

# GLOBAL OVERVIEW OF DRUG DEMAND AND SUPPLY

Latest trends, cross-cutting issues

WORLD  $\infty$   
DRUG  
REPORT 2018

2

© United Nations, June 2018. All rights reserved worldwide.  
ISBN: 978-92-1-148304-8  
eISBN: 978-92-1-045058-4  
United Nations publication, Sales No. E.18.XI.9

This publication may be reproduced in whole or in part and in any form for educational or non-profit purposes without special permission from the copyright holder, provided acknowledgement of the source is made. The United Nations Office on Drugs and Crime (UNODC) would appreciate receiving a copy of any publication that uses this publication as a source.

Suggested citation:

*World Drug Report 2018* (United Nations publication, Sales No. E.18.XI.9).

No use of this publication may be made for resale or any other commercial purpose whatsoever without prior permission in writing from UNODC. Applications for such permission, with a statement of purpose and intent of the reproduction, should be addressed to the Research and Trend Analysis Branch of UNODC.

#### DISCLAIMER

The content of this publication does not necessarily reflect the views or policies of UNODC or contributory organizations, nor does it imply any endorsement.

Comments on the report are welcome and can be sent to:

Division for Policy Analysis and Public Affairs  
United Nations Office on Drugs and Crime  
PO Box 500  
1400 Vienna  
Austria  
Tel: (+43) 1 26060 0  
Fax: (+43) 1 26060 5827

E-mail: [wdr@un.org](mailto:wdr@un.org)

Website: <https://www.unodc.org/wdr2018>



## PREFACE

Both the range of drugs and drug markets are expanding and diversifying as never before. The findings of this year's *World Drug Report* make clear that the international community needs to step up its responses to cope with these challenges.

We are facing a potential supply-driven expansion of drug markets, with production of opium and manufacture of cocaine at the highest levels ever recorded. Markets for cocaine and methamphetamine are extending beyond their usual regions and, while drug trafficking online using the darknet continues to represent only a fraction of drug trafficking as a whole, it continues to grow rapidly, despite successes in shutting down popular trading platforms.

Non-medical use of prescription drugs has reached epidemic proportions in parts of the world. The opioid crisis in North America is rightly getting attention, and the international community has taken action. In March 2018, the Commission on Narcotic Drugs scheduled six analogues of fentanyl, including carfentanil, which are contributing to the deadly toll. This builds on the decision by the Commission at its sixtieth session, in 2017, to place two precursor chemicals used in the manufacture of fentanyl and an analogue under international control.

However, as this *World Drug Report* shows, the problems go far beyond the headlines. We need to raise the alarm about addiction to tramadol, rates of which are soaring in parts of Africa. Non-medical use of this opioid painkiller, which is not under international control, is also expanding in Asia. The impact on vulnerable populations is cause for serious concern, putting pressure on already strained health-care systems.

At the same time, more new psychoactive substances are being synthesized and more are available than ever, with increasing reports of associated harm and fatalities.

Drug treatment and health services continue to fall short: the number of people suffering from drug use disorders who are receiving treatment has remained low, just one in six. Some 450,000 people died in 2015 as a result of drug use. Of those deaths, 167,750 were a direct result of drug use disorders, in most cases involving opioids.

These threats to health and well-being, as well as to security, safety and sustainable development, demand an urgent response.

The outcome document of the special session of the General Assembly on the world drug problem held in 2016 contains more than 100 recommendations on promoting evidence-based prevention, care and other measures to address both supply and demand.

We need to do more to advance this consensus, increasing support to countries that need it most and improving international cooperation and law enforcement capacities to dismantle organized criminal groups and stop drug trafficking.

The United Nations Office on Drugs and Crime (UNODC) continues to work closely with its United Nations partners to assist countries in implementing the recommendations contained in the outcome document of the special session, in line with the international drug control conventions, human rights instruments and the 2030 Agenda for Sustainable Development.

In close cooperation with the World Health Organization, we are supporting the implementation of the *International Standards on Drug Use Prevention* and the international standards for the treatment of drug use disorders, as well as the guidelines on treatment and care for people with drug use disorders in contact with the criminal justice system.

*The World Drug Report 2018* highlights the importance of gender- and age-sensitive drug policies, exploring the particular needs and challenges of women and young people. Moreover, it looks into

increased drug use among older people, a development requiring specific treatment and care.

UNODC is also working on the ground to promote balanced, comprehensive approaches. The Office has further enhanced its integrated support to Afghanistan and neighbouring regions to tackle record levels of opiate production and related security risks. We are supporting the Government of Colombia and the peace process with the Revolutionary Armed Forces of Colombia (FARC) through alternative development to provide licit livelihoods free from coca cultivation.

Furthermore, our Office continues to support efforts to improve the availability of controlled substances for medical and scientific purposes, while preventing misuse and diversion – a critical challenge if we want to help countries in Africa and other regions come to grips with the tramadol crisis.

Next year, the Commission on Narcotic Drugs will host a high-level ministerial segment on the 2019 target date of the 2009 Political Declaration and Plan of Action on International Cooperation towards an Integrated and Balanced Strategy to Counter the World Drug Problem. Preparations are under way. I urge the international community to take this opportunity to reinforce cooperation and agree upon effective solutions.



Yury Fedotov  
Executive Director  
United Nations Office on Drugs and Crime



# CONTENTS

**BOOKLET 1** EXECUTIVE SUMMARY — CONCLUSIONS AND POLICY IMPLICATIONS

**BOOKLET 2** GLOBAL OVERVIEW OF DRUG DEMAND AND SUPPLY  
 Latest trends, cross-cutting issues

PREFACE..... 1

EXPLANATORY NOTES ..... 5

KEY FINDINGS ..... 6

INTRODUCTION..... 9

**A. EXTENT OF DRUG USE ..... 11**

More than a quarter of a billion people use drugs globally ..... 11

Trends in drug treatment are consistent with changing patterns  
 of drug use in different regions..... 13

**B. HEALTH CONSEQUENCES OF DRUG USE ..... 14**

Almost 11 million people worldwide injected drugs in 2016..... 15

One in eight people who inject drugs is living with HIV ..... 16

Injecting drugs is a major route for transmission of the HCV virus..... 17

Coverage of core interventions to prevent spread of HIV and HCV among  
 PWID remains poor and insufficient..... 19

Deaths attributable to drug use remain high globally ..... 21

**C. EXTENT OF DRUG SUPPLY ..... 28**

Drug cultivation and production..... 28

Drug seizures..... 29

Drug trafficking via the darknet is a growing challenge for authorities ..... 33

GLOSSARY..... 59

REGIONAL GROUPINGS..... 60

**BOOKLET 3** ANALYSIS OF DRUG MARKETS  
 Opioids, cocaine, cannabis, synthetic drugs

**BOOKLET 4** DRUGS AND AGE  
 Drugs and associated issues among young people and older people

**BOOKLET 5** WOMEN AND DRUGS  
 Drug use, drug supply and their consequences

## Acknowledgements

The *World Drug Report 2018* was prepared by the Research and Trend Analysis Branch, Division for Policy Analysis and Public Affairs, United Nations Office on Drugs and Crime, under the supervision of Jean-Luc Lemahieu, Director of the Division, and Angela Me, Chief of the Research and Trend Analysis Branch.

### *General coordination and content overview*

Chloé Carpentier  
Angela Me

### *Analysis and drafting*

Philip Davis  
Kamran Niaz  
Thomas Pietschmann

### *Data management and estimates production*

Enrico Bisogno  
Coen Bussink  
Jesus Maria Garcia Calleja (WHO)  
Hernan Epstein  
Riku Lehtovuori  
Andrea Oterová  
Umidjon Rakhmonberdiev  
Ali Saadeddin  
Keith Sabin (UNAIDS)  
Antoine Vella

### *Editing*

Jonathan Gibbons

### *Graphic design and production*

Anja Korenblik  
Suzanne Kunnen  
Kristina Kuttinig

### *Coordination*

Francesca Massanello

### *Data support*

Diana Camerini  
Chung Kai Chan  
Sarika Dewan  
Smriti Ganapathi

### *Administrative support*

Anja Held  
Iulia Lazar

### *Review and comments*

The *World Drug Report 2018* benefited from the expertise of and invaluable contributions from UNODC colleagues in all divisions.

The Research and Trend Analysis Branch acknowledges the invaluable contributions and advice provided by the *World Drug Report* Scientific Advisory Committee:

Jonathan Caulkins  
Paul Griffiths  
Marya Hynes  
Vicknasingam B. Kasinather  
Letizia Paoli

Charles Parry  
Peter Reuter  
Francisco Thoumi  
Alison Ritter

*In memoriam*  
Brice de Ruyver

The research and production of the joint UNODC/UNAIDS/WHO/World Bank estimates of the number of people who inject drugs were partly funded by the HIV/AIDS Section of the Drug Prevention and Health Branch of the Division for Operations of UNODC.



## EXPLANATORY NOTES

The boundaries and names shown and the designations used on maps do not imply official endorsement or acceptance by the United Nations. A dotted line represents approximately the line of control in Jammu and Kashmir agreed upon by India and Pakistan. The final status of Jammu and Kashmir has not yet been agreed upon by the parties. Disputed boundaries (China/India) are represented by cross-hatch owing to the difficulty of showing sufficient detail.

The designations employed and the presentation of the material in the *World Drug Report* do not imply the expression of any opinion whatsoever on the part of the Secretariat of the United Nations concerning the legal status of any country, territory, city or area, or of its authorities or concerning the delimitation of its frontiers or boundaries.

Countries and areas are referred to by the names that were in official use at the time the relevant data were collected.

All references to Kosovo in the *World Drug Report*, if any, should be understood to be in compliance with Security Council resolution 1244 (1999).

Since there is some scientific and legal ambiguity about the distinctions between “drug use”, “drug misuse” and “drug abuse”, the neutral terms “drug use” and “drug consumption” are used in the *World Drug Report*. The term “misuse” is used only to denote the non-medical use of prescription drugs.

All uses of the word “drug” in the *World Drug Report* refer to substances controlled under the international drug control conventions.

All analysis contained in the *World Drug Report* is based on the official data submitted by Member States to the United Nations Office on Drugs and Crime through the annual report questionnaire unless indicated otherwise.

The data on population used in the *World Drug Report* are taken from: *World Population Prospects: The 2017 Revision* (United Nations, Department of Economic and Social Affairs, Population Division).

References to dollars (\$) are to United States dollars, unless otherwise stated.

References to tons are to metric tons, unless otherwise stated.

The following abbreviations have been used in the present booklet:

- ATS** amphetamine-type stimulants
- EMCDDA** European Monitoring Centre for Drugs and Drug Addiction
- Europol** European Union Agency for Law Enforcement Cooperation
- HBV** hepatitis B virus
- HCV** hepatitis C virus
- HIV** human immunodeficiency virus
- LSD** lysergic acid diethylamide
- NPS** new psychoactive substances
- PWID** people who inject drugs
- UNAIDS** Joint United Nations Programme on HIV/AIDS
- UNODC** United Nations Office on Drugs and Crime
- WHO** World Health Organization



## KEY FINDINGS

### *Drug use is associated with significant adverse health consequences*

About 275 million people worldwide, which is roughly 5.6 per cent of the global population aged 15–64 years, used drugs at least once during 2016. Some 31 million people who use drugs suffer from drug use disorders, meaning that their drug use is harmful to the point where they may need treatment. Opioids continue to cause the most harm, accounting for 76 per cent of deaths where drug use disorders were implicated. PWID — some 10.6 million worldwide in 2016 — endure the greatest health risks. More than half of them live with hepatitis C, and one in eight live with HIV.

### *Number of deaths associated with the use of drugs remains high*

Roughly 450,000 people died as a result of drug use in 2015, according to WHO. Of those deaths, 167,750 were directly associated with drug use disorders (mainly overdoses). The rest were indirectly attributable to drug use and included deaths related to HIV and hepatitis C acquired through unsafe injecting practices.

### *Overdose deaths from the non-medical use of pharmaceutical opioid use reach epidemic proportions in North America*

In 2015 and 2016, for the first time in half a century, life expectancy in the United States of America declined for two consecutive years. A key factor was the increase in unintentional injuries, which include overdose deaths.

In 2016, 63,632 people died from a drug overdose in the United States, the highest number on record and a 21 per cent increase from the previous year. This was largely due to a rise in deaths associated with pharmaceutical opioids, including fentanyl and fentanyl analogues. This group of opioids, excluding methadone, was implicated in 19,413 deaths in the country, more than double the number in 2015. Evidence suggests that Canada is also affected, with

a large number of overdose deaths involving fentanyl and its analogues in 2016.

Outside North America, with the exception of Estonia, the impact of fentanyl and its analogues is relatively low.

### *Many countries still fail to provide adequate drug treatment and health services to reduce the harm caused by drugs*

One in six people suffering from drug use disorders received treatment for those disorders during 2016, which is a relatively low proportion that has remained constant in recent years.

Some of the most adverse health consequences of drug use are experienced by PWID. A global review of services aimed at reducing adverse health consequences among PWID has suggested that only 79 countries have implemented both needle and syringe programmes and opioid substitution therapy. Only four countries were classified as having high levels of coverage of both of those types of interventions.

Information on the availability of HIV testing and counselling and antiretroviral therapy remains sparse: only 34 countries could confirm the availability of HIV-testing programmes for PWID, and 17 countries confirmed that they had no such programmes. There was no information on the availability of antiretroviral therapy for 162 countries.

### *Witnessing an overdose and experiencing a non-fatal overdose are common*

Witnessing an overdose is common among those who use heroin and/or cocaine and who inject drugs. This provides an opportunity to intervene and influence the outcome of the situation (for example, in the administration of naloxone in the case of opioid overdose) and whether it proves to be fatal.

Many people who use heroin and/or cocaine and who inject drugs also report that they have



experienced a non-fatal overdose. Non-fatal overdoses can leave drug users with significant health problems and have also been shown to be associated with a subsequent fatal overdose, with the risk of death increasing with the number of prior non-fatal overdoses.

### *Prisoners are at higher risk for infectious diseases but are poorly served*

People in prison and other closed settings are at a much greater risk of contracting infections such as tuberculosis, HIV and hepatitis C than the general population, but access to treatment and prevention programmes is often lacking. Even where such programmes are available, they are not necessarily of the same standard as those provided in the community. The lack of access to prevention measures in many prisons can result in the rapid spread of HIV and other infections.

People who use heroin are exposed to a severe risk of death from overdose after release from prison, especially in the first two weeks. Such deaths are related to a lowered tolerance to the effects of heroin use developed after periods of relative abstinence, including during incarceration. However, released prisoners are rarely able to access overdose management interventions, including prevention medications such as naloxone, or treatment for substance dependence, including methadone.

### *Afghan opium poppy cultivation drives record opiate production*

Total global opium production jumped by 65 per cent from 2016 to 2017, to 10,500 tons, easily the highest estimate recorded by UNODC since it started estimating global opium production at the beginning of the twenty-first century. The total area under opium poppy cultivation worldwide increased to almost 420,000 ha in 2017. More than 75 per cent of that area is in Afghanistan.

Overall seizures of opiates rose by almost 50 per cent from 2015 to 2016. The quantity of heroin seized globally reached a record high of 91 tons in 2016. Most opiates were seized near the manufacturing hubs in Afghanistan.

### *A notable increase has been seen in cocaine manufacture*

Global cocaine manufacture in 2016 reached its

highest level ever: an estimated 1,410 tons. After falling during the period 2005–2013, global cocaine manufacture rose by 56 per cent during the period 2013–2016. The increase from 2015 to 2016 was 25 per cent. The total area under coca cultivation worldwide in 2016 was 213,000 ha, almost 69 per cent of which was in Colombia.

### *Global seizures are still dominated by cannabis but sharp increases are reported for other drugs*

Despite declining in 2016, cannabis continues to be the drug seized in the greatest quantities worldwide, followed by coca/cocaine-related substances and opioids. Both the quantity of ATS and of cocaine seized worldwide reached a record level in 2016. The sharpest increases in the quantities of drugs intercepted worldwide in 2016 were reported for plant-based NPS, which rose sevenfold, mainly due to seizures of kratom. The quantity of synthetic NPS seized worldwide, by contrast, saw a marked decline of more than 50 per cent in 2016, mainly due to a decline in the quantities of phenethylamines and synthetic cannabinoids seized.

### *Effect of the crackdown on darknet drug dealers is not yet clear*

In July 2017, police forces from several countries worked together to take down the largest drug-trading platform on the darknet, the part of the “deep web” containing information that is only accessible using special web browsers. Before it was closed, AlphaBay had featured more than 250,000 listings for illegal drugs and chemicals. It had had over 200,000 users and 40,000 vendors during its existence. The authorities also succeeded in taking down the trading platform Hansa, described as the third largest criminal marketplace on the dark web.

It is not yet clear what effect the closures will have. According to an online survey in January 2018, 15 per cent of those who had used darknet sites for purchasing drugs said that they had used such markets less frequently since the closures, and 9 per cent said they had completely stopped. However, more than half did not consider themselves to have been affected by the closures.

Although the scale of drug trafficking on the darknet remains limited, it has shown signs of rapid

growth. Authorities in Europe estimated that drug sales on the darknet from 22 November 2011 to 16 February 2015 amounted to roughly \$44 million per year. However, a later study estimated that, in early 2016, drug sales on the darknet were between \$14 million and \$25 million per month, equivalent to between \$170 million and \$300 million per year.

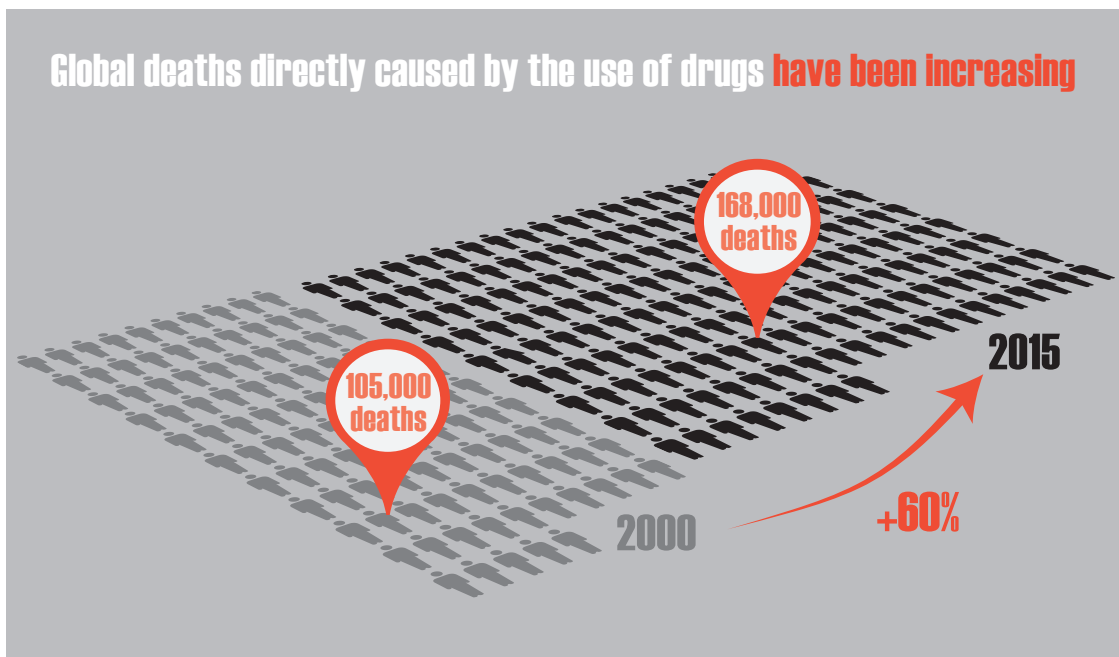


## INTRODUCTION

This booklet constitutes the second part of the *World Drug Report 2018*. It provides a global overview of the latest estimates of and trends in drug use and drug supply, as well as of several cross-cutting issues related to the world drug problem. Such issues comprise the health impact of drug use, including trends in drug use disorders, problem drug use as reflected in treatment demand and estimates of the number of people who inject drugs (PWID) and of those living with HIV and hepatitis.

The present booklet also examines the global extent of deaths attributable to drug use, with recent trends in overdose deaths in some countries being presented

as illustrative. Information on witnessing an overdose or personally experiencing a non-fatal overdose is also presented. A review of the availability and levels of coverage of core interventions (particularly needle and syringe programmes and opioid substitution therapy) to help prevent the spread of HIV and HCV among PWID is also included. Finally, the booklet contains a global overview of the latest estimates of and trends in cultivation, production and trafficking of illicit drugs, including on the Internet, using the darknet.



Source: UNODC analysis based on WHO, Disease burden and mortality estimates, Global Health Estimates 2015: deaths by cause, age, sex, by country and by region, 2000–2015.



## A. EXTENT OF DRUG USE

### More than a quarter of a billion people use drugs globally

It is estimated that in 2016 some 275 million people worldwide had used drugs at least once in the previous year (range: 204 million to 346 million). Corresponding to 5.6 per cent of the global population aged 15–64 years (range: 4.2 to 7.1 per cent), or approximately 1 of every 18 people. The actual number of people who use drugs increased by 20 million people from 2015 to 2016. This change is the consequence of an increase in the global number of cannabis users and, to a lesser extent, changes in the methodology used to produce this estimate.<sup>1</sup> However, caution is required in interpreting trends because of the wide uncertainty intervals for the estimates.

### Some 31 million people worldwide suffer from drug use disorders

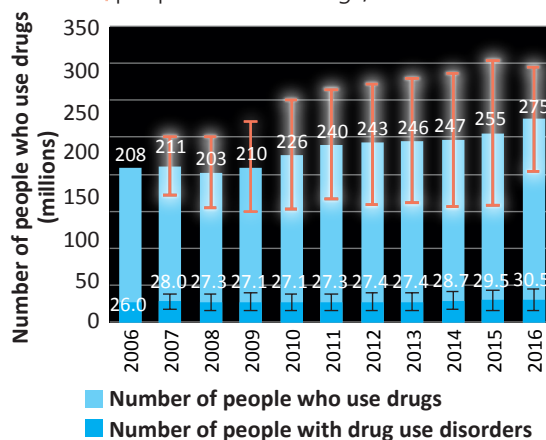
Of concern is the fact that an estimated one in nine people who use drugs (11 per cent) suffer from drug use disorders, meaning that their drug use is harmful to the point where they may experience drug dependence and/or require treatment. This amounted to an estimated 30.5 million people worldwide in 2016 (range: 16.7 million to 44.4 million), or 0.62 per cent (range: 0.34 to 0.91 per cent) of the global population aged 15–64 years. An increase of 1 million people from 2015 to 2016, this mainly reflects a global increase in the number of users of opiates, as well as an increase in the number of users of cocaine.

### Evidence of increasing cannabis use in some subregions

Cannabis remained by far the most widely consumed drug worldwide in 2016, with 192.2 million past-year users, corresponding to 3.9 per cent of the global population aged 15–64 years. High annual prevalence rates of cannabis use continue in West and Central Africa (13.2 per cent), North America (12.9 per cent) and Oceania (11.0 per cent). Experts in many countries in Africa and Asia perceived an increase in cannabis use, although there is a lack of information on the extent of drug use based on

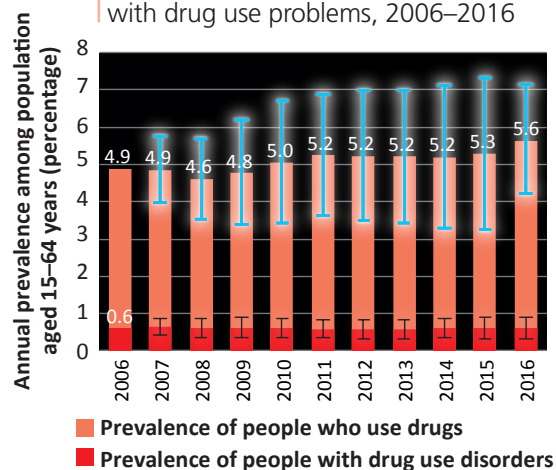
<sup>1</sup> See the online methodology section of the present report.

**FIG. 1** Global trends in estimated number of people who use drugs, 2006–2016



Source: UNODC, responses to the annual report questionnaire.  
 Note: Estimates are for adults (aged 15–64 years) who used drugs in the past year.

