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United Nations Office on Drugs and Crime



DRUGS AND AGE

Drugs and associated issues among
young people and older people

WORLD ∞
DRUG
REPORT 2014

4

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ISBN: 978-92-1-148304-8
eISBN: 978-92-1-045058-4
United Nations publication, Sales No. E.18.XI.9

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Suggested citation:

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

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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



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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.

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

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The research for booklet 4 was made possible by the generous contribution of Germany (German Agency for International Cooperation (GIZ)).



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:

- EMCDDA** European Monitoring Centre for Drugs and Drug Addiction
- LSD** Lysergic acid diethylamide
- GHB** *gamma*-Hydroxybutyric acid
- MDMA** 3,4-methylenedioxyamphetamine
- UNICEF** United Nations Children’s Fund
- WHO** World Health Organization
- UNODC** United Nations Office on Drugs and Crime
- INCB** International Narcotics Control Board
- Europol** European Union Agency for Law Enforcement Cooperation



KEY FINDINGS

Drug use and associated health consequences are highest among young people

Surveys on drug use among the general population show that the extent of drug use among young people remains higher than that among older people, although there are some exceptions associated with the traditional use of drugs such as opium or khat. Most research suggests that early (12–14 years old) to late (15–17 years old) adolescence is a critical risk period for the initiation of substance use and that substance use may peak among young people aged 18–25 years.

Cannabis is a common drug of choice for young people

There is evidence from Western countries that the perceived easy availability of cannabis, coupled with perceptions of a low risk of harm, makes the drug among the most common substances whose use is initiated in adolescence. Cannabis is often used in conjunction with other substances and the use of other drugs is typically preceded by cannabis use.

Two extreme typologies of drug use among young people: club drugs in nightlife settings; and inhalants among street children

Drug use among young people differs from country to country and depends on the social and economic circumstances of those involved.

Two contrasting settings illustrate the wide range of circumstances that drive drug use among young people. On the one hand, drugs are used in recreational settings to add excitement and enhance the experience; on the other hand, young people living in extreme conditions use drugs to cope with their difficult circumstances.

The typologies of drugs used in these two different settings are quite different. Club drugs such as “ecstasy”, methamphetamine, cocaine, ketamine, LSD and GHB are used in high-income countries, originally in isolated “rave” scenes but later in

settings ranging from college bars and house parties to concerts. The use of such substances is reportedly much higher among young people. Among young people living on the street, the most commonly used drugs are likely to be inhalants, which can include paint thinner, petrol, paint, correction fluid and glue.

Many street children are exposed to physical and sexual abuse, and substance use is part of their coping mechanism in the harsh environment they are exposed to on the streets. The substances they use are frequently selected for their low price, legal and widespread availability and ability to rapidly induce a sense of euphoria.

Young people's path to harmful use of substances is complex

The path from initiation to harmful use of substances among young people is influenced by factors that are often out of their control. Factors at the personal level (including behavioural and mental health, neurological developments and gene variations resulting from social influences), the micro level (parental and family functioning, schools and peer influences) and the macro level (socioeconomic and physical environment) can render adolescents vulnerable to substance use. These factors vary between individuals and not all young people are equally vulnerable to substance use. No factor alone is sufficient to lead to the use of substances and, in many instances, these influences change over time. Overall, it is the critical combination of the risk factors that are present and the protective factors that are absent at a particular stage in a young person's life that makes the difference in their susceptibility to drug use. Early mental and behavioural health problems, poverty, lack of opportunities, isolation, lack of parental involvement and social support, negative peer influences and poorly equipped schools are more common among those who develop problems with substance use than among those who do not.

Harmful use of substances has multiple direct effects on adolescents. The likelihood of unemployment, physical health problems, dysfunctional social relationships, suicidal tendencies, mental illness and even lower life expectancy is increased by substance use in adolescence. In the most serious cases, harmful use of drugs can lead to a cycle in which damaged socioeconomic standing and ability to develop relationships feed substance use.

Many young people are involved in the drug supply chain due to poverty and lack of opportunities for social and economic advancement

Young people are also known to be involved in the cultivation, manufacturing and production of and trafficking in drugs. In the absence of social and economic opportunities, young people may deal drugs to earn money or to supplement meagre wages. Young people affected by poverty or in other vulnerable groups, such as immigrants, may be recruited by organized crime groups and coerced into working in drug cultivation, production, trafficking and local-level dealing. In some environments, young people become involved in drug supply networks because they are looking for excitement and a means to identify with local groups or gangs. Organized crime groups and gangs may prefer to recruit children and young adults for drug trafficking for two reasons: the first is the recklessness associated with younger age groups, even when faced with the police or rival gangs; the second is their obedience. Young people involved in the illicit drug trade in international markets are often part of large organized crime groups and are used mainly as “mules”, to smuggle illegal substances across borders.

Increases in rates of drug use among older people are partly explained by ageing cohorts of drug users

Drug use among the older generation (aged 40 years and older) has been increasing at a faster rate than among those who are younger, according to the limited data available, which are mainly from Western countries.

People who went through adolescence at a time when drugs were popular and widely available are more likely to have tried drugs and, possibly, to have continued using them, according to a study in the

United States. This pattern fits in particular the so-called “baby boomer” generation in Western Europe and North America. Born between 1946 and 1964, baby boomers had higher rates of substance use during their youth than previous cohorts; a significant proportion continued to use drugs and, now that they are over 50, this use is reflected in the data.

In Europe, another cohort effect can be gleaned from data on those seeking treatment for opioid use. Although the number of opioid users entering treatment is declining, the proportion who were aged over 40 increased from one in five in 2006 to one in three in 2013. Overdose deaths reflect a similar trend: they increased between 2006 and 2013 for those aged 40 and older but declined for those aged under 40. The evidence points to a large cohort of ageing opioid users who started injecting heroin during the heroin “epidemics” of the 1980s and 1990s.

Older people who use drugs require tailored services, but few treatment programmes address their specific needs

Older drug users may often have multiple physical and mental health problems, making effective drug treatment more challenging, yet little attention has been paid to drug use disorders among older people. There were no explicit references to older drug users in the drug strategies of countries in Europe in 2010 and specialized treatment and care programmes for older drug users are rare in the region; most initiatives are directed towards younger people.

Older people who use drugs account for an increasing share of deaths directly caused by drug use

Globally, deaths directly caused by drug use increased by 60 per cent from 2000 to 2015. People over the age of 50 accounted for 39 per cent of the deaths related to drug use disorders in 2015. However, the proportion of older people reflected in the statistics has been rising: in 2000, older people accounted for just 27 per cent of deaths from drug use disorders.

About 75 per cent of deaths from drug use disorders among those aged 50 and older are linked to the use of opioids. The use of cocaine and the use of amphetamines each account for about 6 per cent; the use of other drugs makes up the remaining 13 per cent.



INTRODUCTION

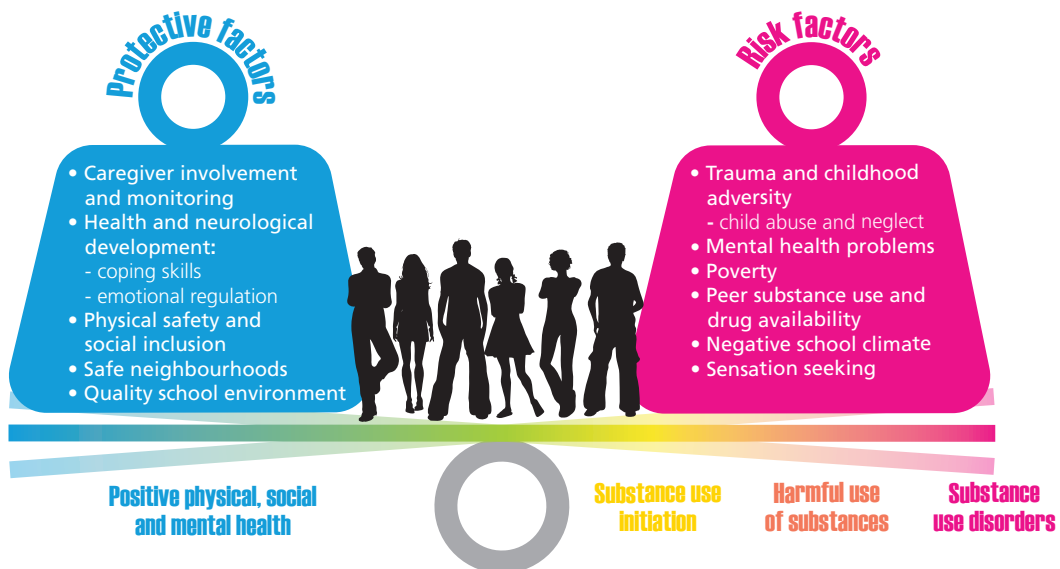
This booklet constitutes the fourth part of the *World Drug Report 2018* and is the first of two thematic booklets focusing on specific population groups. In this booklet, the focus is on drug issues affecting young and older people.

Section A provides an overview of how the extent and patterns of drug use vary across different age groups, using examples from selected countries. Section B contains a discussion of three aspects of drug use among young people. Based on a review of the scientific literature, the section describes the wide range of patterns of drug use among young people, including the use of inhalants among street children and drug use in nightlife settings. Next, there is a discussion of the link between child and youth development and the factors that determine pathways to substance use and related problems, as well as the

social and health consequences of drug use among young people. The final part of the section contains a discussion of how the lives of young people are affected by illicit crop cultivation, drug production and trafficking in drugs.

Section C is focused on older people who use drugs. It describes the increases in the extent of drug use among older people that have been observed over the past decade or so in some countries. The possible factors that might help explain those increases are briefly explored. The particular issues faced by older people with drug use disorders in relation to drug treatment and care are also discussed. Finally, information on deaths due to drug use disorders illustrates the severe health impact of drug use on older people.

Protective factors and risk factors for substance use



A. DRUG USE AMONG YOUNG PEOPLE AND OLDER PEOPLE

Trends in age demographics

The population in many parts of the world is relatively young. In 2016, more than 4 in every 10 people worldwide were younger than 25 years old, 26 per cent were aged 0–14 years and 16 per cent were aged 15–24 years. Europe was the region with the lowest proportion of its population under 25 (27 per cent) and Africa was the region with the highest proportion (60 per cent). However, in all regions, the proportion of the population aged 15–24 is projected to decline by 2050.¹

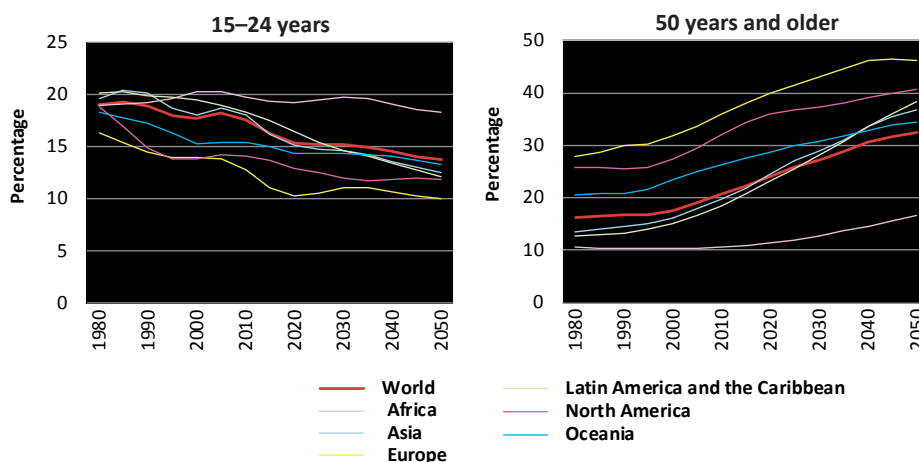
On the other hand, in recent years, gains in life expectancy have been achieved in all regions, with life expectancy globally projected to increase by 10 per cent over the next generation or so, from 71 years (2010–2015) to 77 years (2045–2050).² As a result, between 2016 and 2050, the number of people aged 50 and older is expected to almost double. By 2050, one third or more of the populations of all regions, except for Africa, will be aged 50 or older.

Extent of drug use is higher among young people than among older people

Surveys on drug use among the general population consistently show that the extent of drug use among older people remains lower than that among young people. Data show that peak levels of drug use are seen among those aged 18–25. This is broadly the situation observed in countries in most regions and for most drug types.

The extent of drug use among young people, in particular past-year and past-month prevalence, which are indicators of recent and regular use, remains much higher than that among older people. However, lifetime prevalence, which is an indicator of the extent of exposure of the general population to drugs, remains higher among older people than among young people for the use of substances that have been on the market for decades. Conversely, the use of substances that have emerged more recently or have infiltrated certain lifestyles are reportedly much higher among young people. One such example is “ecstasy”, which has low levels of lifetime use and hardly any current use among older people, but high levels of lifetime use among young people.

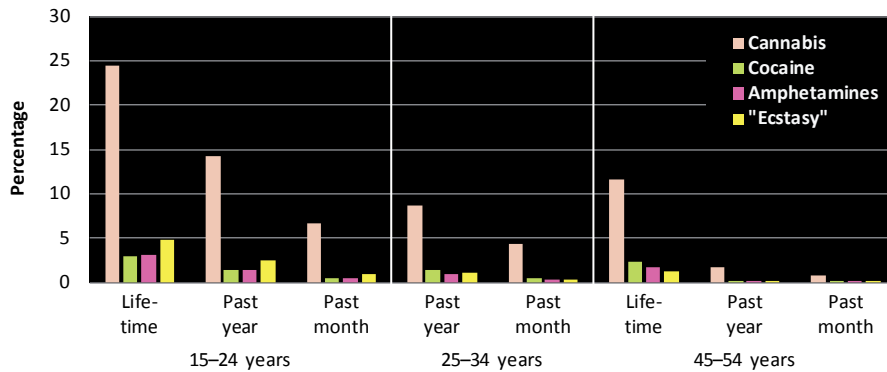
FIG. 1 | Proportion of population aged 15–24 years and aged 50 years or older, 1980–2050



Source: United Nations, Department of Economic and Social Affairs, Population Division, World Population Prospects database, 2017 revision.

1 United Nations, Department of Economic and Social Affairs, Population Division, World Population Prospects database, 2017 revision.

2 United Nations, Department of Economic and Social Affairs, Population Division, “World population prospects: the 2017 revision, key findings and advance tables”, Working paper No. ESA/P/WP/248 (New York, 2017).

FIG. 2 | Prevalence of drug use in Europe, by age group, 2017

Source: EMCDDA.

Note: The information represented is the unweighted average of data from the European Union member States, Norway and Turkey, reporting to EMCDDA on the basis of general population surveys conducted between 2012 and 2015.

Differences in the extent of lifetime drug use should be interpreted taking into account the “cohort effect”, which pertains to differences in drug use, related attitudes and behaviours among people born during specific time periods.³ Persons who reach the age of greatest vulnerability to drug use initiation during a period when drugs are popular and widely available are at particularly high risk of trying drugs and, possibly, continuing to use them.⁴ One such example in the United States of America is of the “baby boomers” (those who were born between 1946 and 1964), who had the highest rates of substance use as young people compared with previous cohorts.⁵ Typically, when a cohort of people starts using a certain substance in large numbers, as in the case of baby boomers, this is reflected in lifetime prevalence in the general population in the years to come, even when many of them discontinue drug use at a later stage. Therefore, lifetime prevalence is an indicator of the extent of exposure of the population and different age groups within the population at any point in time to drugs, while past-year and

past-month prevalence are indicators of current levels of drug use in that population.

Given the paucity of drug use survey data from different regions, as well as the different measures of prevalence and age groups used in the surveys available, it is difficult to construct a global comparison of drug use between young people and older people. In the following paragraphs, therefore, examples from different countries and regions are presented to illustrate the extent of and compare drug use among the different age groups in those countries and regions.

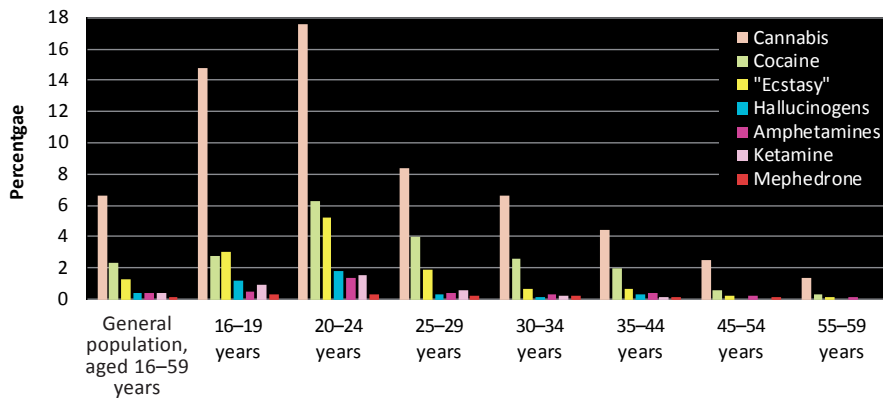
In all the regions for which data could be analysed by age, current drug use is much higher among young people than older people. People aged over 40 generally have different patterns of drug use than young people, except when it comes to substances such as opium and khat, which have a long tradition of use in particular societies or cultures. Older people are typically not exposed as much as young people to new drugs that enter the market and they tend to follow the drug use patterns that were initiated during their youth.

Europe

Data for the 28 States members of the European Union, plus Norway and Turkey, show that the lifetime use in those countries of amphetamines and “ecstasy” is between two and three times higher among those aged under 35 than among older people. Past-month use of most drugs is up to seven times higher among young people. However, current use of “ecstasy” is nearly 20 times higher among

- Lloyd D. Johnston and others, *Monitoring the Future National Survey Results on Drug Use: 2016 Overview, Key Findings on Adolescent Drug Use* (Ann Arbor, Michigan, Institute for Social Research, University of Michigan, 2017).
- J.D. Colliver and others, “Projecting drug use among aging baby boomers in 2020”, *Annals of Epidemiology*, vol. 16, No. 4 (April 2006), pp. 257–265.
- J. Gfroerer and others, “Substance abuse treatment need among older adults in 2020: the impact of the aging baby-boom cohort”, *Drug and Alcohol Dependence*, vol. 69, No. 2 (March 2003), pp. 127–135.

FIG. 3 | Annual prevalence of drug use in England and Wales, fiscal year 2016–17



Source: United Kingdom of Great Britain and Northern Ireland, Office for National Statistics, "Drug misuse: findings from the 2016/17 crime survey for England and Wales", Statistical Bulletin 11/17 (London, July 2017).

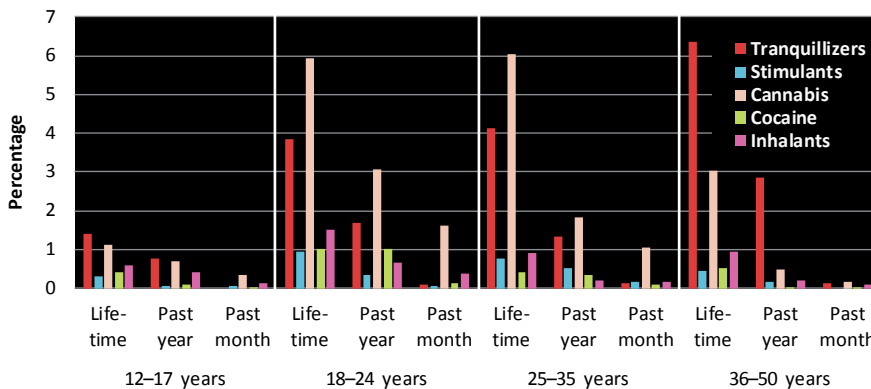
people aged 15–24 than among those aged 45–54. By contrast, the rates of lifetime prevalence of cocaine in Europe among those aged 15–24 and those aged 45–54 are comparable, while lifetime use of cannabis is much higher among those aged under 35. This may reflect differences in the age of initiation for those substances, as well as different historical levels of use among young people in Europe.

In England and Wales, the annual prevalence of drug use was highest in the 20–24 age group for all drug types in the period 2016–2017. For those aged 45 and older, the annual prevalence of drug use was considerably lower.

Bolivia (Plurinational State of)

In the Plurinational State of Bolivia, recent and current use of almost all substances is substantially higher among those aged 18–24 than among those in other age groups; as seen in the majority of countries, cannabis is the most commonly used drug across most age groups. The lifetime use of cannabis, cocaine, stimulants and inhalants is up to two times higher among those aged 18–24 than those aged 36 or older. In most cases, the past-year and past-month use of those substances is also reported at much higher levels among those aged 18–24 than among the 36–50 age group. For instance, the past-year use of cannabis is more than six times higher among those aged 18–24 than those aged 36–50.

FIG. 4 | Prevalence of drug use in the Plurinational State of Bolivia, by drug type and age group, 2014



Source: Plurinational State of Bolivia, National Council against Drug Trafficking (CONALTID), *II Estudio Nacional de Prevalencia y Características del Consumo de Drogas en Hogares Bolivianos de Nueve Ciudades Capitales de Departamento, más la Ciudad de El Alto*, 2014 (La Paz, 2014).

Conversely, the lifetime and past-year non-medical use of tranquillizers, the second-most misused substance in the Plurinational State of Bolivia, is almost twice as high among those aged 36–50, although the past-month use of tranquillizers was reported at similar levels among all age groups, except for 12–17 year olds.⁶

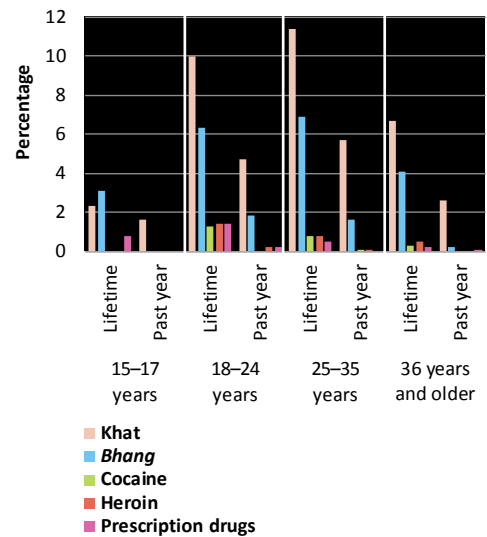
Kenya

In Kenya, older people report a higher use of established substances such as khat in different forms (*miraa* and *muguka*) and cannabis (*bhang* and hashish), while drugs that have become available in Africa more recently, such as cocaine and heroin, are reported to be used more frequently among those aged 18–24. Among the general population, khat and cannabis remain the two most commonly used substances, with the highest lifetime and past-year use among those aged 25–35. Conversely, the lifetime use of cocaine, heroin and prescription drugs is nearly three times higher among people aged 18–24 than among those aged 36 years and older.

