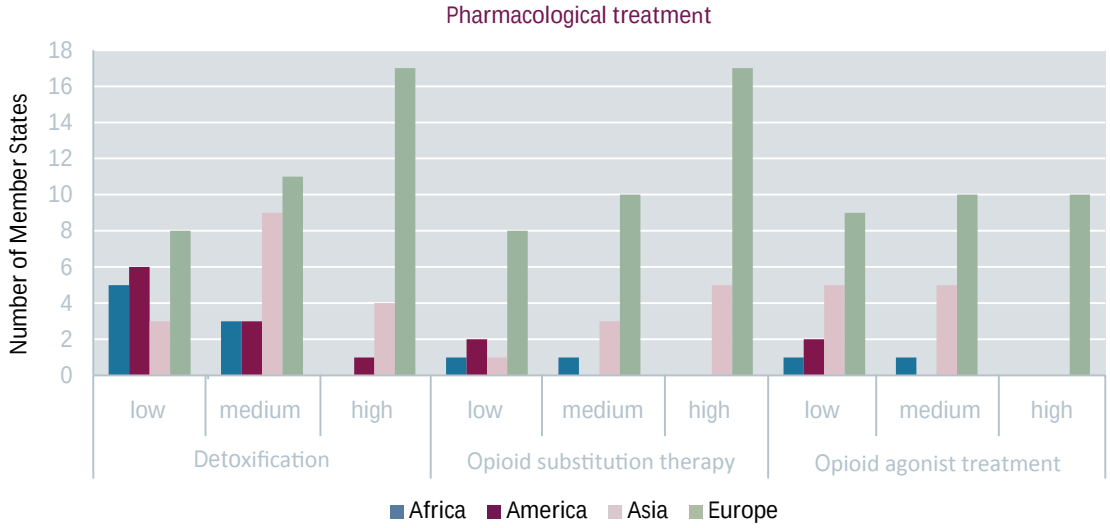
168 D. P. Hopkins and others, "Reviews of evidence regarding interventions to reduce tobacco use and exposure to environmental tobacco smoke", *American Journal of Preventive Medicine*, vol. 20, No. 2, Suppl. No. 1 (2001), pp. 16-66.

169 M. Ferri and others, "Media campaigns for the prevention of illicit drug use in young people", *Cochrane Database of Systematic Reviews*, No. 6 (2013).

170 D. Werb and others, "The effectiveness of anti-illicit-drug public-service announcements: a systematic review and meta-analysis", *Journal of Epidemiology and Community Health*, vol. 65, No. 10 (2011), pp. 834-840.

171 Based on the responses to the annual report questionnaire on availability and coverage of drug treatment services. See also E/CN.7/2015/3.

FIG. 28. Global extent of drug dependence treatment services, by region



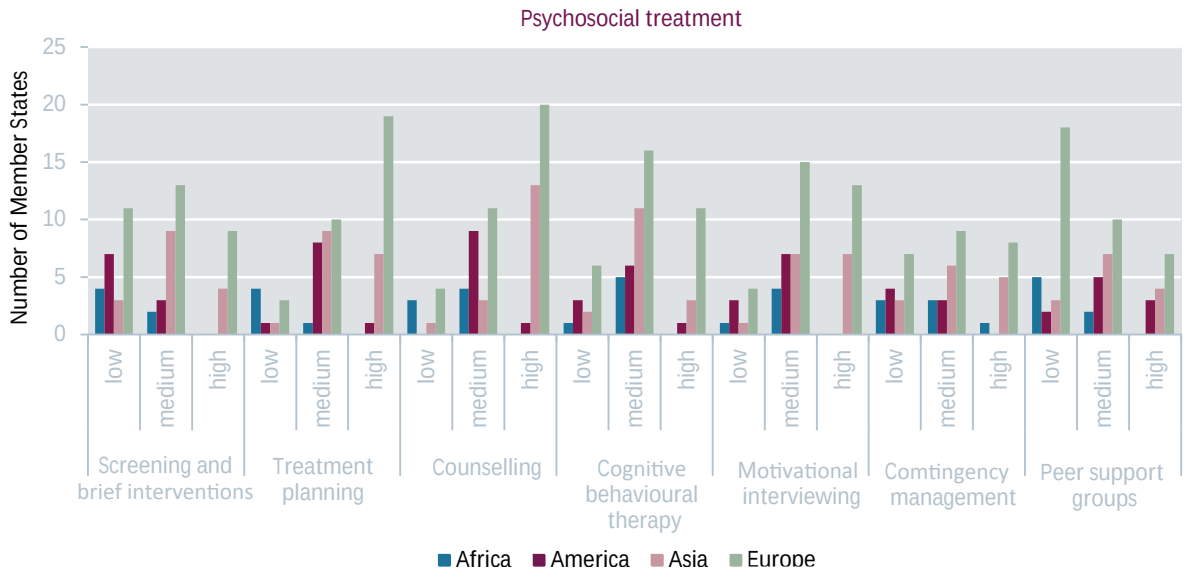
Source: Annual report questionnaire, part II (Member State responses on treatment of drug dependence in 2013).

It is difficult to determine the quality of different types of intervention available at the global level, but there is a greater level of pharmacological and psychosocial services and interventions in Europe than in other regions, particularly Western and Central Europe, where higher levels of opioid substitution also reflect the fact that opioids are the major substance for which drug users receive treatment in the region. In other regions, Governments may not yet be ready to address drug dependence with pharmacologically assisted treatment, leading to limited coverage of such programmes.

In Africa, the fact that counselling is more available than other types of intervention could be due to cannabis being the most common substance for which drug users receive treatment. However, most drug treatment services in the region are provided in specialized psychiatric hospitals, which may explain why there is a considerable number of interventions in the treatment of psychiatric comorbidities in Africa, although the lack of other types of intervention in Africa may also indicate limited responses to treatment needs in general.