**FIG. 2** Global trends in the estimated annual prevalence of drug use and people with drug use problems, 2006–2016

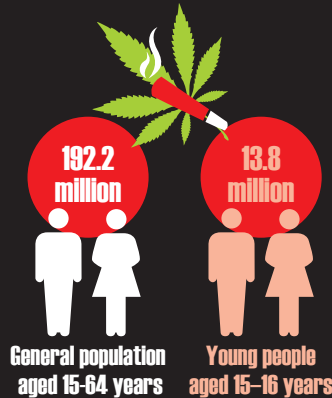


Source: UNODC, responses to the annual report questionnaire.  
 Note: Estimated percentage of adults (aged 15–64 years) who used drugs in the past year.

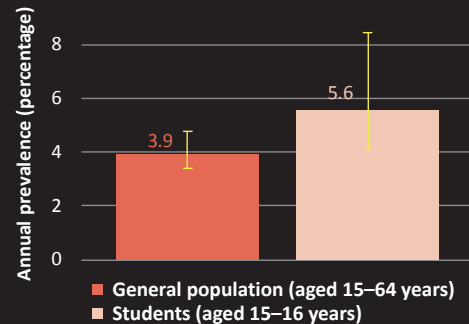
national surveys in most countries in those two regions and more evidence is needed. Cannabis use also continues to increase in North America, and many countries in Latin America also report an increase in use. Cannabis use remains high in Western and Central Europe, with use stabilizing in high-prevalence countries, while several other countries that historically have had a low prevalence of cannabis use are now reporting an increase.

## Cannabis use among young people

In most countries, cannabis is the drug most widely used, both among the general population and among youth. A global estimate, produced for the first time by UNODC, based on available data from 130 countries, suggests that in 2016 13.8 million young people (mostly students) aged 15–16 years used cannabis at least once over the previous 12 months, equivalent to 5.6 per cent of the population in this age range. Annual use of cannabis in 15–16 year old people was slightly higher than among the general population aged 15–64 years (3.9 per cent in 2016). However, caution is required as error margins around these two estimates overlap.



Global annual prevalence of cannabis use among the general population, aged 15–64 years and among students aged 15–16 years, 2016



Sources: UNODC, annual report questionnaire data and other government reports.

Note: the estimate of cannabis use in the last year in young people aged 15–16 years is based on school surveys in most countries, thus the use of the term 'students'.

In most countries, cannabis is the most widely used drug, both among the general population and among young people. A global estimate, produced for the first time by UNODC, based on available data from 130 countries, suggests that, in 2016, 13.8 million young people (mostly students) aged 15–16 years used cannabis at least once in the previous 12 months, equivalent to 5.6 per cent of the population in that age range. Annual use of cannabis in 15–16 year old people was slightly higher than among the general population aged 15–64 years (3.9 per cent in 2016). However, caution is required as error margins around these two estimates overlap.

### *Opioids are responsible for most of the negative health impact of drug use*

While cannabis is the most widely used drug globally, opioids are responsible for most of the negative health impact of drug use. For example, opioids accounted for 76 per cent of deaths from drug use disorders in 2015.<sup>2</sup> There were an estimated 34.3 million past-year users of opioids (persons who use opiates and persons who use prescription opioids for non-medical purposes) globally in 2016,

corresponding to 0.7 per cent of the global population aged 15–64 years. The prevalence of past-year use of opioids among the population aged 15–64 years is high in North America (4.2 per cent) and Oceania (2.2 per cent). Among users of opioids, 19.4 million were past-year users of opiates (heroin and opium), corresponding to 0.4 per cent of the population aged 15–64 years, with high prevalence rates of past-year use of opiates in Central Asia and Transcaucasia (0.9 per cent), Eastern and South-Eastern Europe (0.7 per cent) and North America (0.8 per cent).

### *Misuse of pharmaceutical opioids is a growing concern*

The misuse of pharmaceutical opioids such as tramadol is reported in many countries in Africa (particularly West and North Africa) and in some countries of the Near and Middle East. This is reflected in the number of people in treatment for tramadol-related problems and the number of tramadol overdose deaths reported in some countries. The high level of misuse of pharmaceutical opioids remains a major concern in North America, a subregion that has seen a resurgence in heroin use in the past four years, particularly in the United States of America. Coupled with the use of fentanyl and its analogues, the interlinked epidemic of

<sup>2</sup> WHO, Disease burden and mortality estimates, Global Health Estimates 2015: deaths by cause, age, sex, by country and by region, 2000–2015. Available at [www.who.int/](http://www.who.int/).

prescription opioids and heroin has taken a heavy toll, especially in terms of the high number of reported fatal overdoses associated with their use. There are also increasing signs of misuse of pharmaceutical opioids in Western and Central Europe, as reflected, for example, in the increasing proportion of people entering treatment services for non-medical use of pharmaceutical opioids in the subregion. While not at the same level as in North America, overdose deaths related to fentanyl and its analogues have also been reported in Western and Central Europe.

### *Amphetamines are one of the most worrying threats of drug use in East and South-East Asia*

In 2016, an estimated 34.2 million people worldwide, or 0.7 per cent of the population aged 15–64 years, used amphetamines in the past year. The highest annual prevalence of use of amphetamines among the population aged 15–64 years was in North America (2.0 per cent), followed by Oceania (1.3 per cent). It is not possible to construct a specific estimate of use of amphetamines in East and South-East Asia due to the chronic lack of data in the subregion, but many countries in that subregion consider methamphetamine use to be one of the most worrying threats of drug use. There are also concerns that an increasing number of countries are reporting methamphetamine use, especially among opioid users in West Asia. “Ecstasy” is used by 0.4 per cent of the global population aged 15–64 years, but its spread across most regions has been striking in recent years, during which time there has also been an increasing trend in “ecstasy” use in Western and Central Europe, as well as Latin America.

### *Indications of an increase in cocaine use in the Americas*

The use of cocaine remains concentrated in North America and South America, where, respectively, 1.9 per cent and 0.95 per cent of the population aged 15–64 years are past-year users, and in Oceania (1.7 per cent) and Western and Central Europe (1.2 per cent). Globally, an estimated 18.2 million people used cocaine in 2016, or 0.4 per cent of the population aged 15–64 years. There are indications of an increase in cocaine use in many countries in North and South America. In addition, the use of cocaine

base paste, previously confined to cocaine-manufacturing countries, has spread to many countries in South America.

### *Non-medical use of benzodiazepines in combination with prescription opioids is a growing problem*

While global estimates of the non-medical use of prescription drugs are not available, such misuse remains quite widespread, particularly among individuals practicing polydrug use. The non-medical use of prescription drugs such as prescription stimulants and benzodiazepines, in combination with prescription opioids, is reported to be a growing problem in many countries. Of misused prescription drugs, the non-medical use of benzodiazepines remains the most common: approximately 60 countries<sup>3</sup> have ranked benzodiazepines among the three most commonly misused substances, and some countries report higher prevalence rates for their use than for many other substances. Benzodiazepines are also frequently reported in fatal overdose cases involving opioids.

### *Trends in drug treatment are consistent with changing patterns of drug use in different regions*

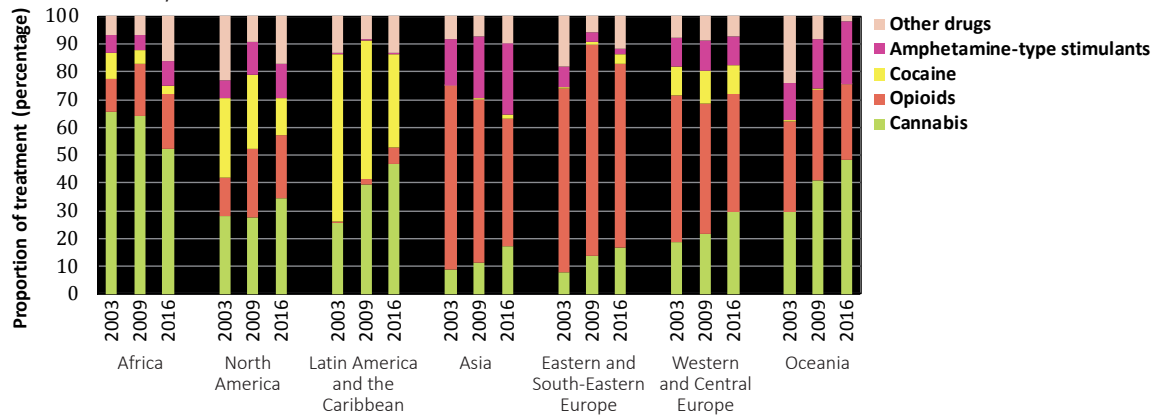
Globally, the extent to which people in need of drug treatment actually receive it remains limited. In 2016, as in previous years, an estimated one in six people who had drug use disorders received treatment. Despite limitations, information about people in treatment for drug use can provide useful insight into trends and geographical variations with respect to drug use disorders. However, this information should be interpreted with caution because treatment numbers reflect not only demand for treatment (the number of people seeking help) but also the extent of the provision of treatment (depending on government willingness to finance treatment services).

Most people in drug treatment in Africa, the Americas and Oceania are being treated for cannabis use. In all regions except Africa, an increasing proportion of the drug treatment provided is related to cannabis use. Although cannabis has consistently been the

3 Based on responses to the annual report questionnaire by Member States in 2015 and 2016.



**FIG. 3** Trends in the proportion of primary drug of use in drug treatment admissions, by region, 2003, 2009 and 2016



Source: UNODC, responses to the annual report questionnaire.

most common drug of use among those receiving drug treatment in Africa, treatment for opioid use disorders is increasing in the region. This trend may be an indication that ongoing trafficking of heroin and pharmaceutical opioids in transit through Africa to other destinations has produced a worrying spillover effect on drug use within Africa. Opioids remain a major concern in Europe and Asia, especially in Eastern and South-Eastern Europe, where two of every three people in drug treatment are there for opioid use disorders.

Cocaine continues to be a drug of concern among those receiving treatment in Latin America and the Caribbean, in particular, where one third of those in treatment for drug use disorders are being treated for cocaine use, although that proportion has been declining. Cocaine use disorders are reported as the primary reason for drug treatment, albeit to a lesser extent, in North America and Western and Central Europe as well. In North America, treatment primarily for cocaine use disorders has been declining in relative importance, while the proportion of those in treatment for opioid use disorders has increased. In the United States, between 2004 and 2014, the number of admissions related primarily to the use of cocaine declined by 65 per cent, from 248,000 to 88,000 individuals, and treatment for the use of opiates increased by 51 per cent, from 323,000 to 490,000 individuals. There is a higher proportion of treatment for the use of ATS in Asia and Oceania than in other regions.

### *Women with drug use disorders are underrepresented in treatment*

Although one in three drug users is a woman, women continue to account for only one in five people in treatment. The proportion of females in treatment tends to be higher for tranquillizers and sedatives (approximately one in three treatment admissions in most subregions of the Americas and Europe) than for other substances. This reflects the fact that although men are three times as likely to use cannabis, cocaine or amphetamines, women are more likely to use tranquillizers and sedatives for non-medical purposes. People in treatment for drug use disorders related to opioids and cocaine tend to be older: in their early thirties on average. By contrast, those in treatment for cannabis use disorders tend to be younger: in their early twenties on average.

## B. HEALTH CONSEQUENCES OF DRUG USE

The main focus of this section are the health-related aspects of the use of drugs, such as injecting drug use, HIV and HCV acquired through unsafe injecting practices, as these are responsible for the greatest burden of disease, in terms of mortality and disability, associated with the use of drugs.<sup>4,5</sup> While opioids

<sup>4</sup> Institute for Health Metrics and Evaluation, Global Burden of Disease Data. Available at [www.healthdata.org/](http://www.healthdata.org/).

<sup>5</sup> *World Drug Report 2017* (United Nations publication, Sales No. E.17.XI.6).



## Cocaine base paste in South America

Traditionally, the use of cocaine base paste had mostly been confined to Colombia and Peru, but over the past decade its use has gradually spread further south, to Argentina, Brazil, Chile and Uruguay. Cocaine base paste is a derivative of coca leaf with a high potential for harmful use and dependence. However, information on the patterns of use, health effects and options for effective treatment is currently limited.<sup>a</sup>

Tighter restrictions on the sale of, and access to, the chemical precursors used in the manufacture of cocaine hydrochloride is one of the reasons for the spread of the use of cocaine base paste to many countries in South America. Cocaine base paste is a derivative of coca leaf produced as an intermediate product in the preparation of cocaine hydrochloride. It is a form of “smokable cocaine” of high toxicity with a greater potential for dependence than cocaine hydrochloride, and is now a matter of concern in South America as it can cause severe psychological and physical disorders.

As is the case for treatment of all psychostimulants, there is currently no established pharmacological treatment for cocaine use disorders. Information regarding the appropriate treatment for cocaine base paste dependence is therefore limited.

<sup>a</sup> Antonio Pascale and others, *Cocaine Base Paste Consumption in South America: A Review of Epidemiological and Medical-Toxicological Aspects* (Washington, D. C., Organization of American States, Inter-American Drug Abuse Control Commission, 2015).

are responsible for most of the negative health impact of drug use, in regions where opioid use is less common, the use of other substances such as cocaine and amphetamines (both injecting and non-injecting use) is also associated with adverse health consequences. There is also increasing awareness of the health risks associated with the use of NPS, although in terms of the magnitude of the problem they are small. Furthermore, in many subregions, the non-medical use of benzodiazepines has been associated with overdose deaths that also involved opioids.

## Almost 11 million people worldwide injected drugs in 2016

The UNODC/WHO/UNAIDS/World Bank joint estimate of the number of PWID in 2016 is 10.6 million (range: 8.3 million to 14.7 million),

corresponding to 0.22 per cent (range: 0.17 to 0.30 per cent) of the global population aged 15–64 years. This estimate is based on the most recent and highest quality information currently available to UNODC. It does not imply that there has been a change in the global number of PWID compared with those published in previous editions of the *World Drug Report*. Based on data from 107 countries, the estimate covers 88 per cent of the global population aged 15–64 years.

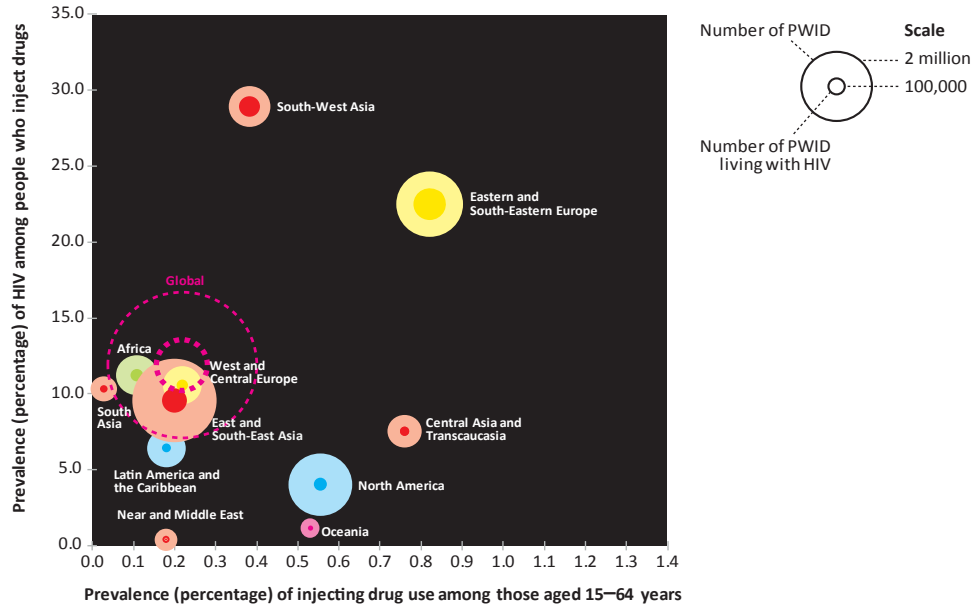
The extent of injecting drug use is less certain or unknown in some subregions due to the paucity of data: in the Caribbean, information is available only for Puerto Rico; for all of Oceania, there are data for Australia and New Zealand only; while for Africa, data are available for countries comprising 58 per cent of the population aged 15–64 years, and for the Near and Middle East, only 17 per cent of that population.

The subregions where the largest numbers of PWID reside are Eastern and South-Eastern Europe, with 17 per cent of the global total number of PWID and where the prevalence of injecting drug use is highest at 3.8 times the global average; North America, with 17 per cent of the global total of PWID and where the prevalence of injecting drug use is 2.5 times the global average; and East and South-East Asia, with 30 per cent of the global total of PWID, but where the prevalence of injecting drug use is relatively low and is below the global average.

Almost half of all PWID worldwide in 2016 were estimated to reside in just three countries: China, the Russian Federation and the United States. Although these three countries combined account for just 27 per cent of the global population aged 15–64 years, together they are home to 45 per cent of the world’s PWID, an estimated 4.8 million people.

In addition to the estimates presented here, another study<sup>6</sup> providing national, regional and global estimates of PWID and the prevalence of HIV among PWID was published in *The Lancet Global Health* in 2017 (see the box, entitled “Injecting drug use

<sup>6</sup> Louisa Degenhardt and others, “Global prevalence of injecting drug use and sociodemographic characteristics and prevalence of HIV, HBV, and HCV in people who inject drugs: a multistage systematic review”, *The Lancet Global Health*, vol. 5, No. 12 (2017), pp. e1192–e1207.

**FIG. 4** | Regional patterns in injecting drug use and HIV among people who inject drugs, 2016

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

Note: The outer circle represents the number of PWID, and the inner circle represents the number of PWID living with HIV. Regions and subregions are coloured: green (Africa), blue (Americas), orange (Asia), yellow (Europe) and pink (Oceania). Data presented for Oceania are for Australia and New Zealand only.

and HIV: a comparison of global estimates”). That study also presented data on PWID disaggregated by gender and age and estimated that approximately one in five PWID are women and a little over one in four are younger than 25 years of age. Information on the gender disaggregation of PWID was available for 91 countries (40 countries in Europe, 21 in Asia, 6 in the Americas, 2 in Oceania and 22 in Africa) and an age breakdown for PWID was available for 72 countries (30 countries in Europe, 16 in Asia, 5 in the Americas, 1 in Oceania and 20 in Africa).

PWID are among the most marginalized and stigmatized people who use drugs. They are exposed to specific risk behaviours and risky environments and experience a broad spectrum of adverse social and health consequences. Homelessness and incarceration are common, as is engagement in risk behaviours such as casual unprotected sex, using a needle-syringe after use by someone else and involvement in sex work.<sup>7</sup>

Unsafe injecting practices, including the sharing of contaminated needles and syringes, is a major route for the transmission of both HIV and HCV among PWID. In addition, those who acquire HIV and HCV through unsafe injecting practices can transmit the diseases to others, for example, through sexual transmission. HCV is more readily spread than HIV through injecting. Studies among health-care workers in the United States (using hospital data on needle-stick injury) have estimated that the probability of transmission of HCV per exposure to a contaminated syringe is between 5 and 20 times higher than for the transmission of HIV.<sup>8</sup>

### One in eight people who inject drugs is living with HIV

Outside sub-Saharan Africa, PWID accounted for 20 per cent of new HIV infections in 2015.<sup>9</sup> Fur-

8 Elijah Paintsil and others, “Survival of hepatitis C virus in syringes: implication for transmission among injection drug users”, *Journal of Infectious Diseases*, vol. 202, No. 7 (2010), pp. 984–990.

9 UNAIDS, *Ending AIDS: Progress Towards the 90–90–90 Targets* (Geneva, 2017).

7 Ibid.

thermore, the number of newly infected PWID worldwide each year has been on the rise, increasing by one third, from 114,000 new cases in 2011 to 152,000 cases in 2015.<sup>10</sup> This contrasts with the estimated 11 per cent decline in new HIV infections among adults in general (more precisely, among people aged 15 years and older) that occurred between 2010 and 2016.<sup>11</sup>

The joint UNODC/WHO/UNAIDS/World Bank 2016 estimate of the prevalence of HIV among PWID is 11.8 per cent, suggesting that 1.3 million PWID are living with HIV. This estimate is based on the reporting of the prevalence of HIV among PWID from 119 countries, covering 94 per cent of the estimated global number of PWID. For PWID living with HIV, co-infection with HCV is highly prevalent, at 82.4 per cent.<sup>12</sup>

By far the highest prevalence of HIV among PWID is in South-West Asia and in Eastern and South-Eastern Europe, with rates that are, respectively, 2.4 and 1.9 times the global average. Together, those two subregions account for 49 per cent of the total number of PWID worldwide living with HIV. Although the prevalence of HIV among PWID in East and South-East Asia is below the global average, 24 per cent of the global total of PWID living with HIV reside in that subregion. An estimated 53 per cent of PWID living with HIV worldwide in 2016 (662,000 people) resided in just three countries (China, Pakistan and the Russian Federation), which is disproportionately large compared with the percentage of the world's PWID living in those three countries (35 per cent).

### **Injecting drugs is a major route for transmission of the HCV virus**

The burden of disease (mortality and morbidity) among PWID resulting from HCV is greater than from HIV.<sup>13</sup> Unsafe injecting by sharing contami-

nated needles and syringes is an important route for the spread of HCV worldwide. Of the total of 1.7 million new HCV infections worldwide in 2015, 23.0 per cent (390,000 people) were attributable to current injecting drug use.<sup>14</sup> Of deaths worldwide in 2015 due to cancer and cirrhosis of the liver associated with HCV infection, 31.5 per cent were attributable to a history of injecting drug use.<sup>15</sup>

HCV infection is highly prevalent among PWID, as every second PWID is living with HCV. The joint UNODC/WHO/UNAIDS/World Bank estimate for 2016 for the prevalence of HCV among PWID is 51.9 per cent; in other words, 5.5 million people who inject drugs are living with HCV. This estimate is based on the reporting of the prevalence of HCV among PWID from 96 countries, covering 91 per cent of the estimated global number of PWID.

The higher risk of the spread of HCV among PWID who are women is of particular concern. A study conducted among 1,868 PWID in Australia, Canada, the Netherlands and the United States estimated that women who inject drugs have a 38 per cent higher risk of contracting HCV than their male counterparts. This higher risk does not seem to be related to different practices in the sharing of syringes, which is a significant risk factor for HCV, but is associated with other factors, including genetic factors, and differences in access to prevention services.<sup>16</sup>

The joint UNODC/WHO/UNAIDS/World Bank global estimate for 2016 for the prevalence of HBV<sup>17</sup> among PWID is 7.5 per cent; in other words, an estimated 0.8 million PWID are living with HBV.

Burden of Disease Study 2013", *The Lancet Infectious Diseases*, vol. 16, No. 12 (2016), pp. 1385–1398.

14 WHO, *Global Hepatitis Report 2017* (Geneva, 2017).

15 Ibid.

16 Aryan Esmaeili and others, "The effect of female sex on hepatitis C incidence among people who inject drugs: results from the International Multicohort InC3 Collaborative", *Clinical Infectious Diseases*, vol. 66, No. 1 (2018), pp. 20–28.

17 The HBV prevalence estimate is intended to refer to active infection (HBsAg), rather than anti-HBc, which indicates previous exposure. However, it is not always possible to differentiate that in the data reported to UNODC.

10 UNAIDS, *Get on the Fast-Track: The Life-cycle Approach to HIV* (Geneva, 2016).

11 Ending AIDS: Progress Towards the 90–90–90 Targets.

12 Lucy Platt and others, "Prevalence and burden of HCV co-infection in people living with HIV: a global systematic review and meta-analysis", *Lancet Infectious Diseases*, vol. 16, No. 7 (2016), pp. 797–808.