United States

Data on drug use among the general population in the United States from 2017 show differences in the lifetime, past-year and past-month use of people aged 18–25 years compared with that of people aged 50–54. These differences are partly explained by the cohort effect. The cohort effect is visible in the lifetime prevalence of those who were young in the late 1960s and in the 1990s, which were times when an increase occurred in the use of numerous drugs by young people. Lifetime use of substances that have an established use over decades, such as cannabis, opioid painkillers, tranquillizers and inhalants, is comparable among those aged 50–54 and those aged 18–25.⁷ For example, almost half of people in both age groups have used cannabis at least once in their lifetime. This pattern is different for cocaine and stimulants. The lifetime prevalence of cocaine

FIG. 5 Prevalence of drug use in Kenya, by age group and drug type, 2012



Source: Kenya, National Authority for the Campaign Against Alcohol and Drug Abuse, *Rapid Situation Assessment of the Status of Drug and Substance Abuse in Kenya* (Nairobi, 2012).

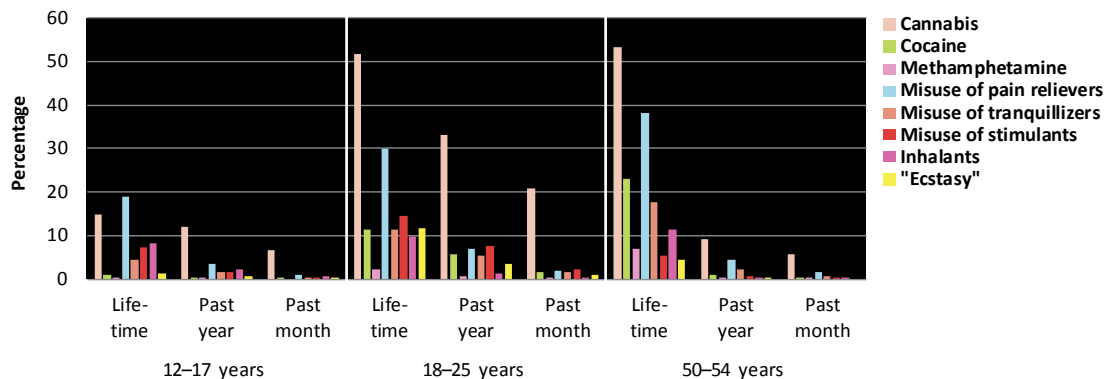
among those aged 18–25 years is half of that among those aged 50–54 years. This is probably the result of a combination of factors, including the declining trends in cocaine use that were observed in the United States at the beginning of 2000 and the sharp decline in such use that was observed in 2006. Conversely, the lifetime non-medical use of stimulants and “ecstasy” among 18–25 year-olds is nearly three times that of the older cohort, reflecting the more recent appearance of these substances in the market. The extent of past-month use of most drugs remains up to three times higher and that of stimulants up to seven times higher among those aged 18–25 than among those aged 50–54. Hardly any current use of “ecstasy” is reported among those 50 years and older.⁸

6 Plurinational State of Bolivia, National Council against Drug Trafficking (CONALTID), *II Estudio Nacional de Prevalencia y Características del Consumo de Drogas en Hogares Bolivianos de Nueve Ciudades Capitales ae Departamento, más la Ciudad de El Alto, 2014* (La Paz, 2014).

7 United States, Substance Abuse and Mental Health Services Administration, Center for Behavioural Health Statistics and Quality, *Results from the 2016 National Survey on Drug Use and Health: Detailed Tables* (Rockville, Maryland, 2017).

8 United States, Substance Abuse and Mental Health Services Administration, Center for Behavioural Health Statistics and Quality, Substance Abuse and Mental Health Services Administration, *Key Substance Use and Mental Health Indicators in the United States: Results from the 2016 National Survey on Drug Use and Health*, HHS Publication No. SMA 17-5044, NSDUH Series H-52 (Rockville, Maryland, 2017).

FIG. 6 | Prevalence of drug use in the United States of America, by age group, 2017



Source: United States, Substance Abuse and Mental Health Services Administration, Center for Behavioural Health Statistics and Quality, *Results from the 2016 National Survey on Drug Use and Health: Detailed Tables* (Rockville, Maryland, 2017).

B. DRUGS AND YOUNG PEOPLE

Drugs affect young people in every part of the world. Young people may use drugs, be involved in the cultivation or production of drugs, or be used as couriers. There are many factors at the personal, micro (family, schools and peers) and macro (socioeconomic and physical environment) levels, the interplay of which may render young people more vulnerable to substance use. Most research suggests that early (12–14 years old) to late (15–17 years old) adolescence is a critical risk period for the initiation of substance use.⁹ Many young people use drugs to cope with the social and psychological challenges that they may experience during different phases of their development from adolescence to young adulthood (ranging from the need to feel good or simply to socialize, to personal and social maladjustments).¹⁰

For the purposes of the present section, as defined by the United Nations, young people are considered as those aged between 15 and 24 years.

Adolescence is the period when young people undergo physical and psychological development (including brain development); substance use may affect that development. Adolescence is universally a time of vulnerability to different influences when adolescents initiate various behaviours, which may include substance use. However, evidence shows that the vast majority of young people do not use drugs and those who do use them have been exposed to different significant factors related to substance use. The misconception that all young people are equally vulnerable to substance use and harmful use of substances ignores the scientific evidence, which has consistently shown that individuals differ in their susceptibility to use drugs. While specific influential factors vary between individuals, and no factor alone is sufficient to lead to harmful use of substances, a critical combination of risk factors that are present and protective factors that are absent makes the difference between a young person's brain that is primed for substance use and one that is not. Thus, from the perspective of preventing the initiation of substance use, as well as preventing the development of substance use disorders within the context of the healthy and safe development of young people, it is important to have a sound understanding of the patterns of substance use as well as the personal social and environmental influences that may result in substance use and substance use disorders among young people.

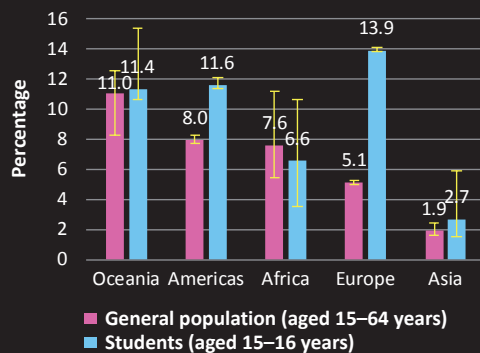
9 United States, Substance Abuse and Mental Health Services Administration, Center for Behavioral Health Statistics and Quality. "Age of substance use initiation among treatment admissions aged 18 to 30", *The TEDS Report*, (Rockville, Maryland, July 2014).

10 Jonathan Shedler and Jack Block, "Adolescent drug use and psychological health: a longitudinal inquiry", *American Psychologist*, vol. 45, No. 5 (1990), pp. 612–630.

Cannabis use among young people

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, equivalent to 5.6 per cent of the population in that age range, used cannabis at least once in the previous 12 months.

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 government reports.

Note: the estimate of past-year cannabis use in young people aged 15–16 years is based on school surveys in most countries, hence the use of the term “students”.

High prevalence of cannabis use was reported in North America (18 per cent)^a and in West and Central Europe (20 per cent), two subregions in which past-year cannabis use among young people was higher than in the general population in 2016. In some other subregions, estimates suggest that cannabis use among young people may be lower than among the general population. More research is needed to understand whether such a difference reflects the initiation of cannabis use at a later age in the areas concerned or is the result of comparatively higher under-reporting of drug use behaviour in young people due to stigma. Another factor may be that, at the age of 15–16, not all young people are necessarily still at school in some developing countries. Those in that age group who are still at school may not be representative of their age range regarding drug use behaviour; they may be part of an elite exhibiting lower drug use than those who are no longer at school.

^a Excluding Mexico: 23 per cent.

Patterns of drug use among young people

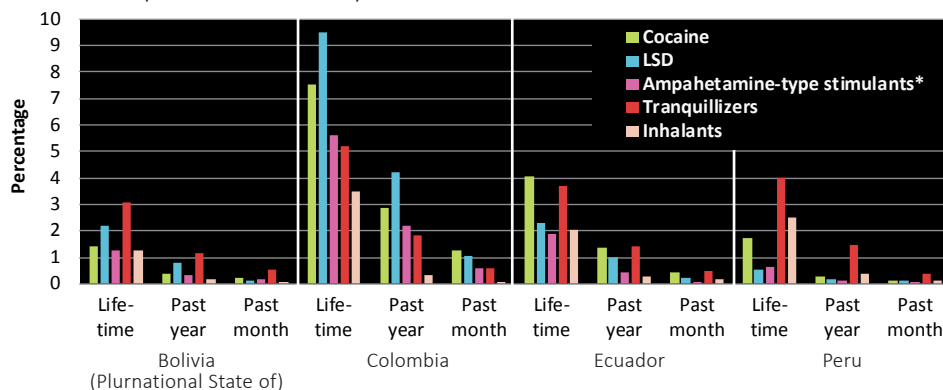
Cannabis remains the most commonly used drug

With the exception of tobacco and alcohol, cannabis is considered the most commonly used drug among young people. Epidemiological research, which is mainly concentrated in high-income countries, suggests that the perceived easy availability of cannabis, coupled with perceptions of a low risk of harm, makes cannabis, after tobacco and alcohol, the most common substance used. Its use is typically initiated in late adolescence and peaks in young adulthood.¹¹ Medical research shows that those who use cannabis before the age of 16 face the risk of acute harm and increased susceptibility to developing drug use disorders and mental health disorders, including personality disorders, anxiety and depression.^{12, 13} Approximately 9 per cent of all people who experiment with cannabis develop cannabis use disorders, whereas 1 in 6 among those who initiate its use as adolescents develop cannabis use disorders.¹⁴ Between one quarter and one half of those who smoke cannabis daily develop cannabis use disorders.¹⁵

The use of other drugs is typically preceded by cannabis use. When compared with non-users, adolescent cannabis users have a higher likelihood of using other drugs even when controlled for other important co-variables such as genetics and environmental influences.¹⁶ Cannabis use during adolescence and the subsequent use of other drugs during young adulthood could be, among other

- 11 Megan Weier and others, “Cannabis use in 14 to 25 years old Australians 1998 to 2013” Centre for Youth Substance Abuse Research Monograph No. 1 (Brisbane, Australia, Centre for Youth Substance Abuse, 2016).
- 12 Deidre M. Anglin and others, “Early cannabis use and schizotypal personality disorder symptoms from adolescence to middle adulthood”, *Schizophrenia Research*, vol. 137, Nos. 1–3 (2012), pp. 45–49.
- 13 Shedler and Block “Adolescent drug use and psychological health”.
- 14 Nora D. Volkow and others, “Adverse health effects of marijuana use”, *New England Journal of Medicine*, 370(23) (2014), pp. 2219–2227.
- 15 Ibid.
- 16 Jeffrey M. Lessem and others, “Relationship between adolescent marijuana use and young adult illicit drug use”, *Behavior Genetics*, vol. 36, No. 4 (2006), pp 498–506.

FIG. 7 Prevalence of drug use among university students in Bolivia (Plurinational State of), Colombia, Ecuador and Peru, 2016



Source: UNODC, *III Estudio Epidemiológico Andino sobre Consumo de Drogas en la Población Universitaria: Informe Regional 2016* (Lima, 2017).

* Includes amphetamine, methamphetamine and "ecstasy".

reasons, the result of common and shared environmental factors. Adolescent users of cannabis may come into contact with other cannabis-using peers or drug dealers who supply other drugs, which may result in increased exposure to a social context that encourages the use of other drugs.^{17, 18} For example, a longitudinal study among adolescent twins showed that the twin who used cannabis differentially progressed towards the use of other drugs, alcohol dependence and drug use disorders at rates that were twice or even five times higher than the twin who did not use cannabis.¹⁹

A comparative study of drug use among university students (18–25 and older) in Bolivia (Plurinational State of), Colombia, Ecuador and Peru in 2016 showed that, after alcohol and tobacco, cannabis was the most commonly used drug among university students. Some 20 per cent of the students in Colombia had used cannabis in the past year, compared with 5 per cent in Bolivia (Plurinational State of) and Peru.

The reported use of other substances was also high among university students in Colombia. The use

of drugs such as cocaine, tranquillizers, LSD and inhalants was also reported among students in all four countries. The proportion of those who initiated drug use at a young age varied among males and females in the survey, with the extent of drug use among male students twice as high as among female students. Polydrug use was also common among the students, with one third of the students in Colombia reported having used two or more drugs concurrently in the past year, compared with 20 per cent in Ecuador and 7 per cent in Peru. Cannabis, cocaine, LSD and ecstasy were among the substances most commonly reported as used concurrently.

Spectrum of drug use in young people: from nightlife settings to the use of inhalants among street children

There are two contrasting settings that illustrate the wide range of circumstances that drive drug use among young people. On the one hand, drugs are used in recreational settings to add excitement and enhance the experience; on the other hand, young people living in extreme conditions use drugs to cope with the difficult circumstances in which they find themselves. This section briefly describes drug use among young people in those settings.

Use of stimulants in nightlife and recreational settings

Over the past two decades, the use among young people in high-income countries and those in urban

¹⁷ Ibid.

¹⁸ Wayne D. Hall and Michael Lynskey, "Is cannabis a gateway drug? Testing hypotheses about the relationship between cannabis use and the use of other illicit drugs", *Drug and Alcohol Review*, vol. 24, No. 1 (2005), pp. 39–48.

¹⁹ Lessem and others, "Relationship between adolescent marijuana use and young adult illicit drug use".

centres of club drugs such as MDMA, or “ecstasy”, methamphetamine, cocaine, ketamine, LSD and GHB, has spread from isolated rave scenes to settings ranging from college bars and house parties to concerts. Some evidence on the approaches of young people to these drugs has been collected in specific contexts.

A qualitative study of club drug users in New York City, for example, found that club drug use could be grouped into three main patterns.²⁰ The first group were inclined to use mainly cocaine, but infrequently, and were identified as “primary cocaine users”. This group had no exposure to other drugs or were disinclined to use multiple substances. The second group were identified as “mainstream users”; they were more inclined to experiment but were focused on the most popular club drugs. This group had a higher frequency of use and were also likely to have used “ecstasy”, but were not likely to have extensive experience with other club drugs. The third group were identified as “wide-range users”; they had a higher frequency of use of more than one drug and were willing to experience “getting high” in different ways. Although there is heterogeneity among the third group, their drug use behaviours have been associated with profound immediate and long-term consequences.

Use of stimulants among socially integrated and marginalized young people

Outside nightlife settings, stimulants such as methamphetamine are also quite commonly used among young people in most parts of the world. A qualitative study in the Islamic Republic of Iran, identified three groups of young methamphetamine users.²¹ The majority were those who had started using methamphetamine, known locally as *shisbeh*, as a way of coping with their current opioid use, either to self-treat opioid dependence or to manage its adverse events. Another, smaller group, were those who had used *shisbeh* during their first substance

use or after a period of cannabis use, as novelty-seeking and to experience a new “high”. The last group constituted those who had switched to methamphetamine use after participating in an opioid withdrawal programme and abstaining from opioid use for a period of time.

A review of studies in Asia and North America of risk factors among young people using methamphetamine identified a range of factors associated with methamphetamine use among socially integrated (low-risk) and marginalized (high-risk) groups of users.²² Among socially integrated young people, males were more likely than females to use methamphetamine. Among that group, a history of engaging in a variety of risky behaviours, including sexual activity under the influence and concurrent alcohol and opiate use, was significantly associated with methamphetamine use. Sexual lifestyle and risky sexual behaviour were also considered risk factors. Engaging in high-risk sexual behaviour, however, could be a gateway for methamphetamine use, or vice versa. Among marginalized groups, females were more likely than males to use methamphetamines. Young people who had grown up in an unstable family environment or who had a history of psychiatric disorders were also identified as being at a higher risk of methamphetamine use.

Drug use among street children

While street children or street-involved youth are a global phenomenon, the dynamics that drive children to the streets vary considerably between high-income and middle- and low-income countries.²³ Young people in this situation in high-income countries have typically experienced conflict in the family, child abuse and/or neglect, parental substance use or poverty. In resource-constrained settings in low and middle-income countries, young people may be on the street because of abject poverty, the death of one or both parents or displacement as a result of war and conflict in addition to the reasons cited above.

20 Danielle E. Ramo and others, “Typology of club drug use among young adults recruited using time-space sampling”, *Drug and Alcohol Dependence*, vol. 107, Nos. 2 and 3 (2010), pp. 119–127.

21 Alireza Noroozi, Mohsen Malekinejad and Afarin Rahimi-Movaghar, “Factors influencing transition to *shisbeh* (methamphetamine) among young people who use drugs in Tehran: a qualitative study”, *Journal of Psychoactive Drugs* (29 January 2018).

22 Kelly Russel and others, “Risk factors for methamphetamine use in youth: a systematic review”, *BioMed Central Pediatrics*, vol. 8, No. 48 (2008).

23 Lonnie Embleton and others, “The epidemiology of substance use among street children in resource-constrained settings: a systematic review and meta-analysis”, *Addiction*, vol. 108, No. 10 (2013), pp. 1722–1733.

Children working and living on the streets: street-involved children

UNICEF defines street children or youth as any girl or boy who has not reached adulthood, for whom the street has become her or his habitual abode and/or source of livelihood, and who is inadequately protected, supervised or directed by responsible adults.

Street children are categorized by their level of involvement in the streets into the following three groups:

1. **Child of the streets:** has no home but the streets. The child may have been abandoned by their family or may have no family members left alive. Such a child has to struggle for survival and might move from friend to friend, or live in shelters such as abandoned buildings.
2. **Child on the street:** visits his or her family regularly. The child might even return every night to

sleep at home but spends most days and some nights on the street because of poverty, overcrowding or sexual or physical abuse at home.

3. **Child part of a street family:** some children live on the streets with the rest of their families, who may have been displaced because of poverty, natural disasters or wars. They move their possessions from place to place when necessary. Often, the children in these families work on the streets with other members of their families.

Source: WHO, "Working with street children: module 1, a profile of street children – a training package on substance use, sexual and reproductive health including HIV/AIDS and STDs", publication No. WHO/MSD/MDP/00.14 (Geneva, 2000).

TABLE 1 Lifetime prevalence of different substances among street-involved children and youth in resource-constrained settings

Substance used	Pooled analysis ^a of lifetime prevalence (percentage)	Confidence interval
Alcohol	41	31–50
Tobacco	44	34–55
Cannabis	31	18–44
Cocaine	7	5–9
Inhalants	47	36–58

Source: Lonnie Embleton and others, "The epidemiology of substance use among street children in resource-constrained settings: a systematic review and meta-analysis", *Addiction*, vol. 108, No. 10 (2013), pp. 1722–1733.

^a Pooled analysis is a statistical technique for combining the results, in this case the prevalence from multiple epidemiological studies, to come up with an overall estimate of the prevalence.

Not only do street children live, survive and grow in an unprotected environment, but they also might be abused or exploited by local gangs or criminal groups to engage in street crimes or sex work. To survive in such a hostile environment, street children may do odd jobs such as street vending, hustling, drug dealing or begging, or may engage in "survival sex work", which is the exchange of sex for specific food items, shelter, money or drugs. Living in precarious conditions also makes street children and youth vulnerable to physical abuse, injuries and violence perpetuated by criminals, gangs or even local authorities.²⁴ It has also been shown that sexual and

physical abuse of street children is strongly associated with their sexual and physical victimization.²⁵ These vulnerabilities, together with the fact that street children may have families or parents with substance use problems, contribute to the development of substance use and psychiatric disorders among street children.

High levels of substance use among street children have been observed in many studies, but there are no global estimates and their patterns of substance

24 WHO, "Working with street children: module 1, a profile of street children – a training package on substance use, sexual and reproductive health including HIV/AIDS and STDs", publication No. WHO/MSD/MDP/00.14 (Geneva, 2000).

25 Kimberly A. Tyler and Lisa A. Melnder, "Child abuse, street victimization and substance use among homeless young adults", *Youth and Society*, vol. 47, No. 4 (2015), pp. 502–519.

26 Khaled H. Nada and El Daw A. Suliman, "Violence, abuse, alcohol and drug use, and sexual behaviors in street children of Greater Cairo and Alexandria, Egypt", *AIDS*, vol. 24, Suppl. 2 (2010), pp. S39–S44.

Different ways of using inhalants

Sniffing: solvents are inhaled directly from a container through the nose and mouth.

Huffing: a shirt sleeve, sock or a roll of cotton is soaked in a solvent and placed over the nose or mouth or directly into the mouth to inhale the fumes.

Bagging: a concentration of fumes from a bag is placed over the mouth and nose or over the head.

use may vary considerably. A systematic review and meta-analysis of studies on substance use among street children in resource-constrained settings reported that inhalants were the most common substance used, with a pooled analysis²⁷ putting lifetime prevalence of their use among street-involved children and youth at 47 per cent.²⁸ While the use of inhalants was found in all regions, use of cocaine among street-involved children was reported mainly in South and Central America, and alcohol use mostly in Africa and South and Central America.

Most of the scientific literature on the subject reports the use of inhalants or volatile substances among street children as a common phenomenon.²⁹ Such substances include paint thinner, petrol, paint, correction fluid and glue. They are selected for their low price, legal and widespread availability and ability to rapidly induce a sense of euphoria among users.³⁰

There are also differences in the extent of substance use among street children that depend on the duration of their exposure to the street environment. Some 58 per cent of street-involved children

interviewed for a study in Kenya reported using glue in the past month, making it the most commonly used substance among this group.³¹ Other substances used by the children included alcohol, tobacco, miraa (a local psychoactive herb), cannabis and petrol. There were considerable differences in the extent of substance use among different categories of street children. The prevalence of past-month use was 77 per cent among those categorized as “children of the street”, compared with 23 per cent reported by “children on the street” (see box for the definition.) Being male, older and having been on the streets for a longer period of time has also been associated with substance use.^{32, 33} Similarly, the absence of family has been consistently associated with substance use among street-involved youth.³⁴

Sudden sniffing death

The intensive use of volatile substances (even during only one session) may result in irregular heart rhythms and death within minutes, a syndrome known as “sudden sniffing death”.

The use of psychoactive substances among street-involved children and youth is often part of their coping mechanism in the face of adverse experiences, such as the physical and sexual abuse and exploitation they experience being on the streets.³⁵ Therefore, many street-involved children perceive inhalants as a form of comfort and relief in a harsh environment, as they numb feelings. In one study, “wanting to forget or escape problems” was reported as the main reason for substance use among street-involved children. For many, peer pressure and the nature of their jobs influenced their use of inhalants.³⁶

27 A pooled analysis is a statistical technique for combining the results, in this case the prevalence from multiple epidemiological studies, to arrive at an overall estimate of the prevalence.

28 Embleton and others, “The epidemiology of substance use among street children in resource-constrained settings”. The meta-analysis looked at 50 studies on substance use among street children. Out of 27 studies, 13 covered resource-constrained settings in Africa, South and Central America, Asia, including the Middle East, and Eastern Europe.

29 L. Baydala, “Inhalant abuse”, *Paediatrics Child Health*, vol. 15, No. 7 (September 2010), pp. 443–448.

30 Colleen A. Dell, Steven W. Gust and Sarah MacLean, “Global issues in volatile substance misuse”, *Substance Use and Misuse*, vol. 46, Suppl. No. 1 (2011), pp. 1–7.