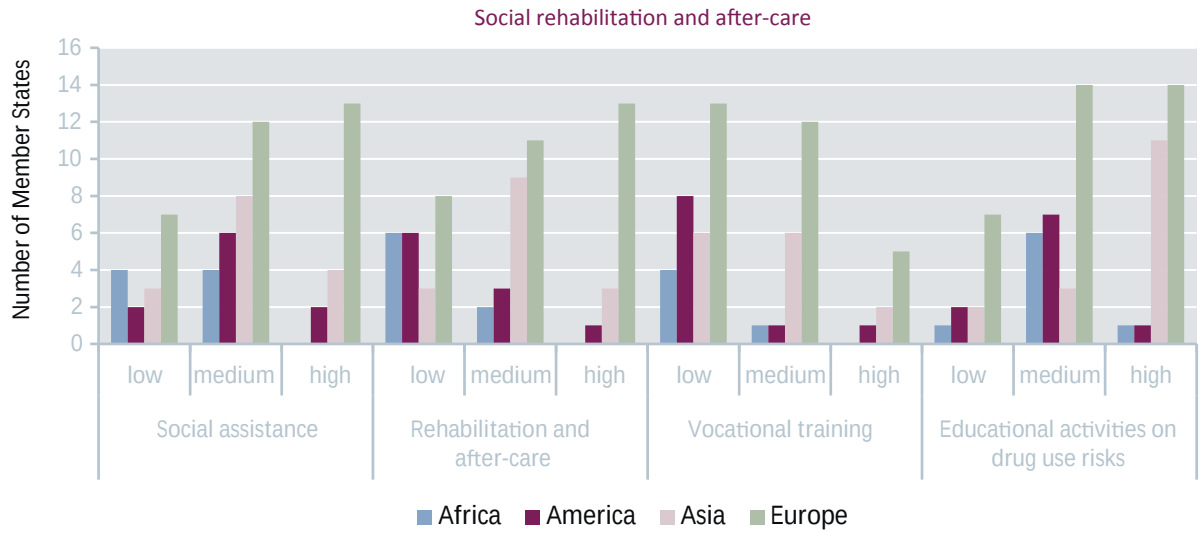
Not only are available services for the treatment of drug use disorders and dependence limited in most countries, there is an overall lack of provision of a continuum of care in interventions to address drug use disorders and drug dependence adequately among those in need of these inter-

FIG. 29. Global extent of drug dependence treatment services, by region



Source: Annual report questionnaire, part II (Member State responses on treatment of drug dependence in 2013).

FIG. 30. Global extent of drug dependence treatment services, by region



Source: Annual report questionnaire, part II (Member State responses on treatment of drug dependence in 2013).

ventions. An outline of what drug treatment actually entails, particularly when considered a chronic condition, and how it should be measured for effectiveness is provided in this section.

Philosophy of chronic care versus acute care: continuity of interventions

Scientific evidence indicates that the development of drug use disorders and dependence is a result of a complex multi-factorial interaction between repeated exposure to drugs and biological and environmental factors. In recent decades, important advances have been made in understanding drug dependence as a complex, multifaceted and relapsing chronic condition. Such a condition therefore requires continuing care and interventions from many disciplines.[172]

These findings have led to increased interest in the development of effective prevention and treatment strategies.[173] It is now known that drug use disorder is a preventable and treatable health problem, and effective, comprehensive and multidisciplinary interventions are available to respond to the different needs of affected individuals.[174] It is critically important, however, to appreciate the chronic nature of the disorder, together with the fact that chronic conditions cannot and should not be treated like acute disorders, for which contemporary medical science has provided indisputable evidence.[175]

There are fundamental differences in the philosophies relating to the treatment of acute and chronic conditions. Acute conditions such as bacterial infections, appendicitis and broken bones, tend to have a clearly identifiable cause (for example an infectious agent, physical trauma, etc.) and can be treated in a relatively short period of time. The symptoms of acute disorders may be intense and disruptive, but people who are treated generally recover with no lasting deterioration of functional capabilities. An individual may break another bone or get another infection, but this is considered a new occurrence, not a relapse. Treatment services for acute disorders are typically delivered in a series of isolated activities — screening, admission, single point-in-time assessment, treatment procedures, discharge and brief "aftercare" followed by the termination of the service relationship. The individual, family or community is given the impression at discharge that "cure has occurred", which is often the case. Long-term recovery is then self-sustainable without ongoing professional assistance.[176,177]

By contrast, chronic health problems such as diabetes, asthma and hypertension are influenced by multiple biological, psychological and social factors, some of which cannot be clearly identified. Lifestyle or personal behavioural choices are often intimately involved in the onset and course of these disorders.[178] There are many effective treatments for chronic disorders, but they tend to be more complex and protracted than acute treatments and do not

172 UNODC and WHO, "Principles of drug dependence treatment", discussion paper, March 2008.

173 Michael Dennis and Christy K. Scott, "Managing addiction as a chronic condition", *Addiction Science and Clinical Practice Perspectives*, vol. 4, No. 1 (2007), pp. 45-55.

174 Ibid.

175 A. Thomas McLellan and others, "Reconsidering the evaluation of addiction treatment: from retrospective follow-up to concurrent recovery monitoring", Addiction, vol. 100, No. 4 (2005), pp. 447-458.

176 Y. I. Hser and others, "Drug treatment careers: a conceptual framework and existing research findings", *Journal of Substance Abuse Treatment*, vol. 14, No. 6 (1997), pp. 543-558.

177 R. L. Stout and others, "Optimizing the cost-effectiveness of alcohol treatment: a rationale for extended case monitoring", *Addictive Behaviors*, vol. 24, No. 1 (1999), pp. 17-35.

178 Thomas Bien, William R. Miller and J. Scott Tonigan, "Brief intervention for alcohol problems: a review", *Addiction*, vol. 88, No. 3 (1993), pp. 315-335.

often result in a "cure" or the same outcome as the treatment of acute conditions. Yet multiple treatment interventions for chronic conditions have been found to be very effective. Treatment of these chronic conditions share three important features:[179]

(a) They can usually remove or reduce symptoms without necessarily removing the root causes of a disease. For example, beta blockers reduce blood pressure and insulin improves the body's ability to digest sugars, as long as the affected individual continues the treatment, i.e., continues taking the medicine;

(b) Treatment of all chronic conditions requires significant changes in behaviour and lifestyle on the part of the patient in order to maximize their benefit. Again, even if individuals with diabetes regularly take their insulin as prescribed, the disease progression will continue if they do not also reduce their intake of sugar and increase physical exercise;

(c) Because of the complexity of the factors that can lead to a chronic illness and the need for ongoing medical care and lifestyle change, it is not surprising that relapses are very likely to occur in all chronic illnesses.