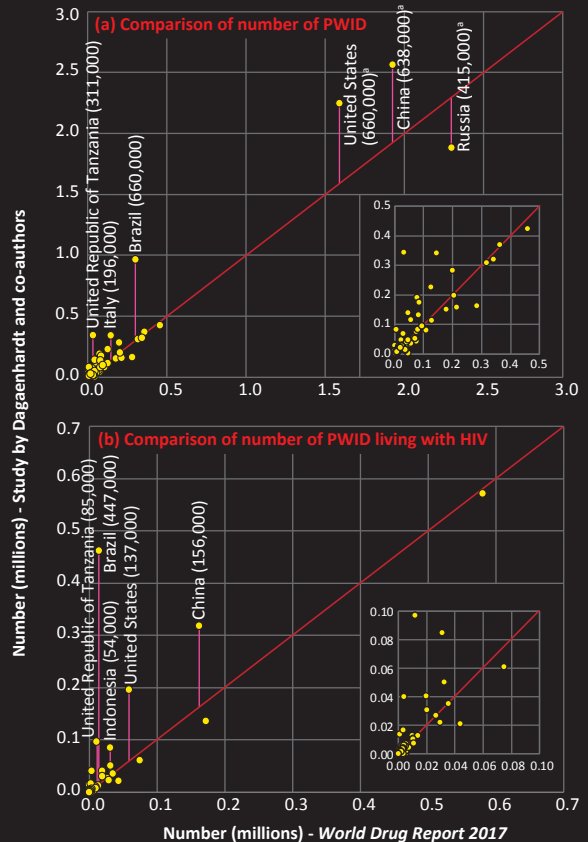
13 Louisa Degenhardt and others, "Estimating the burden of disease attributable to injecting drug use as a risk factor for HIV, hepatitis C, and hepatitis B: findings from the Global

## Injecting drug use and HIV: a comparison of global estimates

Given the hidden and stigmatized nature of injecting drug use, it is extremely challenging to arrive at accurate and valid population size estimates for PWID and the prevalence of HIV among PWID in a given country. Aggregating national data and producing regional and global estimates is even more challenging, given the gaps in data at the country level. Numerous methods are employed, including respondent-driven sampling, capture-recapture, the treatment multiplier or unique object multiplier methods, network-scale up, census and enumeration, and general population surveys to generate such estimates. Each method has its own advantages and disadvantages, relies on particular theoretical assumptions that may not fully reflect the real situation, may be logistically difficult to implement, or may not yet have been fully validated.<sup>a</sup> Estimating the prevalence of HIV among PWID is further complicated by selection bias and the difficulty of recruiting a representative sample. The prevalence of HIV among PWID can vary considerably between geographical locations within a country, thus making the calculation of a national estimate challenging.

In 2017, Degenhardt and co-authors published country, regional and global population size estimates for PWID and the prevalence of HIV among PWID.<sup>b</sup> Their global estimate for the number of PWID in 2015 was 3.8 million higher than the corresponding joint UNODC/WHO/UNAIDS/World Bank estimate, and their estimated number of PWID living with HIV was 1.25 million higher. The methodologies used by Degenhardt and co-authors and the joint UNODC/WHO/UNAIDS/World Bank estimates were broadly consistent. The selection of country estimates was based on a comparable grading of the quality of the available national estimates. In both cases, a population-weighted average approach was used to determine regional and global estimates and to infer estimates for countries for which no data were available. In the study by Degenhardt and co-authors, PWID population size estimates were identified for 83 countries, and the prevalence of HIV among PWID was identified for 108 countries. UNODC identified estimates of PWID population size for 107 countries and prevalence of HIV among PWID for 118 countries. Degenhardt and co-authors conducted a systematic review of peer-reviewed and grey literature before UNODC conducted an exhaustive annual search of the scientific literature for countries for which data were not reported to UNODC, or were of insufficient quality, and also conducted a global consultation with experts over the prior four years. Where multiple high-quality studies on PWID were available for a country, Degenhardt and co-authors pooled the estimates through meta-analysis. For the prevalence of HIV, if there were multiple estimates available for a given country, Degenhardt and co-authors pooled the estimates published in the four years previous to the most recent estimate available. UNODC generally selected the most recent estimates from studies of the highest quality, giving due consideration to the definition of injecting, sample size and geographical coverage.

Comparison of estimates of (a) numbers of PWID and (b) numbers of PWID living with HIV, selected countries, 2015



Source: *World Drug Report 2017* (comprising the responses to the annual report questionnaire, progress reports of UNAIDS on the global AIDS response (various years), the former Reference Group to the United Nations on HIV and Injecting Drug Use, and published peer-reviewed articles and government reports); and Louisa Degenhardt and others, "Global prevalence of injecting drug use and sociodemographic characteristics and prevalence of HIV, HBV, and HCV in people who inject drugs: a multistage systematic review", *The Lancet Global Health*, vol. 5, No. 12 (2017), pp. e1192–e1207.

Note: The estimated number of PWID and number of PWID living with HIV are for the 15–64 years age category.

<sup>a</sup> The difference between the estimates produced by the two studies.

For approximately one third of the countries (25), the PWID size estimates presented in the study by Degenhardt and co-authors were retained from the previous global systematic review published 10 years ago, in 2008.<sup>c</sup> PWID population size estimates were not updated for some countries that account for a large share of PWID: Brazil, China, India, Italy and the Russian

Federation. Estimates of the prevalence of HIV among PWID was included for 108 countries, using estimates retained from the 2008 review for 12 of those countries, including Brazil and Argentina.

More recent data on injecting drug use have become available for the Russian Federation, China and Italy since the 2008 review and were published in the *World Drug Report 2017*. The estimates, which used indirect methods of estimation, were officially reported to UNODC or UNAIDS but were not otherwise available in the public domain.

A direct comparison is made, at the country level, of the number of PWID and PWID living with HIV, in order to identify those countries for which there are the largest differences between the estimates of the *World Drug Report 2017* and the study by Degenhardt and co-authors.

The methodology to determine regional and global estimates and imputing data for countries with missing information was based on the same approach in both studies and has not produced tangible discrepancies. A large part of the discrepancy in regional and global estimates is due to the differences in national data for a handful of countries.

There are important policy implications that arise from the differences in the regional estimates put forward by the two data sets. The study by Degenhardt and co-authors shows the highest prevalence of HIV among PWID living with HIV in Latin America, whereas the estimates of the *World Drug Report 2017* point to Eastern Europe as the region of greatest concern. From a global perspective, regional data on PWID and PWID living with HIV are crucial to prioritize efforts to support national institutions and non-governmental organizations to provide prevention and treatment services. Thus, defining the most recent and methodologically sound set of information is vital to ensuring that global efforts are properly targeted where they are most needed.

<sup>a</sup> Abu S. Abdul-Quader, Andrew L. Baughman and Wolfgang Hladik, “Estimating the size of key populations: current status and future possibilities”, *Current Opinion in HIV and AIDS*, vol. 9, No. 2 (2014), pp. 107–114.

<sup>b</sup> Louisa Degenhardt and others, “Global prevalence of injecting drug use and sociodemographic characteristics and prevalence of HIV, HBV, and HCV in people who inject drugs: a multistage systematic review”, *The Lancet Global Health*, vol. 5, No. 12 (2017), pp. e1192–e1207.

<sup>c</sup> Bradley M. Mathers and others, “Global epidemiology of injecting drug use and HIV among people who inject drugs: a systematic review”, *The Lancet*, vol. 372, No. 9651 (2008), pp. 1733–1745.

## Coverage of core interventions to prevent spread of HIV and HCV among PWID remains poor and insufficient

The coverage of core interventions to help prevent the spread of HIV and HCV among PWID in most countries remains too low to be effective.<sup>18</sup> Core, science-based interventions for the prevention of HIV are, in order of priority: needle and syringe programmes that provide sterile injecting equipment; opioid substitution therapy to reduce dependency on opioids and hence decrease the frequency of injecting; HIV testing and counselling, which is an important gateway into treatment and care; and antiretroviral therapy to reduce the viral load and the transmission of HIV.<sup>19</sup> For effective HCV prevention, key interventions are needle and syringe programmes and opioid substitution therapy coupled with HCV treatment to substantially reduce the ongoing HCV transmission in the community.<sup>20, 21</sup> In particular, needle and syringe programmes and opioid substitution therapy can be especially effective for both HIV and HCV prevention when they are implemented together with high levels of coverage among PWID (see table 1).<sup>22, 23, 24</sup>

18 Sarah Larney and others, “Global, regional, and country-level coverage of interventions to prevent and manage HIV and hepatitis C among people who inject drugs: a systematic review”, *The Lancet Global Health*, vol. 5, No. 12 (2017), pp. e1208–e1220.

19 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).

20 Katy M. E. Turner and others, “The impact of needle and syringe provision and opiate substitution therapy on the incidence of hepatitis C virus in injecting drug users: pooling of UK evidence”, *Addiction*, vol. 106, No. 11 (2011), pp. 1978–1988.

21 Peter Vickerman and others, “Can needle and syringe programmes and opiate substitution therapy achieve substantial reductions in hepatitis C virus prevalence? Model projections for different epidemic settings”, *Addiction*, vol. 107, No. 11 (2012), pp. 1984–1995.

22 Louisa Degenhardt and others, “Prevention of HIV infection for people who inject drugs: why individual, structural and combination approaches are needed”, *The Lancet*, vol. 376, No. 9737 (2010), pp. 285–301.

23 Natasha K. Martin and others, “Combination interventions to prevent HCV transmission among people who inject drugs: modeling the impact of antiviral treatment, needle and syringe programs, and opiate substitution therapy”, *Clinical Infectious Diseases*, vol. 57, Suppl. No. 2 (2013), pp. S39–S45.

24 Turner and others, “The impact of needle and syringe



## Availability of services for people in prison and post release

People who use drugs in prison are at greater risk of acquiring infectious diseases and have less access to relevant prevention and treatment services than those in the community outside prison.<sup>a</sup> The prevalence of risk behaviours, coupled with the lack of access to prevention measures in many prisons, can result in the frighteningly rapid spread of HIV. The prevalence of HIV, HCV, HBV and tuberculosis among people in prison and other closed settings is 2 to 10 times higher than among the general population.<sup>b, c, d, e</sup> However, access to HIV prevention, treatment and care programmes is often lacking in prison, and even where they are available, in many cases, such programmes are not necessarily of the same standard as those provided in the community.<sup>f</sup>

On release from prison, most people living with HIV are often discharged without support and have to face pervasive and multidimensional forms of exclusion, stigma and discrimination stemming from their incarceration history, HIV status, socioeconomic class and ethnicity.<sup>g, h</sup> People in prison are often not in contact with HIV, HCV and drug dependence treatment services upon release, or are provided with only some services, because often they are unaware of what services are offered.<sup>i, j</sup> The widespread lack of adequate discharge planning and follow-up after release has profound and immediate health effects. A systematic review found that prisoners were unlikely to be placed in contact with community health-care services upon their release from prison. People recently released from prison had poor access to HIV prevention, treatment and care as a result of stigma and discrimination, and missed out on follow-up care by health services after release due to a lack of discharge planning.<sup>k</sup> Research suggests that after release, use of antiretroviral therapy decreases from 51 per cent to 29 per cent, and viral suppression drops from 40 per cent to 21 per cent.<sup>l</sup> Lack of follow-up for HCV treatment undermines the effectiveness of prison-provided care, where it is available, and contributes to the spread of the disease in the community.<sup>m, n</sup>

People who use heroin are exposed to a severe risk of death from overdose after release from prison, especially in the first two weeks. Such deaths are related to a lowered tolerance to the effects of heroin developed during incarceration.<sup>o</sup> Yet released prisoners are rarely able to access overdose prevention medications such as naloxone and methadone, or other treatment for substance dependence.<sup>p</sup> Having secured housing is an important determinant of access to and retention in HIV care. Disparities in housing status contribute substantially to the gap in HIV treatment outcomes between homeless and non-homeless patients, including the attainment of viral suppression over time.<sup>q</sup>

<sup>a</sup> Ralf Jürgens, Manfred Nowak and Marcus Day, "HIV and incarceration: prisons and detention", *Journal of the International AIDS Society*, vol. 14, No. 26 (2011), pp. 1–17.

<sup>b</sup> Kate Dolan and others, "Global burden of HIV, viral hepatitis, and tuberculosis in prisoners and detainees", *The Lancet*, vol. 388, No. 10049 (2016), pp. 1089–1102.

<sup>c</sup> Kate Dolan and others, "Drug injection, sexual activity, tattooing and piercing among prison inmates: A global systematic review and meta-analysis of 2,359,220 prisoners" *Epidemiological Reviews*, (2018) (in press).

<sup>d</sup> Amber Arain, Geert Robaey and Heino Stöver, "Hepatitis C in European prisons: a call for an evidence-informed response", *BMC Infectious Diseases*, vol. 14, Suppl. No. 6 (2014), pp. 1–6.

<sup>e</sup> Lilangane Telisinghe and others, "HIV and tuberculosis in prisons in sub-Saharan Africa", *The Lancet*, vol. 388, No. 10050 (2016), pp. 1215–1227.

<sup>f</sup> Josiah D. Rich and others, "Clinical care of incarcerated people with HIV, viral hepatitis, or tuberculosis", *The Lancet*, vol. 388, No. 10049 (2016), pp. 1103–1114.

<sup>g</sup> Leonard S. Rubenstein and others, "HIV, prisoners, and human rights", *The Lancet*, vol. 388, No. 10050 (2016), pp. 1202–1214.

<sup>h</sup> Alexis C. Dennis and others, "'You're in a world of chaos': experiences accessing HIV care and adhering to medications after incarceration", *Journal of the Association of Nurses in AIDS Care*, vol. 26, No. 5 (2015), pp. 542–55.

<sup>i</sup> Liza Solomon and others, "Survey finds that many prisons and jails have room to improve HIV testing and coordination of postrelease treatment", *Health Affairs (Millwood)*, vol. 33, no. 3 (2014), pp. 434–442.

<sup>j</sup> Sung-Pil Choi and others, "Prevalence and correlates of community re-entry challenges faced by HIV-infected male prisoners in Malaysia", *International Journal of STD and AIDS*, vol. 21, No. 6 (2010), pp. 416–23.

<sup>k</sup> Rubenstein and others, "HIV, prisoners, and human rights".

<sup>l</sup> Princess A. Iroh and others, "The HIV care cascade before, during, and after incarceration: a systematic review and data synthesis", *American Journal of Public Health*, vol. 105, No. 7 (2015), pp. e5–16.

<sup>m</sup> Tianhua He and others, "Prevention of hepatitis C by screening and treatment in U.S. prisons", *Annals of Internal Medicine*, vol. 164, No. 2 (2016), pp. 84–92.

<sup>n</sup> Natasha K. Martin and others, "HCV treatment as prevention in prison: key issues", *Hepatology*, vol. 61, No. 1 (2015), pp. 402 and 403.

<sup>o</sup> WHO, *Preventing Overdose Deaths in the Criminal Justice System* (Copenhagen, 2014).

<sup>p</sup> D. Leach and P. Oliver, "Drug-related death following release from prison: a brief review of the literature with recommendations for practice", *Current Drug Abuse Reviews*, vol. 4, No. 4 (2011), pp. 292–297.

<sup>q</sup> Alexei Zelenev and others, "Patterns of homelessness and implications for HIV health after release from jail", *AIDS and Behaviour*, vol. 17, Suppl. No. 2 (2013), pp. 181–194.

**TABLE 1** | Definition of high, moderate and low target levels for coverage of interventions

Intervention	Indicator	Level of coverage		
		low	moderate	high
Needle-syringe programmes (NSP)	Number of needle-syringes distributed per PWID per year	Less than 100	100 to less than 200	200 or more
Opioid substitution therapy (OST)	Number of OST clients per 100 PWID	Less than 20	20 to less than 40	40 or more
Antiretroviral therapy (ART)	Number of PWID receiving ART per 100 HIV-positive PWID	Less than 25	25 to less than 75	75 or more
HIV testing and counselling (HTC)	Number of PWID receiving an HIV test in the past 12 months per 100 PWID	Less than 40	40 to less than 75	75 or more

Source: 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).

The above-mentioned core interventions are not available in all countries where there is evidence of injecting drug use. The level of coverage of these interventions has been categorized by WHO, UNODC and UNAIDS as low, moderate, or high.<sup>25</sup>

A global review of the availability of these interventions assessed that the coverage of needle and syringe programmes and opioid substitution therapy among PWID was at low levels, with an estimated 33 (range: 21 to 50) needle-syringes distributed per PWID per year, and 16 (range: 10 to 24) clients of opioid substitution therapy per 100 PWID.<sup>26</sup> It was not possible to produce global coverage estimates for HIV testing and counselling and antiretroviral therapy because of a lack of data. In subregions with the largest numbers of PWID (East and South-East Asia, Eastern Europe and North America), there were low levels of service coverage for both needle and syringe programmes and opioid substitution therapy, with the single exception of moderate coverage of opioid substitution therapy in North America.

Of the 179 countries where there was evidence of injecting drug use (although not necessarily a PWID population size estimate), needle and syringe programmes were known to be available in 93 countries (52 per cent) and was confirmed to be absent in 83 countries (46 per cent). There was evidence of

implementation of opioid substitution therapy in 86 countries (48 per cent) but it was absent in 92 countries (46 per cent). There were 79 countries (44 per cent) implementing both needle and syringe programmes and opioid substitution therapy. Information on the availability of HIV testing and counselling and antiretroviral therapy was found to be very sparse. There were 34 countries with evidence of HIV-testing programmes for PWID and 17 countries confirming an absence of such programmes. Data on antiretroviral therapy were not available in 162 countries.<sup>27</sup>

High levels of coverage of needle and syringe programmes and opioid substitution therapy were available in only 5 per cent and 11 per cent, respectively, of the 179 countries where there was evidence of injecting drug use. There were 79 countries (44 per cent) with implementation of both needle and syringe programmes and opioid substitution therapy; however, there were only 4 countries (3 in Western Europe and 1 in Oceania) with high coverage of both needle and syringe programmes and OST.

### Deaths attributable to drug use remain high globally

Dying prematurely as a consequence of drug use is the most extreme outcome for people who use drugs. However, determining the extent of mortality attributable to drug use is not straightforward: deaths caused by drug use can be directly related to drug use disorders, such as overdose,<sup>28</sup> or can be indirectly

provision and opiate substitution therapy on the incidence of hepatitis C virus in injecting drug users”.

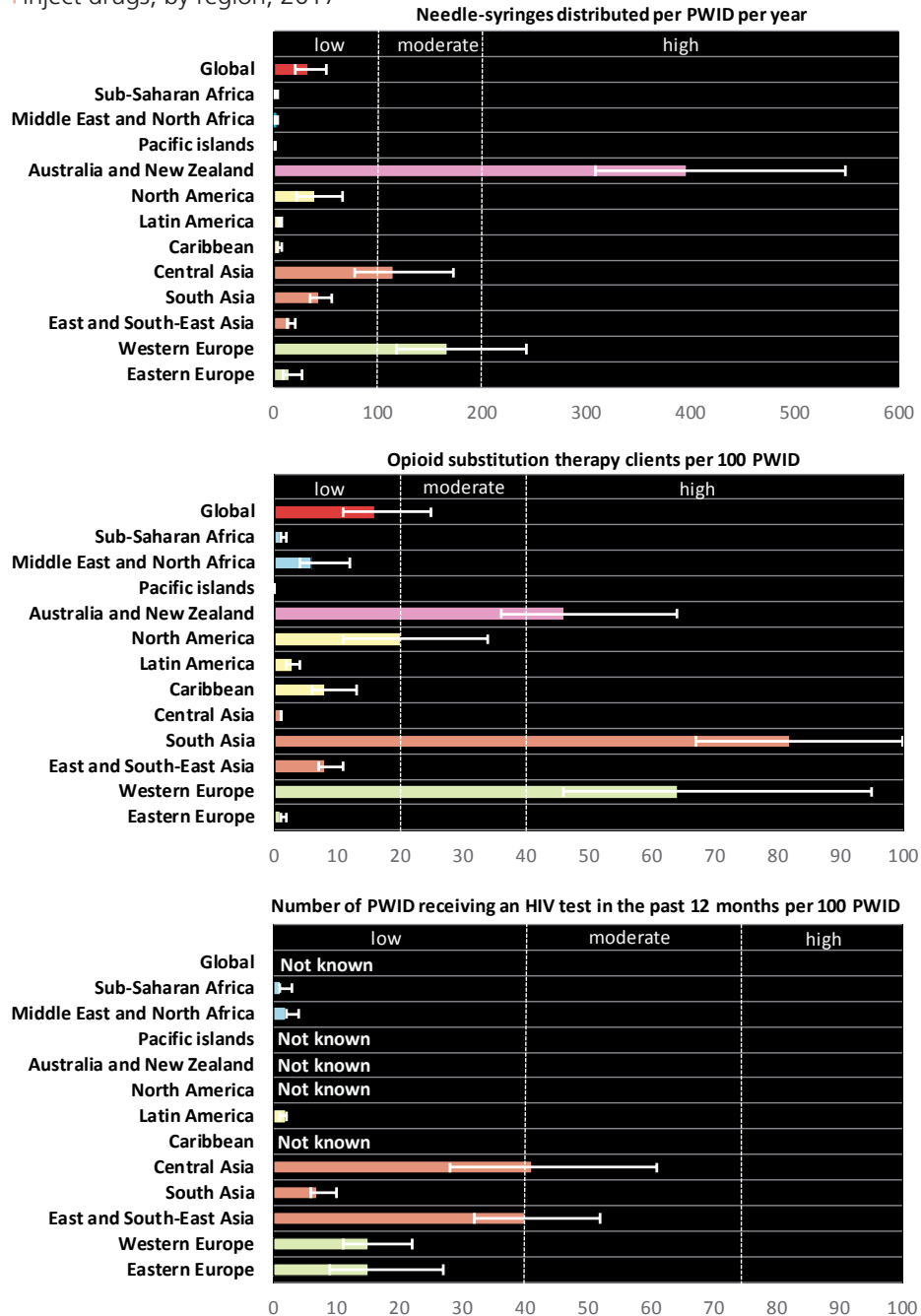
25 WHO, UNODC, UNAIDS Technical Guide.

26 Larney and others, “Global, regional, and country-level coverage of interventions to prevent and manage HIV and hepatitis C among people who inject drugs: a systematic review”.

27 Ibid.

28 According to the International Classification of Diseases (tenth revision) of WHO, the corresponding codes are:

**FIG. 5** Coverage of core interventions to prevent the spread of HIV and HCV among people who inject drugs, by region, 2017

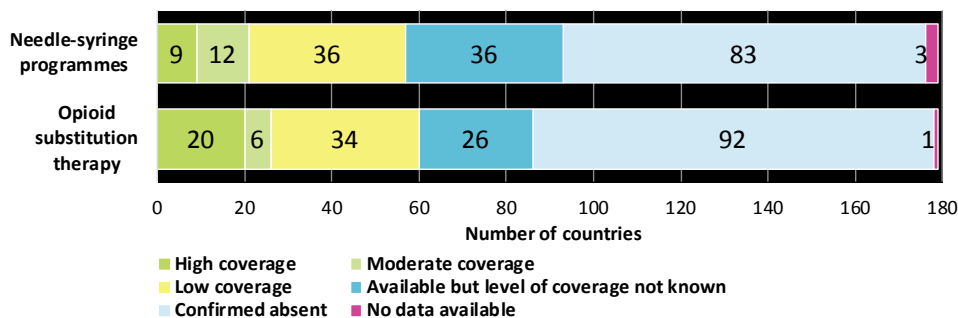


Source: Sarah Larney and others, "Global, regional, and country-level coverage of interventions to prevent and manage HIV and hepatitis C among people who inject drugs: a systematic review", *The Lancet Global Health*, vol. 5, No. 12 (2017), pp. e1208–e1220.

Notes: Regional grouping are those used by the authors. The level of coverage is classified as low, moderate or high according to 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) (Geneva, WHO, 2012). In the present figure, for Australasia, information is available for only Australia and New Zealand. Regional coverage could not be determined for antiretroviral therapy because of the lack of data.



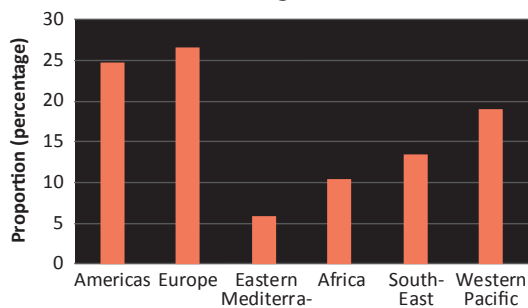
**FIG. 6** Availability and coverage of needle and syringe programmes and opioid substitution therapy, by number of countries, 2017



Source: Sarah Larney and others, "Global, regional, and country-level coverage of interventions to prevent and manage HIV and HCV among people who inject drugs: a systematic review", *The Lancet Global Health*, vol. 5, No. 12 (2017), pp. e1208–e1220.