31 Lonnie Embleton and others, “Knowledge, attitudes, and substance use practices among street children in western Kenya”, *Substance Use and Misuse*, vol. 47, No. 11 (2012), pp. 1234–1247.

32 Embleton and others, “The epidemiology of substance use among street children in resource-constrained settings”.

33 Yone G. de Moura and others, “Drug use among street children and adolescents: what helps?”, *Cadernos Saúde Pública*, vol. 28, No. 6 (2012), pp. 1371–1380.

34 Embleton and others, “The epidemiology of substance use among street children in resource-constrained settings”.

35 UNODC, *Solvent Abuse among Street Children in Pakistan*, Publication No. UN-PAK/UNODC/2004/1 (Islamabad, 2004).

36 A. Elkoussi and S. Bakheet, “Volatile substance misuse among street children in Upper Egypt”, *Substance Use and*

The injecting of drugs is also reported among street-involved youth. A cross-sectional study in Ukraine reported that 15 per cent of the children living on the streets were injecting drugs. Nearly half of them shared injecting equipment and 75 per cent were sexually active.³⁷ In another study among street children in Pakistan, cannabis and glue were the drugs most commonly used by the respondents (80 per cent and 73 per cent, respectively), while 9 per cent smoked or sniffed heroin and 4 per cent injected it.³⁸ Similarly, in a Canadian prospective cohort study among street-involved youth, 43 per cent of participants reported injecting drugs at some point.³⁹ Moreover, being helped with injecting was seen among a more vulnerable subgroup of respondents, i.e., those who were young and/or female. Those respondents were more likely to receive help in injecting methamphetamine than heroin or cocaine, in particular because of the higher daily frequency of injecting reported for methamphetamine.

Sexual abuse and exploitation is a common feature in the lives of street-involved children and may contribute to substance use. A study in Brazil reported that a significantly higher proportion of street-involved boys (two thirds) as compared with girls (one third) reported having had sex at some point in their lives. Over half of the respondents reported becoming sexually active before the age of 12. Almost half of the street-involved children interviewed reported more than three sexual partners in the past year. One third of the children reported having had unprotected sex under the influence of drugs or alcohol.⁴⁰ In Ukraine, a study showed that nearly 17 per cent of street-involved adolescent boys

and more than half of adolescent street-involved girls had received payment for sex or had been forced to have sex.⁴¹ The above-mentioned study in Pakistan showed that slightly more than half of street children had exchanged sex for food, shelter, drugs or money.

Street-involved children remain one of the most vulnerable, marginalized and stigmatized groups. They are exposed to abuse and violence, drug use and other behaviours that put them at high risk of HIV and tuberculosis infection, and other conditions including malnutrition and general poor health. Despite these vulnerabilities, they are often the most likely to be excluded from receiving any form of social or health-care support to ameliorate their condition.⁴²

Polydrug use remains common among young people

As with adults, a major characteristic of drug use among young people is the concurrent use of more than one substance. Polydrug use remains fairly common among both recreational and regular drug users. However, polydrug use among young adults is symptomatic of more established patterns of use of multiple substances, which is linked to an increased risk of developing long-term problems as well as of engaging in acute risk-taking through binge drinking or binge use of stimulants such as “ecstasy” at rave parties or similar settings.⁴³

Evidence collected in some regions and countries shows examples of the level and combinations of substances typically used by young people. In Europe, a wide variation in patterns of polydrug use among the population of drug users was reported, ranging from occasional alcohol and cannabis use to the daily use of combinations of heroin, cocaine, alcohol and benzodiazepines.⁴⁴ The most common polydrug use combinations reported in Europe

Misuse, vol. 46, Suppl. No. 1 (2011), pp. 35–39.

- 37 Joanna R. Busza and others, “Street-based adolescents at high risk of HIV in Ukraine”, *Journal of Epidemiology and Community Health*, vol. 65, No. 11 (2011), pp. 1166–1170.
- 38 Susan S. Sherman and others, “Drug use, street survival, and risk behaviours among street children in Lahore, Pakistan”, *Journal of Urban Health*, vol. 82, Suppl. No. 4 (2005), pp. iv113–iv124.
- 39 Tessa Cheng and others, “High prevalence of assisted injection among street-involved youth in a Canadian setting”, *AIDS and Behaviour*, vol. 20, No. 2 (2016), pp. 377–384.
- 40 Fernanda T. de Carvalho and others, “Sexual and drug use risk behaviours among children and youth in street circumstances in Porto Alegre, Brazil”, *AIDS and Behaviour*, vol. 10, Suppl. No. 1 (2006), pp. 57–66.

- 41 Busza and others, “Street-based adolescents at high risk of HIV in Ukraine”.
- 42 UNICEF, *The State of the World's Children 2012: Children in an Urban World* (United Nations publication, Sales No. E.12.XX.1).
- 43 EMCDDA, *Polydrug Use: Patterns and Response* (Luxembourg, Office for Official Publications of the European Communities, 2009).
- 44 *Ibid.*

included tobacco, alcohol and cannabis, together with “ecstasy”, cocaine, amphetamines, LSD or heroin.

In a national survey among college students in Brazil, cannabis, amphetamines, inhalants, tranquilizers and hallucinogens were the five drugs most frequently used with alcohol both in the past 12 months and in the past 30 days.⁴⁵ The results of the National Survey on Drug Use and Health in the United States showed that polydrug use among current “ecstasy” users aged 18–29 years was a common feature: among those users, 44 per cent had used three or more types of drug in the past year.⁴⁶ The most common combinations included cannabis, cocaine, tranquilizers and opiates.

The use of heroin and other opioids is problematic not only because of the potential for developing opioid use disorders, but also because of the increased likelihood of developing health problems associated with unsafe injecting practices. In the past decade, heroin use among young people showed declining trends in North America, but a recent resurgence of opioid use, along with the risky use of multiple substances, is also affecting young people. A qualitative study of young people who injected heroin in the United States showed that misuse of prescription opioids and tranquilizers was also quite common among them. They misused tranquilizers and prescription opioids not only as a substitute for heroin, but also to boost the effects of heroin, to manage withdrawals or even to reduce use or the risks associated with injecting heroin.⁴⁷

45 Lúcio G. de Oliveria and others, “Polydrug use among college students in Brazil: a nationwide survey”, *Revista Brasileira de Psiquiatria*, vol. 35, No. 3 (2013), pp. 221–230.

46 Katherine M. Keyes, Silvia S. Martins and Deborah S. Hasin, “Past 12-month and lifetime comorbidity and poly-drug use of ecstasy users among young adults in the United States: results from the national epidemiologic survey on alcohol and related conditions”, *Drug and Alcohol Dependence*, vol. 97, Nos. 1 and 2 (2008), pp. 139–149.

47 E. S. Lankenau and others, “Patterns of prescription drug misuse among young injection drug users”, *Journal of Urban Health*, vol. 89, No. 6 (December 2012).

Pathways to substance use disorders

Integrative developmental model for understanding pathways to substance use and harmful use of substances

Persons who initiate substance use and later develop substance use disorders typically transition through a number of stages, including initiation of use, escalation of use, maintenance, and, eventually, addiction.^{48, 49} These pathways fluctuate in the use and desistance or cessation of drug use. Some groups of users may maintain moderate use for decades and never escalate. Others may exhibit intermittent periods of cessation, abstain permanently, or escalate rapidly and develop substance use disorders.

Understanding the risk factors that determine whether experimental users continue on a path to harmful use of substances is a question that has compelled researchers and practitioners to try to better understand, predict and appropriately intervene in these distinct etiological pathways.

The “ecobiodevelopmental” theoretical framework, founded on an integration of behavioural science fields, can help elucidate substance use pathways. In this model, human behaviour is viewed as the result of emerging from the “biological embedding”⁵⁰

48 On the basis of the International Statistical Classification of Diseases and Related Health Problems (ICD 10) definition, the term “harmful use of substances” has been used in the present section instead of the term “substance abuse” to refer to a pattern of use that causes damage to physical or mental health. The *Diagnostic and Statistical Manual of Mental Disorders* (DSM-5) of the American Psychiatric Association refers to “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. Many of the scientific literature that dates prior to the introduction of DSM-5 refers to “substance abuse”, which was defined in DSM-4 as a maladaptive pattern of substance use leading to clinically significant impairment or distress, including recurrent substance use in which it is hazardous or continuous use despite persistent social or interpersonal problems. Similarly, the term “addiction” refers to a chronic relapse condition that is characterized by compulsive drug-seeking despite harmful consequences.

49 Denise B. Kandel, ed., *Stages and Pathways of Drug Involvement: Examining the Gateway Hypothesis* (Cambridge, Cambridge University Press, 2002).

50 “Biological embedding” refers to how early personal experiences and environmental exposure are “built into the bodies”.

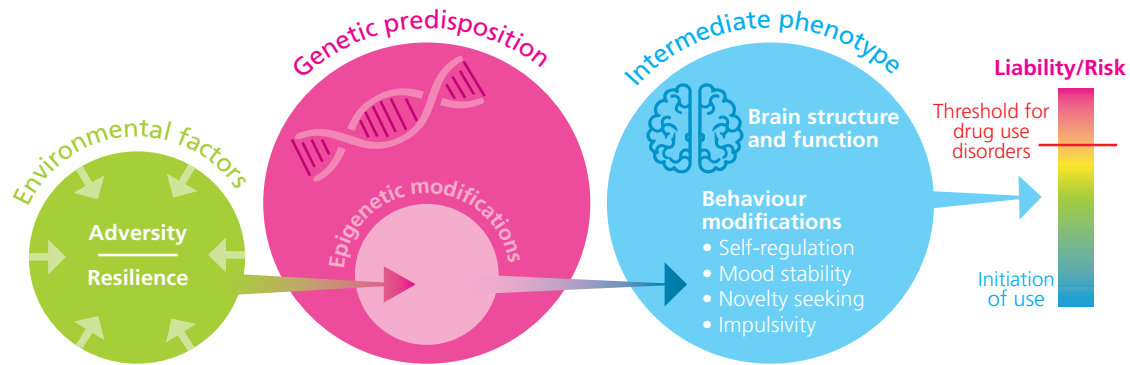
FIG. 8 | Factors that determine different pathways to substance use and substances use disorders

Figure 8 shows the two main categories of factors conferring risk for substance use: genes and the environment. Genetic variants are like switches: they are either turned on or off, but their expression is influenced by experience (i.e., epigenetic modifications). Environmental factors are more like dials that are turned up or down, also depending on experience. Risk or adversity factors include child maltreatment, poverty, poorly equipped schools, dysfunctional families, discrimination and witnessing violence. Resiliency or protective factors include high-quality education, housing, health care, social attachments and parenting. The combination of switches and dials crosses a liability threshold that, when predominantly negative, primes the brain for substance use. The functional relationship between factors is not linear, nor is it static; it fluctuates throughout a lifespan. Some environmental influences confer resiliency and may attenuate the effects of genetic predispositions. Thus, psychosocial interventions and practices are of the utmost importance in determining final outcomes.

of social and physical environmental conditions.⁵¹ Individual-level characteristics, such as personality and genetics, interact with experiences and exposures to socioenvironmental factors to directly affect the developing brain's structure and function.^{52, 53, 54}

This inherent “experience-dependence” of the brain means that the nature of conditions to which individuals are exposed — both optimal and suboptimal — influence the resultant behaviour. An abundance of positive experiences, such as protective factors including family support or well-equipped schools, can strengthen the neural connections underlying

self-regulation, impulse control and executive decision-making. On the other hand, negative or adverse exposures can translate into impairments in a developing child's ability to regulate behaviour and emotions.^{55, 56} Therefore, the exposures and experiences during an individual's developmental stage have differential effects on social, psychological and neural processes and have functional and behavioural implications.^{57, 58}

Immediate micro-level factors, such as the family, and surrounding macro-level factors, such as the neighbourhood, which influence the development and prevalence of behaviour on individual functioning, are acknowledged in this framework.

While specific influential factors vary between individuals, and no factor alone is sufficient to lead to

- 51 Jack P. Shonkoff and Deborah A. Phillips, eds., *From Neurons to Neighborhoods: The Science of Early Childhood Development* (Washington, D. C., National Academy Press, 2000).
- 52 Hirokazu Yoshikawa, Lawrence J. Aber and William R. Beardslee, “The effects of poverty on the mental, emotional, and behavioral health of children and youth: Implications for prevention”, *American Psychologist*, vol. 67, No. 4 (2012), pp. 272–284.
- 53 Megan M. Sweeney, “Family-structure instability and adolescent educational outcomes: a focus on families with stepfathers”, in *Whither Opportunity? Rising Inequality, Schools, and Children's Life Chances*, Greg J. Duncan and Richard J. Murnane, eds. (New York, Russell Sage Foundation, 2011), pp. 229–252.
- 54 Mary E. O'Connell, Thomas Boat and Kenneth E. Warner, eds., *Preventing Mental, Emotional, and Behavioral Disorders among Young People: Progress and Possibilities*. (Washington, D. C., National Academies Press, 2009).

- 55 Danya Glaser, “Child abuse and neglect and the brain: a review”, *Journal of Child Psychology and Psychiatry*, vol. 41, No. 1 (2000), pp. 97–116.
- 56 Bruce S. McEwen and John H. Morrison, “The brain on stress: vulnerability and plasticity of the prefrontal cortex over the life course”, *Neuron*, vol. 79, No. 1 (2013), pp. 16–29.
- 57 Susan L. Andersen, “Commentary on the special issue on the adolescent brain: adolescence, trajectories, and the importance of prevention”, *Neuroscience and Biobehavioral Review*, vol. 70 (2016), pp. 329–333.
- 58 Sara B. Johnson, Jenna L. Riis and Kimberly G. Noble, “State of the art review: poverty and the developing brain”, *Pediatrics*, vol. 137, No. 4 (2016).

harmful use of substances, there may be some critical combination of risk factors that are present and protective factors that are absent that makes the difference between having a brain that is primed for substance use and one that is not. This threshold is

unique to each individual and can be affected by any number of potential combinations of external and personal factors. Brain development is exquisitely sensitive to psychosocial experiences. Such experiences affect the way the brain develops and functions and have a direct impact on a child's ability to self-regulate and, ultimately, on susceptibility to substance use. Substance use among adolescents is of particular concern given the evidence that substances with psychoactive effects have a greater impact on adolescents than adults. Age-related variations in drug responses are likely the result of differences in the pharmacological effects of substances on the brain systems that are still under construction. These differences may have significant implications for adolescents increasing the tendency to consume greater amounts and more drug types, thereby, compromising their neurodevelopment.

The evolution and the impact of drug use in childhood and youth can be characterized by three elements:

- Risk factors that determine the fragility or resilience of the individual to drug dependence
- The health and social impact of drug use on individual development
- The impact of caregivers' drug use on the individual

FIG. 9 | Risk factors in substance use and harmful use of substances



Risk and protective factors

The present subsection contains a discussion of the association of person-level micro- and macro-level risk factors in substance use and harmful use as sources of vulnerability versus resilience. The consequences of eventual substance use for child and adolescent development and the multiple impacts of caregiver substance use on the development of the child and adolescent are also discussed. Throughout the subsection, the evidence of aetiology (causation) and knowledge regarding the consequences of drug use for the child and adolescent are discussed within the context of an integrated developmental framework.

Individual-level risk factors

An individual's characteristics play a significant role in determining whether that individual will use substances, will progress to harmful use of substances or will develop substance use disorders, or whether the individual will abstain from or desist such use during the developmental pathway. Taking these characteristics into account is important for three reasons: (a) neurobiological functioning, personality, emerging stress and coping strategies help to determine an individual's response to prevailing social and environmental influences, contributing to eventual outcomes; (b) personal-level characteristics have been shown to predict or moderate outcomes, as they interact with environmental influences in unique and complex ways; and (c) knowing these characteristics is critical in determining what prevention and treatment interventions may have the greatest potential to benefit any given individual or subgroup. This information can also help identify opportunities during the development of an individual for implementing the most effective prevention strategies. Favourable changes in these characteristics are expected if the intervention positively influences its targets (a mediation effect).

Particular personality traits have been associated with externalizing disorders, which have been consistently implicated in the use and harmful use of substances.⁵⁹ These characteristics include

heightened reward sensitivity, poor inhibitory control, aggression and novelty-seeking.^{60, 61} Variation in these personality dimensions, particularly impulsivity and novelty-seeking, may contribute to the initiation of substance use, as well as the transition from initial to intermittent and then regular substance use, the transition from harmful use to dependence or addiction, and the propensity for repeated relapse after achieving abstinence.⁶² Individuals with these traits tend to seek highly stimulating and risky situations and show less anxiety in anticipation of the consequences of their behaviour.^{63, 64}

Similar to environmental factors, personality influences also have a differential impact on these complex behaviours at different stages of an individual's development.^{65, 66} Normative development during adolescence is typified by heightened levels of impulsivity and novelty-seeking, in part due to dramatic fluctuations in hormone levels that affect brain development and other systems. The subgroup of adolescents that exhibits an especially high level of any combination of these personality traits is at heightened risk of harmful use of substances. These characteristics may, in effect, contribute to individual differences in the reinforcing effects of drugs.⁶⁷

59 Irene J. Elkins, Matt McGue and William G. Iacono, "Prospective effects of attention-deficit/hyperactivity disorder, conduct disorder, and sex on adolescent substance use and abuse", *Archives of General Psychiatry*, vol. 64, No. 10 (2007), pp. 1145–1152.

60 Michael J. Frank and others, "Genetic triple dissociation reveals multiple roles for dopamine in reinforcement learning", *Proceedings of the National Academy of Sciences*, vol. 104, No. 41 (2007), pp. 16311–16316.

61 Tilmann A. Klein and others, "Genetically determined differences in learning from errors". *Science*, vol. 318, No. 5856 (2007), pp. 1642–1645.

62 Mary J. Kreek and others, "Genetic influences on impulsivity, risk taking, stress responsivity and vulnerability to drug abuse and addiction", *Nature Neuroscience*, vol. 8, No. 11 (2005), pp. 1450–1457.

63 Ibid.

64 Didier Jutras-Aswad and others, "Cannabis-dependence risk relates to synergism between neuroticism and proenkephalin SNPs associated with amygdala gene expression: case-control study" *PLoS ONE*, vol. 7, No. 6 (2012).

65 James J. Li and others, "Polygenic risk, personality dimensions, and adolescent alcohol use problems: a longitudinal study", *Journal of Studies on Alcohol and Drugs*, vol. 78, No. 3 (2017), pp. 442–451.

66 Kenneth S. Kendler, Charles O. Gardner and Carol A. Prescott, "Personality and the experience of environmental adversity", *Psychological Medicine*, vol. 33, No.7 (2003), pp. 1193–1202.

67 Caryn Lerman and Raymond Niaura, "Applying genetic

Behavioural and mental health

The co-occurrence of mental health and substance use disorders afflicts millions of people, according to data from multiple sources, including WHO. Specifically, internalizing symptoms such as post-traumatic stress disorder, depression and anxiety, along with externalizing behaviours such as conduct disorder, attention-deficit hyperactivity disorder, oppositional defiant disorder, antisocial personality disorder and certain other mental health conditions, are strongly and consistently related to the risk of harmful use of substances.⁶⁸ Individuals with these disorders are in general more likely to use substances and to do so at an earlier age than those without.⁶⁹ Mood and anxiety disorders, for example, double the risk of an individual developing substance use disorders.⁷¹

The presence of mental and behavioural health disorders may exacerbate the role of poor or maladaptive stress reactivity patterns in the developmental pathways to substance use. Individuals with internalizing disorders tend to have higher levels of arousal in the brain systems that are responsible for stress responses, which may lead to a tendency to self-medicate the symptoms of anxiety and depression.⁷² Those with externalizing disorders tend to have a lower level of arousal in these systems, which has been associated with a relative lack of regard for consequences and a need for additional stimulation.

The likelihood of a person with conditions such as post-traumatic stress disorder or attention-deficit

hyperactivity disorder effectively meeting social challenges is diminished, as doing so requires intact neurocognitive and emotional functions which are often compromised in psychiatric disorders.⁷³

Some of the mental health conditions that may be correlated with drug use have a gender factor, which translates into a gender differential in terms of the risk of harmful use and drug dependence: males more often exhibit antisocial personality disorder, while females demonstrate higher rates of mood and anxiety disorders.⁷⁴ Among both adolescents and adults, efforts to self-manage psychiatric symptoms further compound the harmful use of substances, as well as adding to the challenges associated with resistance to treatment for substance use disorders.⁷⁵

Neurological development and adolescence

One pathway to harmful use of substances is believed to originate in a deviation or delay in neurological development that is thought to underlie the problem and risky behaviours that often precede substance use. Understanding the neurobiological contribution to the aetiology of substance use involves characterizing the brain maturation processes that occur during adolescence, such as reduced inhibitory control and increased reward sensitivity, and are associated with substance use.

Substance use and harmful use of substances are the result of a developmental process beginning in the prenatal period and lasting until a person is in their mid- to late 20s. Data from surveys on drug use indicate that initiation of substance use is most common in early to mid-adolescence and, for the subgroup of users that escalate, substance use peaks during the transition into young adulthood.⁷⁶ Criti-

approaches to the treatment of nicotine dependence”, *Oncogene*, vol. 21, No. 48 (2002), pp. 7412–7420.

- 68 Tonya D. Armstrong, and Jane E. Costello, “Community studies on adolescent substance use, abuse, or dependence and psychiatric comorbidity”, *Journal of Consulting and Clinical Psychology*, vol. 70, No. 6 (2002), pp. 1224–1239.
- 69 Michael D. De Bellis and others, “Brain structures in pediatric maltreatment-related posttraumatic stress disorder: a sociodemographically matched study” *Biological Psychiatry*, vol. 52, No. 11 (2002), pp. 1066–1078.
- 70 Cynthia L. Rowe and others, “Impact of psychiatric comorbidity on treatment of adolescent drug abusers”, *Journal of Substance Abuse Treatment*, vol. 26, No. 2 (2004), pp. 129–140.
- 71 Susan B. Quello and others, “Mood disorders and substance abuse disorders: a complex comorbidity”, *Science and Practice Perspectives*, vol. 3, No. 1 (2005), pp. 13–21.
- 72 Andrea M. Hussong and others, “An internalizing pathway to alcohol use and disorder”, *Psychology of Addictive Behaviors*, vol. 25, No. 3 (2011), pp. 390–404.