For these reasons, most contemporary treatment strategies in chronic illness involve regular monitoring of medication adherence, coupled with encouragement and support for pro-health behavioural changes as well as support by trained family members, to provide continuing monitoring and assistance for the behavioural changes necessary to sustain good quality of life. Consequently, "nothing less" must be provided or can be effective for the treatment of drug dependence than a qualified, systematic, science-based approach, similar to treatment of other chronic health problems such as diabetes or hypertension.

Is drug treatment better than no treatment?

Effectiveness of treatment

For over four decades scientific research has shown that effective treatment for drug-use disorders has helped drug-dependent individuals to halt their consumption, prevent relapse, reduce their involvement in crime, change other dysfunctional behaviour and make a positive contribution to their family and community.[180] Effective treatment typically incorporates many components — pharmacotherapy, behavioural therapy and social support — each directed towards a particular aspect of the disorder and matching an individual's particular problems and needs.[181]

179 Sondra Burman, "The challenge of sobriety: natural recovery without treatment and self-help programs", *Journal of Substance Abuse*, vol. 9 (1997), pp. 41-61.

180 United States, Department of Health and Human Services, National Institute on Drug Abuse, *Principles of Drug Addiction Treatment: A Research-based Guide*, 3rd ed., NIH publication No. 12-4180 (2012).

181 Ibid.

Treatment programmes for women

Research indicates that current addiction treatment programmes can be effective for different age and gender groups.[182] Studies that have reviewed treatment programmes for women indicate that women who are enrolled in gender-specific programmes, which in addition to pharmacotherapy and behavioural therapy address their unique treatment needs, have better treatment outcomes and improvements in important areas of their lives than those women who are in non-gender-specific programmes. These interventions may include addressing psychosocial issues that are more prevalent among women such as child care and employment support, family issues, psychiatric comorbidities, and psychological issues such as child abuse and trauma, victimization.[183,184,185]

Treatment programmes for adolescents

The findings of several large studies[186,187] clearly indicate that treatment programmes can decrease drug and alcohol use, improve school performance and reduce the nature and extent of problem behaviours. The National Institute on Drug Abuse supported Drug Abuse Treatment Outcome Studies for Adolescents (DATOS-A) reviewed 23 community-based adolescent treatment programmes, which in essence addressed peer relationships, educational concerns and family issues such as parent-child relationships and parental substance use. They also included elements of adult treatment programmes, such as participation in group therapy and in a 12-step programme. Adolescents who participated in these treatment programmes have reported improved psychological adjustment, and longer stays in treatment produced more favourable outcomes in several of the criteria. However, strategies specific to adolescents are needed to improve their treatment retention and completion in order to maximize the therapeutic benefits of drug treatment.[188]

Cost and benefit of treatment

An apparent major benefit of drug treatment, aside from the recovery of the patient and the subsequent health and social implications, is the element of cost, as research studies indicate that spending on treatment is cost-

182 Ibid.

183 S. F. Greenfield and others, "Substance abuse treatment entry, retention, and outcome in women: a review of the literature", *Drug and Alcohol Dependence*, vol. 86, No. 1 (2007), pp. 1-21.

184 R. E. Claus and others, "Does gender-specific substance abuse treatment for women promote continuity of care?", *Journal of Substance Abuse Treatment*, vol. 32, No. 1 (2007), pp. 27-39.

185 United Kingdom, National Health Services, National Treatment Agency for Substance Misuse, "Women in drug treatment: what the latest figures reveal", March 2010.

186 Y. I. Hser and others, "An evaluation of drug treatments for adolescents in 4 US cities", *Archives of General Psychiatry*, vol. 58, No. 7 (2001), pp. 689-695.

187 Kimberly R. Martin, "Adolescent treatment programs reduce drug abuse, produce other improvements", *NIDA Notes*, vol. 17, No. 1 (2002).

188 Ibid.

effective.[189,190,191] At the least, the ratio of saving to investment is 3:1 (for every dollar invested three are saved), and when a broader calculation of costs associated with crime, health and social productivity is taken into account, the rate of savings to investment can rise to 13:1.[192]

When the cost of each option is weighed up, it can be shown that drug treatment is less expensive than either incarceration or a complete lack of treatment.[193] Drug treatment is cost-effective in reducing drug use along with its associated health and social costs and it is also less expensive than the alternatives, such as not treating addicts or simply incarcerating dependent users. For example, in the United States the average cost of one full year of methadone maintenance treatment is approximately $4,700 per patient, whereas one full year of imprisonment costs approximately $18,400 per person.[194] In the United Kingdom, it is estimated that, with under 165,000 people in treatment for heroin and/or "crack" dependency, an estimated 4.9 million acquisitive crimes such as burglary, robbery and shoplifting were prevented during 2010-2011.[195]

Although many treatment activities can be initially resource intensive, every dollar invested in treatment yields up to 10 dollars in reduced costs in lost productivity, use of social services and criminality.[196] When savings related to health care are included, total savings can exceed costs by a ratio of 12 to 1. Major savings to the individual and society also come from significant drops in interpersonal conflicts, improvements in workplace productivity and reductions in drug-related accidents.

Why drug treatment is often perceived to be ineffective

The scientific evidence is clear that the best available treatments for individuals with drug dependence are those that are ongoing, able to address multiple problems in numerous life domains — such as medical and psychiatric symptoms and social instability — and are well integrated into the community, making them available and accessible to such individuals.

One major difference in the perception of their ineffectiveness is that drug dependence treatments are not provided and evaluated under the same assumptions that pertain to other chronic illnesses. Particularly important in this regard is that drug dependence treatments are rarely delivered under a continuing care model that would be appropriate for a chronic health problem. Indeed, with the exception of methadone maintenance and the 12-step approach, most contemporary treatments for drug dependence are acute care episodes.

It is common for a drug dependent individual to be admitted to a 30 to 90 day outpatient rehabilitation programme,[197] rarely accompanied by medical monitoring or medication. This period of treatment is typically followed by discharge and while the intentions and overall goals of treatment might be conceptualized as ongoing by those in the treatment field, operationally addiction treatments are delivered in much the same way as one might treat a patient with a broken bone or with an acute infection.