Notes: Countries included (179) are those for which there was evidence of injecting drug use, even if there was no estimate of the number of PWID. For needle and syringe programmes, the level of coverage is determined by the number of needle-syringes distributed per PWID per year, classified as follows: "low" is less than 100; "moderate" is 100–199; and "high" is 200 or more. For opioid substitution therapy, the level of coverage is determined by the number of opioid substitution therapy clients per 100 primary opioid injectors, classified as follows: "low" is less than 20; "moderate" is 20–39; and "high" is 40 or more.

**FIG. 7** Regional proportions of deaths attributed to drug use disorders, 2015



Source: WHO, Global Health Estimates 2015, deaths by cause, age, sex, by country and by region, 2000–2015.

Note: Regions correspond to the classification used by WHO.

related to drug use, such as from HIV/AIDS or HCV acquired through unsafe injecting practices. The International Classification of Diseases (tenth revision) differentiates among these causes of death, but how it is applied in recording cause of death varies from country to country.

WHO estimates that there were 450,000 deaths attributable to drug use worldwide in 2015.<sup>29</sup> Of these, 167,750 deaths were associated with drug use

X40–44 (unintentional overdose), X61–62 (intentional self-harm (suicide)), Y10–14 (overdose of undetermined intent), T40 and T42 (poisoning by narcotic drugs).

<sup>29</sup> WHO, *Public health dimension of the world drug problem*. Report by the Secretariat to the 70th World Health Assembly. A70/29. 27 March 2017.

disorders, that is, directly the result of drug use (with 76 per cent of deaths from drug use disorders related to the use of opioids).<sup>30</sup> WHO also estimates that deaths from drug use disorders had been increasing globally over the prior 15 years from an estimated 105,000 deaths in 2000. Deaths that are indirectly attributable to drug use, such as those related to HIV and HCV acquired through unsafe injecting, or from suicides, accounted for the remaining two thirds (63 per cent) of the 450,000 deaths attributable to drug use in 2015.

In previous years, the *World Drug Report* has presented global and regional estimates of deaths caused by drug use. Participants at an Expert Working Group on Improving Drug Statistics and Strengthening the annual report questionnaire, held in Vienna in January 2018, identified, given the lack of data on deaths caused by drug use in general, the need for further discussion and collaboration between UNODC and WHO in order to estimate global (direct and indirect) drug-related deaths.

*Overdose deaths continue to rise in several countries with large numbers of such deaths*

In 2015 and 2016, for the first time in half a century, life expectancy in the United States of America declined for two consecutive years. A key factor was

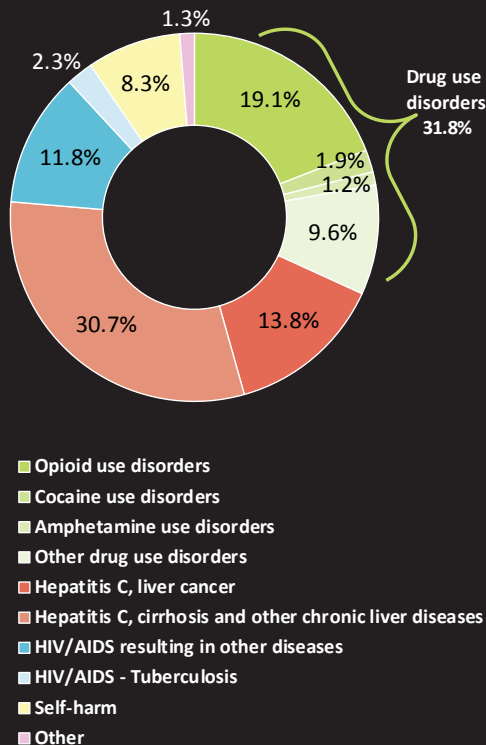
<sup>30</sup> WHO, Global Health Estimates 2015, deaths by cause, age, sex, by country and by region.

## Causes of mortality and early loss of life attributable to drug use: The Global Burden of Disease Study 2016

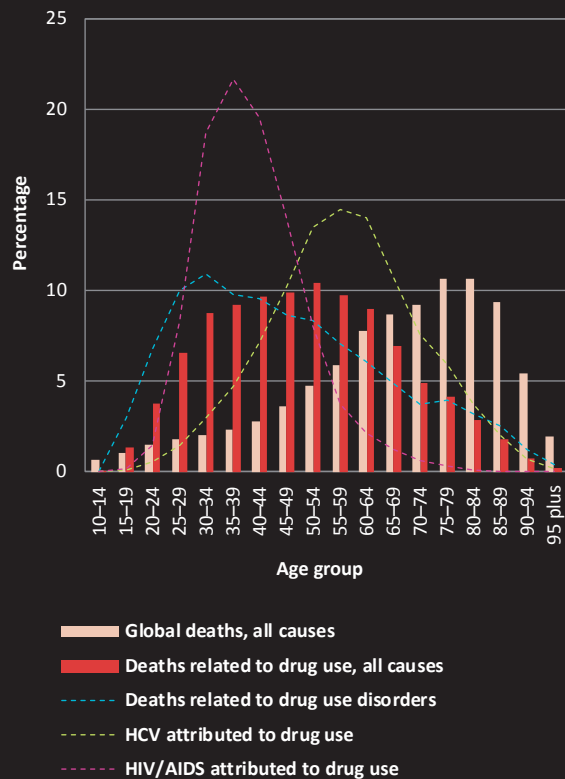
The Global Burden of Disease Study<sup>a</sup> estimated that there were 452,000 deaths (range: 420,000 to 487,000) worldwide in 2016 attributable to drug use (accounting for 0.83 per cent of global deaths from all causes). Approximately three out of four (74 per cent) of those deaths were of males. Untreated HCV, which can give rise to liver cancer and liver cirrhosis, constituted the largest proportion of them (45 per cent).

Globally, deaths attributable to drug use resulted in 16.8 million (range: 15.5 to 18.2 million) years of life lost due to premature death in 2016.<sup>b</sup> This suggests that a person who dies from causes attributable to drug use loses on average 37 years of life, a statistic that reflects the very young age at which many such premature deaths occur. Deaths attributed to drug use disorders (mostly overdose) peak among the youngest age group (30–34 years), while deaths from untreated HCV typically occur among an older age group (55–59 years).

(a) Leading causes of deaths attributable to drug use, 2016



(b) Age distribution of deaths attributable to drug use compared to global deaths from all causes, 2016



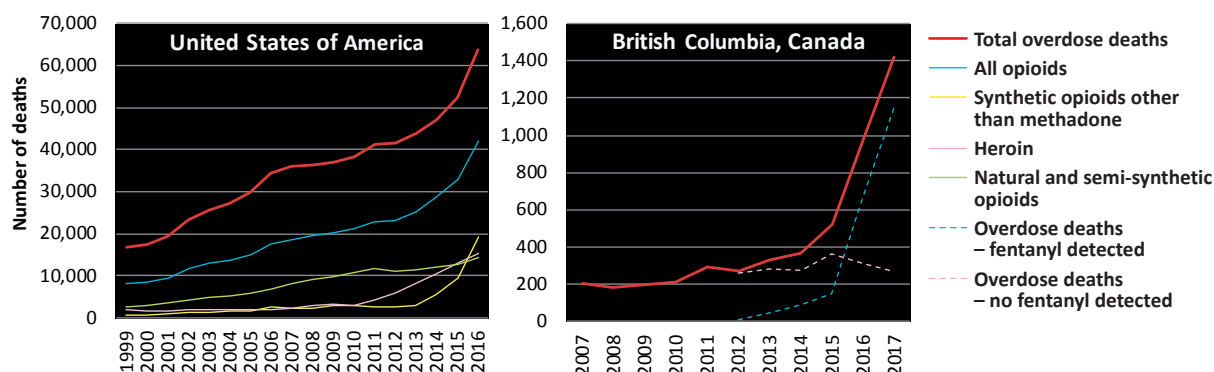
Source: Emmanuela Gakidou and others, “Global, regional, and national comparative risk assessment of 84 behavioural, environmental and occupational, and metabolic risks or clusters of risks, 1990–2016: a systematic analysis for the Global Burden of Disease Study 2016”, *The Lancet*, vol. 390, No. 10100 (2017), pp. 1345–1422.

Source: Institute for Health Metrics and Evaluation, Global Burden of Disease Data.

<sup>a</sup> Emmanuela Gakidou and others, “Global, regional, and national comparative risk assessment of 84 behavioural, environmental and occupational, and metabolic risks or clusters of risks, 1990–2016: a systematic analysis for the Global Burden

of Disease Study 2016”, *The Lancet*, vol. 390, No. 10100 (2017), pp. 1345–1422.

<sup>b</sup> Institute for Health Metrics and Evaluation, Global Burden of Disease Data.

**FIG. 8** | Overdose deaths from selected drugs in the United States and British Columbia, Canada

Source: For United States, see Holly Hedegaard, Margaret Warner and Arialdi M. Miniño, “Drug overdose deaths in the United States, 1999–2016”, NCHS Data Brief, No. 294 (December 2017). For British Columbia, Canada, see British Columbia Coroners’ Service, “Illicit drug overdose deaths in B.C., January 1, 2008–February 28, 2018” (Burnaby, British Columbia, Office of the Chief Coroner, 5 April 2018); and British Columbia Coroners’ Service, “Fentanyl-detected illicit drug overdose deaths. January 1, 2012–December 31, 2017” (Burnaby, British Columbia, Office of the Chief Coroner, 31 January 2018).

an increase in unintentional injuries, which include drug-related deaths.<sup>31</sup> A study that looked at reasons for declines in life expectancy related to certain causes of mortality over the period 2000–2015 found that overdose deaths, particularly those involving the use of opioids, made an important contribution to the causes of losses in years of life expectancy.<sup>32</sup> Overdose deaths continued to increase in the United States, rising faster than ever, with the largest annual percentage increase ever recorded in the age-adjusted overdose mortality rate occurring from 2015 to 2016. Total overdose deaths increased by 21.4 per cent from 2015 to 2016 to reach 63,632, the highest number on record. This increase was mostly related to deaths associated with synthetic opioids other than methadone (including fentanyl, fentanyl analogues and tramadol), which increased substantially to 19,413 overdose deaths in 2016; an increase of 103 per cent (more than doubling) from 2015, which continued the sharply increasing trend that started in 2012, since when deaths associated with synthetic opioids other than methadone have

increased tenfold among men and fivefold among women. In 2016, for the first time, deaths from synthetic opioids other than methadone surpassed both deaths from heroin and deaths from natural and semi-synthetic opioids (including morphine, codeine, hydrocodone and oxycodone). Overdose deaths associated with the use of heroin increased by 19 per cent from 2015 to 2016. Since 1999, deaths related to the use of heroin have increased more than twelvefold among women and sevenfold among men.<sup>33, 34</sup> This is in line with the 150 per cent increase in past-year heroin use among women and the 79 per cent increase in use among men that occurred from the period 2002–2004 to the period 2013–2015.<sup>35</sup> Excluding those deaths that also included synthetic opioids (primarily fentanyl), deaths related to the use of heroin, cocaine and methamphetamine have, however, remained essentially stable since 2013.

31 Kenneth D. Kochanek and others, Mortality in the United States, 2016. National Center for Health Statistics Data Brief No. 293, December 2017. Centers for Disease Control and Prevention.

32 Deborah Dowell and others, “Contribution of opioid-involved poisoning to the change in life expectancy in the United States, 2000–2015”, *JAMA*. vol. 318, No. 11 (2017), pp. 1065–1067.

33 Holly Hedegaard, Margaret Warner and Arialdi M. Miniño, “Drug overdose deaths in the United States, 1999–2016”, NCHS Data Brief, No. 294 (December 2017).

34 Centers for Disease Control and Prevention, National Center on Health Statistics, CDC WONDER. Available at <https://wonder.cdc.gov/>.

35 United States, Center for Behavioral Health Statistics and Quality, *Key Substance Use and Mental Health Indicators in the United States; Results from the 2015 Survey on Drug Use and Health*, HHS Publication No. SMA 16-4984, NSDUH Series H-51 (Rockville, Maryland, 2016).

Overdose deaths in British Columbia, Canada, reached a record level in 2017, continuing the sharply increasing trend that began in 2012. This increase was largely associated with fentanyl and its analogues (consumed either alone or in combination with other drugs), which had been detected in just 4 per cent of overdose deaths in 2012, whereas they were detected in 81 per cent of overdose deaths in 2017. There was a 73 per cent increase in overdose deaths in which fentanyl was detected from 2016 to 2017. The number of overdose deaths in which fentanyl was not detected, however, remained fairly stable over the period 2012–2017.<sup>36, 37</sup> Fentanyl remains a minor problem in other countries, with the notable exception of Estonia, where fentanyl has dominated the use of opioids for 15 years.

In Europe, overdose deaths rose for the third consecutive year to reach the highest number on record in 2015 (latest year for which data are available), with 8,441 deaths. Opioid-related deaths were responsible for the overall increase, with the presence of opioids (mostly heroin) detected in 79 per cent of overdose deaths in 2015. Increases in overdose deaths were reported in Germany, Lithuania, the Netherlands, Spain, Sweden and the United Kingdom.<sup>38</sup> The United Kingdom reported the highest number of overdose deaths in Europe, accounting for approximately one third (31 per cent) of the total.<sup>39</sup> In England and Wales,<sup>40</sup> the number of drug misuse deaths for both men and women that were registered in 2016 was the highest since records began in 1993: 2,593 drug misuse deaths, mostly due to heroin and/or morphine.<sup>41</sup>

In Australia, since 2011 there has been a significant increase in the rate of drug-induced deaths (deaths directly attributable to drug use), with the number reaching the highest on record in 2016 at 1,808 deaths. The majority of those deaths were caused by unintentional overdose (71 per cent), followed by suicide overdose (23 per cent), with other causes such as chronic complications of drug use or deaths of undetermined intent accounting for the remaining 6 per cent. These drug-induced deaths were mainly associated with non-medical use of benzodiazepines and oxycodone, which are both prescription drugs, used to manage anxiety and pain, respectively. Deaths from use of controlled substances have also been increasing, with the mortality rate related to stimulants (including methamphetamine and crystalline methamphetamine) quadrupling since 1999.<sup>42</sup>

### *Witnessing or personally experiencing an overdose is common*

Non-fatal overdoses are substantially more common than fatal ones, with many drug users reporting that they have personally experienced a non-fatal overdose. Overdoses that are fatal make up only a very small proportion of all overdoses, an estimated 2–4 per cent.<sup>43</sup> Based on a global, systematic review of the literature, almost half (47 per cent; range: 17 to 68 per cent) of the drug users included in the studies<sup>44</sup> reported that they had experienced a non-fatal overdose at least once in their lives, with almost one in six (17 per cent; range: 4 to 38 per cent) personally experiencing a non-fatal overdose in the past year.<sup>45</sup>

The risk of overdose is related to the route of administration of drugs, with injecting carrying the highest

36 Canada, British Columbia Coroners' Service, "Illicit drug overdose deaths in B.C. January 1, 2008–February 28, 2018" (Burnaby, British Columbia, Office of the Chief Coroner, 5 April 2018).

37 Canada, British Columbia Coroners' Service, "Fentanyl-detected illicit drug overdose deaths. January 1, 2012–December 31, 2017" (Burnaby, British Columbia, Office of the Chief Coroner, 31 January 2018).

38 EMCDDA, *European Drug Report 2017: Trends and Developments*, (Luxembourg, Publications Office of the European Union, 2017).

39 Ibid.

40 The definition of a drug misuse death is either a death where the underlying cause is drug abuse or drug dependence or a death where the underlying cause is drug poisoning and where any substance controlled under the United Kingdom Misuse of Drugs Act 1971 is involved.

41 United Kingdom, Office for National Statistics, "Deaths

related to drug poisoning in England and Wales: 2016 registrations", *Statistical Bulletin* (August 2017).

42 Australian Bureau of Statistics, "Causes of death, Australia, 2016", No. 3303.0, 27 September 2017. Available at [www.abs.gov.au/ausstats/abs@.nsf/mf/3303.0](http://www.abs.gov.au/ausstats/abs@.nsf/mf/3303.0).

43 Shane Darke, Richard P. Mattick and Louisa Degenhardt, "The ratio of non-fatal to fatal heroin overdose", *Addiction*, vol. 98, No. 8 (2003), pp. 1169–1171.

44 Among the 43 separate studies, 6 studies were among users of any substance, while the vast majority of the studies were among heroin, "crack" and/or cocaine users (21 studies), or among people who inject drugs (16 studies).

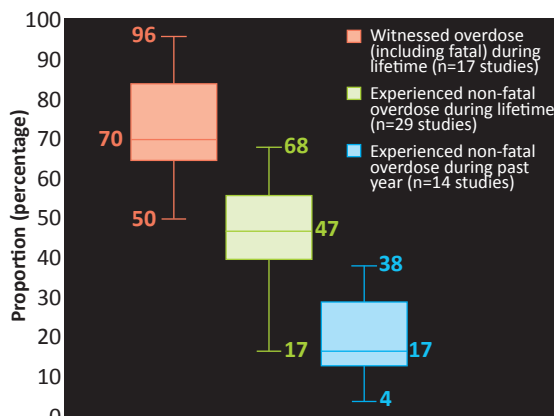
45 Silvia S. Martins and others, "Worldwide prevalence and trends in unintentional drug overdose: a systematic review of the literature", *American Journal of Public Health*, vol. 105, No. 11 (2015), pp. e29–e49.

risk of overdose compared with swallowing, sniffing or smoking.<sup>46</sup> Using combinations of certain drugs increases the risk of overdose, particularly the use of heroin in combination with depressants such as alcohol and benzodiazepines.<sup>47</sup> For people who use opioids, starting use again following a period of abstinence, such as disrupted or discontinued treatment, or soon after release from prison, leads to a heightened risk of overdose linked to a reduced tolerance to opioids.<sup>48, 49</sup>

Non-fatal overdoses can leave drug users with significant health problems such as muscle tissue breakdown, kidney failure, heart problems, seizures, nerve damage or cognitive impairment.<sup>50</sup> Experiencing a non-fatal overdose has been shown to be associated with a subsequent fatal overdose, and the risk increases with the number of prior non-fatal overdoses.<sup>51, 52</sup>

Early recognition that an overdose is occurring and subsequent intervention is often vital in preventing a fatal overdose. A very high proportion of people who use heroin and/or cocaine, or who inject drugs (almost three in four), report that they have witnessed an overdose (including those that prove fatal).<sup>53</sup> This means that people who use drugs have

**FIG. 9** Proportion of drug users<sup>a</sup> who have witnessed an overdose (including fatal overdoses) or personally experienced a non-fatal overdose



Source: Silvia S. Martins and others, “Worldwide prevalence and trends in unintentional drug overdose: a systematic review of the literature”, *American Journal of Public Health*, vol. 105, No. 11 (2015), pp. e29–e49.

Note: The numbers of studies included are shown in the legend. The shaded box depicts the middle 50 per cent of the data points (i.e., corresponding to the 25th and 75th percentiles) with the horizontal line within this box depicting the median value. The error bars are the minimum and maximum values.

<sup>a</sup> Of the 43 separate studies, 6 studies were among users of any substance, while the vast majority were among heroin, “crack” and/or cocaine users (21 studies), or among PWID (16 studies).

- 46 M. Teresa Brugal and others, “Factors associated with non-fatal heroin overdose: assessing the effect of frequency and route of heroin administration”, *Addiction*, vol. 97, No. 3 (2002), pp. 319–327.
- 47 UNODC and WHO, “Opioid overdose: preventing and reducing opioid overdose mortality”, Discussion paper, UNODC/WHO 2013 (June 2013).
- 48 WHO, *Preventing Overdose Deaths in the Criminal Justice System* (Copenhagen, 2014).
- 49 John Strang and others, “Loss of tolerance and overdose mortality after inpatient opiate detoxification: follow up study”, *British Medical Journal*, vol. 326, No. 7396 (2003), pp. 959 and 960.
- 50 Matthew Warner-Smith and others, “Heroin overdose: causes and consequences”, *Addiction*, vol. 96, No. 8 (2001), pp. 1113–1125.
- 51 Mark A. Stoové, Paul M. Dietze and Damien Jolley, “Overdose deaths following previous non-fatal heroin overdose: record linkage of ambulance attendance and death registry data”, *Drug and Alcohol Review*, vol. 28, No. 4 (2009), pp. 347–352.
- 52 Alexander Caudarella and others, “Non-fatal overdose as a risk factor for subsequent fatal overdose among people who inject drugs”, *Drug and Alcohol Dependence*, vol. 162 (2016), pp. 51–55.
- 53 Silvia S. Martins and others, “Worldwide prevalence and trends in unintentional drug overdose: a systematic review of the literature”, *American Journal of Public Health*, vol. 105, No. 11 (2015), pp. e29–e49.

an opportunity to intervene and influence the outcome of the situation and whether it proves fatal, for example, by administering naloxone in the case of an opioid overdose. So called “take-home” naloxone programmes have been implemented in a number of countries over the past 20 years, providing naloxone training and overdose management education, as well as take-home naloxone kits, to opioid users and others likely to witness opioid overdoses. Through an adequate response, including the administration of naloxone by someone witnessing the overdose, opioid overdose is reversible.<sup>54, 55, 56, 57</sup>

- 54 John Strang and Rebecca McDonald, eds., *Preventing Opioid Overdose Deaths with Take-home Naloxone*, Insights Series No. 20 (Luxembourg, EMCDDA, 2016).
- 55 WHO, *Community Management of Opioid Overdose* (Geneva, 2014).
- 56 EMCDDA, *Preventing Fatal Overdoses: A Systematic Review of the Effectiveness of Take-home Naloxone*, EMCDDA Papers (Luxembourg, Publications Office of the European Union, 2015).
- 57 Alexander Y. Walley and others, “Opioid overdose rates and implementation of overdose education and nasal naloxone



## C. EXTENT OF DRUG SUPPLY

### Drug cultivation and production

#### *Cannabis continues to be the most widely produced illicit drug worldwide*

In addition to being the most widely consumed drug worldwide, cannabis continues to be the most widely produced. Over the period 2010–2016, the cultivation of cannabis was reported, directly or indirectly, to UNODC by 145 countries located in all regions. Accounting for 94 per cent of the global population, that is more than twice the number of countries reporting opium poppy cultivation.

#### *Cultivation of both opium poppy and coca bush show a marked increase*

Growing by some 37 per cent from the previous year, the total global area under opium poppy cultivation has doubled since 2006 to reach almost 418,000 hectares in 2017. This was primarily the result of a marked increase in opium poppy cultivation in Afghanistan,<sup>58</sup> which accounted for 86 per cent of global opium production in 2017. There is no single reason for the increase in opium poppy cultivation in Afghanistan as many complex and geographically diverse elements influence farmers' decisions to cultivate opium poppy. A combination of events, including political instability, corruption and a lack of government control and security may have exacerbated rule of law challenges. By shifting its focus to combatting anti-government elements in densely populated areas, the Afghan Government may have made the rural population more vulnerable. A reduction in the engagement of the international aid community may also have hindered socioeconomic development opportunities in rural areas.

Accounting for some 5 per cent of global opium production in 2017, Myanmar, by contrast, reported a decrease in opium poppy cultivation and production.

Covering an area roughly half the size of the area under opium poppy cultivation, global coca bush cultivation, which had declined by 45 per cent over the period 2000–2013, increased by 76 per cent

over the period 2013–2016 to 213,000 ha.<sup>59</sup> Coca bush cultivation is thus back to the level reported in 2001, only slightly below (4 per cent lower) the peak in 2000. That decline and subsequent increase in coca production were primarily the consequence of changes in coca bush cultivation in Colombia; however, coca bush cultivation increased in all three coca-producing countries, Bolivia (Plurinational State of), Colombia and Peru, in 2016, resulting in a 36 per cent increase in the total area under coca bush cultivation that year.

#### *Opium production is at its highest level since UNODC monitoring began and cocaine manufacture is at its highest ever level*

With some 10,500 tons of production, estimated global opium production in 2017 is by far the highest on record since UNODC started monitoring global opium production on an annual basis at the beginning of the twenty-first century.<sup>60</sup> Global opium production<sup>61</sup> increased by 65 per cent from 2016 to 2017 (and, increased by 120 per cent since 2015), a far greater increase than the corresponding increase in the area under opium poppy cultivation. This was mainly the result of a gradual increase in poppy yields in Afghanistan, which were starting to recover from the low levels reported in the main cultivation areas over the previous few years.