- 73 Maria Kovacs and David Goldston, “Cognitive and social cognitive development of depressed children and adolescents”, *Journal of the American Academy of Child and Adolescent Psychiatry*, vol. 30, No. 3 (1991), pp. 388–392.
- 74 United States, National Institute on Drug Abuse, “Comorbidity: addiction and other mental illnesses”, NIDA Research Report Series, NIH Publication No. 10–5771 (Washington, D.C., 2010).
- 75 Kristin L. Tomlinson, Sandra Brown and Ana Abrantes, “Psychiatric comorbidity and substance use treatment outcomes of adolescents”, *Psychology of Addictive Behaviors*, vol. 18, No. 3 (2004), pp. 160–169.
- 76 Rachel N. Lipari and others, “Risk and protective factors and estimates of substance use initiation: results from the 2016 National Survey on Drug Use and Health”, NSDUH Data Review (September 2017).

cally, new social challenges, such as increased autonomous decision-making, that adolescents face coincide with complex changes in brain wiring and connectivity that take place throughout this time. These have implications for adaptive decision-making and the ability to self-regulate behaviour and emotion.⁷⁷ In effect, some degree of impulsivity, risk-taking and sensation-seeking is normative during adolescence, as indicated above. However, a heightened level of risk-taking may extend from a combination of social circumstances and non-normative neurodevelopmental immaturity or dysfunction.

Neurobiological development during adolescence occurs transitionally rather than as a single snapshot in time.⁷⁸ The prefrontal cortex, the part of the brain responsible for executive cognitive functions such as decision-making, impulse control and working memory, is still under construction. A central function of these executive cognitive functions is to shield long-term goals from temptations afforded by short-term benefits that often lead to negative consequences.⁷⁹ The prefrontal “top-down” cognitive regulation over subcortical regions is somewhat functionally disconnected throughout adolescence. This translates into the natural tendency of adolescents to act on emotional stimuli, with little cognitive control.⁸⁰ Through both the natural course of development and environmental experience, connections between the cognitive regulation and emotional stimuli regions of the brain are strengthened, providing a mechanism for increasing top-down regulation of emotional brain systems.⁸¹

In addition, brain circuits, such as ventral striatum, that are involved in processing rewards, show rapid maturation during the adolescent years, heightening sensitivity to rewarding experiences.^{82, 83, 84} This development may play a unique role in the initiation of substance use in early to mid-adolescence and may be exaggerated in the subgroup that escalate use. Subsequent use of substances may exacerbate some adolescents’ already heightened reward sensitivity, resulting in a strengthening of the drug’s reinforcing properties.⁸⁵ Together with this increase in reward sensitivity, adolescence brings a series of other characteristics to the development process that compromise neurodevelopment and can cause measurable dysfunction in the brain systems. These include:

- A greater tendency to sensation- and novelty-seeking
- Early puberty and erratic hormone levels
- Detrimental environmental conditions such as stress, adversity, maltreatment and other negative experiences⁸⁶

Regardless of the source of delayed or deficient neurodevelopment, the imbalance between social demands and emergent neurobiological systems during adolescence may lead to heightened vulnerability to substance use and escalation to harmful use of substance. This evidence has direct implications for the design of intervention components that target this period of development.

Source: B. J. Casey and R. M. Jones, “Neurobiology of the adolescent brain and behavior: implications for substance use disorder”, *Journal of the American Academy of Child and Adolescent Psychiatry*, vol. 49, No. 12 (December 2010).

77 Scott Marek and others, “The contribution of network organization and integration to the development of cognitive control”, *PLoS Biology*, vol. 13, No. 12 (2015).

78 B. J. Casey, Rebecca M. Jones and Hare A. Todd, “The adolescent brain”, *Annals of the New York Academy of Sciences*, vol. 1124, No. 1 (2008), pp. 111–126.

79 Maria Kharitonova and Yuko Munakata, “The role of representations in executive function: investigating a developmental link between flexibility and abstraction”, *Frontiers in Psychology*, vol. 2, art. 347 (2011).

80 Leah H. Somerville and B. J. Casey, “Developmental neurobiology of cognitive control and motivational systems”, *Current Opinion in Neurobiology*, vol. 20, No. 2 (2010), pp. 236–241.

81 Nim Tottenham, Hare A. Todd and B. J. Casey, “Behavioral assessment of emotion discrimination, emotion regulation, and cognitive control in childhood, adolescence, and

adulthood”, *Frontiers in Psychology*, vol. 2, art. 39 (2011).

82 A. Padmanabhan and others, “Developmental changes in brain function underlying the influence of reward processing on inhibitory control”, *Developmental Cognitive Neuroscience*, vol. 1, No. 4 (2011), pp. 517–529.

83 C. F. Geier and others, “Immaturities in reward processing and its influence on inhibitory control in adolescence”, *Cerebral Cortex*, vol. 20, No. 7 (2010), pp. 1613–1629.

84 Somerville and Casey, “Developmental neurobiology of cognitive control and motivational systems”.

85 Michael E. Hardin and Monique Ernst, “Functional brain imaging of development-related risk and vulnerability for substance use in adolescents”, *Journal of Addiction Medicine*, vol. 3, No. 2 (2009), pp. 47–54.

86 Laurence Steinberg, “A dual systems model of adolescent risk-taking”, *Developmental Psychobiology*, vol. 52, No. 3

Stress exposures and physiological reactivity

Stress is a major common denominator across the neurobiological, physiological, psychological and environmental domains implicated in susceptibility to substance use, substance use escalation, relapse and treatment resistance.

Stress refers to processes involving perception, appraisal and response to harmful, threatening or challenging external events or conditions, known as “stressors”, such as poverty, prenatal exposures, child maltreatment, divorce and bereavement.

Source: A. Levine and others, “Molecular mechanism for a gateway drug: epigenetic changes initiated by nicotine prime gene expression by cocaine”, *Science Translational Medicine*, vol. 3, No. 107 (November 2011).

Numerous studies have demonstrated the associations between increasing levels of emotional and physiological stress and decreases in behavioural control, higher levels of impulsivity and high levels of maladaptive behaviours.^{87, 88, 89} There is also substantial evidence to support the role of stress in substance use pathways.^{90, 91} Early life adversity in particular is markedly associated with an increased risk of substance use, harmful use and dependence.⁹² This fundamental relationship is clearly

(2010), pp. 216–224.

- 87 Jumi Hayaki and others, “Adversity among drug users: relationship to impulsivity”, *Drug and Alcohol Dependence*, vol. 7778, No. 1 (2005), pp. 65–71.
- 88 Barbara Greco and Mirjana Carli, “Reduced attention and increased impulsivity in mice lacking NPY Y2 receptors: relation to anxiolytic-like phenotype”, *Behavioural Brain Research*, vol. 169, No. 2 (2006), pp. 325–334.
- 89 Martin Hatzinger and others, “Hypothalamic–pituitary–adrenocortical (HPA) activity in kindergarten children: importance of gender and associations with behavioral/emotional difficulties”, *Journal of Psychiatric Research*, vol. 41, No. 10 (2007), pp. 861–870.
- 90 Hanie Edalati and Marvin D. Krank, “Childhood maltreatment and development of substance use disorders: a review and a model of cognitive pathways” *Trauma, Violence, & Abuse*, vol. 17, No. 5 (2016), pp. 454–467.
- 91 Christine M. Lee, Clayton Neighbors and Briana A. Woods, “Marijuana motives: young adults’ reasons for using marijuana”, *Addictive Behaviors*, vol. 32, No. 7 (2007), pp. 1384–1394.
- 92 Shanta R. Dube and others, “Childhood abuse, neglect, and household dysfunction and the risk of illicit drug use: the adverse childhood experiences study”, *Pediatrics*, vol. 111, No. 3 (2003), pp. 564–572.

TABLE 2 Estimates of the population-attributable risk of adverse childhood experiences for selected outcomes among women

Population-attributable risk of adverse childhood experience	Substance use
65 per cent	Alcoholism
50 per cent	Harmful use of drugs
78 per cent	Injecting drug use

Early life adversity is markedly associated with increased risk of substance use, harmful substance use and drug dependence. Drug use may occur as a maladaptive response to stressful experiences.

demonstrated by the results of the Adverse Childhood Experiences study, as shown in table 2.^{93, 94, 95} These findings suggest that very early development sets the stage for response to initiation of substance use by primary biological, psychological and social responses to initiation.

Like all other risk factors, exposure to stress has differential effects on social, psychological and neural functioning and, in turn, on the risk of substance use and harmful use, based on sex, genetic vulnerabilities and developmental stages of exposure.^{96, 97} In terms of sex differences, girls not only report a greater number of negative life events during adolescence than boys, but they are also more likely to experience interpersonal stressors and be adversely affected by them.⁹⁸ For example, post-traumatic stress disorder often antedates drug use and harmful drug use among girls but it occurs more often after harmful substance use in boys, perhaps suggesting

- 93 Daniel P. Chapman and others, “Adverse childhood experiences and the risk of depressive disorders in adulthood”, *Journal of Affective Disorders*, vol. 82, No. 2 (2004), pp. 217–225.
- 94 Dube and others, “Childhood abuse, neglect, and household dysfunction and the risk of illicit drug use”.
- 95 Robert F. Anda and others, “Adverse childhood experiences and prescription drug use in a cohort study of adult HMO patients”, *BMC Public Health*, 4 June 2008.
- 96 Kendler, Gardner and Prescott, “Personality and the experience of environmental adversity”.
- 97 Susan L. Andersen and Martin H. Teicher, “Desperately driven and no brakes: developmental stress exposure and subsequent risk for substance abuse”, *Neuroscience and Biobehavioral Reviews*, vol. 33, No. 4 (2009), pp. 516–524.
- 98 Xiaojia Ge and others, “Parents’ stressful life events and adolescent depressed mood”, *Journal of Health and Social Behaviour*, vol. 35, No. 1 (1994), pp. 28–44.

that females are more likely to self-medicate their symptoms, whereas males may be more likely to experience trauma owing to the risk situations associated with harmful substance use.⁹⁹ Females are also at increased risk of harmful substance use when exposed to the stressors of family violence and alcoholism.¹⁰⁰ These findings and many others reveal sex differences in the exposure to and experience of trauma and stress, as well as the differential influence of sex on substance use patterns, and suggest that gender aspects should be considered in etiological research and in the development of a prevention intervention or treatment plan.

Research shows that early life stress predisposes individuals to use substances later because the stressors have an impact on immature neurophysiological systems. In adolescence, when these emergent systems become increasingly functional, the damage is expressed in heightened risk of psychopathology.¹⁰¹ Greater levels of stress also affect adolescents' already lowered behavioural and cognitive controls.^{102, 103} Stress exposures disrupt both the hormonal and the physiological systems that regulate these functions, impairing learning, memory, decision-making and other functions that normally support the self-regulation of behaviour.^{104, 105, 106} These biological

stress responses activate the same neural systems that underlie the positive reinforcing effects of drugs,¹⁰⁷ potentially reinforcing drug-taking behaviours. As a result, drug taking may occur as a maladaptive response to stressful experiences. Recognizing the increased risk of substance use in young people who have experienced early life stressors is critical to guide efforts designed to both prevent exposure to and counteract the potential subsequent negative consequences of substance use.

Epigenetics, genetic variations and response to social influences

Genetic variations contribute to a determination of an individual's response to prevailing social influences; genetic influences on propensity to substance use and substance use disorders are thought to be mediated by individual characteristics in interaction with environmental factors, with stress exposures having a particular impact.¹⁰⁸ At the core of the interaction between genes and the environment are epigenetic modifications that occur at the level of gene activities in response to changes in the environment. Adverse experiences, especially in early life, have the potential to modify gene expression or suppression, which has important implications for phenotypic impact on stress hormones and behaviour.¹⁰⁹ Ongoing environmental change can further modify epigenetic processes, for better or for worse, helping to explain individual differences in response to stress as well as the potential for positive environmental change, for example through intervention, to reverse earlier negative modifications. As indicated in the "conceptual model" (figure 8 on page 23), not all people who are exposed to stress or trauma will exhibit maladaptive physiological and psychological stress responses that affect substance use and harmful use of substance.

- 99 Eva Y. Deykin and Stephen L. Buka, "Prevalence and risk factors for posttraumatic stress disorder among chemically dependent adolescents", *American Journal of Psychiatry*, vol. 154, No. 6 (1997), pp. 752–757.
- 100 Stephen T. Chermack, Brett E. Fuller and Frederic C. Blow, "Predictors of expressed partner and non-partner violence among patients in substance abuse treatment", *Drug & Alcohol Dependence*, vol. 158, Nos. 1 and 2 (2000), pp. 43–54.
- 101 Andersen and Teicher, "Desperately driven and no brakes".
- 102 Susan L. Andersen and Martin H. Teicher, "Stress, sensitive periods and maturational events in adolescent depression", *Trends in Neurosciences*, vol. 31, No. 4 (2008), pp. 183–191.
- 103 Rajita Sinha, "How does stress increase risk of drug abuse and relapse?", *Psychopharmacology*, vol. 158, No. 4 (2001), p. 343.
- 104 Gerald Heuther, "Stress and the adaptive self-organization of neuronal connectivity during early childhood", *International Journal of Developmental Neuroscience*, vol. 16, Nos. 3 and 4 (June/July 1998), pp. 297–306.
- 105 William R. Lavallo and others, "Lifetime adversity leads to blunted stress axis reactivity: studies from the Oklahoma family health patterns project", *Biological Psychiatry*, vol. 71, No. 4 (2012), pp. 344–349.
- 106 C. A. Nelson and L. J. Carver, "The effects of stress and trauma on brain and memory: a view from developmental cognitive neuroscience", *Development and Psychopathology*,

vol. 10, No. 4 (1998), pp. 793–809.

- 107 George F. Koob and Michel Le Moal, "Drug abuse: hedonic homeostatic dysregulation", *Science*, vol. 278, No. 5335 (1997), pp. 52–58.
- 108 Mary-Anne Enoch, "The influence of gene–environment interactions on the development of alcoholism and drug dependence", *Current Psychiatry Reports*, vol. 14, No. 2 (2012), pp. 150–158.
- 109 Moshe Szyf and others, "The dynamic epigenome and its implications for behavioral interventions: a role for epigenetics to inform disorder prevention and health promotion", *Translational Behavioral Medicine*, vol. 6, No. 1 (2016), pp. 55–62.

Different susceptibility to harmful substance use is a function of the complex interrelationships between genetic, environmental and epigenetic factors that individuals experience dynamically.

While genes do not increase the risk of using or of developing harmful use of specific substances, there is evidence that they do affect neurobiological systems and phenotypic traits that more directly influence pathways to or from substance use. These systems and traits fundamentally interact with stress exposures that, when they are repeated or if they are severe, have the potential to compromise the development of neural systems that underlie social, behavioural, cognitive and emotional functioning in profound and enduring ways.^{110, 111}

Micro-level influences

Substance use among young people cannot be understood or addressed without comprehending the social context within which individuals grow, develop and interact. Contextual factors that may vary across cultures can accentuate the relations between parenting and family, peer influences, pubertal timing and problem outcomes such as substance use, in ways that differ between the sexes. In the present subsection, both the liability factors that influence problem behaviour and the environmental conditions that may insulate individuals from negative outcomes are considered.

Parenting and family functioning

Parenting and the home environment exert profound influences on early child development in multiple domains of functioning.¹¹² The strength of parental influence on substance use, for example,

Children exposed to negative parenting qualities are two to four times more likely to develop mental and physical health issues than those within the norms.

Source: T. I. Herrenkohl and others, "Family influences related to adult substance use and mental health problems: a developmental analysis of child and adolescent predictors", *The Journal of Adolescent Health*, vol. 51, No. 2 (February 2012), pp. 129–135.

cannot be underestimated.¹¹³ Parenting that is harsh, restrictive, inconsistent, hostile and/or high in conflict can often lead to negative behavioural outcomes in children.¹¹⁴

At the extreme of parenting behaviour, abuse, neglect and domestic violence, in particular, threaten every aspect of children's development. The quality of parenting further interacts with factors such as psychological well-being, exposure to stress and social support in predicting general antisocial behaviour, as well as substance use and substance use disorders.¹¹⁵

Parenting can exacerbate the risk of substance use as early as infancy, particularly for babies with a "difficult" temperament. These early signs are often manifested as irritability, frequent crying, withdrawal from affection, irregular sleeping or eating patterns, and inability to soothe. Such problems commonly originate in genetic, congenital and prenatal processes.¹¹⁶ Babies with hard-to-manage temperaments may elicit negative responses such as rejection, ineffective practices, harsh discipline, maltreatment or substance use on the part of their caregivers. Any of these responses can exacerbate

110 Robin Davidson, "Can psychology make sense of change?", in *Addiction: Processes of Change*, Griffith Edwards and Malcolm H. Lader, eds., Society for the Study of Addiction Monograph No. 3 (New York, Oxford University Press, 1994).

111 Pia Pechtel and Diego A. Pizzagalli, "Effects of early life stress on cognitive and affective function: an integrated review of human literature", *Psychopharmacology*, vol. 214, No. 1 (2011), pp. 55–70.

112 United States, National Research Council and Institute of Medicine of the National Academies, *Preventing Mental, Emotional, and Behavioral Disorders Among Young People: Progress and Possibilities*, Mary E. O'Connell, Thomas Boat and Kenneth E. Warner, eds. (Washington, D.C., National Academies Press, 2009).

113 Melissa A. Lippold and others, "Unpacking the effect of parental monitoring on early adolescent problem behavior: mediation by parental knowledge and moderation by parent-youth warmth", *Journal of Family Issues*, vol. 35, No. 13 (2014), pp. 1800–1823.

114 Anne E. Barrett and R. Jay Turner, "Family structure and mental health: the mediating effects of socioeconomic status, family process, and social stress", *Journal of Health and Social Behavior*, vol. 46, No. 2 (2005), pp. 156–169.

115 Benjamin J. Hinnant, Stephen A. Erath and Mona El-Sheikh, J "Harsh parenting, parasympathetic activity, and development of delinquency and substance use", *Journal of Abnormal Psychology*, vol. 124, No. 1 (2015), pp. 137–151.

116 Lyndall Schumann and others, "Persistence and innovation effects in genetic and environmental factors in negative emotionality during infancy: a twin study", *PLoS ONE*, vol. 12, No. 4 (2017).

this developmental process.¹¹⁷ This scenario can be particularly impactful in the context of pre-existing dysfunction or hardship in the caregivers, such as mental illness, harmful use of substances, antisocial behaviour or poverty.^{118, 119} In addition, more “difficult” children can provoke harsher and less effective responses even from caregivers with the psychological wherewithal or physical resources to cope with their baby’s special problems and needs. Once the caregiver-child relationship is strained, there is often less warmth, attachment and effective coping, further heightening the child’s risk for maladaptive behaviours. In short, the child’s responses stimulate predictable reactions from the social environment. This may reinforce or counteract the child’s reactions, thus contributing to further changes in reactions from both the social environment and the child. This “action-reaction” sequence places the child at increased risk for long-term social maladjustment and risky behaviours. Rather than replacing one behaviour with another in response to changing socioenvironmental conditions, however, behaviours tend to diversify and can strengthen, weaken or reverse the developmental path over time.

In addition to parenting, various aspects of the family environment can influence a child’s subsequent substance use behaviour. These can include structural characteristics, family cohesion, family communication and family management.¹²⁰ Family processes that tend to be the most averse are those with high levels of stress exposure and coercion.¹²¹ Additionally, greater tendencies towards substance use have been found in adolescents from single-parent

families, which is consistent with studies reporting that dual-parent families better afford protection against substance use.¹²² This finding could be the result of the lack of a protective presence of an additional person in the home who can protect the child from stress exposure and lack of monitoring.

Parenting and the home environment continue to be important when adolescents begin to have more autonomy and opportunities for either prosocial or risky behaviours.¹²³ The effects of a chaotic home environment, ineffective parenting and lack of mutual attachment in particular have an impact on overall child outcomes.¹²⁴ This scenario may particularly affect girls, who tend to be more sensitive to family-centred and relational problems.^{125, 126} This could heighten susceptibility among girls to stress and mental health issues, including early onset of substance use and harmful use, as well as other risky behaviours.

The regulatory skills that children need to resist substance use and other problem behaviours are instilled early in life, suggesting that a favourable home environment (family cohesion, family communication, and family management) confer protection against negative outcomes, including substance use.

Schools and educational opportunities

The quality of the school environment, teachers, the curriculum and students’ social networks in school are major socializing influences on student

117 Kerry Lee, Rebecca Bull and Ringo M. Ho, “Developmental changes in executive functioning”, *Child Development*, vol. 84, No. 6 (2013), pp. 1933–1953.

118 Thomas G. O’Connor and others, “Co-occurrence of depressive symptoms and antisocial behavior in adolescence: a common genetic liability”, *Journal of Abnormal Psychology*, vol. 107, No. 1 (1998), pp. 27–37.

119 Thomas G. O’Connor, and others, “Genotype-environment correlations in late childhood and early adolescence: antisocial behavioral problems and coercive parenting”, *Developmental Psychology*, vol. 34, No. 5 (1998), pp. 970–981.

120 Richard D. B. Velleman, Lorna J. Templeton and Alex G. Copello, “The role of the family in preventing and intervening with substance use and misuse: a comprehensive review of family interventions, with a focus on young people”, *Drug and Alcohol Review*, vol. 24, No. 2 (2005), pp. 93–109.

121 Barret and Turner, “Family structure and mental health”.

122 Gunilla R. Weitoft and others, “Mortality, severe morbidity, and injury in children living with single parents in Sweden: a population-based study”, *Lancet*, vol. 361, No. 9354 (2003), pp. 289–295.

123 Monique Ernst and Sven C. Muller, “The adolescent brain: insights from functional neuroimaging research”, *Developmental Neurobiology*, vol. 68, No. 6 (2008), pp. 729–743.

124 Kristen W. Springer and others, “Long-term physical and mental health consequences of childhood physical abuse: results from a large population-based sample of men and women”, *Child Abuse and Neglect*, vol. 31, No. 5 (2007), pp. 517–530.

125 Jennifer Connolly and others, “Conceptions of cross-sex friendships and romantic relationships in early adolescence”, *Journal of Youth and Adolescence*, vol. 28, No. 4 (1999), p. 481.

126 Eleanor E. Maccoby, *The Two Sexes: Growing Up Apart, Coming Together* (Cambridge, Massachusetts, Harvard University Press, 1999).

learning and behaviour.^{127, 128} At a very basic level, absence from school through truancy, suspension or expulsion increases the risk of poor outcomes on multiple levels; chronic absenteeism may be especially problematic for children with self-regulatory problems.¹²⁹ Moreover, unqualified teachers, ineffective teaching practices and low-quality curricula confer significant additional risks, leading to academic failure.^{130, 131} Lack of a good education and poor classroom management sets the stage for lower levels of cognitive functioning, poor social skills, high levels of stress and perceptions of inadequacy and failure,¹³² each of which is implicated in risk of substance use. Absence of adequate educational support and/or targeted school programmes, learning disabilities and mental health problems further compound the risk of substance use and harmful substance use.¹³³ In the longer term, a poor-quality education results in an inability to compete in the workforce and obtain jobs that pay a good wage,¹³⁴ factors also associated with later substance use.