Outcome evaluations tend to be conducted 6 to 12 months after treatment discharge. A major (and sometimes exclusive) measure in all such evaluations is whether patients have been continuously abstinent since leaving treatment. In other words, policymakers and society in general generally ignore the fact that during treatment patients are most likely to experience significant symptom (compulsive drug use) decrease and an improvement in psychosocial functioning, with treatment effectiveness only being measured based on pre- and post-outcomes, an approach that is applicable for the treatment of acute conditions.

If these goals and this treatment/evaluation strategy were applied to a hypothetical hypertension treatment regime, patients who meet diagnostic criteria for hypertension would be admitted to a 30-to-90 day outpatient "hypertension rehabilitation" programme where they might receive medication, behavioural change therapy, dietary education and an exercise regime. Because of some ideological limits and evaluation goals, the medication would be tapered during the final days of the treatment and patients would be referred to "community sources". The evaluation team would re-contact the patient six months later and determine whether the patient continuously had normal blood pressure throughout the post-treatment period. Only those patients who met this criterion would be considered "successfully treated". Clearly, this hypothetical treatment management strategy and its associated

189 Paul G. Barnett and Ralph W. Swindle, "Cost-effectiveness of inpatient substance abuse treatment", *Health Services Research*, vol. 32, No. 5 (1997), pp. 615-629.

190 Paul G. Barnett and Stanley S. Hui, "The cost-effectiveness of methadone maintenance", *The Mount Sinai Journal of Medicine*, vol. 67, Nos. 5 and 6 (2000), pp. 365-374.

191 L. W. Gerson and others, "Medical care use by treated and untreated substance abusing medicaid patients", *Journal of Substance Abuse Treatment*, vol. 20, No. 2 (2001), pp. 115-120.

192 William S. Cartwright, "Economic costs of drug abuse: financial, cost of illness, and services", *Journal of Substance Abuse Treatment*, vol. 34, No. 2 (2008), pp. 224-233.

193 United States, Department of Health and Human Services, National Institute on Drug Abuse, *Principles of Drug Addiction Treatment for Criminal Justice Populations: A Research-based Guide*, 3rd ed., NIH publication No. 11-5316 (April 2014), pp. 26-28.

194 S. L. Ettner and others, "Benefit-cost in the California treatment outcome project: does substance abuse treatment 'pay for itself'?", *Health Services Research*, vol. 41, No. 1 (2006), pp. 192-213.

195 United Kingdom, National Health Services, National Treatment Agency for Substance Misuse, "Falling drug use: the impact of treatment", December 2012.

196 *Report of the International Narcotics Control Board for 2013* (E/INCB/2013/1).

197 McLellan and others, "Reconsidering the evaluation of addiction treatment" (see footnote 175).

As in the case of hypertension, symptoms of drug use disorder remain under control during the course of treatment. However, as the severity of the problem and symptoms reappear once patients are out of treatment, the effectiveness of treatment can only be measured during treatment and not once it is over.

outcome evaluation approach would be absurd if applied to any chronic illness, including drug dependence.

How to measure success in treatment

As discussed in the previous section, traditionally treatment of drug dependence has been seen in the context of acute care and a simple recovery/rehabilitation oriented model, which assumed relatively short interventions and services after which the patient is considered successfully treated, discharged and expected to continue their recovery.[198] As noted by McLellan and colleagues:[199] "Typically, the immediate goal of reducing alcohol and drug use is necessary but rarely sufficient for the achievement of the longer-term goals of improved personal health and social function and reduced threats to public health and safety — i.e., recovery." Moreover, as noted by the Betty Ford Institute Consensus Panel on "what is recovery", unlike the term "cancer survivor", for instance, the term "in recovery" has not been clearly defined and may not be well understood by the public.[200]

Consequently, the traditional method of evaluating treatment outcomes has been to contact patients after certain intervals and assess if the person has retained those positive changes, including "cessation of drug use" following discharge. As research has shown, the majority of patients relapse following cessation of treatment, giving rise to the interpretation that available treatment of drug dependence is not effective.

As substance-use disorders are increasingly viewed as chronic conditions, drug dependence treatment services have also adopted models that aim to assess effectiveness of interventions and the impact of the health problem on the person's overall well-being regularly over the course of treatment.

The different treatment outcome domains identified as relevant to both the patient and to society include:[201,202,203]

(a) Reduction in substance abuse; increase or improvement in personal health including physical and psychological improvements (including spiritual);

(b) Improvement in social functioning, including employment, family and social relationships;

(c) Reductions in behaviours that are a threat to public health and safety or that are associated with the spread of infectious diseases or with personal and property crimes.

It has therefore been suggested that outcome evaluations of addiction treatment should use clinical and social behavioural indicators with repeated measurement procedures commonly used in chronic medical conditions as part of standard treatment delivery.[204]

Treatment in primary health-care settings

Drug use is one of the top 20 risk factors for poor health worldwide and among the top 10 in developed countries. Drug use disorders are associated with an increased risk of other diseases such as HIV/AIDS, hepatitis, tuberculosis and cardiovascular diseases, as well as suicide and overdose deaths. Injecting drug use is a major conduit of HIV and hepatitis transmission in many regions.[205] Additionally, individuals with drug use disorders have health-care costs that are nearly twice as high as those of patients without such disorders, which contributes to the growing cost of health care.[206]

Despite the availability of effective treatments, most individuals with drug use disorders have never been treated.[207] A big gap exists between the number of people who want or could benefit from treatment for drug use disorders and the number of people who actually receive services.[208]

There are many reasons for this, with one of the key factors being the difficulties in accessing treatment due to insufficient integration of substance use disorder services in mainstream general health-care delivery. This lack of integration is a problem because so many individuals who

198 Ibid.

199 Ibid.

200 Betty Ford Institute Consensus Panel, "What is recovery? A working definition from the Betty Ford Institute", *Journal of Substance Abuse Treatment*, vol. 33, No. 3 (2007), pp. 221-228.

201 McLellan and others, "Reconsidering the evaluation of addiction treatment" (see footnote 175).

202 WHO Quality of Life Assessment Group, "The World Health Organization Quality of Life assessment (WHOQOL): position paper from the World Health Organization", *Social Science and Medicine*, vol. 41, No. 10 (1995), pp. 1403-1409.

203 Alexandre B. Laudent, "The case for considering quality of life in addiction research and clinical practice", *Addiction Science and Clinical Practice*, vol. 6, No. 1 (2001), pp. 44 and 45.