Having fallen over the period 2005–2013, global cocaine manufacture<sup>62</sup> rose by 56 per cent over the period 2013–2016. Potential cocaine output reached 1,410 tons (at 100 per cent purity) in 2016, the highest level ever estimated, representing a 25 per

59 The latest data available on coca bush cultivation are from 2016.

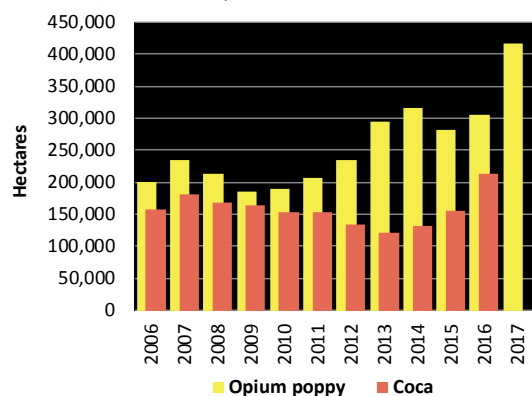
60 Estimates available on opium production in the literature for the early decades of the twentieth century show far higher levels of opium production up to the mid-1930s than in the recent past (see UNODC, *A Century of International Drug Control*, 2009); however, those earlier estimates were based on different methodologies (such as payments of taxes and other levies by opium farmers) and are not fully comparable with the data presented in the present report, which are largely based on remote sensing and yield surveys (see the online methodological annex for details).

61 To estimate opium production, the area under opium poppy cultivation is multiplied by the respective opium yield per hectare in each region.

62 The Single Convention on Narcotic Drugs of 1961 refers to production of a substance, such as opium, where no further processing takes place, and the manufacture of substance, such as cocaine, where processing in laboratories is required.

distribution in Massachusetts: interrupted time series analysis", *BMJ*, vol. 346 (2013), pp. 1–13.

58 For a detailed discussion on the opioid market, see booklet 3.

**FIG. 10** Total area under opium and coca cultivation, 2006–2017

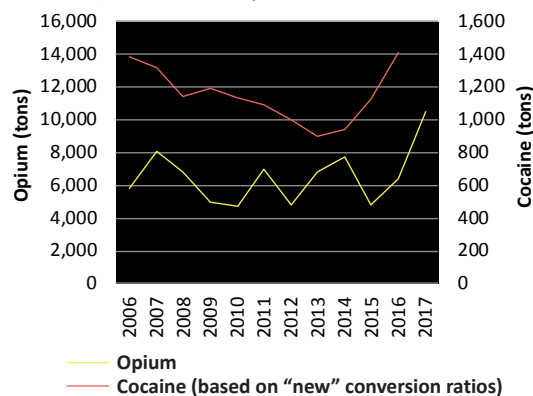
Source: UNODC, coca and opium surveys in various countries; responses to the annual report questionnaire; and United States, Department of State, *International Narcotics Control Strategy Report*, various years.

cent rise in global cocaine manufacture from the previous year. The largest increase in potential cocaine manufacture (34 per cent) in 2016 was reported by Colombia, which accounted for more than 60 per cent of the global total.

### Drug seizures

The distribution, level and pattern of drug seizures can be analysed either in terms of the quantities of a drug seized (by weight) or the number of seizure cases. Neither are a direct indicator of the trafficking of drugs as they also reflect law enforcement capacity and priorities. However, changes in the number of drug seizure cases and quantities of a drug seized, if considered together, and taking into account changes in purity-adjusted prices, can help identify trends in, and patterns of, drug supply, as well as changes in law enforcement activity and drug trafficking strategy. For example, a recent study in Australia suggested that, for most drugs (notably cocaine and ATS), increases in the frequency of seizures and the quantities intercepted primarily reflected changes in supply: those increases were shown to coincide with subsequent increases in low-level trafficking, as well as in drug-related arrests and consumption (as reflected in emergency room visits), and vice versa.<sup>63</sup>

63 Wai-Yin Wan, Don Weatherburn, Grand Wardlaw, Vsailis Sarafidis, Grant Sara, “Do drug seizures predict drug-related emergency department presentations or arrests for drug use and possession?”, *International Journal of Drug Policy*, 27 (2016), pp. 74–81.

**FIG. 11** Global opium production and cocaine manufacture, 2006–2017

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

Note: Cocaine manufacture is expressed in terms of a hypothetical manufacturing output level of 100 per cent pure cocaine; actual cocaine manufacturing output, unadjusted for purity, is significantly higher. (More information on the “new” versus the “old” conversion ratios can be found in the online methodology section of this report.)

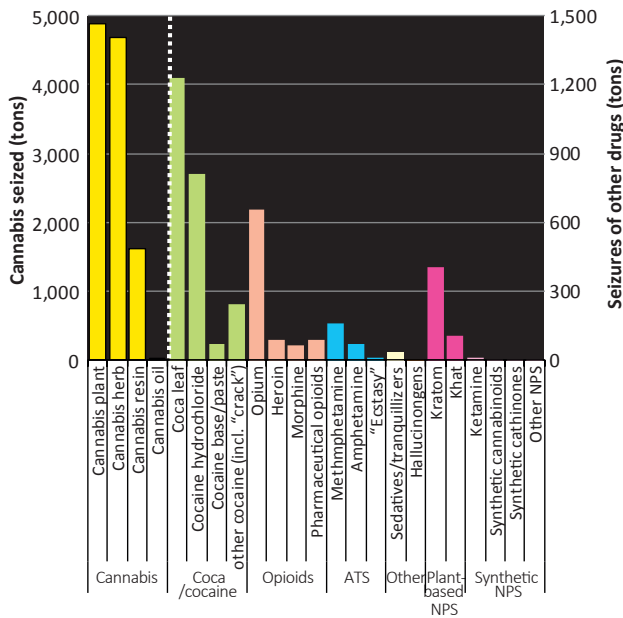
### Cannabis remains the drug seized in the greatest quantities worldwide, followed by coca and cocaine-related substances

Cannabis continued to account for the largest quantities of drugs seized at the global level in 2016, followed by coca and cocaine-related substances, opioids, NPS and ATS (mostly methamphetamine).

The largest quantities of opioids seized globally in 2016 were of opium. When expressed in heroin equivalent,<sup>64</sup> however, the largest quantities of opioids seized were of heroin, followed by pharmaceutical opioids. Seizures of the latter consisted mainly of tramadol, an opioid not under international control and, to a lesser extent, of codeine, oxycodone and fentanyl. Fentanyl and its analogues can be between 100 and 10,000 times more potent than morphine, so even small quantities can represent a very large number of doses. In terms of doses, fentanyl and its analogues are therefore estimated to account for the majority of pharmaceutical opioids seized in 2016.<sup>65</sup>

64 10 kg of opium is equivalent to 1 kg of heroin.

65 See the online methodological annex for detailed calculations of the quantities seized as expressed in estimated number of doses.

**FIG. 12 |** Global quantities of drugs seized, 2016

Source: UNODC, responses to the annual report questionnaire data, providing information from 124 countries.

Note: Quantities seized have not been adjusted for purity or potency.

For the first time, the largest total quantity of plant-based NPS seized in 2016 was of kratom (*Mitragyna speciosa*), which has both opioid properties and stimulant-like effects; the second largest total seizure quantity of plant-based NPS was of the stimulant khat. Of the total quantity of sedatives and tranquilizers seized in 2016, the largest portion was related to methaqualone, followed by benzodiazepines, while quantities of barbiturates seized remained small. Seizures of hallucinogens in 2016 were dominated by LSD.

### Marked increases in quantities of amphetamine-type stimulants, cocaine, plant-based new psychoactive substances and sedatives seized

Although cannabis continued to dominate global drug seizures, quantities of cannabis products seized decreased by 16 per cent in 2016. This reflected a 22 per cent decrease in the quantities of cannabis herb seized (driven by decreases in Africa and the Americas) to 4,700 tons and a 6 per cent increase in the quantities of cannabis resin seized to 1,600 tons.

Quantities of ATS seized worldwide increased by 20 per cent in 2016 to 247 tons, a record high. Quantities of amphetamine seized rose by 35 per cent to a record high of 70 tons in 2016, quantities of "ecstasy" seized increased by 37 per cent to 14 tons, and quantities of methamphetamine seized increased by 12 per cent to a record high of 158 tons.

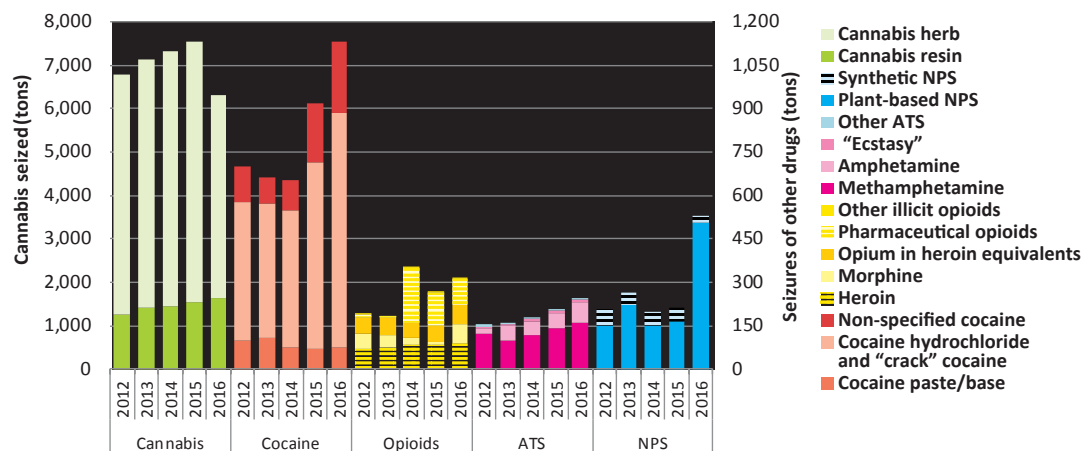
Similarly, at more than 1,100 tons,<sup>66</sup> the total quantity of cocaine seized worldwide (including coca paste and cocaine base) also reached an all-time high in 2016, an increase of more than 20 per cent from the previous year and of more than 60 per cent since 2012. This may be linked to the marked increases in the cultivation of coca leaf and global cocaine manufacture seen in recent years.

The sharpest increases reported in the quantities of a particular drug seized in 2016 were, however, of plant-based NPS, mainly due to seizures of kratom, which rose sevenfold to more than 400 tons. Quantities of synthetic NPS seized, by contrast, saw a marked decline of more than 50 per cent in 2016, and a decline of more than 60 per cent since 2012. The decline was most pronounced in the quantities of phenetalamines (-99 per cent) and synthetic cannabinoids seized, which decreased by 87 per cent over the period 2012–2016; this was mostly related to a marked decline in quantities of "Spice"-type mixtures intercepted (herbal substances mixed with synthetic cannabinoids). Quantities of piperazines seized remained stable while quantities of synthetic cathinones, tryptamines and ketamine and phencyclidine-type substances seized increased over the period 2012–2016.

Quantities of opioids seized worldwide increased by some 13 per cent in 2016, mostly as a result of the increasing quantities of opiates intercepted, which reflected ongoing increases in opium production and morphine and heroin manufacture. With respective increases of 12 and 10 per cent, new record levels of both opium (658 tons) and heroin (91 tons) seizures were reported in 2016, while the total quantity of morphine intercepted rose sevenfold to 65 tons.

<sup>66</sup> This figure is not comparable to the estimated amount of cocaine manufactured (1,410 tons), as cocaine manufactured is estimated at 100 per cent purity while cocaine seized is not adjusted for purity.



**FIG. 13** | Global quantities of selected drugs seized, 2012–2016


Source: UNODC, responses to the annual report questionnaire.

Note: A rate of 10:1 was used to transform seizures of opium into seizures expressed in heroin equivalents.

Although the total quantity of pharmaceutical opioids seized worldwide in 2016 decreased by more than 20 per cent from the very high level in 2015, it was still nine times the amount seized in 2012. The increase over the period 2012–2016 was mainly driven by a large increase in the quantities of tramadol intercepted, as well as of hydrocodone, oxycodone and fentanyl.

A sevenfold increase was reported in the quantities of sedatives and tranquilizers intercepted in 2016. This was mainly the result of a marked increase in the quantities of methaqualone, benzodiazepines and GHB seized.

Quantities of hallucinogens seized worldwide decreased by more than 90 per cent from 2015 to 2016 and, over the medium term, decreased by 75 per cent from 2012 to 2016, mostly because of a marked decline in North America. However, quantities of the prototype hallucinogen LSD seized more than doubled in 2016, for the most part because of an increase in the quantities of LSD seized in Europe and North America.

*The decline in the average size of drug seizures may reflect changes in both drug trafficking and law enforcement strategies*

Member States reported 2.5 million drug seizure cases to UNODC in 2016, up from 2.4 million in 2015 (reported by 69 and 65 countries, respectively). More than half of all drug seizure cases in the period

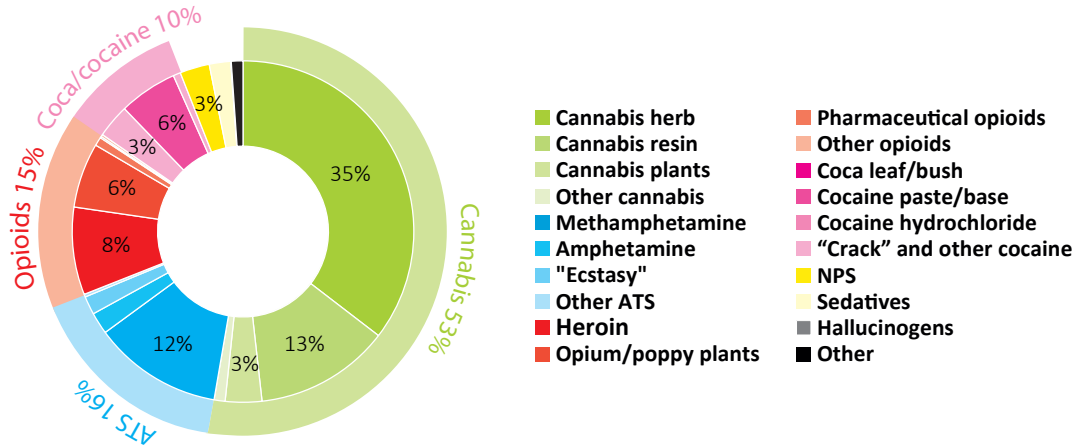
2015–2016 were of cannabis (mostly herb), while the next largest number of seizure cases were of ATS.

Analysis of trends in the respective shares of each drug in seizure cases shows a decline in the share of global cannabis seizure cases over the past decade. By contrast, the share of seizure cases of ATS (mostly methamphetamine), opioids and NPS rose over the same period. Such trends are confirmed when analysing data from 71 countries that reported seizure cases in the two periods, 2005–2006 and 2015–2016.

It is challenging to compare global trends in the number of drug seizure cases and quantities seized because not all countries always report the number of seizure cases intercepted. Considering the sample of countries that reported the number of seizures and quantities seized in both 2005–2006 and 2015–2016 (71 countries), it can be noted that overall the number of drug seizure cases increased by 17 per cent from the period 2005–2006 to the period 2015–2016, while the quantities of drugs seized increased by 3 per cent.

The average size of drug seizure cases decreased from roughly 6 kg in 2005–2006 to 5 kg in the period 2015–2016. However, that overall decline in the average seizure size in the 71 reporting countries masks the variations between the different types of drug intercepted. The average size of seizure cases of cannabis herb, cannabis resin, cocaine, morphine, "ecstasy", plant-based NPS and synthetic NPS

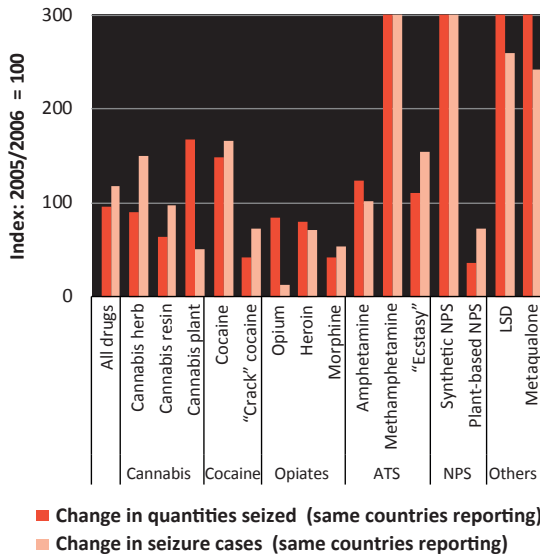
**FIG. 14** | Distribution of global number of drug seizure cases, 2015–2016



Source: UNODC, responses to the annual report questionnaire.

Note: The calculations are based on a breakdown of almost 5 million seizure cases reported to UNODC in the period 2015–2016 period. The data set includes 2.4 million seizures cases reported in 2015 and 2.5 million seizures cases in 2016. Seizure case information is based on information from 80 countries, including 65 countries reporting in 2015 and 69 countries reporting in 2016.

**FIG. 15** | Changes in quantities of drugs seized and number of drug seizure cases from 2005–06 to 2015–16



Source: UNODC, responses to the annual report questionnaire

Note: Calculation based on data from 71 countries (index: 2005–2006 = 100).

decreased from the period 2005–2006 to the period 2015–2016, while the average size of individual seizure cases of cannabis plant, opium, methamphetamine, amphetamine, LSD and methaqualone increased.

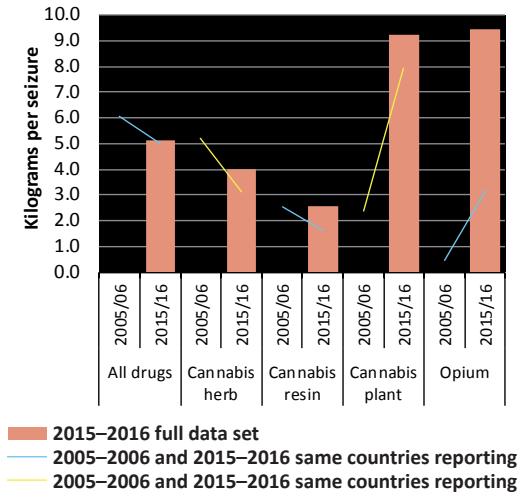
The stronger increase in the number of drug seizure cases as compared to the quantities of drugs seized and thus the decline in the average size of seizure cases from the period 2005–2006 to the period 2015–2016 might stem from changes in both law enforcement and drug trafficking practices. Changes in law enforcement strategies may include the targeting of retail and microtrafficking and a greater emphasis on less bulky types of drugs. Changes in drug trafficking activities may include a trend towards an increasing number of shipments of smaller quantities of a drug — a strategy used by drug trafficking organizations to reduce losses resulting from seizures (including the use of drug mules and postal/private parcel services, particularly in the case of drugs sold on the darknet). A trend of trafficking less bulky drugs or trafficking substances of a higher purity might also be responsible for declining amounts seized per seizure cases, as might be an increase in the use of social supply networks for distributing drugs. Improved reporting of smaller seizure cases might also have contributed to the decline in the average size of individual seizures.

However, differences in the average weight of seizure cases for different drug types are not necessarily an indication of changes in law enforcement interventions or the modus operandi of drug traffickers, as there are large differences in purity and potency for the various substances.



Seizures of some of the bulkiest drugs, such as plant-based NPS (13 kg per case, and mainly reflecting seizures of khat and kratom), opium (9.5 kg) and cannabis plant (9.2 kg), accounted for the largest average size of seizure cases over the period 2015–2016.

**FIG. 16** Average size of drug seizures in 2015–2016 and trend in average size from the period 2005–2006 to the period 2015–2016, selected drugs



Source: UNODC, responses to the annual report questionnaire.  
 Note: See online methodological annex for calculation details.

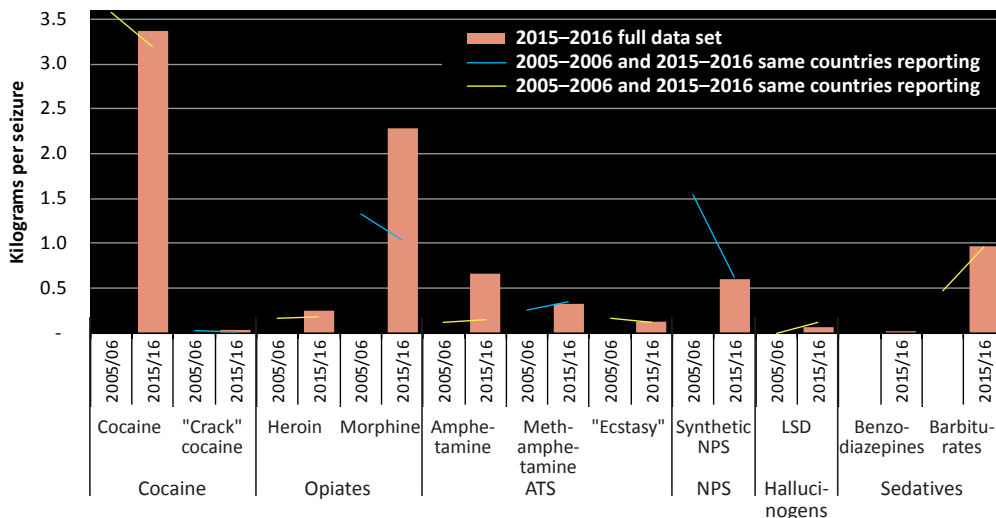
The average size of seizures of cocaine (3.4 kg per case) intercepted in the period 2015–2016 was far larger than, for example, the average size of individual seizures of ATS, synthetic NPS or heroin, which may suggest that cocaine is more likely than other drugs to be trafficked in large quantities, for instance, on semi-submersibles and ships and in containers. Despite being trafficked on similarly long and diverse trafficking routes to its main consumer markets, seizure cases of heroin (0.2 kg) were, on average, substantially smaller in terms of weight than those of cocaine.

The smallest average seizures (under 10 g) reported in the period 2015–2016 were of LSD, benzodiazepines, “crack” cocaine and barbiturates. This may be a reflection of the relatively short distances between manufacturing locations (LSD, “crack” cocaine), or between the point where they are diverted into illicit channels (benzodiazepines and barbiturates), and their respective consumer markets.

### Drug trafficking via the darknet is a growing challenge for authorities

Empirical research on the darknet (the part of the “deep web” containing information that is only accessible using special web browsers) is limited so far. Summarized below, some recent studies

**FIG. 17** Average size of drug seizures in 2015–2016 and trend in average size from the period 2005–2006 to the period 2015–2016, selected drugs



Source: UNODC, responses to the annual report questionnaire.  
 Note: See online methodological annex for calculation details.

(typically making use of web-crawling techniques whereby repeated snapshots of various darknet market sites are made and analysed) help provide a better understanding of trends and patterns linked to drug purchases via the darknet. The discussion also draws on the experience and in-depth knowledge of European and North American police specialists involved in undercover activities to identify drug sellers and dismantle darknet drug selling platforms.

### *Darknet: drug market business model*

The darknet is being used for many illicit activities, including drug trafficking. A darknet study conducted jointly by EMCDDA and Europol found that more than 60 per cent of all listings on five major darknet markets worldwide up to August 2017 were related to the illicit sale of drugs, including drug-related chemicals and pharmaceuticals.<sup>67</sup> The illicit sale of drugs alone accounted for almost half of all such listings.

People wishing to purchase drugs via the darknet typically access it through the “Onion router” (TOR) to ensure that their true identities remain concealed. The use of specialized darknet explorers, such as Grams, enables them to navigate to their desired market platform where products bought on darknet marketplaces are typically paid for in cryptocurrencies such as bitcoin.<sup>68</sup> Bitcoins can then be used to purchase other goods and services or can be exchanged for different national currencies. The delivery of drugs purchased on those marketplaces is usually undertaken by public or private postal services,<sup>69</sup> with parcels often sent to anonymous post office boxes, particularly to automated “pack stations”, for self-service collection.

67 EMCDDA and Europol, *Drugs and the Darknet: Perspectives for Enforcement*, Research and Policy, Joint publications series (Luxembourg, Publications Office of the European Union, 2017), p. 15.

68 Since the beginning of the darknet drug markets, the bitcoin has been the most popular payment currency (Martin Horton-Eddison and Matteo Di Cristofaro, “Hard interventions and innovation in crypto-drug markets: the escrow example”, Policy Brief No. 11 (Swansea, United Kingdom, Global Drug Policy Observatory, Swansea University, August 2017)), p. 4.