Another aspect of school influences is the important role of school connectedness. Research suggests that young people are more likely to have mental health

A child's attachment to school appears to be a component of resilience (a protective factor), indicating that effective and responsive teachers, evidence-based curricula and classroom reinforcements may play an important role in the prevention of substance use.

problems and an increased likelihood of using substances in early secondary school when they report low school connectedness, and interpersonal conflict.^{135, 136}

Peer influences and substance use

There is a strong association between adolescent substance use and contact with substance-using peers. Research suggests that other adolescents provide a unique source of access to drugs, reinforcement and opportunity to use drugs.^{137, 138, 139} Adolescents tend to display similar behaviours, attitudes and personality traits to their friends.¹⁴⁰ Studies suggest that adolescents who choose substance-using friends may differ from those who do not. The quality of the friendship also seems to be a factor in determining the extent to which an individual may be influenced by a friend: a high-quality relationship may be more valued by an adolescent, who may be more likely to change their behaviour to please the friend. Closer friends may spend more time together, resulting in more modelling and emulation of high-risk behaviour. One of the ways in

127 Lyndal Bond and others, "Social and school connectedness in early secondary school as predictors of late teenage substance use, mental health, and academic outcomes", *Journal of Adolescent Health*, vol. 40, No. 4 (2007), pp. 357.e9-357.e18.

128 H. Harrington Cleveland and Richard P. Wiebe, "Understanding the association between adolescent marijuana use and later serious drug use: gateway effect or developmental trajectory?" *Development and Psychopathology*, vol. 20, No. 2 (2008), pp. 615-632.

129 Christine A. Christle, Kristine Jolivet and C. Michael Nelson, "Breaking the school to prison pipeline: identifying school risk and protective factors for youth delinquency", *Exceptionality*, vol. 13, No. 2 (2005), pp. 69-88.

130 Ibid.

131 L. Darling-Hammond, "How teacher education matters", *Journal of Teacher Education*, vol. 51, No. 3 (2000), pp. 166-173.

132 Patrice L. Engle and Maureen M. Black, "The effect of poverty on child development and educational outcomes", *Annals of the New York Academy of Sciences*, vol. 1136, No. 1 (2008), pp. 243-256.

133 Michael J. Mason and Jeremy Mennis, "An exploratory study of the effects of neighborhood characteristics on adolescent substance use", *Addiction Research and Theory*, vol. 18, No. 1 (2010), pp. 33-50.

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

135 Bond and others, "Social and school connectedness in early secondary school as predictors of late teenage substance use, mental health, and academic outcomes".

136 Richard F. Catalano and others, "Positive youth development in the United States: research findings on evaluations of positive youth development programs", *Annals of the American Academy of Political and Social Science*, vol. 591, No. 1 (2004).

137 Deirdre M. Kirke, "Chain reactions in adolescents' cigarette, alcohol, and drug use: similarity through peer influence or the patterning of ties in peer networks?", *Social Networks*, vol. 26, No. 1 (2004), pp. 3-28.

138 Bruce G. Simons-Morton and Tilda Farhat, "Recent findings on peer group influences on adolescent smoking", *Journal of Primary Prevention*, vol. 31, No. 4 (2010), pp. 191-208.

139 Kathryn A. Urberg and others, "A two-stage model of peer influence in adolescent substance use: individual and relationship-specific differences in susceptibility to influence", *Addictive Behaviors*, vol. 28, No. 7 (2003), pp. 1243-1256.

140 Ibid.

which peers appear to influence one another is through the idea of “pluralistic ignorance”,¹⁴¹ whereby the general belief that more individuals are engaging in substance use than actually are may contribute to their own use of substances.^{142, 143} Conversely, those who believe substance use will have harmful consequences are less likely to engage in such use.¹⁴⁴

There also appear to be some distinctive ways in which girls are influenced by peers to use substances. For example, they are more susceptible to social pressures when the source is a friend or partner.¹⁴⁵ Girls also tend to have a greater level of sensitivity to peer approval, depression and body image, which are all interrelated and can increase the risk of substance use.¹⁴⁶ Early pubertal development in girls can also play a role; for example, early-maturing girls are more likely to spend time with older males, who are inclined towards risk-taking activities and may introduce them to the use of substances.^{147, 148} Pubertal onset, in particular among girls, is also

associated with increased conflict among parents and adolescents with regard to issues such as selection of friends or dating and to shifting behavioural expectations^{149, 150, 151} that can lead to more conduct problems, exposure to peer deviance and risky sexual behaviours.¹⁵² Furthermore, residing in a disadvantaged neighbourhood appears to further exacerbate the effect of peers for both sexes.^{153, 154}

Macro-level influences

The neighbourhood, the physical environment and the media

Social conditions in neighbourhoods have major implications for risk of substance use as they shape social norms, enforce patterns of social control, influence perception of the risk of substance use and affect psychological and physiological stress responses.¹⁵⁵ One aspect of neighbourhood influence is social cohesion, an indicator of attachment to and satisfaction with the neighbourhood and its residents that involves trust and support for one another in a community.

It has been suggested that high levels of social cohesion are associated with lower levels of substance use

- 141 Deborah A. Prentice and Dale T. Miller, “Pluralistic ignorance and alcohol use on campus: some consequences of misperceiving the social norm”, *Journal of Personality and Social Psychology*, Vol. 64, No. 2 (1993), pp. 243–256.
- 142 Mitchell J. Prinstein and Shriley S. Wang, “False consensus and adolescent peer contagion: examining discrepancies between perceptions and actual reported levels of friends’ deviant and health risk behaviors”, *Journal of Abnormal Child Psychology*, vol. 33, No. 3 (2005), pp. 293–306.
- 143 Sarah L. Tragesser, Patricia A. Aloise-Young and Randall C. Swaim, “Peer influence, images of smokers, and beliefs about smoking among preadolescent nonsmokers”, *Social Development*, vol. 15, No. 2 (2006), pp. 311–325.
- 144 National Centre on Addiction and Substance Abuse, Columbia University, *Adolescent Substance Use: America’s #1 Public Health Problem* (New York, June 2011).
- 145 Vera Frajzyngier and others, “Gender differences in injection risk behaviors at the first injection episode”, *Drug and Alcohol Dependence*, vol. 89, Nos. 2 and 3 (2007), pp. 145–152.
- 146 Steven P. Schinke, Lin Fang and Kristin C. A. Cole, “Substance use among early adolescent girls: risk and protective factors”, *Journal of Adolescent Health*, vol. 43, No. 2 (2008), pp. 191–194.
- 147 David Magnusson and L. R. Bergman, “A pattern approach to the study of pathways from childhood to adulthood”, in *Straight and Devious Pathways from Childhood to Adulthood*, Lee N. Robins and Michael Rutter, eds. (Cambridge, Cambridge University Press, 1990), pp. 101–115.
- 148 Karina Weichold, Rainer K. Silbereisen and Eva Schmitt-Rodermund, “Short-term and long-term consequences of early versus late physical maturation in adolescents”, in *Gender Differences at Puberty*, Chris Hayward, ed., Cambridge Studies on Child and Adolescent Health Series

(New York, Cambridge University Press, 2003), pp. 241–276.

- 149 Xiaojia Ge, Rand D. Conger and Glen H. Elder Jr., “Coming of age too early: pubertal influences on girls’ vulnerability to psychological distress”, *Child Development*, vol. 67, No. 6 (1996), pp. 3386–3400.
- 150 Roberta L. Paikoff and Jeanne Brooks-Gunn, “Do parent-child relationships change during puberty?”, *Psychological Bulletin*, vol. 110, No. 1 (1991), pp. 47–66.
- 151 Lynda M. Sagrestano and others, “Pubertal development and parent-child conflict in low-income, urban, African American adolescents”, *Journal of Research on Adolescence*, vol. 9, No. 1 (2010), pp. 85–107.
- 152 Dana L. Haynie, “Contexts of risk? Explaining the link between girls’ pubertal development and their delinquency involvement”, *Social Forces*, vol. 82, No. 1 (2003), pp. 355–397.
- 153 Xiaojia Ge and others, “It’s about timing and change: pubertal transition effects on symptoms of major depression among African American youths”, *Developmental Psychology*, vol. 39, No. 3 (2003), pp. 430–439.
- 154 Dawn Obeidallah and others, “Links between pubertal timing and neighborhood contexts: implications for girls’ violent behaviour”, *Journal of the American Academy of Child and Adolescent Psychiatry*, vol. 43, No. 12 (2004), pp. 1460–1468.
- 155 Elvira Elek, Michelle Miller-Day and Michael L. Hecht, “Influences of personal, injunctive, and descriptive norms on early adolescent substance use”, *Journal of Drug Issues*, vol. 36, No. 1 (2006), pp. 147–172.

among adolescents, fewer perceived youth drug problems and fewer drug-related deaths.¹⁵⁶ The extent to which the neighbourhood is perceived as disorganized or disordered or is an area characterized by vandalism, abandoned buildings and lots, graffiti, noise and dirt may also influence levels of substance use among adolescents. The neighbourhood context has been found to be particularly influential for young people living in low-income urban areas owing to the high level of exposure to drug activity, disorder and violence in their neighbourhoods, all of which may influence substance use among young people.^{157, 158} Many aspects of the physical design of the environment can also harm young people's overall development and social relations and lead to the commission of crime and to substance use.^{159, 160}

Decayed and abandoned buildings, ready access to alcohol and other drugs, urbanization and neighbourhood deprivation are associated with drugs, crime, violence and accidents.

A high level of exposure to toxic substances such as heavy metals, in utero alcohol, lead, cadmium, mercury, manganese or arsenic is another aspect of the physical environment that can harm overall development. During the prenatal period and early childhood, such exposure has been shown to be strongly and consistently linked to functional deficits such as cognitive dysfunction and psychological

disorders.¹⁶¹ Such exposure has also been linked to later risk of harmful substance use, as well as other forms of psychopathology. Although the research is scant with respect to its direct association with substance use, such exposure is more definitively related to the personal characteristics, such as psychiatric disorders, lack of impulse control or cognitive deficits, that are known to increase the risk of substance use and harmful use of substances.

The media is a powerful influence on social norms and other messages that are favourable to substance use.¹⁶² Adolescents in particular spend a great deal of time using the Internet, messaging services and social media, in particular on smartphones, as well as being entertained by television, movies and other media. Media portrayals of substance use as glamorous, fun and relaxing all contribute to the initiation and continued use of psychoactive substances among young people.¹⁶³ In essence, certain media messages can make substance use appear to be normative behaviour and can alter attitudes about the safety of substance use. Social media has been repeatedly linked to the initiation of substance use;^{164, 165} for example, a study in the United States found an association between exposure to cannabis in popular music and initiation of its use among adolescents.¹⁶⁶

Income and resources

Other macro-level influences include degrees of poverty that young people experience in their communities. A growing body of evidence has been

156 Peter Anderson and Ben Baumberg, *Alcohol in Europe: A Public Health Perspective*, (London, Institute of Alcohol Studies, 2006).

157 Anne Buu and others, "Parent, family, and neighborhood effects on the development of child substance use and other psychopathology from preschool to the start of adulthood", *Journal of Studies on Alcohol and Drugs*, vol. 70, No. 4 (2009), pp. 489–498.

158 Sharon F. Lambert and others, "The relationship between perceptions of neighborhood characteristics and substance use among urban African American adolescents", *American Journal of Community Psychology*, vol. 34, Nos. 3 and 4 (2004), pp. 205–218.

159 Tama Leventhal and Jeanne Brooks-Gunn, "The neighborhoods they live in: the effects of neighborhood residence on child and adolescent outcomes", *Psychological Bulletin*, vol. 126, No. 2 (2000), pp. 309–337.

160 National Research Council and Institute of Medicine, *From Neurons to Neighborhoods: The Science of Early Childhood Development*, Jack P. Shonkoff and Deborah A. Phillips, eds. (Washington, D.C., National Academies Press, 2000).

161 David C. Bellinger, "A strategy for comparing the contributions of environmental chemicals and other risk factors to neurodevelopment of children", *Environmental Health Perspectives*, vol. 120, No. 4 (2002), pp. 501–507.

162 Emily C. Feinstein and others, "Addressing the critical health problem of adolescent substance use through health care, research, and public policy", *Journal of Adolescent Health*, vol. 50, No. 5 (2012), pp. 431–436.

163 Ibid.

164 Christine McCauley Ohannessian and others, "Social media use and substance use during emerging adulthood", *Emerging Adulthood*, vol. 5, Issue 5 (2017), pp. 364–370.

165 Caitlin R. Costello and Danielle E. Ramo, "Social media and substance use: what should we be recommending to teens and their parents?", *Journal of Adolescent Health*, vol. 60, Issue 6, (2017) pp. 629–630.

166 Brian A. Primack and others, "Exposure to cannabis in popular music and cannabis use among adolescents", *Addiction*, vol. 105, (2009), pp. 515–523.

Among the main risk factors for substance use in impoverished neighbourhoods are:

- A high proportion of single-parent families
- Racial segregation and inequality based on race, sex or other characteristics
- Homelessness
- Transiency and malnutrition
- Poorly equipped schools and poorly trained teachers
- High levels of child abuse and infant mortality
- High school dropout rates, academic failure, crime, delinquency and mental illness

amassed to aid understanding of how overall conditions in impoverished communities lead to considerable delays or deficits in child and adolescent development.¹⁶⁷

On an individual level, the influence of poverty on families and parenting can lead to harmful effects on child and youth development by increasing stress among parents and caregivers, reducing their ability to invest in learning and educational opportunities and compromising their ability to be involved, patient, responsive and nurturing parents to their children.¹⁶⁸ These conditions — both individually and through their interaction — are risk factors for substance use.¹⁶⁹ The caregiving environment for children in low-income families is more likely to be disorganized and lacking in appropriate stimulation and support, thereby creating conditions that are stressful for children.^{170, 171} Stress in the context of

an impoverished and unsupportive environment impedes growth, leads to dysregulated physiological responses to stressful situations, increases the risk of psychological disorders such as depression, anxiety and traumatic stress disorders and compromises the development of self-regulatory skills: these are all factors that increase vulnerability to substance use.

Young people who experience extreme poverty or a lack of resources are subject to a host of environmental and health factors including homelessness, street involvement, exposure to toxic substances and work at a young age. As a result, there is a high incidence of behavioural and psychological problems, including use and harmful use of substances, among these young people.^{172, 173} In terms of implications for prevention, high-quality caregiving moderates the effects of poverty on child development,¹⁷⁴ in particular for girls.¹⁷⁵ Increased availability of services for disadvantaged children can foster their potential to develop skills that would improve their chances of success in school and life and combat many of the risk factors for substance use.¹⁷⁶

Discrimination and social exclusion

Another macro-level factor affecting child development is discrimination and social exclusion, which arise from structural and cultural perspectives. Structural inequalities lead to adverse educational, health and behavioural outcomes and are largely the result

167 Clancy Blair, “Stress and the development of self-regulation in context”, *Child Development Perspectives*, vol. 4, No. 3 (2010), pp. 181–188.

168 Kenneth R. Ginsburg, “The importance of play in promoting healthy child development and maintaining strong parent-child bonds”, *Pediatrics*, vol. 119, No. 1 (2007), pp. 182–191.

169 Aurora P. Jackson and others, “Single mothers in low-wage jobs: financial strain, parenting, and preschoolers’ outcomes”, *Child Development*, vol. 71, No. 5 (2000), pp. 1409–1423.

170 Gary W. Evans, “The environment of childhood poverty”, *American Psychologist*, vol. 59, No. 2 (2004), pp. 77–92.

171 Rena L. Repetti, Shelley E. Taylor and Teresa E. Seeman, “Risky families: family social environments and the mental

and physical health of offspring”, *Psychological Bulletin*, vol. 128, No. 2 (2002), pp. 330–366.

172 H. Meltzer and others, “Victims of bullying in childhood and suicide attempts in adulthood”, *European Psychiatry*, vol. 26, No. 8 (2011), pp. 498–503.

173 Nada and Suliman, “Violence, abuse, alcohol and drug use, and sexual behaviors in street children of Greater Cairo and Alexandria, Egypt”.

174 Gary W. Evans, John Eckenrode and Lyscha A. Marcynyszyn, “Chaos and the macrosetting: the role of poverty and socioeconomic status”, in *Chaos and its Influence on Children’s Development: An Ecological Perspective*, Gary W. Evans and Theodore D. Wachs, eds. (Washington, D.C., American Psychological Association, 2010), pp. 225–238.

175 Karol L. Kumpfer and others, “Cultural adaptation process for international dissemination of the strengthening families program”, *Evaluation and the Health Professions*, vol. 31, No. 2 (2008), pp. 226–239.

176 Angela Hudson and Karabi Nandy, “Comparisons of substance abuse, high-risk sexual behavior and depressive symptoms among homeless youth with and without a history of foster care placement”, *Contemporary Nurse*, vol. 42, No. 2 (2014), pp. 178–186.

TABLE 3 | Summary of substance use stages and associated mental and physical health conditions, by life

Substance	Physical/medical conditions	Mental health/psychiatric disorders
Adolescence		
Alcohol Cannabis Tobacco Inhalants Psychotherapeutic drugs • Amphetamines • Opioids/pain relievers	Accidental injury • Automobile • Accidents Physical/sexual violence Poisoning/overdose Sexually transmitted diseases Respiratory problems • Asthma Pain-related diagnoses	Suicidal ideation/behaviours Internalizing disorders • Depression • Anxiety Externalizing disorders • Oppositional defiant disorder • Attention deficit/hyperactivity disorder • Conduct disorder
Adulthood		
Alcohol Cannabis Tobacco Psychotherapeutic drugs • Opioids/pain relievers • Tranquillizers/benzodiazepines Cocaine/"crack" Heroin Methamphetamine	Poisoning/overdose Sexually transmitted diseases Cancers Heart disease/hypertension/stroke Reproductive morbidity/fetal damage Diabetes Respiratory problems • Asthma • Infection Liver damage/disease	Suicidal ideation/behaviours Mood disorders • Depression • Bipolar I and II Anxiety disorders • Panic disorder • Post-traumatic stress disorder • Social and specific phobias • Generalized anxiety disorder Antisocial personality disorder
Older Adulthood		
Alcohol Psychotherapeutic drugs • Opioids/pain relievers • Sedatives/benzodiazepines • Amphetamines Cannabis Tobacco	Accidental injury Cirrhosis Heart attack/stroke Insomnia Cancers Diabetes	Suicidal ideation/behaviours Depression/bereavement Anxiety disorders • Social and specific phobias • Generalized anxiety disorder Dementia/Wernicke-Korsakoff Syndrome Insomnia

Source: T. M. Schulte and Y. Hser, "Substance use and associated health conditions throughout the lifespan", *Public Health Review*, vol. 35, No. 2 (2014).

of differential access to basic needs such as adequate nutrition, quality housing and schools, as well as increased exposure to environmental toxins and hazards. Poor access to services and social support and a lack of collective neighbourhood efficacy compound the problem.^{177, 178} Adding to the challenge is the lack of effective coping strategies that often characterize disadvantaged children. These problems tend to be compounded in individuals with refugee or immigrant status.¹⁷⁹ A range of substance use

was described in the 1990s in different settings among young people and adults with refugee status: khat chewing among conflict-affected Somali refugees, opioid use among Afghan refugees in Iran (Islamic Republic of) and Pakistan, non-medical use of benzodiazepines among displaced people in Bosnia and Herzegovina an use of methamphetamine among refugees from Myanmar in Thailand.¹⁸⁰

Consequences for young people who use drugs

Research on substance use among adolescents and young adults suggests that chronic use of substances

among Latino immigrant parents in the USA", *Social Science and Medicine*, vol. 73, No. 8 (1982), pp. 1169–1177.

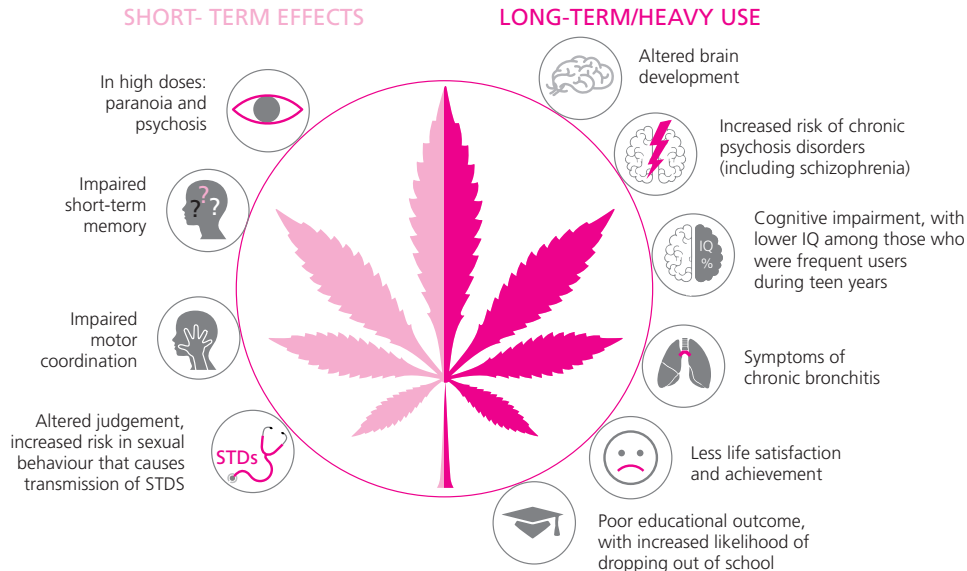
180 Nadine Ezard and others, "Six rapid assessments of alcohol and other substance use in populations displaced by conflict", *Conflict and Health*, vol. 5, No. 1 (2011).

177 Candice L. Odgers and others, "Supportive parenting mediates widening neighborhood socioeconomic disparities in children's antisocial behavior from ages 5 to 12", *Development and Psychopathology*, vol. 24, No. 3 (2012), pp. 705–721.

178 Fay Saechao and others, "Stressors and barriers to using mental health services among diverse groups of first-generation immigrants to the United States", *Community Mental Health Journal*, vol. 48, No. 1 (2012), pp. 98–106.

179 India J. Ornelas and Krista M. Perreira, "The role of migration in the development of depressive symptoms

THE NEGATIVE HEALTH EFFECTS OF CANNABIS



Source: Nora D. Volkow and others, "Adverse health effects of marijuana use", *New England Journal of Medicine*, 370(23) (2014), pp. 2219–2227.

is associated with deficits in domains including physical health, cognitive functioning, educational achievement and psychology, as well as overall impairment in social competencies and relationships.¹⁸¹ Physical health problems experienced by young drug users most obviously include increased risk of overdose, accidental injury such as motor vehicle accidents or falls, and attempted suicide. A large, national study of 856,385 people who were admitted for drug use disorders into publicly funded treatment facilities in the United States showed that 28 per cent of the respondents had psychiatric comorbidity.¹⁸² Regular substance use can also profoundly impact neurodevelopment, which can interfere with academic performance and cognitive functioning during adolescence and lead to dysfunction in the social and employment realms later in life.¹⁸³

Although many of these health problems are clearly a result of substance use, other problems, such as cognitive deficits and mental health disorders in chronic users, may have preceded substance use, even though they are often referred to as consequences. Disentangling the antecedents from the consequences of substance use represents one of the most fundamental challenges in the field, with the greatest implications for prevention of substance use in adolescence.