204 McLellan and others, "Reconsidering the evaluation of addiction treatment" (see footnote 175).

205 UNODC and WHO, "The joint UNODC-WHO programme on drug dependence treatment and care" (2009).

206 C. Boyd and others, "Clarifying multimorbidity to improve targeting and delivery of clinical services for medicaid populations", Faces of Medicaid Data Series (Hamilton, New Jersey, Center for Health Care Strategies, December 2010).

207 W. M. Compton and others, "Prevalence, correlates, disability, and comorbidity of DSM-IV drug abuse and dependence in the United States: results from the National Epidemiologic Survey on Alcohol and Related Conditions", *Archives of General Psychiatry*, vol. 64, No. 5 (2007), pp. 566-576.

208 United States of America, Department of Health and Human Services, Substance Abuse and Mental Health Services Administration, *Results from the 2011 National Survey on Drug Use and Health: Summary of National Findings*, NSDUH Series H-44, DHHS Publication No. (SMA) 12-4713 (Rockville, Maryland, 2012).

need drug treatment services also need other health services. This problem is particularly severe for vulnerable groups who have limited or no contacts with health-care providers.

However, the data show that individuals are seldom screened for drug-related problems by their primary-care physicians.[209] The failure of providers to identify drug use issues is typically due to reluctance to deal with these illnesses, and remains one of the most common obstacles to early diagnosis and treatment.[210] Contributing factors include inadequate medical training to deal with drug use disorders, a belief that there is no effective treatment, insufficient time during the visit and a general feeling of inadequacy.[211,212]

Providing screening and initial services in primary health-care settings is feasible;[213,214] and it can reach many more individuals than can reliance on specialized treatment alone, promises better outcomes for patients[215,216] and can result in reduced overall health-care costs.[217] Early detection of drug-related problems can facilitate treatment and, ultimately, a reduction in the significant disability and comorbidity that accompany these disorders. Therefore, it is critical for primary-care practitioners to recognize and effectively respond to patients with drug use issues.

The first step is screening and assessment that will enable the integration of clinical findings into a potential diagnosis of drug use disorders. The timing of the diagnosis is critical, since early intervention, before severe complications have happened and a patient's relationship with the drug becomes stronger than relationships with family and friends, is the most effective.[218] Once a diagnosis of drug use disorder has been established, an intervention can either be implemented by the primary health-care practitioner, or patients can be referred to the appropriate specialist for treatment. While a specialty treatment programme remains the gold standard, various studies demonstrate that a primary health-care role in early intervention is essential to the success of any treatment.[219,220,221,222]

Targeted brief interventions can be effective primary-care treatment models, as demonstrated by studies on brief office-based interventions.[223,224] Studies evaluating the effectiveness of integrating primary medical care with addiction treatment have demonstrated cost benefits and improved medical outcomes.[225] For example, patients with primary-care connections were shown to be less likely to seek expensive emergency department and hospital services,[226] while for every dollar invested in evidence-based integrated treatment, up to six dollars are saved in terms of costs for health, security and welfare.

Efforts to integrate substance use disorder services with primary care face significant barriers, many of which arise at the policy level. Integrating drug treatment with mainstream primary health-care delivery, expanding and developing specific competencies in primary health-care practitioners, enabling same-day services, improving access to medications and improving access to specialty care should be the global priorities.

F. EXTENT OF DRUG SUPPLY

The regions in which the cultivation and manufacture of drugs take place have not changed. Herbal cannabis production occurs in most countries worldwide, while the production of cannabis resin remains confined to a few countries in North Africa, the Middle East and South-West

209 D. Ernst, W. R. Miller and S. Rollnick, "Treating substance abuse in primary care: a demonstration project", *International Journal of Integrated Care*, vol. 7 (2007).

210 C. M. Delos Reyes, "Overcoming pessimism about treatment of addiction", *Journal of the American Medical Association*, vol. 287, No. 14 (2002), p. 1857.

211 Bridget M. Kuehn, "Despite benefit, physicians slow to offer brief advice on harmful alcohol use", *Journal of the American Medical Association*, vol. 299, No. 7 (2008), pp. 751-753.

212 Brian Vastag, "Addiction poorly understood by clinicians", *Journal of the American Medical Association*, vol. 290, No. 10 (2003), pp. 1299-1303.

213 Ernst, Miller and Rollnick, "Treating substance abuse in primary care" (see footnote 39).

214 B. K. Madras and others, "Screening, brief interventions, referral to treatment (SBIRT) for illicit drug and alcohol use at multiple healthcare sites: comparison at intake and 6 months later", *Drug Alcohol Dependence*, vol. 99, Nos. 1-3 (2009), pp. 280-295.

215 T. F. Babor and others, "Screening, brief intervention, and referral to treatment (SBIRT): toward a public health approach to the management of substance abuse", *Substance Abuse*, vol. 28, No. 3 (2007), pp. 7-30.

216 R. Saitz and others, "Screening and brief intervention for unhealthy drug use in primary care settings: randomized clinical trials are needed", *Journal of Addiction Medicine*, vol. 4, No. 3 (2010), pp. 123-130.

217 Constance Weisner and others, "Integrating primary medical care with addiction treatment: a randomized controlled trial", *Journal of the American Medical Association*, vol. 286, No. 14 (2001), pp. 1715-1723.

218 S. Butterfield, "Treat addicted patients for the long-term", *American College of Physicians Internist*, June 2009.

219 J. R. Mertens and others, "The role of medical conditions and primary care services in 5-year substance use outcomes among chemical dependency treatment patients", *Drug Alcohol Dependence*, vol. 98, Nos. 1 and 2 (2008), pp. 45-53.

220 M. L. Willenbring, S. H. Massey and M. B. Gardner, "Helping patients who drink too much: an evidence-based guide for primary care physicians", *American Family Physician*, vol. 80, No. 1 (2009), pp. 44-50.

221 S. Coulton, "Alcohol misuse", *American Family Physician*, vol. 79, No. 8 (2009), pp. 692-694.

222 William E. Cayley Jr., "Effectiveness of brief alcohol interventions in primary care", *American Family Physician*, vol. 79, No. 5 (2009), pp. 370 and 371.