69 World Customs Organization, *Illicit Trade Report 2015* (Brussels, December 2016), p. 44.

The main advantage for both suppliers and customers is the anonymity of the transaction as it does not require any physical contact. Darknet trafficking also overcomes the challenge of suppliers and customers having to be in the same location, as well as the need for suppliers to have the critical mass necessary to sustain a standard drug market. As with orthodox Internet transactions, customers also benefit from other customers’ feedback on the quality of products sold and the reliability of the supplier. Darknet platforms also guarantee the payment of the goods sold, typically making use of escrow account systems,<sup>70</sup> which request immediate payment for goods ordered while delaying the finalization of payment until goods ordered have actually been received by the customer.

### *High degree of volatility and frequent disappearance of darknet drug trading platforms*

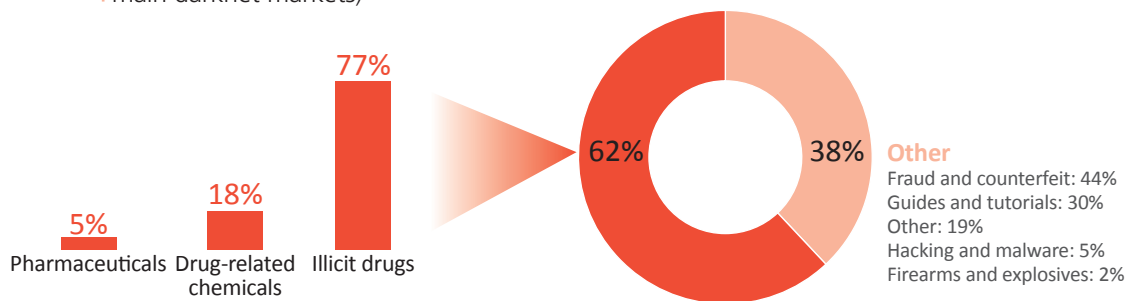
Darknet markets have been in operation since 2010,<sup>71</sup> although they have only gained true importance since the start of the Silk Road trading platform in February 2011 (closed down in October 2013). They consist of websites that are used as trading platforms, similar to licit trading platforms on the public World Wide Web (the “Surface Web”) used for purchasing licit goods and services. The illegality of many darknet transactions means, however, that there are significant differences between darknet and open World Wide Web trading platforms.

Principal among those differences are the use of a dedicated currency, mostly bitcoin, escrow accounts and the rapid emergence and disappearance of trading platforms, often directly linked to illegal business practices. Based on a detailed analysis by EMCDDA and Europol of 103 darknet marketplaces operating globally over the period 2011–2017, darknet markets remain active for just over eight months on average, with the most enduring ones operating, on average, for just under four years, and most not lasting more than a year. The main platforms on the darknet have thus changed frequently, from Silk Road over the period 2011–2013, to Agora and

70 Horton-Eddison and Di Cristofaro, “Hard interventions and innovation in crypto-drug markets”, p. 3.

71 EMCDDA and Europol, *Drugs and the Darknet*.

**FIG. 18** | Importance of drugs and drug-related chemicals for the darknet (based on listings on the main darknet markets)



Source: EMCDDA and Europol, *Drugs and the darknet*, November 2017, p. 15.

Note: Based on active listings data from AlphaBay, Dream Market, Hansa, TradeRoute and Valhalla darknet marketplaces, spanning from the launch of each marketplace to 21 August 2017 (or market closure).

Evolution in 2014, AlphaBay, Nucleus and Dream Market in 2015–2016, and predominantly AlphaBay in 2017. Since the dismantlement of AlphaBay in July 2017, the main platforms have been Dream Market and emerging markets such as Valhalla, Silk Road 3.1, Darknet Heroes League, Apple Market, House of Lions Market, TradeRoute, Wall Street Market, RSClub Market, Zion Market, Infinite Market, CGMC and OW Market.<sup>72</sup>

EMCDDA and Europol also analysed the reasons for the closure of 89 marketplaces operating globally over the period extending from 2010 to the end of July 2017. They found that “exit scams”, in which operators suddenly closed down their sites and pocketed all money held in escrow accounts which had been used to facilitate transactions, were the most common reason for closure (35 per cent), followed by “voluntary exits” (27 per cent), closures prompted by law enforcement action (17 per cent) and hacking by third parties (12 per cent).<sup>73</sup>

Even though law enforcement agencies were not responsible for the bulk of closures of trading platforms, in terms of the number of sites operating on the darknet over the period 2011–2017, authorities had one of their biggest successes in July 2017 with the take-down of the then largest drug trading platform, AlphaBay, as part of Operation Bayonet, jointly conducted by the United States, Canada, Thailand, The Netherlands, Europol and various

other European police forces.<sup>74</sup> In early 2016, with 38,000 listings, AlphaBay accounted for almost 30 per cent of all listings identified on darknet sites at that time.<sup>75</sup> A year later, there were more than 250,000 listings for illegal drugs and chemicals on AlphaBay, as well as over 100,000 listings for stolen and fraudulent identification documents and access devices, counterfeit goods, malware and other computer hacking tools, firearms and fraudulent services. AlphaBay reached over 200,000 users and 40,000 vendors during its existence.<sup>76</sup> The site’s daily sales in early 2017 amounted to more than 600,000 euros, up from some 200,000 euros per day a year earlier and about twice as much as the record sales figure of Silk Road at its peak in summer 2013, a few months before the site was shut down by authorities.<sup>77</sup> The authorities also succeeded in taking down the trading platform Hansa, the then “third largest criminal marketplace on the dark web, trading similarly high volumes in illicit drugs and other commodities”.<sup>78</sup>

In the past, the take-down of major trading platforms did not have a major impact on drug trafficking via the darknet over a prolonged period

74 Europol, “Massive blow to criminal dark web activities after globally coordinated operation”, Press release, 20 July 2017.

75 Kristy Kruithof and others, “Internet facilitated drugs trade: an analysis of the size, scope and the role of the Netherlands”, Research Report Series, document No. RR-1607-WODC (Santa Monica, California, Rand Corporation, 2016). Available at [www.rand.org/](http://www.rand.org/).

76 Europol, “Massive blow to criminal dark web activities...”.

77 EMCDDA and Europol, *Drugs and the Darknet*, p. 42.

78 Europol, “Massive blow to criminal dark web activities...”.

72 Ibid.

73 Ibid.



of time. EMCDDA and Europol suggest that “law enforcement interventions in the form of darknet market take-downs disrupt darknet markets, although the overall ecosystem appears to be fairly resilient with new markets quickly becoming established”.<sup>79</sup> Examples have shown that both vendors and customers simply migrate to the next largest trading platform and continue their operations.<sup>80</sup> The listings of major darknet drug markets, analysed by Europol, revealed an immediate decline in overall darknet activities following the shutdown of major darknet drug markets, and thus an increase in prices on the surviving marketplaces in the immediate aftermath of the takedown. However, prices soon returned to their pre-takedown levels as vendors and customers migrated to alternative darknet markets.<sup>81</sup>

Monitoring the volume of darknet transactions will show whether the take-down of the AlphaBay and Hansa platforms in July 2017 have a long-term impact. Indeed, before taking down the Hansa site, the police continued operating the site for a couple of days to gain insights into its operations and to obtain additional data on clients and vendors.

The value of the bitcoin is not affected by shutdowns of darknet markets. Speculative investment in the bitcoin market has been of far greater importance to the value of the bitcoin than have darknet market take-downs. Bitcoins remain the principal means of exchange in darknet market transactions, but the volume of bitcoins used for illicit drug transactions still appears to account for a limited portion of all bitcoins transactions. One recent study of bitcoin laundering, using a new forensic analysis tool that combines public blockchain data with a proprietary data set of bitcoin addresses, suggested that “illicit bitcoins”, which were mostly linked to transactions on darknet markets (mainly to Silk Road in 2013, Agora in 2014 and 2015, and AlphaBay in 2016) accounted for just 0.6 per cent of all incoming transactions exchanged into different national currencies over the period 2013–2016. The study’s authors

conceded, however, that this was probably a lower-bound estimate and that the true percentage of bitcoin laundering may be higher.<sup>82</sup>

### *The overall importance of drug trafficking via the darknet remains very limited*

EMCDDA and Europol estimated drug sales made on 16 major darknet markets over the period from 22 November 2011 to 16 February 2015 to have amounted to 172.4 million euros worldwide (79 million euros generated in European Union countries and 93.3 million euros in other countries),<sup>83</sup> equivalent to some \$222 million, or an average of \$44 million per year. The largest revenues in Europe were generated by the sale of ATS (amphetamine and “ecstasy”), followed by sales of cannabis and cocaine, with the drug vendors accounting for the largest revenues being those in Germany (more than 25 million euros), the United Kingdom (20 million euros) and the Netherlands (18 million euros).<sup>84</sup>

A subsequent analysis of drug trafficking via AlphaBay<sup>85</sup> revealed that the former site actually generated far larger drug sales over the period 2015–2017 than over the previous four-year period. Sales in the period 2015–2017 were estimated to be 163 million euros, consisting of 46.4 million euros in European Union countries and 116.6 million euros in the rest of the world, in the period from January 2015 to July 2017 (equivalent to 65 million euros or \$73 million per year on average). It is unclear, however, if the increase in the volume of transactions via AlphaBay over the period 2015–2017 was the result of a sharp increase in overall drug trade on the darknet or an increase in the popularity of the site at the expense of other sites.

Another study, conducted by RAND Europe in 2016, estimated that monthly drug-related revenues

79 EMCDDA and Europol, *Drugs and the Darknet*, p. 11.

80 Based on the findings of an international conference on joint investigations to combat drug trafficking via the virtual market (darknet) in the European Union, held in Bad Erlach, Austria, from 18 to 20 November 2015.

81 EMCDDA and Europol, *Drugs and the darknet*, p. 62.

82 Yaya J. Fanusie and Tom Robinson, “Bitcoin laundering: an analysis of illicit flows into digital currency services”, 12 January 2018. Available at [www.defenddemocracy.org/](http://www.defenddemocracy.org/).

83 EMCDDA and Europol, *Drugs and the Darknet*, p. 35.

84 EMCDDA and Europol, *Drugs and the Darknet*, p. 47.

85 Based on the application of DATACRYPTO, a web crawler, RAND Europe identified 37,896 listings on AlphaBay on 22 December 2014; the total number of listings identified on 19 cryptomarkets (mostly investigated a few months later, in 2015) reached a total of 133,061 listings; see web article “Internet-facilitated drugs trade”, available at [www.rand.org](http://www.rand.org).

generated by the then eight largest darknet markets<sup>86</sup> amounted to a total of \$14 million to \$25 million per month in early 2016 (equivalent to \$170 million to \$300 million per year). A much higher figure than the EMCDDA/Europol estimate for the period 2011–2015 (\$44 million per year), this could suggest a marked expansion in darknet market activities in recent years. Nevertheless, according to the estimates provided in the RAND Europe study, the global darknet drug market accounts for no more than 0.1–0.2 per cent of the combined annual drug retail markets of the United States<sup>87</sup> and the European Union.<sup>88</sup> Caution needs to be applied, however, as the methodology used in the RAND Europe study assumed that all buyers purchased only the amounts specifically mentioned in offers on the darknet, which may underestimate overall quantities purchased per transaction and, thus, underestimate the overall estimated revenue.

The RAND Europe study also estimated that the largest drug-related revenues on the darknet in 2016 were generated by vendors operating in North America (43 per cent of global revenues), most notably those operating out of the United States (36 per cent of global revenues) and, to a lesser extent, Canada (7 per cent). This was followed by vendors operating out of Europe (more than 35 per cent of global revenues), most notably those operating out of the United Kingdom (16 per cent of global revenues), Germany (8 per cent) and the Netherlands (8 per cent).<sup>89</sup> Those three countries were also identified by the EMCDDA/Europol study as the European countries most affected by darknet trafficking.<sup>90</sup> Other main vendors were found in Australia (11 per cent of global revenues), while a

further 3 per cent of revenues were generated in other countries. Analysis of the number of vendors found by email addresses next to drug listings on various darknet market sites (available from a fifth of all vendors) also identified a number of vendors in Asia, most notably in China (9 per cent of all such identified email listings) and India (3 per cent), as well as Afghanistan (1 per cent).<sup>91</sup>

### *Studies suggest marked growth in drug-related darknet activities in recent years*

Information provided by law enforcement<sup>92</sup> and research on drug supply and demand suggest that drug-related activities on the darknet have increased in recent years.<sup>93</sup> The RAND Europe study found that monthly transactions rose 2.6-fold over the period from October 2013 to January 2017,<sup>94</sup> and the EMCDDA darknet study showed that monthly darknet sales via AlphaBay tripled between early 2016 and early 2017.<sup>95</sup> To date, no information is available on the evolution of darknet sales subsequent to the dismantling of AlphaBay and Hansa in July 2017.

The Global Drug Survey, based on a non-representative convenience sample (which cannot be extrapolated to drug users outside the survey) of around 100,000 self-selected people in over 50 countries (more developed countries than developing countries) who responded to an online survey, found that the proportion of Internet users using drugs who purchased their drugs via the darknet rose from 4.7 per cent in 2014 to 9.3 per cent in January 2018, with increases reported in practically all countries. The highest proportions of Internet users using drugs reporting the purchase of drugs via the darknet in 2018 were found in North America, Oceania and Europe.

One survey question regarding the consequences of the shutdown of AlphaBay and Hansa revealed that 15 per cent of Internet users who use the darknet for purchasing drugs had used darknet markets

86 These markets were, in January–February 2016, AlphaBay, Nucleus, Dreammarket, Cryptomarket, Hansa, Python, French Dark Net, Dark Net Heroes League, then accounting for some 80 per cent of all listings.

87 The United States drug market was estimated by the Office of National Drug Control Policy at around \$109 billion in 2010 (range: \$69–\$171 billion) (Beau Kilmer and others, *What America's Users Spend on Illegal Drugs: 2000–2010*, Research Report Series, document No. RR-534-ONDCCP (Santa Monica, California, Rand Corporation, 2014)).

88 EMCDDA estimated the European retail value of the illicit drug market was around 24.3 billion euros (range: 21 billion–31 billion euros) in 2013, equivalent to some \$32 billion per year.

89 Rand Europe, “Internet-facilitated drugs trade”.

90 EMCDDA and Europol, *Drugs and the Darknet*, p. 47.

91 Rand Europe, “Internet-facilitated drugs trade”.

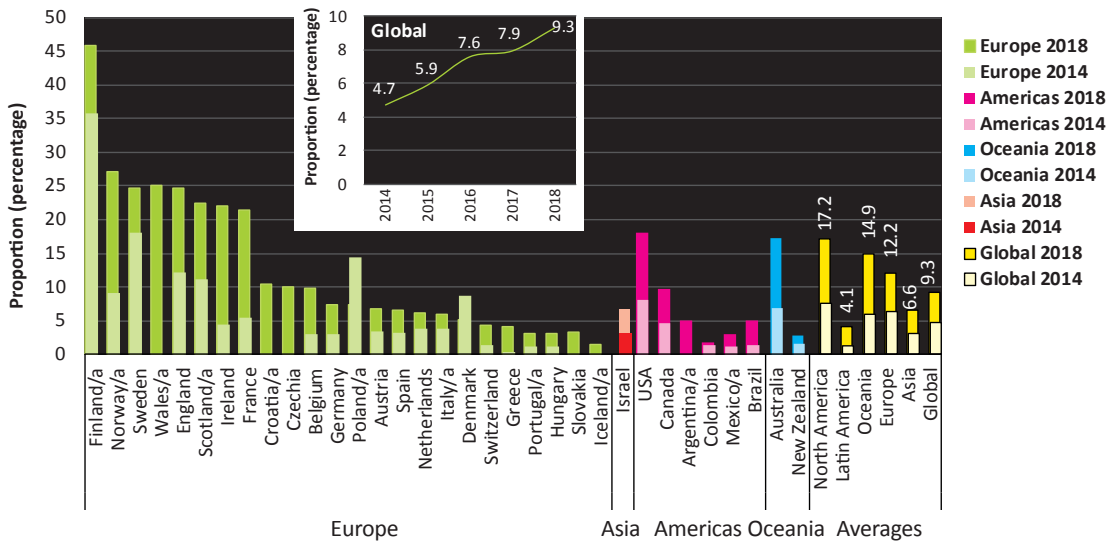
92 Europol, SOCTA 2017: *European Union and Organised Crime Threat Assessment – Crime in the Age of Technology* (The Hague, 2017), p. 11.

93 EMCDDA and Europol, *Drugs and the Darknet*, p. 10.

94 RAND Europe, “Internet-facilitated drugs trade”.

95 EMCDDA and Europol, *Drugs and the Darknet*, p. 43.

**FIG. 19** | Proportion of Internet users reporting to an online survey who used drugs in the past year and who purchased drugs via the darknet, 2014 and 2018 (annual prevalence)



Source: Global Drug Survey. Available at [https://www.globaldrugsurvey.com/wp-content/themes/globaldrugsurvey/results/GDS2017\\_key-findings-report\\_final.pdf](https://www.globaldrugsurvey.com/wp-content/themes/globaldrugsurvey/results/GDS2017_key-findings-report_final.pdf).

Note: The proportions shown here are based on convenience samples of people who volunteered to participate in these surveys. The total number of persons answering darknet market-related questions was 53,5572 in 2018, all of whom also reported their past-year drug use.

<sup>a</sup> For the following countries no data for 2014 or 2018 were available, so data from the closest year were used instead: Finland (2016 and 2018); Norway (2016 and 2017); Wales (2017); Scotland (2015 and 2018); Croatia (2017); Greece (2017); Poland (2015 and 2018); Italy (2015 and 2018); Portugal (2014 and 2017); Iceland (2017); Argentina (2017); Mexico (2014 and 2017).

less frequently thereafter while 9 per cent had completely stopped using the darknet for drug purchases while 19 per cent applied operational security changes to increase their security when using the darknet markets. Most (57 per cent), however, did not consider themselves affected by the closure of the darknet markets.





Annual prevalence of the use of cannabis, opioids and opiates, by region and globally, 2016

Region or subregion	Cannabis						Opioids (opiates and prescription opioids)						Opiates					
	Number (thousands)			Prevalence (percentage)			Number (thousands)			Prevalence (percentage)			Number (thousands)			Prevalence (percentage)		
	Best estimate	Lower	Upper	Best estimate	Lower	Upper	Best estimate	Lower	Upper	Best estimate	Lower	Upper	Best estimate	Lower	Upper	Best estimate	Lower	Upper
<b>Africa</b>	<b>51,930</b>	<b>37,110</b>	<b>75,930</b>	<b>7.6</b>	<b>5.5</b>	<b>11.2</b>	<b>2,190</b>	<b>970</b>	<b>3,700</b>	<b>0.32</b>	<b>0.14</b>	<b>0.54</b>	<b>2,060</b>	<b>970</b>	<b>3,150</b>	<b>0.30</b>	<b>0.14</b>	<b>0.46</b>
East Africa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
North Africa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Southern Africa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
West and Central Africa	34,260	28,520	42,420	13.2	11.0	16.3	-	-	-	-	-	-	-	-	-	-	-	-
<b>Americas</b>	<b>52,900</b>	<b>51,600</b>	<b>55,080</b>	<b>8.0</b>	<b>7.8</b>	<b>8.3</b>	<b>14,330</b>	<b>12,660</b>	<b>17,100</b>	<b>2.16</b>	<b>1.90</b>	<b>2.57</b>	<b>2,840</b>	<b>2,070</b>	<b>3,650</b>	<b>0.43</b>	<b>0.31</b>	<b>0.55</b>
Caribbean	630	230	1,730	2.2	0.8	6.1	-	-	-	-	-	-	-	-	-	-	-	-
Central America	820	410	1,320	2.8	1.4	4.4	-	-	-	-	-	-	-	-	-	-	-	-
North America	41,510	41,330	41,680	12.9	12.9	13.0	13,570	12,330	14,520	4.22	3.84	4.52	2,560	1,890	3,150	0.80	0.59	0.98
South America	9,940	9,630	10,340	3.5	3.4	3.6	580	250	2,160	0.20	0.09	0.76	240	150	330	0.08	0.05	0.12
<b>Asia</b>	<b>56,610</b>	<b>47,750</b>	<b>71,180</b>	<b>1.9</b>	<b>1.6</b>	<b>2.4</b>	<b>13,590</b>	<b>9,390</b>	<b>19,340</b>	<b>0.46</b>	<b>0.32</b>	<b>0.65</b>	<b>11,230</b>	<b>7,740</b>	<b>15,650</b>	<b>0.38</b>	<b>0.26</b>	<b>0.53</b>
Central Asia	1,480	440	2,440	2.6	0.8	4.2	540	480	590	0.93	0.83	1.03	520	460	580	0.90	0.80	1.00
East and South-East Asia	9,650	4,460	21,490	0.6	0.3	1.3	3,280	2,320	4,010	0.20	0.14	0.25	3,280	2,320	4,010	0.20	0.14	0.25
Near and Middle East/South-West Asia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
South Asia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Europe</b>	<b>27,860</b>	<b>27,180</b>	<b>28,610</b>	<b>5.1</b>	<b>5.0</b>	<b>5.2</b>	<b>3,570</b>	<b>3,430</b>	<b>3,790</b>	<b>0.65</b>	<b>0.63</b>	<b>0.69</b>	<b>3,200</b>	<b>2,990</b>	<b>3,620</b>	<b>0.59</b>	<b>0.55</b>	<b>0.66</b>
Eastern and South-Eastern Europe	5,490	5,120	5,830	2.4	2.3	2.6	1,750	1,670	1,840	0.78	0.74	0.81	1,500	1,430	1,590	0.67	0.63	0.70
Western and Central Europe	22,370	22,060	22,780	7.0	6.9	7.1	1,820	1,760	1,950	0.57	0.55	0.61	1,700	1,560	2,040	0.53	0.49	0.64
<b>Oceania</b>	<b>2,850</b>	<b>2,130</b>	<b>3,250</b>	<b>11.0</b>	<b>8.3</b>	<b>12.6</b>	<b>580</b>	<b>550</b>	<b>610</b>	<b>2.24</b>	<b>2.13</b>	<b>2.37</b>	<b>40</b>	<b>40</b>	<b>70</b>	<b>0.16</b>	<b>0.14</b>	<b>0.28</b>
Australia and New Zealand	2,070	2,070	2,070	11.0	11.0	11.0	560	550	570	2.95	2.90	2.99	35	35	41	0.18	0.18	0.22
Melanesia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Micronesia	60	40	80	16.6	10.7	22.7	-	-	-	-	-	-	-	-	-	-	-	-
Polynesia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>GLOBAL ESTIMATE</b>	<b>192,150</b>	<b>165,760</b>	<b>234,060</b>	<b>3.9</b>	<b>3.4</b>	<b>4.8</b>	<b>34,260</b>	<b>27,010</b>	<b>44,540</b>	<b>0.70</b>	<b>0.55</b>	<b>0.91</b>	<b>19,380</b>	<b>13,800</b>	<b>26,150</b>	<b>0.40</b>	<b>0.28</b>	<b>0.53</b>

Source: UNODC estimates based on annual report questionnaire data and other official sources.