Nevertheless, substance use among teenagers, in particular young teenagers, is of particular concern given the evidence that substances with psychoactive effects have a greater impact on adolescents than adults.¹⁸⁴ Age-related variations in drug responses are likely to be the result of differences in the pharmacological effects of substances on the brain systems, such as the mesolimbic dopamine system, that are still under construction. These differences may have significant implications for adolescents who exhibit reduced sensitivity to various

181 Robert J. Johnson and Howard B. Kaplan, "Stability of psychological symptoms: drug use consequences and intervening processes", *Journal of Health and Social Behavior*, vol. 31, No. 3 (1990), pp. 277–291.

182 Noa Krawczyk and others, "The association of psychiatric comorbidity with treatment completion among clients admitted to substance use treatment programs in a U.S. national sample". *Drug and Alcohol Dependence*, vol. 175 (June 2017), pp. 157–163.

183 Kim T. Mueser and others, "Antisocial personality disorder in people with co-occurring severe mental illness and

substance use disorders: clinical, functional, and family relationship correlates", *Psychosis*, vol. 4, No. 1 (2012), pp. 52–62.

184 Nicole L. Schramm-Sapyta and others, "Are adolescents more vulnerable to drug addiction than adults? Evidence from animal models", *Psychopharmacology*, vol. 206, No. 1 (2009), pp. 1–21.

substances, increasing the tendency to consume greater amounts and more drug types, thereby compromising their neurodevelopment.¹⁸⁵

Although there have been claims that chronic substance use may permanently damage the brain, the evidence from human studies is equivocal.¹⁸⁶ This inconclusiveness may be due in part to the methodologies that have been employed to assess the possible developmental consequences of substance use. Nevertheless, the literature suggests that there may be a dose-response relationship between substance use and cognitive deficits, providing some support for substance-induced alterations, in particular in memory, attention and executive functions.¹⁸⁷ Studies that have included individuals who initiate substance use during adolescence show persistent deficits into adulthood, with reported cognitive decline 10 years later, even in those who had quit, but more so for those who continued to use drugs.¹⁸⁸

Of increasingly greater concern is that the use of multiple substances — polysubstance use — is widespread and represents a major challenge to prevention and treatment efforts. Polydrug use confers greater health risks and negative consequences, as well as poorer outcomes of interventions among users.

The direct effects of harmful substance use on the adolescent brain dynamically interact with the social and environmental contexts to which users are exposed, increasing the risk of poor outcomes in numerous functional domains. Unemployment, physical health problems, dysfunctional social relationships, susceptibility to accidents, suicidal tendencies and behaviours, mental illness and even lower life expectancy are all increased by substance

use in adolescence, particularly when continued into adulthood.^{189, 190} Harmful use of substances influences all the people in an individual's life, as well as society more broadly through the associated costs of their social, physical and mental health problems.¹⁹¹ The cumulative and interactive consequences of harmful drug use further undermine young people's socioeconomic standing, the quality of the parenting they provide, their ability to develop positively supportive relationships and their ability to maintain employment, which further reinforces their substance use.¹⁹²

Consequences for children and adolescents of substance use by caregivers

Children and adolescents whose caregivers have substance use disorders are significantly compromised in terms of their safety, mental and physical health, and school readiness.^{193, 194} They can be directly exposed to dangerous substances, and the ability of caregivers to adequately supervise and nurture their development can be compromised as a result of drug use disorders. Children affected by the harmful use of substances by their parents exhibit higher levels of externalizing symptoms such as attention-deficit hyperactivity disorder or antisocial personality disorder and of internalizing symptoms such as depression, anxiety or post-traumatic stress disorder, which are key risk factors for adverse developmental trajectories.¹⁹⁵ As they approach adolescence, chil-

185 Ibid.

186 Nadia Solowij and Robert Battisti, "The chronic effects of cannabis on memory in humans: a review", *Current Drug Abuse Reviews*, vol. 1, No. 1 (2008), pp. 81–98.

187 Thomas Lundqvist, "Cognitive consequences of cannabis use: comparison with abuse of stimulants and heroin with regard to attention, memory and executive functions", *Pharmacology Biochemistry and Behavior*, vol. 81, No. 2 (2005), pp. 319–330.

188 Karel L. Hanson and others, "Impact of adolescent alcohol and drug use on neuropsychological functioning in young adulthood: 10-year outcomes", *Journal of Child and Adolescent Substance Abuse*, vol. 20, No. 2 (2011), pp. 135–154.

189 Dieter Henkel, "Unemployment and substance use: a review of the literature (1990–2010)", *Current Drug Abuse Reviews*, vol. 4, No. 1 (2011), pp. 4–27.

190 WHO, Health for the world's adolescents: a second chance in the second decade. Available at <http://apps.who.int/adolescent/second-decade>.

191 Steve Sussman, Silvana Skara and Susan L. Ames, "Substance abuse among adolescents", *Substance Use and Misuse*, vol. 43, Nos. 12 and 13 (2008), pp. 1802–1828.

192 "Comorbidity: addiction and other mental illnesses".

193 Sonja Bröning and others, "Selective prevention programs for children from substance-affected families: a comprehensive systematic review", *Substance Abuse Treatment, Prevention, and Policy*, vol. 7, No. 23 (2012).

194 Center for Children's Justice, "Pennsylvania's heroin and opioid 'epidemic' jeopardizes early childhood", Children's justice and advocacy report, 2016. Available at www.c4cj.org.

195 Ricardo Velleman and Lorna Templeton, "Understanding and modifying the impact of parents' substance misuse on children", *Advances in Psychiatric Treatment*, vol. 13, No. 2 (2007), pp. 79–89.

dren exposed to a caregiver's harmful substance use more often exhibit early onset of substance use themselves,^{196, 197} earlier episodes of drunkenness,¹⁹⁸ more binge drinking¹⁹⁹ and a much greater likelihood of developing substance use disorders at a younger age than their counterparts.²⁰⁰ In effect, exposure to a caregiver's harmful substance use places children's ability to meet developmental milestones in jeopardy. They face a significantly heightened risk of academic failure, severe behavioural and mental health problems, criminality and inability to enter the workforce.^{201, 202, 203}

In part, the relationship between harmful use of substances by a parent and the substance use outcomes of a child are mediated by parental neglect,²⁰⁴ which biases the developmental trajectory toward these outcomes. The risk is transmitted through both the direct effects of neglectful and poor parenting and prevailing living circumstances, such as unsupportive interpersonal relationships and disorganized households.

- 196 Geary S. Alford, Ernest N. Jouriles and Sara C. Jackson, "Differences and similarities in the development of drinking behavior between alcoholic offspring of alcoholics and alcoholic offspring of nonalcoholics", *Addictive Behavior*, vol. 16, No. 5 (1991), pp. 341–347.
- 197 Emily F. Rothman and others, "Adverse childhood experiences predict earlier age of drinking onset: results from a representative US sample of current or former drinkers", *Pediatrics*, vol. 122, No. 2 (2008), pp. 298–304.
- 198 Thomas McKenna and Roy Pickens, "Alcoholic children of alcoholics", *Journal of Studies on Alcohol and Drugs*, vol. 42, No. 11 (1981), pp. 1021–1029.
- 199 Elissa R. Weitzman and Henry Wechsler, "Alcohol use, abuse and related problems among children of problem drinkers: findings from a national survey of college alcohol use", *Journal of Nervous and Mental Disease*, vol. 188, No. 3 (2000), pp. 148–154.
- 200 Andrea Hussong, Daniel Bauer and Laurie Chassin, "Telescoped trajectories from alcohol initiation to disorder in children of alcoholic parents", *Journal of Abnormal Psychology*, vol. 117, No. 3 (2008), pp. 63–78.
- 201 Dennis C. Daley, "Family and social aspects of substance use disorders and treatment", *Journal of Food and Drug Analysis*, vol. 21, No. 4 (2013), pp. S73–S76.
- 202 Jeanne Whalen, "The children of the opioid crisis", *Wall Street Journal*, updated 15 December 2006.
- 203 Chris Elkin, "Born to do drugs: overcoming a family history of addiction", 10 February 2016. Available at www.drugrehab.com.
- 204 Marija G. Dunn and others, "Origins and consequences of child neglect in substance abuse families", *Clinical Psychology Review*, vol. 22, No. 7 (2002), pp. 1063–1090.

Another interrelated factor is the co-occurrence of mental health disorders in individuals who have a substance use disorder, which further hinders the ability of caregivers to adequately parent and provide support for healthy child development.^{205, 206} Such situations have repeatedly been shown to be a strong predictor of substance use in adolescence among the children of affected individuals.^{207, 208}

Further compounding the problem is the high prevalence of maltreatment, poverty, community violence and substandard housing conditions experienced by children whose caregivers suffer from drug use disorders, although this scenario is not universal.²⁰⁹ The psychological trauma of exposure to such conditions has as profound an impact as the harm to the physical health of children of individuals who have substance use disorders. The most frequent and long-term addiction-related mental and behavioural health problems developed by children include post-traumatic stress disorder, depression, anxiety, externalizing behaviours such as aggression, harmful use of substances and many other maladaptive reactions.

Another common feature of harmful use of substances by parents is prenatal exposure to substances, which is considered as both a direct and a mediating mechanism. Prenatal and early exposure to cigarette smoke has been shown to increase children's propensity to smoke, become dependent on nicotine and exhibit externalizing behaviours, such as conduct problems (e.g., aggression), and internalizing

- 205 Kimberlie Dean and others, "Full spectrum of psychiatric outcomes among offspring with parental history of mental disorder", *Archives of General Psychiatry*, vol. 67, No. 8 (2010), pp. 822–829.
- 206 Kathleen R. Merikangas, Lisa C. Dierker and Peter Szatmari, "Psychopathology among offspring of parents with substance abuse and/or anxiety disorders: a high-risk study", *Journal of Child Psychology and Psychiatry*, vol. 39, No. 5 (2003), pp. 711–720.
- 207 S. N. Madu and M. P. Matla, "Correlations for perceived family environmental factors with substance use among adolescents in South Africa", *Psychological Reports*, vol. 92, No. 2 (2003), pp. 403–415.
- 208 D. De Micheli and M. L. Formigoni, "Are reasons for the first use of drugs and family circumstances predictors of future use patterns?", *Addictive Behaviors*, vol. 27, No. 1 (2002), pp. 87–100.
- 209 Child Welfare Information Gateway, "Parental substance use and the child welfare system", *Bulletins for Professionals Series* (October 2014). Available at www.childwelfare.gov.

symptoms, such as depression and anxiety.^{210, 211} Prenatal drug and alcohol exposure are associated with subsequent behavioural problems in childhood and adolescence, including eventual substance use and harmful use of substances.^{212, 213} Alterations associated with self-regulation, reward and motivation in the neurological systems of a fetus, caused by the properties of the substance or substances used by pregnant women, appear to be how prenatal substance exposure affects children. The effects of these sorts of prenatal exposure on mental health and behaviour will tend to exacerbate any pre-existing susceptibilities to substance use and to developing substance use disorders.

Understanding differential pathways to substance use and implications for prevention and policy

It is well known that individuals who experience adversity as children have a higher risk of developing drug use disorders as adults.²¹⁴ The current misconception that individuals are equally vulnerable to substance use and harmful use ignores the scientific evidence that has consistently shown individual differences in propensity. These widespread beliefs hinder the application of effective and targeted solutions. The multiple life-course conditions that influence whether an individual will develop a serious problem with substances are alterable and, in many cases, preventable. Protective conditions can be strengthened, while detrimental factors can be attenuated or even prevented.

- 210 Marie D. Cornelius and others, “Long-term effects of prenatal cigarette smoke exposure on behavior dysregulation among 14-year-old offspring of teenage mothers”, *Maternal and Child Health Journal*, vol. 16, No. 3 (2012), pp. 694–705.
- 211 Brian J. Piper and Selena M. Corbett, “Executive function profile in the offspring of women that smoked during pregnancy”, *Nicotine and Tobacco Research*, vol. 14, No. 2 (2012), pp. 191–199.
- 212 Jennifer A. DiNieri and others, “Maternal cannabis use alters ventral striatal dopamine D2 gene regulation in the offspring”, *Biological Psychiatry*, vol. 70, No. 8 (2011), pp. 763–769.
- 213 Thitinant Sithisarn, Don T. Grangerand and Henrietta S. Bada, “Consequences of prenatal substance use”, *International Journal of Adolescent Medicine and Health*, vol. 24, No. 2 (2011), pp. 105–112.
- 214 Diana H. Fishbein and Ty A. Ridenour, “Advancing transdisciplinary translation for prevention of high-risk behaviors: introduction to the special issue”, *Prevention Science*, vol. 14, No. 3 (2013), pp. 201–215.

Young people and the supply chain

Young people can be affected not only by drug use but also by illicit crop cultivation, drug production and trafficking in drugs. Exposure to these different activities can have equally long-term implications for young people and their future prospects. Some of these activities are discussed in the present subsection.

Information on the involvement of young people in the drug supply chain is limited and, in most instances, is restricted to media reports. Consequently, media sources, in addition to other reports, have been used to highlight issues on young people in place of evidence purely from research.

Illicit crop cultivation and drug manufacture

Opium poppy cultivation

Afghanistan continues to be the world’s largest opium producer, where insurgent groups such as the Taliban have been able to generate significant revenue by taxing drugs passing through the regions they control.²¹⁵ Media outlets have reported that independent young farmers witnessing the lucrative business have also attempted to participate in this “profitable trade”.²¹⁶ Boys as young as 6 work in the fields, harvesting the opium poppy and collecting the opium that will be used to produce heroin. Some cases have been reported of farmers who, unable to pay back loans taken to cultivate opium, turn to arranged child marriage. In such cases, families offer their daughters to be married, often to older men or to live far away from the support network they grew up with, as payment or simply because they can no longer support them financially.²¹⁷

In Myanmar, some 1.3 million children under the age of 14 are thought to be child labourers, according to statistics from the Ministry of Labour, Immigration and Population and reported in the

- 215 United States, Department of State, *International Narcotics Control Strategy Report 2017*, vol. I, *Drug and Chemical Control*, (Washington D.C., March 2017), pp. 90–91.
- 216 Franz J. Marty, “Afghanistan’s Opium Trade: A Free Market of Racketeers”, *The Diplomat*, 19 July 2017.
- 217 Fariba Nawa, *Opium Nation: Child Brides, Drug Lords, and One Woman’s Journey Through Afghanistan*, (New York, Harper Perennial, 2011).

media.²¹⁸ Some of the reported occupations of child labourers include drug production and trafficking. A ripple effect on the education of these children is likely, as parents usually consider a basic level of literacy and numeracy to be sufficient.²¹⁹

Within the last decade, drug cartels and organized crime groups in Mexico have increasingly displaced indigenous people not only from their land but also from their community networks.²²⁰ Many reports have noted that children and young people in certain areas were being kidnapped and forced to work in opium poppy cultivation, production and trafficking by organized crime groups.^{221, 222, 223}

Coca bush cultivation

In Colombia, children between 6 and 13 who lived in places affected by the armed conflict in coca regions were often used as labour in the fields. At the beginning of the 2010s, it was estimated that there were about 18,000 children and teenagers in illegal armed groups in Colombia and at least 100,000 in sectors of the illegal economy directly controlled by those groups.²²⁴ Most of those young people were recruited before the age of 12, were affected by poverty and came from regions affected by violence. Some of those children grew up working with their parents in the coca harvest and in coca paste distribution.²²⁵

A significant number of teenage and young workers, called *raspachines*, are responsible for coca leaf collection in Bolivia (Plurinational State of), Colombia and Peru. Young people from the Andean region,

many of them indigenous, leave their families and communities to find food, clothing, transportation and entertainment. Wages in coca leaf collection are substantially higher than the average for agricultural work. Many of them are children of landless peasants and lack the education and opportunities that would normally allow them greater stability and socioeconomic development. These young people are the weakest link in the chain formed by the agro-industrial system of coca. Given that juveniles are unlikely to be held accountable for their crimes, they are increasingly exposed to high-risk work such as buying and transporting coca paste.^{226, 227}

Cannabis farms

Research on youth involvement in cannabis cultivation is limited and concentrated in a few Western countries. Given that cannabis is cultivated in virtually every country, this evidence may mask different global patterns. In Canada, Ireland and the United Kingdom, the number of cannabis-growing operations, known as grow-ops, has increased considerably in the past few years.^{228, 229, 230} Media outlets have reported that young people in the United Kingdom, mostly trafficked from countries in Asia, are recruited to work for the criminal organizations running these farms.²³¹ They are often locked up alone and forced to tend plants in converted houses, usually in extremely dangerous conditions. Among the risks mentioned are injury or even death from dangerous equipment, fire, respiratory illness from mould, electrocution and violence due to burglaries and turf wars between the organizations running the grow-ops.

218 Hoogan, "Too young to toil".

219 Ibid.

220 Alejandra S. Inzunza and José Luis Pardo, "Cartels are displacing an indigenous group that's lived in this Mexican state for centuries", *Vice News*, 20 May 2016.

221 Convention on the Rights of the Child, *Concluding observations on the combined fourth and fifth periodic reports of Mexico*, CRC/C?MEX/CO/4.5

222 Mexico, *Gaceta Parlamentaria*, año XVI, número 3757-IX, jueves 25 de abril de 2013.

223 Inter-American Commission on Human Rights, *Situation of human rights in Mexico*, Organization of American States, December 2015.

224 Natalia Springer, *Como corderos entre lobos: del uso y reclutamiento de niñas, niños y adolescentes en el marco del conflicto armado y la criminalidad en Colombia* (Bogotá, Springer Consulting Services, 2012), pp. 20–30.

225 Ibid.

226 Juan G. Ferro and others, *Jóvenes, coca y amapola: un estudio sobre las transformaciones socioculturales en zonas de cultivos ilícitos* (Bogotá, Universidad Javeriana, 1999), p. 20.

227 Colombia, Programa Nacional Integral de Sustitución de Cultivos Ilícitos, decree No. 896 of 29 May 2017.

228 Sue Reed, "Vietnamese child slaves working in UK cannabis factories", *Daily Mail*, 17 December 2017.

229 Migrant Rights Centre Ireland, "Trafficking for forced labour in cannabis production: the case of Ireland" (Dublin, 2015).

230 Susan C. Boyd and Connie I. Carter, *Killer Weed: Marijuana Grow Ops, Media and Justice* (Toronto, Canada, University of Toronto Press, 2014), pp. 167–180.

231 Reed, "Vietnamese child slaves working in UK cannabis factories".

Media outlets have also reported that immigrants often enter the United Kingdom with no intention of cultivating cannabis. However, commercial cannabis cultivation offers itself as the obvious choice for immigrants to pay back large debts to lenders who threaten their families back home.²³² When cannabis farms are raided, these youth workers may be prosecuted, convicted and eventually imprisoned for crimes they may have been forced to commit, while their traffickers may evade justice.²³³

Manufacture of synthetic drugs

Europe remains the most dynamic market for synthetic drugs such as MDMA, amphetamine and, to a lesser extent, methamphetamine, and organized crime groups in the region are involved in the manufacture of those drugs.²³⁴ In Europe, the number of home-based laboratories operated by criminal groups has increased in the last decade, in particular those for the production of methamphetamine in Czechia and for MDMA in the Netherlands.²³⁵ In Asia, criminal syndicates capitalize on the limited capacity of law enforcement to police drug manufacturing, which exposes local communities to the illegal drug industry. Inevitably, children and young people within those communities become involved in the production and supply chain of drugs.²³⁶

In the United States, most of the domestic laboratories seized in 2016 were small-capacity covert production laboratories known as “one-pots” or manufacturing sites known as “shake and bakes”. They can be set up anywhere: in private residences, motel and hotel rooms, trailers, campgrounds and commercial establishments.²³⁷ Children who live

at these sites, visit them or are present during drug manufacture may run acute health and safety risks.²³⁸ The age-related behaviours of young children, such as frequent hand-to-mouth contact and physical contact with their environment, increase the likelihood that they will inhale, absorb or ingest toxic chemicals, or contaminated food.²³⁹

In Australia, crystalline methamphetamine is manufactured and distributed by local motorcycle gangs that work with major organized crime groups. These groups often recruit children aged between 11 and 15 to cook the substance and target potential young users in country towns.²⁴⁰ Between 2006 and 2010 in New Zealand, police found 384 children in 199 laboratories, and convictions for neglect or abuse were obtained for people in 19 laboratories. In those cases, drug paraphernalia was stored in children’s lunch boxes and drinking bottles.²⁴¹ Since 2012, the number of minors, with an average age of 6 years, found in methamphetamine laboratories in New Zealand has increased, according to the National Drug Intelligence Bureau.²⁴²

Young people in the drug trafficking chain

Young people can become entangled in drug trafficking in both the local and international drug markets. However, the available evidence regarding young people’s involvement in drug trafficking is limited to a few countries and comes from a limited number of studies.

At times, young people’s place of birth, as well as their socioeconomic environment, determines how they evolve inside criminal organizations. Beyond exploitation, there are several reasons why a young person may participate in drug dealing and trafficking. They may do so as an aspirational financial

232 Amelia Gentleman, “Trafficked and enslaved: the teenagers tending UK cannabis farms”, *The Guardian*, 25 March 2017.

233 “Trafficking for forced labour in cannabis production”.

234 Europol, “Business fundamentals: how illegal drugs sustain organised crime in the EU” (2017).

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

236 Fifi Rahman and Nick Crofts, eds., *Drug Law Reform in East and Southeast Asia* (Plymouth, United Kingdom, Lexington Books, 2013), pp. 157–159.

237 United States, Department of Justice, Drug Enforcement Administration, *2017 National Drug Threat Assessment* (Washington, D.C., 2017).

238 Ibid.

239 Karen Swetlow, “Children at clandestine methamphetamine labs: helping meth’s youngest victims”, OVC Bulletin June 2003 (United States Department of Justice, Office of Justice Programs, Office for Victims of Crime).

240 Caro Meldrum-Hanna, “Crystal meth: former drug lab cook recruited at age 11 as outlaw motorbike gangs push drugs in rural towns”, *Four Corners*, 20 October 2014.

241 “Children raised in meth labs”, *New Zealand Herald*, 2 June 2013.

242 New Zealand Police Association, “Meth Kids”, (2013) vol. 46, No.2. Available at <https://www.policeassn.org.nz/news-room/publications/featured-articles/meth-kids>.

measure or as part of their family's established economic activities. In other cases, socioeconomic disadvantage is thought to place young people at increased risk of drug dealing in order to survive in an environment of limited opportunities.²⁴³ Most studies in the United States identify participants who deal drugs as a means to seek economic gain to supplement meagre wages. Young people are also involved in the illicit drug trade to obtain easy access to drugs or because of parental drug use or dealing. Carrying or accessing guns has also been identified as a variable that could lead adolescents to drug dealing.²⁴⁴ Although the definition of minors and juveniles differs across countries, minors and juveniles are subject to lenient laws, prosecution and penalties for criminal offences (compared with adults), including drug offences, which makes it convenient for organized crime groups to exploit young people to undertake various tasks within the drug supply chain.