223 Willenbring, Massey and Gardner, "Helping patients who drink too much" (see footnote 220).

224 Coulton, "Alcohol misuse", (see footnote 221).

225 Weisner and others, "Integrating primary care with addiction treatment" (see footnote 217).

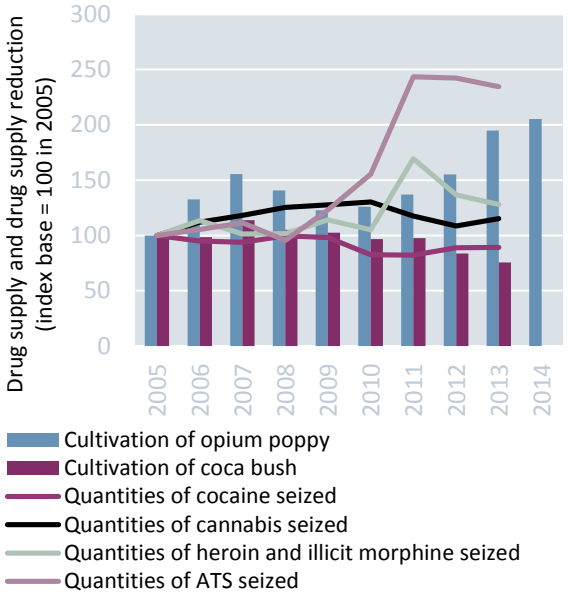
226 Peter D. Friedmann and others, "Do mechanisms that link addiction treatment patients to primary care influence subsequent utilization of emergency and hospital care?", *Medical Care*, vol. 44, No. 1 (2006), pp. 8-15.

Asia.[227] In South America, three Andean countries continue to account for virtually all global cultivation of coca bush, while the vast majority of illicit opium poppy cultivation worldwide remains concentrated in two countries in Asia. The manufacture of synthetic drugs is difficult to assess in a quantitative way, but there are reports of the manufacture of ATS in all regions. The emergence in recent years of a large number of NPS[228] has increased the range of synthetic drugs available on the market, but it is difficult to ascertain whether these substances are replacing existing drugs under international control.

Cannabis continues to be the most-seized drug worldwide, both in terms of the number of seizure cases and actual quantities intercepted. This is probably due to the fact that the cannabis market is the largest drug market globally with an extremely extensive web of trafficking flows.

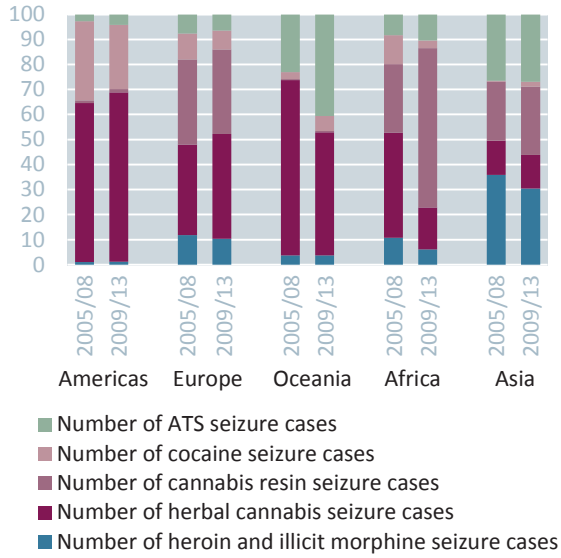
With the exception of heroin/illicit morphine and ATS, overall quantities of drugs seized in the past decade have

FIG. 31. Global trends in main indicators of drug supply and drug supply reduction, 2005-2014



Source: UNODC, responses to annual report questionnaire and other official sources.

FIG. 32. Distribution of global seizures, by drug and region (number of cases), 2005-2008 and 2009-2013



Source: UNODC, responses to annual report questionnaire and other official sources.

INTERPRETING DRUG SEIZURES

A direct indicator of counter-narcotics law enforcement activity, drug seizures are the result of those successful operations that end in drug interceptions, and are thus influenced by law enforcement resources and priorities. At the same time, seizures are one of the key elements that help to establish the size of drug markets, drug availability and trafficking patterns and trends, particularly if broad geographical entities are considered and long periods are analysed. For example, the expansion of the cocaine market in Europe from the mid-1990s to the middle of the first decade of the 2000s was reflected in rising cocaine seizures. Similarly, the 2001 "heroin drought" in Australia and the sharp decline in the cocaine market in the United States from 2007 to 2012 were also reflected in falling seizures.

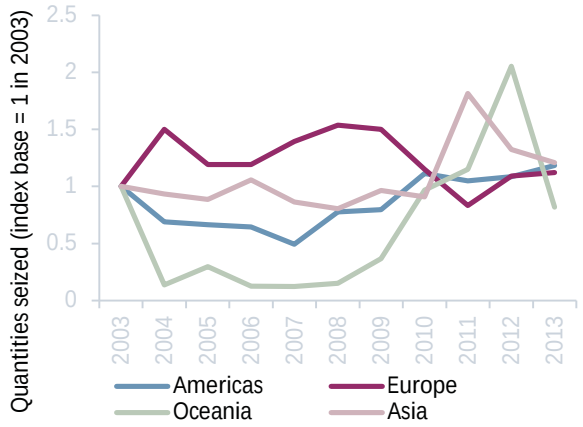
Seizure information can serve as a powerful market indicator, particularly if triangulated with other data such as drug prices and purity. Falling seizures in combination with rising drug prices and falling purity levels may suggest a decline in overall drug supply, while rising seizures in combination with falling drug prices and rising purity levels are usually considered a good indicator of an increase in drug supply. However, rising drug seizures in combination with rising drug prices and falling purity levels may suggest intensified law enforcement activity and thus a potential overall decline in drug supply.

It should be noted that reported seizures relate to events that took place in the past and in specific locations. In an environment where drug traffickers adapt quickly to changing risks and opportunities, drug trafficking patterns and flows derived from seizure data do not necessarily reflect the current modus operandi of traffickers in every detail. At the same time, experience has shown that some of the main drug-trafficking routes, once established, can prove rather resilient to change.