Annual prevalence of the use of cocaine,<sup>a</sup> amphetamines<sup>b</sup> and "ecstasy", by region and globally, 2016

Region or subregion	Cocaine						Amphetamines and prescription stimulants						"Ecstasy"					
	Number (thousands)			Prevalence (percentage)			Number (thousands)			Prevalence (percentage)			Number (thousands)			Prevalence (percentage)		
	Best estimate	Lower	Upper	Best estimate	Lower	Upper	Best estimate	Lower	Upper	Best estimate	Lower	Upper	Best estimate	Lower	Upper	Best estimate	Lower	Upper
<b>Africa</b>	<b>3,180</b>	<b>920</b>	<b>5,720</b>	<b>0.47</b>	<b>0.13</b>	<b>0.84</b>	<b>5,980</b>	<b>1,910</b>	<b>10,420</b>	<b>0.88</b>	<b>0.28</b>	<b>1.53</b>	<b>1,410</b>	<b>450</b>	<b>2,420</b>	<b>0.21</b>	<b>0.07</b>	<b>0.36</b>
East Africa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
North Africa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Southern Africa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
West and Central Africa	1,805	725	2,890	0.69	0.28	1.11	-	-	-	-	-	-	-	-	-	-	-	-
<b>Americas</b>	<b>9,230</b>	<b>8,510</b>	<b>9,880</b>	<b>1.39</b>	<b>1.28</b>	<b>1.49</b>	<b>7,530</b>	<b>6,210</b>	<b>8,790</b>	<b>1.13</b>	<b>0.93</b>	<b>1.32</b>	<b>3,480</b>	<b>3,370</b>	<b>3,610</b>	<b>0.52</b>	<b>0.51</b>	<b>0.54</b>
Caribbean	180	80	330	0.63	0.29	1.16	260	10	710	0.90	0.05	2.48	60	30	100	0.23	0.10	0.36
Central America	200	100	300	0.66	0.35	1.01	60	30	90	0.21	0.09	0.31	50	20	100	0.17	0.07	0.33
North America	6,140	5,990	6,280	1.91	1.86	1.95	6,500	5,540	7,240	2.02	1.72	2.25	2,860	2,860	2,860	0.89	0.89	0.89
South America	2,720	2,340	2,970	0.95	0.82	1.04	710	630	740	0.25	0.22	0.26	510	470	550	0.18	0.16	0.19
<b>Asia</b>	<b>1,040</b>	<b>150</b>	<b>1,940</b>	<b>0.03</b>	<b>0.01</b>	<b>0.07</b>	<b>17,450</b>	<b>2,690</b>	<b>32,220</b>	<b>0.59</b>	<b>0.09</b>	<b>1.08</b>	<b>11,200</b>	<b>1,270</b>	<b>21,140</b>	<b>0.38</b>	<b>0.04</b>	<b>0.71</b>
Central Asia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
East and South-East Asia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Near and Middle East/South-West Asia	70	30	130	0.02	0.01	0.04	-	-	-	-	-	-	-	-	-	-	-	-
South Asia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Europe</b>	<b>4,330</b>	<b>3,870</b>	<b>4,880</b>	<b>0.79</b>	<b>0.71</b>	<b>0.90</b>	<b>2,850</b>	<b>2,290</b>	<b>3,450</b>	<b>0.52</b>	<b>0.42</b>	<b>0.63</b>	<b>4,050</b>	<b>3,490</b>	<b>4,740</b>	<b>0.74</b>	<b>0.64</b>	<b>0.87</b>
Eastern and South-Eastern Europe	620	290	1,000	0.28	0.13	0.44	720	400	1,060	0.32	0.18	0.47	1,330	840	1,840	0.59	0.37	0.82
Western and Central Europe	3,710	3,580	3,890	1.16	1.12	1.22	2,130	1,900	2,390	0.67	0.59	0.75	2,720	2,650	2,900	0.85	0.83	0.91
<b>Oceania</b>	<b>430</b>	<b>420</b>	<b>430</b>	<b>1.65</b>	<b>1.61</b>	<b>1.65</b>	<b>350</b>	<b>320</b>	<b>360</b>	<b>1.34</b>	<b>1.24</b>	<b>1.38</b>	<b>420</b>	<b>400</b>	<b>420</b>	<b>1.64</b>	<b>1.56</b>	<b>1.65</b>
Australia and New Zealand	420	420	420	2.19	2.19	2.19	250	250	250	1.34	1.34	1.34	410	400	420	2.17	2.12	2.23
Melanesia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Micronesia	-	-	-	-	-	-	6	2	11	1.63	0.58	3.15	-	-	-	-	-	-
Polynesia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>GLOBAL ESTIMATE</b>	<b>18,200</b>	<b>13,870</b>	<b>22,850</b>	<b>0.37</b>	<b>0.28</b>	<b>0.47</b>	<b>34,160</b>	<b>13,420</b>	<b>55,240</b>	<b>0.70</b>	<b>0.27</b>	<b>1.13</b>	<b>20,570</b>	<b>8,990</b>	<b>32,340</b>	<b>0.42</b>	<b>0.18</b>	<b>0.66</b>

Source: UNODC estimates based on annual report questionnaire data and other official sources.

<sup>a</sup> Cocaine includes cocaine salt, "crack" cocaine and other types such as coca paste, cocaine base, "basuco", "paco" and "merla". <sup>b</sup> Amphetamines include both amphetamine and methamphetamine.

Estimated number and prevalence (percentage) of people who inject drugs and those living with HIV among this group, by region, 2016

Region or subregion	People who inject drugs					HIV among people who inject drugs						
	Estimated number			Prevalence (%)		Data coverage of population aged 15-64 years			Prevalence (%) Best estimate	Data coverage of estimated number of people who inject drugs		
	Low	Best	High	Low	Best	High	Low	Best			High	
<b>Africa</b>	390,000	730,000	2,310,000	0.06	0.11	0.34	57.6%	36,000	82,000	564,000	11.2	75.5%
<b>America</b>	1,860,000	2,400,000	3,300,000	0.28	0.36	0.50	85.2%	75,000	111,000	211,000	4.6	93.1%
North America	1,550,000	1,780,000	2,010,000	0.48	0.55	0.63	100%	62,000	71,000	81,000	4.0	100%
Latin America and the Caribbean	310,000	610,000	1,290,000	0.09	0.18	0.37	71.3%	14,000	39,000	129,000	6.4	73.2%
<b>Asia</b>	3,470,000	4,840,000	6,300,000	0.12	0.16	0.21	94.3%	388,000	581,000	861,000	12.0	95.3%
Central Asia and Transcaucasia	400,000	440,000	500,000	0.69	0.76	0.87	93.6%	28,000	33,000	42,000	7.5	93.6%
East and South-East Asia	2,210,000	3,200,000	4,190,000	0.14	0.20	0.26	95.1%	174,000	306,000	510,000	9.6	96.4%
South-West Asia	560,000	740,000	930,000	0.29	0.38	0.48	100%	160,000	212,000	267,000	28.8	100%
Near and Middle East	50,000	190,000	380,000	0.04	0.18	0.36	17.2%	400	800	7,300	0.4	55.8%
South Asia	270,000	280,000	300,000	0.03	0.03	0.03	99.9%	25,000	29,000	34,000	10.3	99.9%
<b>Europe</b>	2,440,000	2,520,000	2,660,000	0.45	0.47	0.49	99.9%	468,000	483,000	503,000	19.1	100%
Eastern and South-Eastern Europe	1,780,000	1,820,000	1,880,000	0.80	0.82	0.85	100%	402,000	409,000	416,000	22.4	100%
Western and Central Europe	650,000	700,000	780,000	0.20	0.22	0.24	99.9%	65,000	74,000	87,000	10.6	99.9%
<b>Oceania</b>	140,000	140,000	150,000	0.52	0.53	0.56	73.3%	1,300	1,600	1,700	1.2	73.3%
<b>Global</b>	8,300,000	10,630,000	14,710,000	0.17	0.22	0.30	88.4%	970,000	1,260,000	2,140,000	11.8	94.3%

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

Note: Prevalence of people who inject drugs is the percentage of the population aged 15-64 years.

## Opium/Heroin

Illicit cultivation of opium poppy, 2006–2017 (hectares)

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
<b>SOUTH-WEST ASIA</b>												
Afghanistan (best estimate)	165,000	193,000	157,000	123,000	123,000	131,000	154,000	209,000	224,000	183,000	201,000	328,000
lower bound <sup>a</sup>				102,000	104,000	109,000	125,000	173,000	196,000	163,000	182,000	301,000
upper bound <sup>a</sup>				137,000	145,000	155,000	189,000	238,000	247,000	202,000	221,000	355,000
<b>SOUTH-EAST ASIA</b>												
Lao People's Democratic Republic (best estimate)	2,500	1,500	1,600	1,900	3,000	4,100	6,800	3,900	6,200	5,700	..	..
lower bound <sup>a</sup>	2,040	1,230	710	1,100	1,900	2,500	3,100	1,900	3,500	3,900		
upper bound <sup>a</sup>	2,990	1,860	2,700	2,700	4,000	6,000	11,500	5,800	9,000	7,600		
Myanmar <sup>b</sup> (best estimate)	21,500	27,700	28,500	31,700	38,100	43,600	51,000	57,800	57,600	55,500	..	41,000 <sup>c</sup>
lower bound <sup>a</sup>	..	22,500	17,900	20,500	17,300	29,700	38,249	45,710	41,400	42,800		30,200
upper bound <sup>a</sup>	..	32,600	37,000	42,800	58,100	59,600	64,357	69,918	87,300	69,600		51,900
<b>AMERICAS</b>												
Colombia (best estimate)	1,023	715	394	356	341	338	313	298	387	595	462	..
Mexico <sup>d, f</sup> (best estimate)	5,000	6,900	15,000	19,500	14,000	12,000	10,500	11,000	17,000	26,100	..	..
lower bound <sup>a</sup>										21,800		
upper bound <sup>a</sup>										30,400		

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
<b>OTHER</b>												
Other countries <sup>e</sup>	5,977	5,885	10,509	9,479	12,221	16,462	12,282	13,293	11,522	10,597	103,839	49,000
<b>TOTAL (best estimate)</b>	<b>201,000</b>	<b>235,700</b>	<b>213,003</b>	<b>185,935</b>	<b>190,662</b>	<b>207,500</b>	<b>234,895</b>	<b>295,291</b>	<b>316,709</b>	<b>281,492</b>	<b>305,301</b>	<b>418,000</b>
lower bound				152,935	149,762	170,000	189,444	245,201	269,809	242,692	265,617	397,217 <sup>f</sup>
upper bound				211,835	233,662	249,400	287,952	338,309	372,209	320,792	346,017	497,717 <sup>f</sup>
<b>TOTAL (best estimate rounded)</b>	<b>201,000</b>	<b>235,700</b>	<b>213,000</b>	<b>185,900</b>	<b>190,700</b>	<b>207,500</b>	<b>234,900</b>	<b>295,300</b>	<b>316,700</b>	<b>281,500</b>	<b>305,300</b>	<b>418,000<sup>f</sup></b>

Source: Afghanistan, Lao People's Democratic Republic and Myanmar: national illicit crop monitoring system supported by the United Nations Office on Drugs and Crime (UNODC). Colombia: Government of Colombia. Mexico: up to 2014, estimates derived from surveys by the Government of the United States of America (international narcotics control strategy reports); for 2015, joint Mexico/UNODC project entitled "Monitoring of the illicit cultivation on Mexican territory".

Note: Figures in italics are preliminary and may be revised when updated information becomes available. Two dots indicate that data were unavailable. Information on estimation methodologies and definitions can be found in the online methodology section of the World Drug Report 2018.

<sup>a</sup> Bound of the statistically derived confidence interval.

<sup>b</sup> May include areas that were eradicated after the date of the area survey.

<sup>c</sup> Estimate for 2017 only covers the States of Shan and Kachin.

<sup>d</sup> Up to 2014, the estimates for Mexico are sourced from the Department of State of the United States. The Government of Mexico does not validate the estimates provided by the United States as they are not part of its official figures and it does not have information on the methodology used to calculate them. Estimates of opium poppy cultivation for the years 2016 and 2017, based on the Mexico/UNODC joint project entitled "Monitoring of the Illicit Cultivation on Mexican Territory", will soon become available.

<sup>e</sup> Includes countries with low levels of cultivation (less than 400 hectares in the latest year with available data) and countries with indirect evidence of illicit cultivation (eradication of opium poppy) but no direct measurement. See table "Cultivation of opium poppy and production of opium in other countries, and eradication of opium poppy, 2007-2017". In addition, for 2016 and 2017, best estimates for countries for which data are not available (Lao People's Democratic Republic, Mexico for 2016 and 2017, Myanmar for 2016 and Colombia for 2017) are included in this category.

Starting in 2008, a new methodology was introduced to estimate opium poppy cultivation and opium/heroin production in countries with no data on illicit cultivation of opium poppy. A detailed description of the estimation methodology is available in the online methodology section of the World Drug Report 2018.

<sup>f</sup> The figures for 2015, as published in the World Drug Report 2016 (United Nations publication, Sales No. E.16.XI.7), have been revised owing to a statistical adjustment processed by UNODC. These figures are based on the estimation period July 2014-June 2015.

## Potential production of oven-dry opium, 2006–2017 (tons)

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
<b>SOUTH-WEST ASIA</b>												
Afghanistan (best estimate)	5,300	7,400	5,900	4,000	3,600	5,800	3,700	5,500	6,400	3,300	4,800	9,000
lower bound <sup>a</sup>					3,000	4,800	2,800	4,500	5,100	2,700	4,000	8,000
upper bound <sup>a</sup>					4,200	6,800	4,200	6,500	7,800	3,900	5,600	10,000
<b>SOUTH-EAST ASIA</b>												
Lao People's Democratic Republic <sup>b, f</sup> (best estimate)	20	9	10	11	18	25	41	23	92	..	..	..
lower bound <sup>g</sup>	16	7	4	7	11	15	18	11	51	84		
upper bound <sup>g</sup>	24	11	16	16	24	36	69	35	133	176		
Myanmar <sup>b</sup> (best estimate)	315	460	410	330	580	610	690	870	670	647	..	550 <sup>h</sup>
lower bound				213	350	420	520	630	481	500		395
upper bound				445	820	830	870	1,100	916	820		706
<b>AMERICAS</b>												
Colombia (best estimate)	13	14	10	9	8	8	8	11	12	17	13	..
Mexico <sup>c, e</sup> (best estimate)	108	150	325	425	300	250	220	225	360	499	..	..
lower bound										279		
upper bound										693		



	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
<b>OTHER</b>												
Other countries <sup>d</sup>	55	58	187	178	224	290	172	182	198	178	1,570	950
<b>TOTAL (best estimate)</b>	5,810	8,091	6,841	4,953	4,730	6,983	4,831	6,810	7,732	4,771	6,383	10,500
lower bound					3,894	5,783	3,738	5,558	6,202	3,758	5,107	9,002
upper bound					5,576	8,214	5,539	8,052	9,419	5,784	7,629	11,915
<b>TOTAL (best estimate rounded)</b>	5,810	8,090	6,840	4,950	4,730	6,980	4,830	6,810	7,730	4,770	6,380	10,500 <sup>i</sup>

Source: Afghanistan, Lao People's Democratic Republic and Myanmar: national illicit crop monitoring system supported by the United Nations Office on Drugs and Crime (UNODC). Colombia: National illicit crop monitoring system supported by UNODC. Since 2008, production was calculated based on updated regional yield figures and conversion ratios from the Department of State and the Drug Enforcement Administration of the United States of America. Mexico: up to 2014, estimates derived from surveys by the United States Government; for 2015, UNODC estimate.

Note: Figures in italics are preliminary and may be revised when updated information becomes available. Two dots indicate that data were unavailable. Information on estimation methodologies and definitions can be found in the online methodology section of the World Drug Report 2018.

a Bound of the statistically derived confidence interval.

b Based on cultivation figures which may include areas eradicated after the date of the area survey.

c Up to 2014, the estimates are sourced from the Department of State of the United States. The Government of Mexico does not validate the estimates provided by the United States as they are not part of its official figures and it does not have information on the methodology used to calculate them. Estimates of opium production for the years 2016 and 2017, based on the Mexico/UNODC joint project entitled "Monitoring of the Illicit Cultivation on Mexican Territory", will soon become available.

d Includes countries with low levels of cultivation (less than 400 hectares in the latest year with available data) and countries with indirect evidence of illicit cultivation (eradication of opium poppy) but no direct measurement. See table "Cultivation of opium poppy and production of opium in other countries, and eradication of opium poppy, 2007-2017".

In addition, for 2016 only, best estimates for countries for which data are not available (Lao People's Democratic Republic, Mexico and Myanmar) are included in this category.

Starting in 2008, a new methodology was introduced to estimate opium poppy cultivation and opium/heroin production in countries with no data on illicit cultivation of opium poppy. These estimates are higher than the previous figures but have a similar order of magnitude. A detailed description of the estimation methodology is available in the online methodology section of the World Drug Report 2017.

e The figures for 2015, as published in the World Drug Report 2016 (United Nations publication, Sales No. E.16.XI.7), have been revised owing to a statistical adjustment processed by UNODC. The Government of Mexico does not validate any opium production estimates. The production figures will be presented once yield data from the joint Mexico/UNODC project entitled "Monitoring of the illicit cultivation on Mexican territory" become available. Opium production estimated by UNODC for 2015 is based on: (a) the area under cultivation, established by the joint project of the Government of Mexico and UNODC; (b) yield data, based on yield studies conducted by the United States in Mexico over the period 2001-2003. The opium production figures shown for 2015 are preliminary and, for methodological reasons, are not comparable with the production figures over the period 1998-2014. As a result of the Mexico/UNODC joint project entitled "Monitoring of the Illicit Cultivation on Mexican Territory", poppy crop estimate figures for the years 2016 and 2017 will become available soon.

f Owing to the late timing of the monitoring activities in 2013, the survey may not have captured illicit cultivation in this year in its entirety.

g Bound of the statistically derived confidence interval, with the exception of 2015. The figures for 2015 represent independently derived upper and lower estimates; the midpoint was used for the calculation of the global total.

h Estimate for 2017 covers only the States of Shan and Kachin.

i Preliminary estimate

## Cultivation of opium poppy and production of opium in other countries, and eradication of opium poppy, 2007–2017

Indicator	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Guatemala Cultivation (hectares)						220	310	640	260	310	
Guatemala Production (tons)						4	6	14	6	6	
Pakistan Cultivation (hectares)	1,701	1,909	1,779	1,721	362	382	493	217	372	130	
Pakistan Production (tons)	43	48	44	43	9	9	12	5	9	3	
Thailand Cultivation (hectares)	205	288	211	289	289	209	265			399	
Thailand Production (tons)	3	5	3	5	6	3	4				
Afghanistan Eradication (hectares)	19,047	5,480	5,351	2,316	3,810	9,672	7,348	2,692	3,760	355	750
Algeria Eradication (plants)				868	340	204	2,721	7,470			
Algeria Seizure poppy plants (in kg equivalents)	7,675	7,761	962	87	34	20.4	272.1			106	
Argentina Seizure poppy plants (in kg equivalents)	5.8									0.2	
Armenia Seizure poppy plants (in kg equivalents)								0.18	0.13	60	
Australia Seizure poppy plants (in kg equivalents)										37	
Austria Seizure poppy plants (in kg equivalents)		8.76	13.83		4.60	1.91	2.07	1.41		0.05	
Azerbaijan Eradication (hectares)					2.26	0.21	0.40	0.45			
Azerbaijan Eradication (plants)					201	2,628	34	284			

Indicator	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Bangladesh	Eradication (hectares)			8	22						
Bangladesh	Seizure poppy plants (in kg equivalents)		145,021								
Belarus	Eradication (hectares)			14	52	26				92	
Belarus	Seizure poppy plants (in kg equivalents)				59		81	51			94
Canada	Eradication (hectares)			7	7						
Canada	Eradication (plants)			60,000	60,000						
Canada	Seizure poppy plants (in kg equivalents)			6600	9.3		7.3			85.9	
China	Eradication (hectares)										6
Colombia	Eradication (hectares)	375	381	546	712	294	514	813	613	450	
Cyprus	Seizure poppy plants (in kg equivalents)									6	
Czechia	Seizure poppy plants (in kg equivalents)								40		
Ecuador	Eradication (plants)	74,555	115,580	257,306	44,200	4,025,800	2,554,865	2,023,385	183,573	1,207,147	
Ecuador	Seizure poppy plants (in kg equivalents)		7,456	11,558	12,865	2,210	185,490	75,765			
Egypt	Eradication (hectares)	89	121	98	222	1	3		98	105	
Egypt	Seizure poppy plants (in kg equivalents)	161									

Indicator	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Georgia Seizure poppy plants (in kg equivalents)								8			
Greece Eradication (plants)						192	60	144	145	624	
Guatemala Eradication (hectares)	449	536	1,345	918	1,490	590	2,568	1,197	430	45	
Guatemala Eradication (plants)										17,643,447	
Guatemala Seizure poppy plants (in kg equivalents)	24,153,765	27,880,441	69,228,416	54,612,442			10,935,532	864,150			
Hungary Seizure poppy plants (in kg equivalents)						1,502	2,152				
India Eradication (hectares)	8,000	624	2,420	3,052	5,746	1,332	865	1,636	3,461	2,875	
India Seizure poppy plants (in kg equivalents)								3,770			
Iran (Islamic Republic of) Eradication (hectares)				2.00		1	1	1		1	
Iran (Islamic Republic of) Eradication (plants)						140,000	100,000	120,000		90,000	
Italy Eradication (plants)				1,797	2,007	6,717					
Italy Seizure poppy plants (in kg equivalents)						716	375	168	30	1,098	
Japan Seizure poppy plants (in kg equivalents)		535	104	90	26	20	11				
Kazakhstan Eradication (hectares)											0.2
Kazakhstan Eradication (plants)					1,692			2,254	19,510	15,515	

Indicator	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Kazakhstan Seizure poppy plants (in kg equivalents)		68	127	105	90	30	2	8	298		
Kyrgyzstan Seizure poppy plants (in kg equivalents)	724	102	344	58	200	399	147	63	55		
Lao People's Democratic Republic Eradication (hectares)	779	575	651	579	662	707	397		809		
Latvia Seizure poppy plants (in kg equivalents)	75	23	31		1	12	7	9	43		
Lebanon Eradication (hectares)	8		21	14	4		6	1			
Lithuania Seizure poppy plants (in kg equivalents)	26	45	16								
Lithuania Eradication (hectares)	2.40										
Mexico Eradication (hectares)	11,046	13,095	14,753	15,491	16,389	15,726	14,662	21,644	25,960	22,437	
Mexico Seizure poppy plants (in kg equivalents)		7,263	7,964	9,335	10,101	9,572	10,209	14,812	17,948	16,401	
Myanmar Eradication (hectares)	3,662	4,820	4,087	8,267	7,058	23,718	12,288	15,188	13,450	7,561	3,533
Nepal Eradication (hectares)		21	35								
Oman Eradication (hectares)							6				
Pakistan Eradication (hectares)	614	0	105	68	1,053	592	568	1,010	605	1,470	
Pakistan Seizure poppy plants (in kg equivalents)	6,880	81,675	25,550				4,650	5,976	4,576	1,023	
Peru Eradication (hectares)	28	23	32	21							
Philippines Seizure poppy plants (in kg equivalents)	250										
Poland Eradication (hectares)			9								

Indicator	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Poland	207										
Portugal					164		1.6	9.4			
Republic of Korea							25,369				
Republic of Korea				3,855					8,013	9,771	
Republic of Moldova					32,413	11,255					
Republic of Moldova	95	79	26,075								
Russian Federation	2.5		3.3		1.4	0.6	0.9	1.1	0.6	0.8	
Russian Federation								645			
Russian Federation	1,863	2,799	2,807	2,575	4,273	3,196	2,216	1,438	1,043	270	
Spain				13		10	30	219		0.02	
State of Palestine					4.2	5.8	1.2	17.8			
Tajikistan					13	5,400	103				
Thailand	220	285	201	278	208	205	264			319	
Ukraine		28		436			39		48	164	
Ukraine				1,185,118		474,000	22,800,000				
Ukraine		164,000		4,162		7.4		384	930		



Indicator	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Uzbekistan					1.0		1.0	0.3	0.3	0.3	
Eradication (hectares)											
Uzbekistan	169	138	687	896	413	330	336	406	205	863	
Seizure poppy plants (in kg equivalents)											
Viet Nam	38	99	31		38	35	25	19	18		
Eradication (hectares)											

Source: United Nations Office on Drugs and Crime annual report questionnaire, government reports, reports of regional bodies, and international narcotics control strategy reports of the United States of America.

### Global manufacture of heroin from global illicit opium production, 2006–2017 (tons)

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
<b>Total potential opium production</b>	5,810	8,091	6,841	4,953	4,730	6,983	4,831	6,810	7,723	4,771	6,383	10,500
Potential opium not processed into heroin	1,786	3,078	2,360	1,680	1,728	3,400	1,850	2,600	2,450	1,360	2,510	1,100-1,400
Potential opium processed into heroin	4,024	5,012	4,481	3,273	3,002	3,583	2,981	4,210	5,273	3,411	3,873	9,100-9,400
<b>Total potential heroin manufacture *</b>	553	686	600	427	383	467	377	555	542	327	408	700-1,050

Notes: The calculation shows the potential amount of heroin that could have been manufactured out of the opium produced in a given year; it does not take into account changes in opium inventories, which may also be used for the manufacture of heroin and which may be important. Afghanistan is the only country for which the proportion of potential opium production not converted into heroin within the country is estimated. For all other countries, for the purposes of this table, it is assumed that all opium produced is converted into heroin, if all of the opium produced in Afghanistan in 2016 had been converted into heroin, total potential heroin manufacture would have amounted to 668 tons at the global level (510 tons in Afghanistan).