Drug dealing in local markets that are non-violent or have a low level of violence

In many places, local-level drug transactions tend to occur in contexts that have a low level of violence or that are non-violent. For example, in Estonia, the most widespread reasons for children becoming involved in drug dealing include the influence of close friends and peers, the desire to become rich, a lack of an alternate income and the need for free drugs.²⁴⁵ In the United Kingdom, the number of children under the age of 16 arrested on suspicion of supplying "crack" cocaine, heroin or cocaine has been increasing in recent years.²⁴⁶ Drug traffickers perceive children as cheap, expendable, easily controlled and often able to operate under the police's

radar. Informal groups known as "county lines", which are not necessarily affiliated as gangs, have been shown to supply drugs from an urban hub to local markets in the United Kingdom.²⁴⁷ Such a phenomenon includes the forced recruitment of young people, many aged between 13 and 18, who may have accumulated drug debts. Most recruits work in remote areas for these groups as street dealers or runners, or by arranging accommodation, hiring cars or booking train tickets, among other minor activities. In this manner, the group exploits young or vulnerable people to achieve the storage or supply of drugs, movement of cash proceeds and to secure the use of dwellings. Group leaders or individuals exploited by them regularly travel between the urban hub and the county market to replenish stock and deliver cash.

Victims may not wish to continue working for county lines, but are afraid of self-incrimination or retribution. They are exposed to varying levels of exploitation, including physical, mental and sexual harm, sometimes over protracted periods. Some vulnerable individuals are also trafficked into remote markets to work and others have their homes taken over (a process known as being "cuckooed") through force or coercion. Many children are also lured by the promise of earnings and valuable assets. The use of social media to recruit members is also reported, and young women are often involved in recruiting other young women who may be vulnerable and in crisis.²⁴⁸

Drug dealing in local markets in violent contexts

In local contexts where violence prevails, drug markets may directly harm all actors involved in drug-related activities, including young people.²⁴⁹

In Brazil, teenagers and young adults who work within drug supply networks are often looking for excitement and a means to identify with local groups or gangs. They also want to consume the illegal drugs that they sell or traffic. Officials tend to ascribe

243 Leah J Floyd and others, "Adolescent drug dealing and race/ethnicity: a population-based study of the differential impact of substance use on involvement in drug trade", *American Journal of Drug and Alcohol Abuse*, vol 36, No.2 (2010), pp.87–91.

244 Tatiana Starr Daniels, "What influences some black males to sell drugs during their adolescence", *McNair Scholars Journal*, vol. 13, (Sacramento, California State University, 2012), pp. 21–39.

245 Nelli Kalikova, Aljona Kurbatova and Ave Talu, *Estonian Children and Adolescents Involved in Drug Use and Trafficking: A Rapid Assessment*, (Geneva, International Labour Organization, International Programme on the Elimination of Child Labour, 2002).

246 Adam Lusher, "Gangs recruiting children as young as 12 as class A drug dealers", *The Independent*, 14 July 2017.

247 United Kingdom, National Crime Agency, "County lines violence, exploitation and drug supply 2017: national briefing report" (November 2017).

248 Ibid.

249 Thomas Babor and others, *Drug Policy and the Public Good* (Oxford, Oxford University Press, 2010).

structural factors that are exacerbated by a lack of financial resources or frail family structures to children's attraction to gangs and drug trafficking.²⁵⁰

Organized crime groups and gangs prefer to recruit children and young adults for drug trafficking for two reasons. The first is the recklessness associated with this age group, even when they are faced with police or rival gangs, and the second is their obedience in carrying out orders. The desire to belong to a gang and to be highly regarded by its members imparts to the children a sense of obedience and a strong will to obey orders from and the rules of their gang.²⁵¹ In Argentina, the selling of drugs in deprived areas is done by a method known as *menudeo*, by which drugs are dispensed from bunkers (small windowless buildings) staffed by a gang member, often a teenager, or even a child. Often, an armed *soldado* (guard) is on the payroll of the local trafficker guards the area.²⁵²

International markets

Young people involved in the illicit drug trade in international markets are often part of large organized crime groups. They are used in different ways for smuggling illegal substances across borders. In the United States, gangs target young people who can legally cross international borders,²⁵³ while in Peru, *mochileros* (backpackers) travel with illicit cargo of cocaine to secret stash points.²⁵⁴ Drug bosses usually use children as lookouts at control points or border check posts.

On the United States-Mexico border, many young people are involved in drug trafficking, serving as so-called “mules”, to carry drugs across the border. Trafficking groups target young people who can

legally cross the border because they are United States citizens who may live in Tijuana and go to school in the United States or possess a border crossing card. In 2013, 118 young people were caught smuggling cannabis, methamphetamine, heroin and cocaine through the San Diego sector. By 2015, that number had dropped to 70. This decline may be attributed to several factors, including tighter border security, but the numbers only reflect those who were caught and not those who were successful in crossing the border.^{255, 256}

The phenomenon of young people crossing borders to smuggle drugs occurs in most regions of the world. In Peru, media sources suggest that young people help to transport cocaine from the valley of three rivers — the Apurimac, Ene and Mantaro — to secret stash points or clandestine airstrips, from where the drugs are moved on by other means. Children and teenagers are the principal workers in the cocaine valley, where backpackers or *mochileros* walk for more than 100 miles through the mountains to avoid police checkpoints and armed gangs.²⁵⁷ Although the journey is long and dangerous, the payments make it lucrative, with every trip worth about \$2,000.²⁵⁸ The *mochileros* are reportedly well organized and prepared for attacks, either from rival groups or the police.

Over the past five years, the number of ethnic minority juveniles engaging in drug trafficking on the border between the Lao People's Democratic Republic and Viet Nam has also increased, according to media sources.²⁵⁹ Suggestions were made that about 20 young people smuggled drugs across the border every day in 2017.²⁶⁰

In recent decades, West Africa has emerged as a major transit point for drug trafficking; according to media sources, this has also increased the level of

250 Jailson de Souza e Silva and André Urani, *Brazil Children in Drug Trafficking: A Rapid Assessment*, Investigating the Worst Form of Child Labour No. 20 (Geneva, International Labour Organization, 2002).

251 Ibid.

252 Mauro Testa and Ross Eventon, “Vulnerable youth and drug trafficking in Rosario, Argentina: between stigmatisation and social control” (Swansea, United Kingdom, Global Drug Policy Observatory, Swansea University, February 2016).

253 Greg Moran, “There has been some progress, but youth drug smuggling persists at the U.S-Mexico border”, *Los Angeles Times*, 20 June 2016.

254 “A look at children's role in cocaine production in Peru”, published on YouTube by AJ+ on 7 May 2015.

255 Moran, “There has been some progress, but youth drug smuggling persists at the U.S-Mexico border”.

256 “Mexico drug gangs using more children as ‘mules’”, *CBS News*, 14 March 2012.

257 “A look at children's role in cocaine production in Peru”.

258 Linda Presley, “The mochileros: high stakes in the high Andes—the young backpackers risking their lives in cocaine valley”, *BBC News*, 24 November 2015.

259 Juvenile drug traffickers multiply at Vietnam-Lao border”, *Voice of Vietnam*, 27 October 2017.

260 Ibid.

exploitation of young people.²⁶¹ Media sources reported that, in 2016, 158 young Nigerians were awaiting execution for drug offences in China, Indonesia, Malaysia and Singapore. Some had claimed to be university students and were colluding with drug traders to undermine the visa system and gain entrance into Malaysia, Indonesia, Thailand or other countries on drug trafficking routes.²⁶²

What is the role of children and street gang members in trafficking drugs?

Drug-related violence, street gangs and exploitation of children by organized crime groups in the drug trade are some of the main concerns of drug policies all over the world. Using data from over 40 countries, about 3 per cent of people arrested or cautioned for possession of drugs in 2015 were aged under 18).^{263, 264} For more serious drug offences, such as sales, only 1 per cent of those arrested or prosecuted were children. Globally, children represent about one third of the global population,²⁶⁵ so children are much less likely than adults to be arrested or prosecuted for drug offences.

Nevertheless, this represents almost 70,000 children arrested for drug possession and over 17,000 arrested for serious drug offences in 2015. The share of children among those arrested for drug offences varies considerably between countries. In general, children represent a larger share of those arrested for possession than for serious offences. Some countries report that more than 10 per cent of people arrested for drug possession are children, but most countries report that fewer than 5 per cent of drug traffickers are under 18.

Children may participate in drug markets through an organized group, such as a street gang. The International Classification of Crime for Statistical Purposes defines a gang as “a group of persons that is defined by a set of characteristics including

261 “Narcotics in Africa: an emerging drug market”, *The Economist* (Nairobi), 14 April 2016.

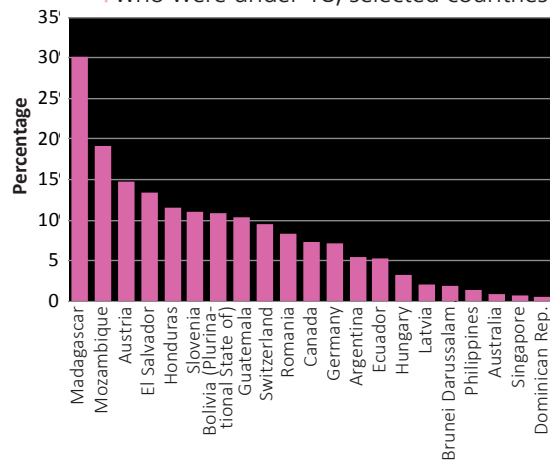
262 Ismael Mudashir, “Drug trafficking: 158 Nigerians on death row in China, Malaysia”, *Daily Trust*, 1 March 2016.

263 According to the United Nations Convention on the Rights of the Child, adulthood starts at 18 years of age.

264 United Nations, *Treaty Series*, vol. 1577, No. 27531.

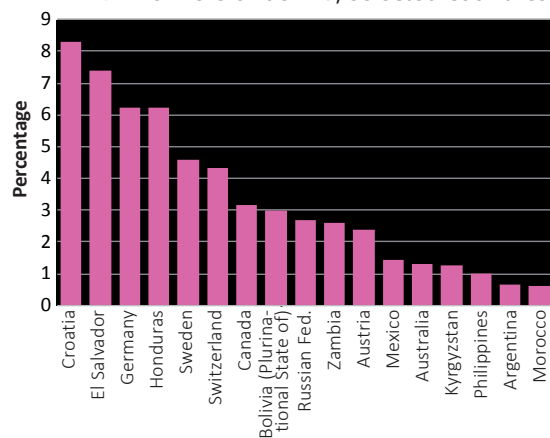
265 United Nations, Department of Economic and Social Affairs, Population Division, *World Population Prospects 2017*. Available at <https://esa.un.org/unpd/wpp>.

FIG. 10 Proportion of people arrested or cautioned for drug possession in 2015 who were under 18, selected countries



Source: UNODC, responses to the annual report questionnaire.

FIG. 11 Proportion of people arrested or cautioned for serious drug offences in 2015 who were under 18, selected countries



Source: UNODC, responses to the annual report questionnaire.

durability over time, street-oriented lifestyle, youthfulness of members, involvement in illegal activities and group identity.”²⁶⁶ “Youthfulness” in this context should be interpreted liberally, since a number of studies indicate that most street gang members appear to be adults.²⁶⁷ Nonetheless, there is well-

266 UNODC, *International Classification of Crime for Statistical Purposes*, version 1.0 (March 2015), p. 98.

267 For example, the National Youth Gang Survey in the United States suggests that more than two thirds of urban street gang members are adults. See National Gang Center, National Youth Gang Survey Analysis, Demographics: age of gang member. Available at www.nationalgangcenter.

Street gangs and drug trafficking

It has been alleged that street gang members, particularly those involved in “mega-gangs” like Mara Salvatrucha, are involved in international drug trafficking. Individual gang members may move on to become drug traffickers, of course, and the skills they acquire in gang activity may prove useful in their new occupation. But there are several reasons to be sceptical that international drug trafficking is a primary activity of the street gangs themselves, or that street gangs are important in facilitating international drug flows.

The territoriality of street gangs is often cited as one of their defining characteristics. Not only does protecting gang territory require time and attention, but also the territories controlled tend to be located in slum areas, far from the transportation corridors relevant to drug trafficking. In the El Salvador gang survey, most of

the respondents were raised in poor communities and dropped out of school before turning 16; many were runaways. This lack of basic education and resources makes it unlikely that they could compete in international drug markets with sophisticated drug trafficking cartels. Moreover, when asked about the nature of the groups trafficking drugs in their countries, law enforcement agencies from the Northern Triangle countries do not mention street gangs.

Source: Max G. Manwaring, *Street Gangs: The New Urban Insurgency*, (Carlisle, Pennsylvania, Strategic Studies Institute, United States Army War College, March 2005) ; John P. Sullivan, “Transnational gangs: the impact of third generation gangs in Central America”, *Air and Space Power Journal*, Second Trimester (2008). The definition used by the United States Department of Justice, available at www.justice.gov/criminal-ocgs/about-violent-gangs

documented involvement of street gang members who are children in the retailing of drugs.

Street gangs such as the Crips and the Bloods were notorious for their role in selling “crack” cocaine in parts of the United States from the late-1980s to the mid-1990s. One study of more than 1,500 arrests for the sale of cocaine made between 1989 and 1991 in two Los Angeles suburbs found that 27 per cent involved gang members.²⁶⁸ The 1996 United States National Youth Gang survey estimated that 43 per cent of all street drug sales nationally involved gang members.²⁶⁹ Both “crack” cocaine use and Los Angeles gang membership have declined dramatically since that time.²⁷⁰

gov/Survey-Analysis/Demographics#anchorage. Research on street gangs in Trinidad and Tobago found that 87 per cent of members were adults. See Charles Katz and David Choate, “Diagnosing Trinidad and Tobago’s gang problem”, conference paper presented at the annual meeting of the American Society of Criminology, Los Angeles, California, 2010. A recent survey of gang members in El Salvador found an average age of 25 years. See José Miguel Cruz and others, *The New Face of Street Gangs: The Gang Phenomenon in El Salvador* (2017).

- 268 Cheryl L. Maxson, “Street gangs and drug sales in two suburban cities”, National Institute of Justice Research in Brief Series (Washington D.C., July 1995).
- 269 Office of Juvenile Justice and Delinquency Prevention, *1996 National Youth Gang Survey* (Washington D.C., July 1999).
- 270 According to online data from the Los Angeles Police Department, the number of street gang members in the city declined from over 64,000 in 1997 to 39,000 in 2005. The number of “hardcore” cocaine users in the United States declined from an estimated 1.1 million in 1988 to 445,000

Today, the most notorious street gangs are found in Latin America, particularly the *maras* of the Northern Triangle of Central America. Children account for a relatively high proportion of those arrested for serious drug offences in Honduras and El Salvador (6 per cent and 7 per cent, respectively).²⁷¹ Over 70 per cent of respondents to a survey of more than 1,000 gang members in El Salvador said they earned less than \$250 a month. Their primary source of income appeared to be extortion,²⁷² so the role they play in the drug economy appears to be peripheral.²⁷³

C. DRUGS AND OLDER PEOPLE

The use of drugs among older people has long been an under-researched area, the importance of which has only recently become recognized. Changes in global demographics point to an increase in both the number and proportion of older people in all regions. In this section, some of the concerns related to the use of drugs among older people are briefly

in 2000 (William Rhodes and others, *What America’s Users Spend on Illegal Drugs, 1988–1998* (Washington, D.C., Office of National Drug Control Policy, 2000).

271 UNODC, responses to the annual report questionnaire.

272 International Crisis Group, “Mafia of the poor: gang violence and extortion in Central America”, Latin America Report No. 62 of 6 April 2017 (Brussels, 2017).

273 Cruz and others, *The New Face of Street Gangs*.

explored, together with examples that illustrate the particular issues and health consequences of drug use among this group.

Changes in the extent of drug use among older people

There is evidence in some countries that the use of drugs among older people, although starting from a low prevalence, has been increasing over the last decade and at a faster rate than among younger age groups.

In the United States, for example, data on the past-year use of any drug shows that, between 1996 and 2016 there was hardly any change in the prevalence rate among those aged 12–17, but drug use among those aged 50 and above²⁷⁴ rose from 1.3 per cent to 9.8 per cent during that period, equivalent to a more than sevenfold increase.²⁷⁵ In terms of the number of older drug users, the increase is even more striking because of the growth in the population of those aged 50 and above. The total number of people in the United States who used drugs in the past year at 50 and older rose from some 900,000 people in 1996 to 10.8 million people in 2016, equivalent to a 12-fold increase.

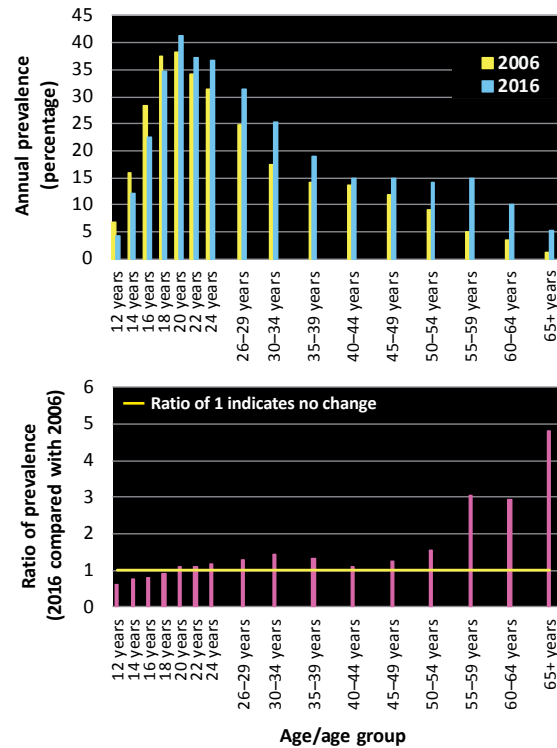
The increase was particularly large during the period 2006–2016, when the total number of annual drug users aged 50 and older tripled, from 3.6 to 10.8 million, and the annual prevalence rate of drug use of those aged 50 and older more than doubled, from 4.1 to 9.8 per cent. For those aged 60 and above, growth in prevalence rates was even more pronounced, with an almost fourfold increase in the last decade, while the total number of annual drug users among those aged 60–64 quadrupled and increased more than sixfold among those aged 65 and older.

In Germany, past-year use of any drug increased more among those aged 40 and above than the younger age groups in the period 2006–2015. Drug use among those aged 18–24 showed a more modest increase (22 per cent) over the same period.

274 Age 50 and above was the oldest age group category in the 1996 national household survey of the United States.

275 United States, Center for Behavioral Health Statistics and Quality, *2016 National Survey on Drug Use and Health: Detailed Tables* (Rockville, Maryland, Substance Abuse and Mental Health Services Administration, 2017 and previous years).

FIG. 12 Annual prevalence of drug use and changes in the United States of America, by age, 2006 and 2016



Source: United States, Center for Behavioral Health Statistics and Quality, *2016 National Survey on Drug Use and Health: Detailed Tables* (Rockville, Maryland, Substance Abuse and Mental Health Services Administration, 2016 and previous years).

Who constitutes "older" in the context of drug use?

There is no consistently adopted lower age cut-off to categorize who is considered an "older" drug user. The cut-off age varies quite extensively across studies, starting from as low as 35.^a More generally, however, studies in European countries have used 40 as the lower cut-off, although some studies from the United States of America have used 50.^b

Given this lack of an internationally accepted definition of "older drug users", the present section contains information on the older age groups as available and provides, as far as possible, comprehensive age breakdowns of the available statistics.

^a April Shaw, *Senior Drug Dependents and Care Structures: Scotland and Glasgow Report* (Glasgow, Scottish Drugs Forum, March 2009).

^b EMCDDA, *Selected Issue 2010: Treatment and Care for Older Drug Users* (Luxembourg, 2010).

Studies among older drug users are limited

Drug use among older people is an under-researched area, the importance of which has only recently been recognized.^{a, b} It should be noted that most studies among older drug users were conducted in developed countries, in particular the United States of America and in countries in Europe, and therefore the conclusions drawn from the literature may not be generalizable to the rest of the world.

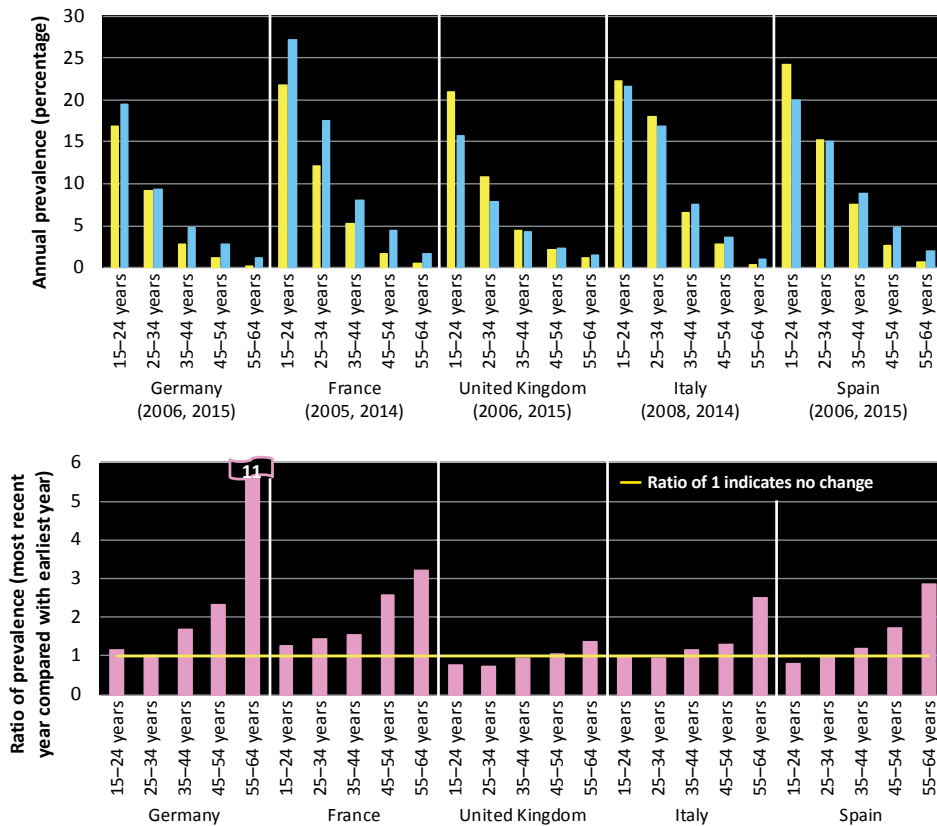
^a Matthew H. Taylor and George T. Grossberg, “The growing problem of illicit substance abuse in the elderly: a review”, *Primary Care Companion for CNS Disorders*, vol. 14, No. 4 (2012).

^b Anne Marie Carew and Catherine Comiskey, “Treatment for opioid use and outcomes in older adults: a systematic literature review”, *Drug and Alcohol Dependence*, vol. 182 (2018), pp. 48-57.