227 UNODC, *World Drug Report 2014*.

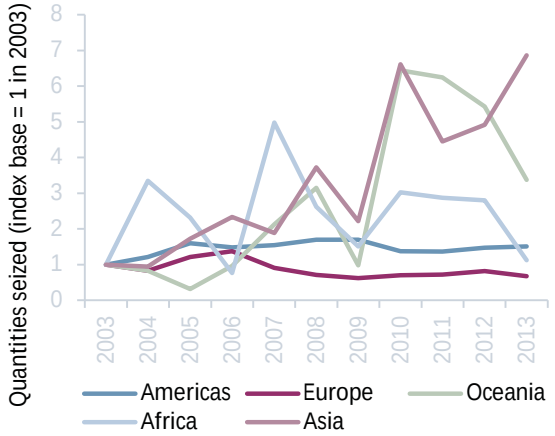
228 For the purposes of the present report, the analysis of NPS includes ketamine, which differs from other NPS in that it is widely used in human and veterinary medicine, while most NPS have little or no history of medical use.

FIG. 33. Quantities of heroin and illicit morphine seized, by region, 2003-2013



Source: UNODC, responses to annual report questionnaire and other official sources.

FIG. 34. Quantities of cocaine seized, by region, 2003-2013



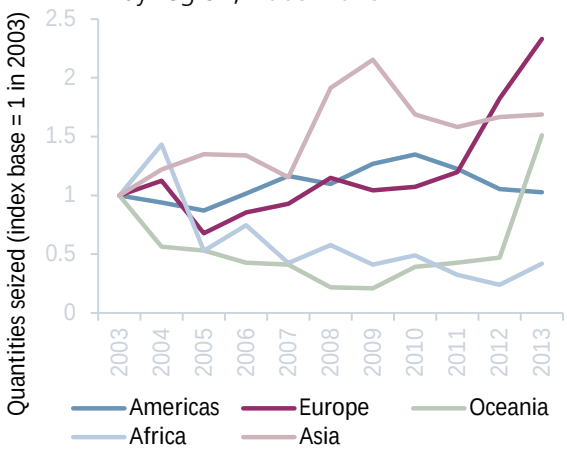
Source: UNODC, responses to annual report questionnaire and other official sources.

remained relatively stable. A peak in heroin/illicit morphine seizures was reported in 2011, which initiated a period of much higher levels of seizures, driven by increased interceptions in Asia. Interceptions of ATS increased continuously from 2003 to 2013 in all regions, with the exception of Europe, where they remained stable. This may suggest the expansion of the ATS market to locations where some of these substances were not previously available.

Large variations in average size of drug seizures

With an average size of less than 1 kg per case over the past five years, seizures of heroin/illicit morphine and ATS are the smallest among all the drug types at the global level. The largest are seizure cases involving herbal cannabis (roughly 10 kg on average), while the average size of seizures of cocaine and cannabis resin is 5 kg and 3 kg, respectively. These differences may result from variations in trafficking modus operandi, whereby cocaine and cannabis products are smuggled in larger shipments than other drugs. Law enforcement may also target different levels of the supply chain depending on the drug. However, other elements such as drug price, market size, value and structure, the dynamics and structure of drug supply chains, as well as law enforcement priorities, would have to be explored before drawing clear conclusions on this subject.

FIG. 35. Quantities of herbal cannabis seized, by region, 2003-2013



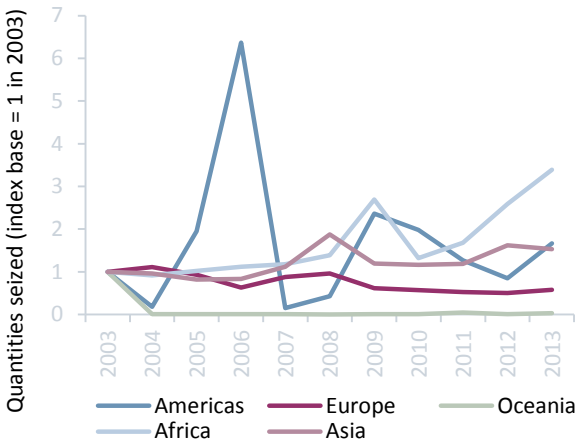
Source: UNODC, responses to annual report questionnaire and other official sources.

The average size of seizure cases of all drugs, except ATS, has decreased in the past decade. This may reflect changes both in the targeting of law enforcement efforts and in trafficking patterns along the supply chain, but may also be the result of improved reporting of small seizure cases in some regions. The average size of seizures of a number of products decreased slightly between 2003 and 2013: heroin/illicit morphine decreased from 0.7 kg to 0.5 kg; cocaine decreased from 6.2 kg to 4.6 kg; and cannabis resin decreased from 4.3 kg to 3.9 kg. However, the average size of herbal cannabis seizures decreased substantially, from 23 kg to 7.8 kg, whereas the average size of ATS seizures doubled over the period, from 0.3 kg to 0.7 kg.

The Americas is the region where seizure cases are the largest on average. In the past five years, seizures of herbal cannabis in the region averaged 41 kg, while seizures of cocaine averaged 13 kg, seizures of ATS averaged 8 kg and seizures of heroin/illicit morphine averaged 3 kg; all significantly larger than in all other regions. It is worth noting, however, that the average size of seizure cases of all drugs in the Americas has decreased in the past decade, as has the number of seizure cases, with the exception of ATS, possibly suggesting an expansion of the ATS market in that region and comparatively greater targeting of ATS trafficking by law enforcement.

At the other end of the scale, the smallest seizures, in terms of their average size, are reported in Europe, irrespective of drug type. In the past five years, seizures of cannabis

FIG. 36. Quantities of cannabis resin seized, by region, 2003-2013



Source: UNODC, responses to annual report questionnaire and other official sources.

resin averaged 1.7 kg per case in the region, while seizures of cocaine averaged 0.8 kg, seizures of herbal cannabis averaged 0.6 kg and both heroin/illicit morphine and ATS seizures averaged 0.2 kg. The small size of seizures in Europe may be due to law enforcement focusing more on the middle and lower end of the supply chains of all drug types than on the upper end, but it could simply reflect better reporting of seizure cases in general, and of small cases in particular.

Emergence of new trafficking hubs[229]

South America remains the main departure hub for cocaine to the rest of the world. The cocaine-producing countries, Bolivia (Plurinational State of), Colombia and Peru, serve as departure (and transit) countries for the export of cocaine to the rest of the region. A number of other countries may serve as transit points for trafficking cocaine from Latin America to the major consumer markets in North America and Western and Central Europe, but Brazil (particularly since 2010) and Argentina are the cocaine transit countries most frequently mentioned in major individual drug seizures.