The amount of heroin produced in Afghanistan is calculated using two parameters that may change: (a) the distribution between opium that is not processed and opium processed into heroin; and (b) the conversion ratio into heroin. The first parameter is indirectly estimated, based on seizures of opium versus seizures of heroin and morphine reported by Afghanistan and neighbouring countries. For 2016, this calculation results in a proportion of 57 per cent of potential opium production in Afghanistan converted into heroin. For the second parameter, from 2005 to 2013, a conversion ratio of opium to morphine/heroin of 7:1 was used, based on interviews conducted with Afghan morphine/heroin "cooks", on an actual heroin production exercise conducted by two (illiterate) Afghan heroin "cooks", documented by the German Bundeskriminalamt in Afghanistan in 2003 (published in Bulletin on Narcotics, vol. LVII, Nos. 1 and 2, 2005, pp. 11-31) and United Nations Office on Drugs and Crime (UNODC) studies on the morphine content of Afghan opium (12.3 per cent over the period 2010-2012, down from 15 per cent over the period 2000-2003). From 2014 to 2016, a different approach to the conversion was adopted, reflecting updated information on morphine content and a different method for taking purity into account. The revised approach uses a ratio of 18.5 kg of opium for 1 kg of 100 per cent pure white heroin hydrochloride (see Afghanistan Opium Survey 2014, UNODC, November 2014), based on an estimated export quality of 51 per cent in 2016, this translates into a ratio of 9.5 kg (range: 9-10 kg) of opium for 1 kg of export-quality heroin (for 2016). For more details, see Afghanistan Opium Survey 2016 (UNODC, October 2016). For countries other than Afghanistan, a "traditional" conversion ratio of opium to heroin of 10:1 is used. The ratios will be adjusted when improved information becomes available. Figures in italics are preliminary and may be revised when updated information becomes available.

For 2017, new evidence has become available of higher purities of heroin produced in Afghanistan. Ranges in the reported figures reflect different purities and the upper and lower bounds of the 95% confidence interval around opium production estimates in Afghanistan in 2017. For more information, see the Afghanistan Opium Survey 2017 (UNODC, May 2018).

\* Heroin manufacture estimated at export purity.

## Coca/Cocaine

### Global illicit cultivation of coca bush, 2006–2016 (hectares)

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Bolivia (Plurinational State of)	27,500	28,900	30,500	30,900	31,000	27,200	25,300	23,000	20,400	20,200	23,100
Colombia <sup>a</sup>	78,000	99,000	81,000	73,000	62,000	64,000	48,000	48,000	69,000	96,000	146,000
Peru <sup>b</sup>	51,400	53,700	56,100	59,900	61,200	64,400					
Peru <sup>c</sup>						62,500	60,400	49,800	42,900	40,300	43,900
<b>Total</b>	<b>156,900</b>	<b>181,600</b>	<b>167,600</b>	<b>163,800</b>	<b>154,200</b>	<b>155,600<sup>d</sup></b>	<b>133,700</b>	<b>120,800</b>	<b>132,300</b>	<b>156,500</b>	<b>213,000</b>

Source: Plurinational State of Bolivia: national illicit crop monitoring system supported by the United Nations Office on Drugs and Crime (UNODC). Colombia: national illicit crop monitoring system supported by UNODC. Peru: national illicit crop monitoring system supported by UNODC.

Note: Different area concepts and their effect on comparability were presented in the World Drug Report 2012 (United Nations publication, Sales No. E.12.XI.1, p. 41–42). Efforts to improve the comparability of estimates between countries continue; since 2011 the net area under coca bush cultivation on the reference date of 31 December was estimated for Peru, in addition to Colombia. The estimate presented for the Plurinational State of Bolivia represents the area under coca cultivation as interpreted on satellite imagery.

<sup>a</sup> Net area on 31 December.

<sup>b</sup> Figures represent the area under coca cultivation as interpreted on satellite imagery.

<sup>c</sup> Net area on 31 December, deducting fields eradicated after satellite imagery was taken.

<sup>d</sup> The global coca cultivation figure was calculated with the "area as interpreted on satellite imagery" for Peru.

### Reported eradication of coca bush, 2007–2016

Method of eradication	Unit	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Bolivia (Plurinational State of)	hectare	6,269	5,484	6,341	8,200	10,509	11,044	11,407	11,144	11,020	6,577
Colombia	hectare	66,392	96,003	60,565	43,804	35,201	30,456	22,121	11,703	13,473	17,642
	spraying	153,134	133,496	104,772	101,940	103,302	100,549	47,052	55,532	37,199	0
Peru	hectare	11,056	10,143	10,025	12,033	10,290	14,171	23,785	31,205	35,868	30,150
Ecuador	hectare	12	12	6	3	14	..	..	..	..	..
	plants	130,000	152,000	57,765	3,870	55,030	122,656	41,996	15,874	45,266	20,896

Source: UNODC annual report questionnaire and government reports.

Note: The totals for Bolivia (Plurinational State of) include voluntary and forced eradication. The totals for Peru include voluntary and forced eradication. Reported eradication refers to the sum of all areas eradicated in a year, including repeated eradication of the same fields. Two dots indicate that data are not available.

## Potential manufacture of 100 per cent pure cocaine, 2006–2016 (tons)

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Bolivia (Plurinational state of)	94	104	113	..	..	..	..	..	..	..	..
Colombia	809	683	471	488	424	384	333	290	442	646	866
Peru	280	290	302	..	..	..	..	..	..	..	..
<b>Total based on "old" conversion ratios<sup>a</sup></b>	<b>1,183</b>	<b>1,077</b>	<b>886</b>	<b>920</b>	<b>862</b>	<b>815</b>	<b>738</b>	<b>662</b>	<b>746</b>	<b>937</b>	<b>1,198</b>
<b>Total based on "new" conversion ratios<sup>a</sup></b>	<b>1,381</b>	<b>1,317</b>	<b>1,143</b>	<b>1,188</b>	<b>1,134</b>	<b>1,090</b>	<b>997</b>	<b>902</b>	<b>943</b>	<b>1,125</b>	<b>1,410</b>

Source: Plurinational State of Bolivia: own calculations based on coca leaf yield surveys by the United Nations Office on Drugs and Crime (UNODC) (Yungas de La Paz) and scientific studies by the Drug Enforcement Administration of the United States of America (Chapare). Colombia: UNODC/Government of Colombia. Peru: own calculations based on coca leaf to cocaine conversion ratio from scientific studies by the Drug Enforcement Administration. Detailed information on the ongoing revision of conversion ratios and cocaine laboratory efficiency is available in the *World Drug Report 2010* (United Nations publication, Sales No. E.10.XI.13), p. 249.

<sup>a</sup> Conversion of areas under coca cultivation into coca leaf and then into cocaine hydrochloride, taking yields, amounts of coca leaf used for licit purposes and cocaine laboratory efficiency into account.

Notes: Owing to a lack of updated conversion factors in Bolivia (Plurinational State of) and Peru, no final estimates of the level of cocaine production can be provided. With respect to data published in the *World Drug Report 2016* (United Nations publication, Sales No. E.16.XI.7), the following amendments have been made: (a) data for Colombia (2005-2008) have been revised in order to ensure a consistent implementation of revisions to the methodology, affecting the way coca production is calculated, for the entire time series 2005-2015 (for details, see Colombia Coca Cultivation Survey Report 2014 (UNODC, 2015) and Colombia Survey of territories affected by illicit crops 2015, Annex 3 (UNODC 2016)); (b) totals for 2009-2012 based on "old" and "new" conversion ratios have been revised to rectify minor inaccuracies in data processing. Figures in italics are subject to revision. Two dots indicate that data are not available. Information on estimation methodologies and definitions can be found in the online methodology section of the *World Drug Report 2018*.

## Cannabis

Cannabis cultivation, production and eradication, latest year available from the period 2011–2016

Year	Country	Product	Outdoors/ indoors	Area cultivated (ha)	Area eradicated (ha)	Harvestable area (ha)	Production (tons)	Plants eradicated	Sites eradicated
2012	Afghanistan	resin	outdoors	10,000			1,400		
2016	Albania	herb	outdoors					2,536,288	5,205
2014	Algeria	resin	outdoors					2,522	
2016	Armenia	herb	outdoors	0.50 <sup>a</sup>	0.50	0.00		757	20
2016	Australia	herb	indoors					31,266	408
2016	Australia	herb	outdoors					22,257	1,021
2015	Austria	herb	outdoors	3.00 <sup>a</sup>	3.00	0.00			
2014	Azerbaijan	herb	outdoors	17.50 <sup>a</sup>	17.50	0.00		14,889	195
2013	Azerbaijan	herb	outdoors	23.95 <sup>a</sup>	23.95	0.00	263.96	8,469	151
2015	Bahamas	herb	outdoors					17,270	
2011	Bangladesh	herb	outdoors					54,244	
2012	Bangladesh	herb	outdoors					39,848	
2013	Bangladesh	herb	outdoors					35,012	
2014	Bangladesh	herb	outdoors					35,988	
2015	Bangladesh	herb	outdoors					39,967	
2016	Bangladesh	herb	outdoors					47,104	
2017	Bangladesh	herb	outdoors					69,989	
2016	Belarus	herb	outdoors		123.80				1,945
2016	Belarus	herb	indoors						28
2015	Belgium	herb	indoors					345,518	1,164
2015	Belgium	herb	outdoors					4,885	93
2015	Belize	herb	outdoors					50,897	
2016	Bolivia (Plurinational State of)	herb	outdoors		14.60				35
2016	Bosnia and Herzegovina	herb	outdoors		1,680.00				
2016	Bosnia and Herzegovina	herb	indoors		39.00				
2014	Brazil	herb	outdoors		44.01			1,364,316	
2015	Bulgaria	herb	indoors					323	
2015	Bulgaria	herb	outdoors				37.77	9,488	

Year	Country	Product	Outdoors/ indoors	Area cultivated (ha)	Area eradicat- ed (ha)	Harvestable area (ha)	Production (tons)	Plants eradicat- ed	Sites eradicat- ed
2016	Chile	herb	indoors					26,988	2,740
2016	Chile	herb	outdoors					58,950	264
2016	China	herb	outdoors		9.80			1,390,000	
2016	Colombia	herb	outdoors		135.00				
2016	Costa Rica	herb	outdoors		17.59			2,122,244	201
2016	Costa Rica	herb	indoors					678.00	5
2016	Côte d'Ivoire	herb	outdoors					5	
2016	Czechia	herb	indoors					53,549	229
2016	Czechia	herb	outdoors					4,111	
2014	Dominican Republic	herb	outdoors	6.00 <sup>a</sup>	6.00	0.00	0.21	111	8
2016	Ecuador	herb	outdoors					224	34
2015	Egypt	herb/resin	outdoors		140.00				
2016	El Salvador	herb	outdoors			1.00		227	25
2014	France	herb	outdoors					158,592	837
2015	Germany	herb	indoors					135,925	786
2015	Germany	herb	outdoors					9,136	127
2016	Greece	herb	indoors					16,554	
2016	Greece	herb	outdoors					39,151	
2016	Guatemala	herb	outdoors		9.00			3,138,298	427
2015	Guyana	herb	outdoors	20.00	9.40	10.60	1,000.00	419,700	19
2016	Honduras	herb	indoors					7	2
2016	Honduras	herb	outdoors					24,253	19
2016	China, Hong Kong SAR	herb	indoors					329	1
2016	Hungary	herb	indoors					5,000	3
2016	Hungary	herb	outdoors					2,000	20
2013	Iceland	herb	indoors					6,652	323
2016	India	herb	outdoors		3,414.74				
2016	Indonesia	herb	outdoors	482.00 <sup>a</sup>	482.00	0.00			
2016	Ireland	herb	indoors					7,273	
2014	Italy	herb	indoors					51,534	639
2014	Italy	herb	outdoors					70,125	1,134

Year	Country	Product	Outdoors/ indoors	Area cultivated (ha)	Area eradicated (ha)	Harvestable area (ha)	Production (tons)	Plants eradicated	Sites eradicated
2012	Jamaica	herb	outdoors					456	382
2016	Kazakhstan	herb	outdoors	18.00 <sup>a</sup>	18.00	0.00		170,000	202
2016	Kenya	herb	outdoors	12.00				8,747	46
2015	Kyrgyzstan	herb	outdoors	5,014.00		5,014.00			
2016	Latvia	herb	indoors					557	35
2016	Latvia	herb	outdoors					78	6
2015	Lebanon	herb	outdoors	3,500.00		3,500.00			
2016	Lithuania	herb	indoors						4
2015	Madagascar	herb	outdoors		11.00			21,325	
2013	Malta	herb	indoors					27	
2016	Mexico	herb	outdoors		5,478.42		6,574,104.0		38,432
2013	Mongolia	herb	outdoors	15,000.00	4,000.00	11,000.00		4,000	4,000
2016	Morocco	plant	outdoors	47,000.00	395.00	46,605.00			
2016	Morocco	herb	outdoors				35,652.83		
2016	Morocco	resin	outdoors				713.00		
2014	Myanmar	herb	outdoors	15.00	10.00	5.00			3
2016	Netherlands	herb	indoors					994,068	5,856
2016	New Zealand	herb	indoors					18,903	607
2016	New Zealand	herb	outdoors					104,725	
2014	Nicaragua	herb	outdoors		0.30		1,507.00	3,014	30
2016	Nigeria	herb	outdoors		718.78				65
2015	Norway	herb	indoors		0.04			4,000	30
2013	Panama	herb	indoors	0.50 <sup>a</sup>	0.50	0.00		37	2
2013	Panama	herb	outdoors	10.50 <sup>a</sup>	10.50	0.00		78,633	2
2016	Paraguay	plant	outdoors	1,298.50 <sup>a</sup>	1,298.50	0.00		5,656,266	4
2016	Paraguay	herb	outdoors				1,298.50		
2016	Paraguay	resin	outdoors				1.15		
2016	Peru	herb	outdoors		87.83			1,429,749	
2016	Philippines	herb	outdoors		8.67			24,635,153	337
2016	Poland	herb	indoors					146,755	1,403
2016	Poland	herb	indoors/ outdoors					4,585	219



Year	Country	Product	Outdoors/ indoors	Area cultivated (ha)	Area eradicat- ed (ha)	Harvestable area (ha)	Production (tons)	Plants eradicat- ed	Sites eradicat- ed
2013	Republic of Korea	herb	outdoors					8,072	
2014	Republic of Moldova	herb	outdoors	100.00	59.00	41.00	10,000.00	200,548	
2014	Republic of Moldova	herb	indoors		41.00				
2016	Romania	herb	indoors					1,433	41
2016	Romania	herb	outdoors		6.99				42
2016	Russian Federation	herb	outdoors	7.61 <sup>a</sup>	7.61	0.00	68.64		1,143
2016	Russian Federation	herb	indoors		0.66				788
2015	Serbia	herb	outdoors				0.05		
2013	Sierra Leone	herb	outdoors		190.00	190.00		190	3
2016	Slovakia	herb	indoors					385	
2014	Slovenia	herb	indoors					9,223	118
2014	Slovenia	herb	outdoors					1,844	
2015	Spain	herb	indoors					244,772	108
2015	Spain	herb	outdoors					135,074	44
2014	Sudan	herb	outdoors	8.00 <sup>a</sup>	8.00	0.00	345.00		
2014	Swaziland	herb	outdoors	1,500.00	1,069.50	430.50		3,000,000	210
2014	Sweden	herb	indoors					10,000	56
2015	Sweden	herb	outdoors				182.00		
2016	Switzerland	herb	indoors					11,386	83
2012	Tajikistan	herb	outdoors					2,180,121	
2016	Thailand	herb	outdoors	1.00 <sup>a</sup>	1.00	0.00	7.50		1
2015	Trinidad and Tobago	herb	outdoors		0.31			375,925	58
2012	Uganda	herb	outdoors	150.00	88.00	62.00			5
2016	Ukraine	herb	outdoors	91.00 <sup>a</sup>	91.00	0.00			
2016	United States of America	herb	indoors					406,125	1,865
2016	United States of America	herb	outdoors					4,940,596	5,513
2016	Uruguay	herb	indoors					661	
2016	Uzbekistan	herb	outdoors	0.20 <sup>a</sup>	0.20	0.00			586
2015	Viet Nam	herb	outdoors		1.00				

Source: United Nations Office on Drugs and Crime annual report questionnaire, government reports and international narcotics control strategy reports of the United States of America.

<sup>a</sup> Area identified by the authorities for eradication.





## GLOSSARY

*amphetamine-type stimulants* — a group of substances composed of synthetic stimulants controlled under the Convention on Psychotropic Substances of 1971 and from the group of substances called amphetamines, which includes amphetamine, methamphetamine, methcathinone and the “ecstasy”-group substances (3,4-methylenedioxymethamphetamine (MDMA) and its analogues).

*amphetamines* — a group of amphetamine-type stimulants that includes amphetamine and methamphetamine.

*annual prevalence* — the total number of people of a given age range who have used a given drug at least once in the past year, divided by the number of people of the given age range, and expressed as a percentage.

*coca paste (or coca base)* — an extract of the leaves of the coca bush. Purification of coca paste yields cocaine (base and hydrochloride).

*“crack” cocaine* — cocaine base obtained from cocaine hydrochloride through conversion processes to make it suitable for smoking.

*cocaine salt* — cocaine hydrochloride.

*drug use* — use of controlled psychoactive substances for non-medical and non-scientific purposes, unless otherwise specified.

*new psychoactive substances* — substances of abuse, either in a pure form or a preparation, that are not controlled under the Single Convention on Narcotic Drugs of 1961 or the 1971 Convention, but that may pose a public health threat. In this context, the term “new” does not necessarily refer to new inventions but to substances that have recently become available.

*opiates* — a subset of opioids comprising the various products derived from the opium poppy plant, including opium, morphine and heroin.

*opioids* — a generic term applied to alkaloids from opium poppy (opiates), their synthetic analogues (mainly prescription or pharmaceutical opioids) and compounds synthesized in the body.

*problem drug users* — people who engage in the high-risk consumption of drugs; for example, people who inject drugs, people who use drugs on a daily basis

and/or people diagnosed with drug use disorders (harmful use or drug dependence), based on clinical criteria as contained in the Diagnostic and Statistical Manual of Mental Disorders (fifth edition) of the American Psychiatric Association, or the International Classification of Diseases and Related Health Problems (tenth revision) of the World Health Organization.

*people who suffer from drug use disorders/people with drug use disorders* — a subset of people who use drugs. People with drug use disorders need treatment, health and social care and rehabilitation. Harmful use of substances and dependence are features of drug use disorders.

*harmful use of substances* — defined in the International Statistical Classification of Diseases and Related Health Problems (tenth revision) as a pattern of use that causes damage to physical or mental health.

*dependence* — defined in the International Statistical Classification of Diseases and Related Health Problems (tenth revision) as a cluster of physiological, behavioural and cognitive phenomena in which the use of a substance or a class of substances takes on a much higher priority for a given individual than other behaviours that once had greater value. A central descriptive characteristic of dependence syndrome is the desire (often strong, sometimes overpowering) to take psychoactive drugs.

*substance or drug use disorders* — the Diagnostic and Statistical Manual of Mental Disorders (fifth edition) of the American Psychiatric Association also refers to “drug or substance use disorder” as patterns of symptoms resulting from the use of a substance despite experiencing problems as a result of using substances. Depending on the number of symptoms identified, substance use disorder may vary from moderate to severe.

*prevention of drug use and treatment of drug use disorders* — the aim of “prevention of drug use” is to prevent or delay the initiation of drug use, as well as the transition to drug use disorders. Once a person develops a drug use disorder, treatment, care and rehabilitation are needed.



## REGIONAL GROUPINGS

The World Drug Report uses a number of regional and subregional designations. These are not official designations, and are defined as follows:

- East Africa: Burundi, Comoros, Djibouti, Eritrea, Ethiopia, Kenya, Madagascar, Mauritius, Rwanda, Seychelles, Somalia, Uganda and United Republic of Tanzania
- North Africa: Algeria, Egypt, Libya, Morocco, South Sudan, Sudan and Tunisia
- Southern Africa: Angola, Botswana, Lesotho, Malawi, Mozambique, Namibia, South Africa, Swaziland, Zambia and Zimbabwe
- West and Central Africa: Benin, Burkina Faso, Cabo Verde, Cameroon, Central African Republic, Chad, Congo, Côte d'Ivoire, Democratic Republic of the Congo, Equatorial Guinea, Gabon, Gambia, Ghana, Guinea, Guinea-Bissau, Liberia, Mali, Mauritania, Niger, Nigeria, Sao Tome and Principe, Senegal, Sierra Leone and Togo
- Caribbean: Antigua and Barbuda, Bahamas, Barbados, Bermuda, Cuba, Dominica, Dominican Republic, Grenada, Haiti, Jamaica, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines and Trinidad and Tobago
- Central America: Belize, Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua and Panama
- North America: Canada, Mexico and United States of America
- South America: Argentina, Bolivia (Plurinational State of), Brazil, Chile, Colombia, Ecuador, Guyana, Paraguay, Peru, Suriname, Uruguay and Venezuela (Bolivarian Republic of)
- Central Asia and Transcaucasia: Armenia, Azerbaijan, Georgia, Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan
- East and South-East Asia: Brunei Darussalam, Cambodia, China, Democratic People's Republic of Korea, Indonesia, Japan, Lao People's Democratic Republic, Malaysia, Mongolia, Myanmar, Philippines, Republic of Korea, Singapore, Thailand, Timor-Leste and Viet Nam
- South-West Asia: Afghanistan, Iran (Islamic Republic of) and Pakistan
- Near and Middle East: Bahrain, Iraq, Israel, Jordan, Kuwait, Lebanon, Oman, Qatar, Saudi Arabia, State of Palestine, Syrian Arab Republic, United Arab Emirates and Yemen
- South Asia: Bangladesh, Bhutan, India, Maldives, Nepal and Sri Lanka
- Eastern Europe: Belarus, Republic of Moldova, Russian Federation and Ukraine
- South-Eastern Europe: Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Montenegro, Romania, Serbia, the former Yugoslav Republic of Macedonia and Turkey
- Western and Central Europe: Andorra, Austria, Belgium, Cyprus, Czechia, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Liechtenstein, Lithuania, Luxembourg, Malta, Monaco, Netherlands, Norway, Poland, Portugal, San Marino, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom of Great Britain and Northern Ireland
- Oceania: Australia, Fiji, Kiribati, Marshall Islands, Micronesia (Federated States of), Nauru, New Zealand, Palau, Papua New Guinea, Samoa, Solomon Islands, Tonga, Tuvalu, Vanuatu and small island territories





**UNODC**

United Nations Office on Drugs and Crime



Following last year's 20<sup>th</sup> anniversary edition, the *World Drug Report 2018* is again presented in a special five-booklet format designed to enhance reader friendliness while maintaining the wealth of information contained within.

Booklet 1 summarizes the content of the four subsequent substantive booklets and presents policy implications drawn from their findings. Booklet 2 provides a global overview of the latest estimates of and trends in the supply, use and health consequences of drugs. Booklet 3 examines current estimates of and trends in the cultivation, production and consumption of the three plant-based drugs (cocaine, opiates and cannabis), reviews the latest developments in cannabis policies and provides an analysis of the global synthetic drugs market, including new psychoactive substances. Booklet 4 looks at the extent of drug use across age groups, particularly among young and older people, by reviewing the risks and vulnerabilities to drug use in young people, the health and social consequences they experience and their role in drug supply, as well as highlighting issues related to the health care needs of older people who use drugs. Finally, Booklet 5 focuses on the specific issues related to drug use among women, including the social and health consequences of drug use and access to treatment by women with drug use disorders; it also discusses the role played by women in the drug supply chain.

Like all previous editions, the *World Drug Report 2018* is aimed at improving the understanding of the world drug problem and contributing towards fostering greater international cooperation for countering its impact on health and security.

The statistical annex is published on the UNODC website:  
<https://www.unodc.org/wdr2018>

ISBN 978-92-1-148304-8