The Netherlands, Morocco and Spain have been mentioned in individual drug seizures as the main departure or transit countries for cannabis over the past decade as a whole and continue to be so when considering more recent trends during the period 2010-2014. Albania and Argentina have emerged respectively as cannabis departure or transit countries in the past five years, confirming that cannabis cultivation and production are dynamic and widespread, and that trafficking routes may be in constant change.

Heroin is produced in three different regions, but while there is information from reports of individual seizures on the trafficking routes for heroin from Afghanistan, available data do not currently allow for the identification of the transit countries used in the trafficking of heroin from Colombia and Mexico or from the Lao People's Democratic Republic and Myanmar. Pakistan is mentioned in individual drug seizure reports more frequently than other countries as a transit country for heroin seized elsewhere. This confirms that Afghan heroin is smuggled southwards from Afghanistan through Pakistan, but it may also suggest that this trafficking route is more successfully targeted by law enforcement in destination countries and/or that data reporting on the last departure country of the shipment seized is comparatively better for this route than for others.

Although opium poppy is cultivated in South-East Asia, individual drug seizures indicate that neither of the opium-cultivating countries in the region, the Lao People's Democratic Republic and Myanmar, appears to be an important heroin trafficking departure hub. This may be due to the fact that Afghan heroin dominates the global market, but it may also reflect the fact that countries that report individual seizures are not markets for heroin produced in South-East Asia.

Most seizures are made on road and rail, but the largest seizures are made at sea and in ports[230]

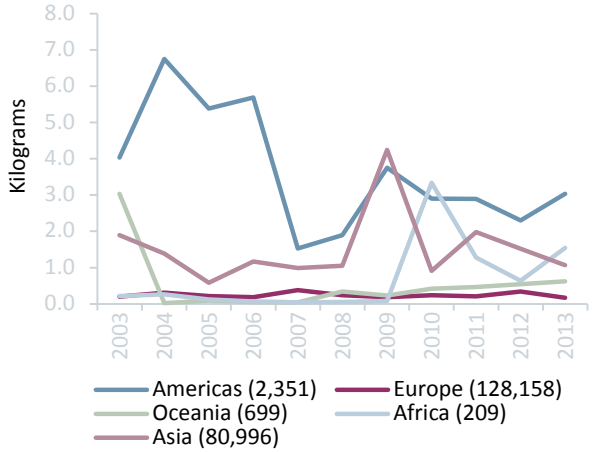
The frequency of use of different modes of transportation used by drug traffickers has not changed a great deal over the past decade. Accounting for nearly half the reported individual seizures in the 2009-2014 period, trafficking by road and rail is the most common mode of transportation used by traffickers globally, along with trafficking by air. The average size of drug shipments intercepted on road and rail increased substantially from 68 kg between 2006 and 2008 to 107 kg between 2009 and 2014.

Accounting for 8 per cent of all reported cases in the past six years, maritime trafficking remains the least common mode of transportation in terms of individual seizure cases, but maritime seizures tend to be comparatively very large. With an average weight of 365 kg per seizure in the 2009-2014 period (compared with 250 kg in the 2006-2008 period) maritime seizures are by far the largest among the three modes of transportation. This confirms that interdiction of maritime shipments has potentially the greatest impact on the total quantities of drugs smuggled, as well as on trafficking flows and the availability of illicit drugs at the global level. For example, parcel post was the most commonly detected method of drug importation at the Australian borders in 2013, yet just three maritime seizure

229 The present section is based on data from the individual drug seizure database. Reporting countries are asked to provide information on the country where the drugs were obtained (or, in the case of unaccompanied shipments, the departure country). For the purposes of this section, such locations are considered to be transit points of the drug.

230 The present section is based on data from the individual drug seizure database.

FIG. 37. Average size of heroin/illicit morphine seizure cases, by region, 2003-2013



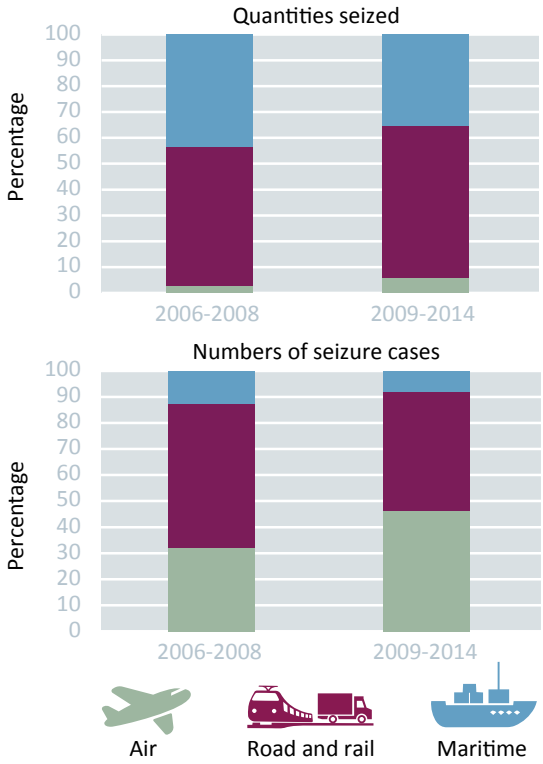
Source: UNODC, responses to annual report questionnaire and other official sources.

Note: The figures provided between brackets refer to the number of heroin/illicit morphine seizure cases for 2013.

cases accounted for 74 per cent of the total weight of heroin intercepted that year in the country.

Trafficking by air has become more frequent, but quantities intercepted remain comparatively small. Drugs being trafficked by air seized from 2009 to 2014 accounted for 46 per cent of global seizure cases, but at an average of 10 kg the size of the interceptions was much smaller. This represents an increase from the average of 6 kg per case observed in the period 2006-2008 and may reflect an increase in seizures involving trafficking by air cargo as opposed to air couriers.

FIG. 38. Mode of transportation reported in individual drug seizure cases, 2006-2008 and 2009-2014



Source: UNODC, individual drug seizure database.

Note: Distribution of main modes of transport excludes cases in which the mode of transport was unknown, not applicable or specified as "other". This analysis is based on 20,326 cases (1,445 tons) for the period 2006-2008 and on 47,319 cases (3,945 tons) for the period 2009-2014.