The use of cannabis has also been on the rise among those aged 55–64 in some of the most populated countries in Western Europe. Annual prevalence data from France, Germany, Italy, Spain and the United Kingdom show that cannabis use among those in that age group has been increasing at a higher rate than any other age group. The increase in past-year cannabis use among those aged 15–24 and 25–34 in those countries has been much less pronounced and, in some cases, the prevalence has declined.

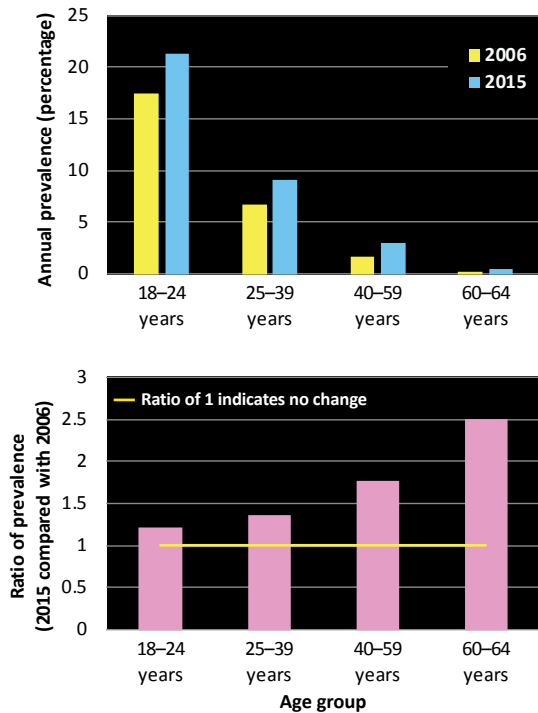
In Australia, there was a small decline in the annual prevalence rate of drug use for those aged 14–19 years during the period 2007–2016, but with prevalence rates increasing by 60 to 70 per cent in the 50–59 and 60 and older age groups.

FIG. 13 Annual prevalence of cannabis use and changes in selected countries in Western Europe, by age group, selected years



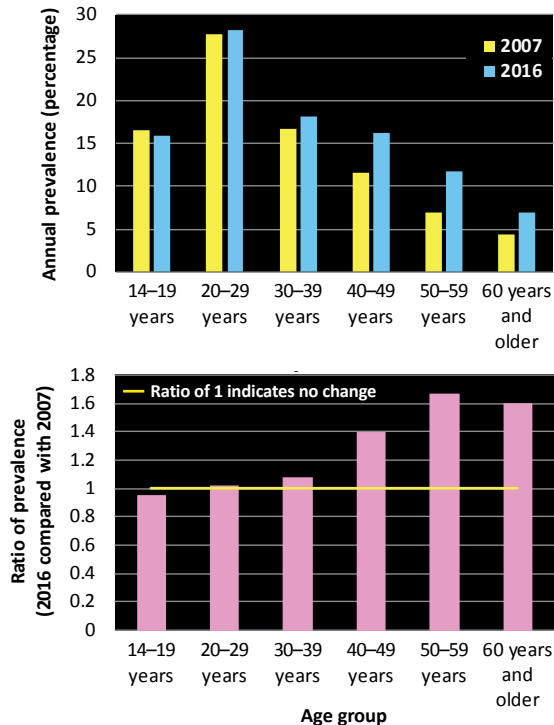
Source: EMCDDA, Statistical Bulletin 2017.

FIG. 14 Annual prevalence of drug use and changes in Germany, by age group, 2006–2015



Source: D. Piontek, E. Gomes de Matos, J. Atzendorf, and L. Kraus, *Kurzbericht Epidemiologischer Suchtsurvey: Trends der Prävalenz des Konsums illegaler Drogen und des klinisch relevanten Cannabisgebrauchs nach Geschlecht und Alter 1990-2015* (Munich, IFT Institut für Therapieforschung, 2016).

FIG. 15 Annual prevalence of drug use and changes in Australia, by age group, 2007–2016



Source: Australian Institute of Health and Welfare, *National Drug Strategy Household Survey 2016: Detailed Findings*, Drug Statistics Series No. 31 (Canberra, September 2017).

In Chile, the past-year use of cannabis among those aged 45–64 showed a fourfold increase over the decade to 2016, and an almost 30-fold increase between 1996 and 2016. The rise in the annual prevalence of cannabis use was less pronounced among younger age groups. A similar pattern was also revealed for the use of cocaine: the annual prevalence of use declined for those aged 12–18 and 19–25 during the period 1996–2016, but increased 14-fold among those aged 35–44.

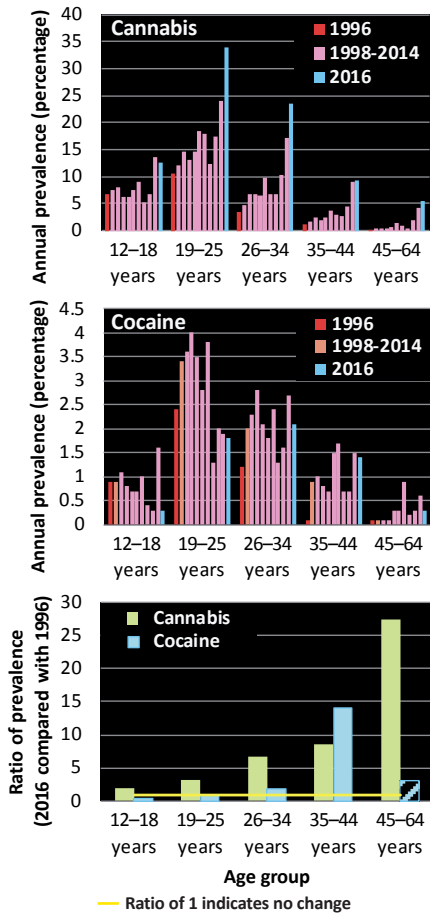
What factors might lie behind the increase in the extent of drug use?

There are a number of factors that could explain the increased prevalence of drug use observed among older people in some countries. Changing perceptions of the risks associated with drug use, the increased availability of drugs, changes in social

acceptance of drug use and self-medication to deal with pain or anxiety or challenges associated with retirement might all contribute to the initiation or resumption of drug use in older people. Another factor could be a cohort effect, whereby groups of people share common social and cultural experiences because of when they were born. These experiences might be different from those of previous cohorts. The increase in drug use seen among the older population could be a consequence of the ageing of a cohort of users who have a higher prevalence of substance use compared with previous cohorts.

There is evidence that, in western countries, the baby-boom generation (born between 1946 and 1964), used drugs when they were young more than the previous generation. Many of them have continued to use drugs into old age, and this is reflected in the increasing prevalence of drug use seen among

FIG. 16 | Changes in annual prevalence of drug use in Chile, by age group, 1996–2016



Source: National Drug and Alcohol Prevention and Rehabilitation Service (SENDA), *Décimo Segundo Estudio Nacional de Drogas en Población General de Chile, 2016* (Chilean Drug Observatory, December 2017)

Note: The annual prevalence of cocaine use is reported at less than 0.1 per cent for 1996 among those aged 45–64 years. In calculating the ratio, a prevalence of 0.1 per cent was used. Given the uncertainty around this assumption and the possibility that the ratio might be much higher, a cross-hatched bar is shown for the increase of cocaine use among those aged 45–64 years over the period 1996–2016.

older age groups in many developed countries as this cohort ages.^{276, 277, 278, 279}

For instance, the United States has witnessed significant increases in the past-year use of cannabis among those aged 50 and older. This trend is capturing, in part, the ageing baby boomers, who

reported higher rates of substance use compared with the previous generation.^{280, 281} Among those aged 50–59, past-year use of cannabis increased from 3.1 per cent to 5.7 per cent from 2002 to 2007, and the rate of past-year non-medical use of prescription drugs increased from 2.2 per cent to 4.4 per cent. Typical characteristics associated with continued drug use in this age group included male gender, unmarried status, early onset of drug use, lower levels of education, low income, unemployment as a result of disability, recent alcohol or tobacco use and having a major depressive episode in the previous year. In addition to the cohort effect of continued cannabis use by baby boomers, a change in the perceptions around cannabis may also have contributed to an increase in use. Over the past decade, decreasing risk perceptions of harm and an ongoing debate around legalization of the drug might have influenced the use of cannabis.^{282, 283, 284}

Among countries in Europe with a higher prevalence of cannabis use among older people, similar age cohort effects have been identified to explain increasing trends in the use of cannabis. Analyses of historical data suggest that the main cause of the phenomenon is an ageing cohort containing a

277 Roger Nicholas and others, *Preventing and Reducing Alcohol- and Other Drug-Related Harm among Older People: A Practical Guide for Health and Welfare Professionals* (Adelaide, South Australia, National Centre for Education and Training on Addiction, Flinders University, 2015).

278 Beth Han, Joseph Gfroerer and James Colliver, “An examination of trends in illicit drug use among adults aged 50 to 59 in the United States”, OAS Data Review (Rockville, Maryland, Office of Applied Studies, Substance Abuse and Mental Health Services Administration (SAMHSA), August 2009).

279 Frederic C. Blow and Kristen L. Barry, “Alcohol and substance misuse in older adults”, *Current Psychiatry Reports*, vol. 14, No. 4 (2012), pp. 310–319.

280 Li-Tzy Wu and Dan G. Blazer, “Illicit and nonmedical drug use among older adults: a review”, *Journal of Ageing and Health*, vol. 23, No. 3 (2011), pp. 481–504.

281 Benjamin H. Han and others, “Demographic trends among older cannabis users in the United States, 2006–13”, *Addiction*, vol. 112, No. 3 (2010), pp. 516–525.

282 Han, Gfroerer and Colliver, “An examination of trends in illicit drug use among adults aged 50 to 59 in the United States”.

283 William C. Kerr, Camillia Lui and Yu Ye, “Trends and age, period and cohort effects for marijuana use prevalence in the 1984–2015 US National Alcohol Surveys”, *Addiction*, vol. 113, No. 3 (2017), pp. 473–481.

284 *World Drug Report 2017* (United Nations publication, Sales No. E.16.XI.6).

276 Caryl M. Beynon, “Drug use and ageing: older people do take drugs!”, *Age and Ageing*, vol. 38, No. 1 (2009), pp. 8–10.

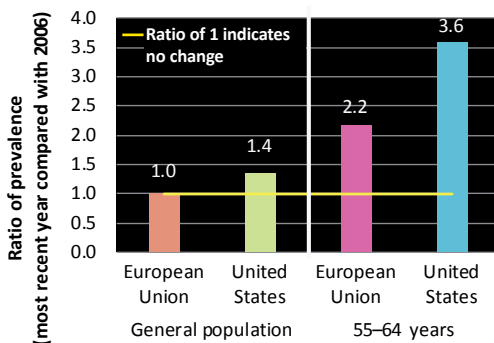
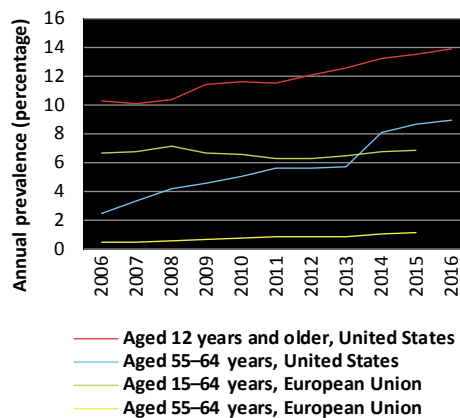
sizeable proportion of individuals who continue using drugs, almost exclusively cannabis, into an advanced age.²⁸⁵

Higher levels of drug use among older people might also be explained by late initiation and changed environmental conditions. However, adolescence (12–17 years of age) is generally regarded as the critical risk period for the initiation of substance use.²⁸⁶ In the United States, a study of drug users aged 50–59 covering the period 2002–2007 found that very few had started to use drugs at an older age. Approximately 90 per cent had initiated drug use by the age of 30 and about 72 per cent had initiated non-medical use of prescription drugs by that age. Only 3 per cent had initiated drug use and 9 per cent had initiated non-medical use of prescription drugs at age 50 or older.²⁸⁷ Reasons for initiating drug use later in life included self-medicating painful medical conditions. Older people experience higher rates of mental health conditions such as depression and higher rates of social risk factors for drug use such as bereavement, social isolation, financial problems and poor social support.²⁸⁸

A major life-changing event that occurs among older people is retirement. Evidence on the impact of retirement on drug use is very limited. However, a study of 978 people in the United States looked at various forms of retirement and the impact it has on drug use. Being fully retired (that is, being completely disengaged from the workforce) was found to be associated with increased use of drugs compared with those who deferred retirement and remained within the workforce. However, this depended on the age of full retirement, with younger retirees reporting more problems related to drug use

than older retirees. This relationship was reversed for those who deferred retirement and remained employed at their primary workplaces. That is, younger, retirement-eligible workers who deferred retirement and continued to work reported fewer drug-related problems than their older peers.²⁸⁹

FIG. 17 Annual prevalence of cannabis use and changes in the United States of America and the European Union among the general population and those aged 55–64 years, 2006–2016



285 EMCDDA, *Selected Issue 2010: Treatment and Care for Older Drug Users* (Luxembourg, Publications Office of the European Union, 2010).

286 Substance Abuse and Mental Health Services Administration, Center for Behavioral Health Statistics and Quality. “Age of substance use initiation among treatment admissions aged 18 to 30”.

287 Han, Gfroerer and Colliver, “An examination of trends in illicit drug use among adults aged 50 to 59 in the United States”.

288 Matthew H. Taylor and George T. Grossberg, “The growing problem of illicit substance abuse in the elderly: a review”, *Primary Care Companion for CNS Disorders*, vol. 14, No. 4 (2012).

Source: United States, Department of Health and Human Services, Substance Abuse and Mental Health Services Administration, *2016 National Survey on Drug Use and Health*, and previous years; and EMCDDA, *Statistical Bulletin 2017*.

Note: Prevalence rates for the European Union are population-weighted means of the national estimates. For years where a prevalence rate is not available for a country, these are either linearly interpolated between the years where national rates are available or, if this is not possible, given the same rate as the nearest year.

289 Samuel Bacharach and others, “Retirement and drug abuse: the conditioning role of age and retirement trajectory”, *Addictive Behaviors*, vol. 33, No. 12 (2008), pp. 1610–1614.

Drug treatment among older people who use drugs

Ageing drug users face multiple health issues

The physical ageing process can be accelerated by the cumulative effects of drug use, including experience of prior drug overdoses and increased risk of acquiring infectious diseases such as hepatitis C and HIV through unsafe injecting practices. Older drug users face health conditions that normally occur with increasing frequency with older age, such as degenerative disorders, circulatory and respiratory problems and diabetes, but at higher rates than among their non-drug using peers. Older drug users also experience mental health issues at higher levels than their peers or younger drug users.^{290, 291, 292, 293, 294}

Challenges for drug treatment and care

The development of drug use disorders and dependence results from a complex interaction between repeated exposure to drugs on the one hand, and biological, psychosocial and social factors on the other. Effective treatment for such a complex, chronic condition as drug dependence requires continuing care and interaction across many disciplines, such as pharmacological, behavioural therapy and social support.²⁹⁵ Numerous challenges exist in providing treatment interventions and care for substance use that are specific to, or more pronounced for, older drug users.

Owing to the possible simultaneous presence of a range of conditions, the complicated physical health needs of older drug users make drug dependence treatment more complex.^{296, 297} Historically, little

attention has been paid to substance use disorders among older people, with insufficient research into and evidence on interventions for their treatment, and with limited discussion on appropriate treatment services.^{298, 299, 300, 301}

In combination with medical and psychiatric problems, older drug users commonly live with the negative social consequences of long-term drug use. These are important considerations in the provision of effective treatment. Older drug users are more likely to be socially and economically disadvantaged and marginalized, with a greater chance of having experienced homelessness or periods of incarceration. Social exclusion and isolation from family and friends and a lack of social support are experienced more often and more acutely by older drug users than their peers or younger drug users. The absence of social support is an important predictor of relapse.^{302, 303, 304}

Drug-related treatment increases among older people who use drugs in the United States

Some of the most comprehensive and detailed treatment data available come from the United States. According to the latest data available from that

Royal College of Psychiatrists, (London, Royal College of Psychiatrists, 2011).

290 EMCDDA, *Health and Social Responses to Drug Problems: a European Guide* (Luxembourg, Publications Office of the European Union, 2017).

291 *Selected Issue 2010*.

292 Caryl M. Beynon and others, "Self reported health status, and health service contact, of illicit drug users aged 50 and over: a qualitative interview study in Merseyside, United Kingdom", *BMC Geriatrics*, vol. 9, No. 45 (2009).

293 Lisa Johnston and others, "Responding to the needs of ageing drug users" (EMCDDA, 2017).

294 Caryl M. Beynon, "Drug use and ageing".

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

296 Ilana Crome and others, *Our Invisible Addicts: First Report of the Older Persons' Substance Misuse Working Group of the*

297 Nick Doukas, "Older adults in methadone maintenance treatment: a literature review", *Journal of Social Work Practice in the Addictions*, vol. 11, No. 3 (2011), pp. 230–244.

298 Anne Marie Carew and Catherine Comiskey, "Treatment for opioid use and outcomes in older adults: a systematic literature review", *Drug and Alcohol Dependence*, vol. 182, (2018), pp. 48–57.

299 Alexis Kuerbis and Paul Sacco, "A review of existing treatments for substance abuse among the elderly and recommendations for future directions", *Substance Abuse: Research and Treatment*, vol. 7 (2013), pp. 13–37.

300 Wu and Blazer, "Illicit and nonmedical drug use among older adults: a review".

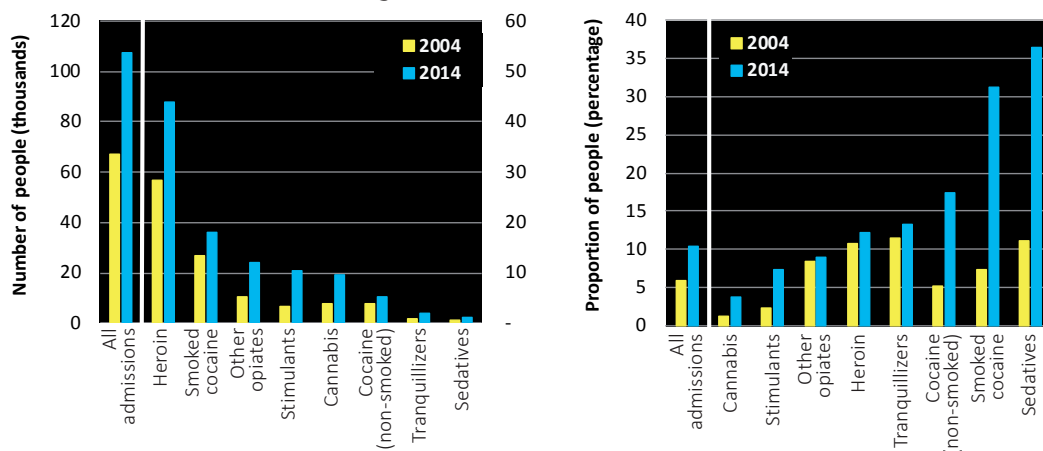
301 Orion Mowbray and Adam Quinn, "A scoping review of treatments for older adults with substance use problems", *Research on Social Work Practice*, vol. 26, No. 1 (2016), pp. 74–87.

302 Michelle R. Lofwall and others, "Characteristics of older opioid maintenance patients", *Journal of Substance Abuse Treatment*, vol. 28, No. 3 (2005), pp. 265–272.

303 *Selected Issue 2010*.

304 Yih-Ing Hser, "Predicting long-term stable recovery from heroin addiction: findings from a 33-year follow-up study", *Journal of Addictive Diseases*, vol. 26, No. 1 (2007), pp. 51–60.

FIG. 18 Trends in the number and proportion of those aged 50 and older in admissions to treatment related to drug use, United States, 2004–2014



Source: United States, Department of Health and Human Services, Substance Abuse and Mental Health Services Administration, Office of Applied Studies, *Treatment Episode Data Set (TEDS): 1994–2004 – National Admissions to Substance Abuse Treatment Services*, DASIS Series: S-33, DHHS Publication No. (SMA) 06-4180 (Rockville, Maryland, 2006); and United States, Department of Health and Human Services, Substance Abuse and Mental Health Services Administration, Center for Behavioral Health Statistics and Quality, *Treatment Episode Data Set (TEDS): 2004–2014 – National Admissions to Substance Abuse Treatment Services*, BHSIS Series S-84, HHS Publication No. (SMA) 16-4986 (Rockville, Maryland, 2016).

Note: In the left chart showing the number of admissions to treatment, “All admissions” are plotted on the left axis, while admissions by specific drug types are plotted on the right axis.

country, the number of admissions to drug use treatment services for those aged 50 and older increased by 59 per cent over the period 2004–2014. This age group is increasingly prominent in treatment admissions, with the proportion of those 50 and older in all treatment admissions nearly doubling to 10.4 per cent during that period.^{305, 306}

The increasing number and prominence of those aged 50 and older who were admitted to treatment services during that period was observed for all drug types. For cocaine in particular, the proportion of all those admitted who were aged 50 and older increased substantially. Although the number of admissions to treatment for the use of sedatives was

relatively low, in 2014 those aged 50 and older accounted for more than one third of the total, up from roughly 1 in 10 a decade earlier. The proportion of treatment admissions for those aged 50 and older who were referred through the court or criminal justice system declined slightly over the period 1992–2012, from 29 per cent to 25 per cent.³⁰⁷

Treatment for the use of opioids in Europe – an ageing cohort of people who use heroin

In Europe, opioid users, particularly those who inject, currently represent a substantial proportion of the drug treatment population and have traditionally represented the largest group requiring specialized drug treatment. Although the number of opioid users entering treatment is declining, the proportion of clients aged over 40 entering treatment for opioid use increased from 1 in 5 in 2006 to 1 in 3 in 2013. The evidence points to a large

305 United States, Department of Health and Human Services, Substance Abuse and Mental Health Services Administration, Office of Applied Studies, *Treatment Episode Data Set (TEDS): 1994–2004–National Admissions to Substance Abuse Treatment Services*, DASIS Series S-33, DHHS Publication No. SMA 06-4180, (Rockville, Maryland, 2006).

306 United States, Department of Health and Human Services, Substance Abuse and Mental Health Services Administration, Center for Behavioral Health Statistics and Quality, *Treatment Episode Data Set (TEDS): 2004–2014–National Admissions to Substance Abuse Treatment Services*, BHSIS Series S-84, HHS Publication No. SMA 16-4986 (Rockville, Maryland, 2016).

307 United States, Department of Health and Human Services, Substance Abuse and Mental Health Services Administration, Center for Behavioral Health Statistics and Quality, *Treatment Episode Data Set: Admissions (TEDS-A) Concatenated, 1992 to 2012*, ICPSR 25221 (Ann Arbor, Michigan, Inter-university Consortium for Political and Social Research, 2015).

ageing cohort of opioid users who started injecting heroin during the heroin “epidemics” of the 1980s and 1990s and who have shaped and characterized current European specialist and low-threshold treatment systems.³⁰⁸

Current lack of response to a growing problem

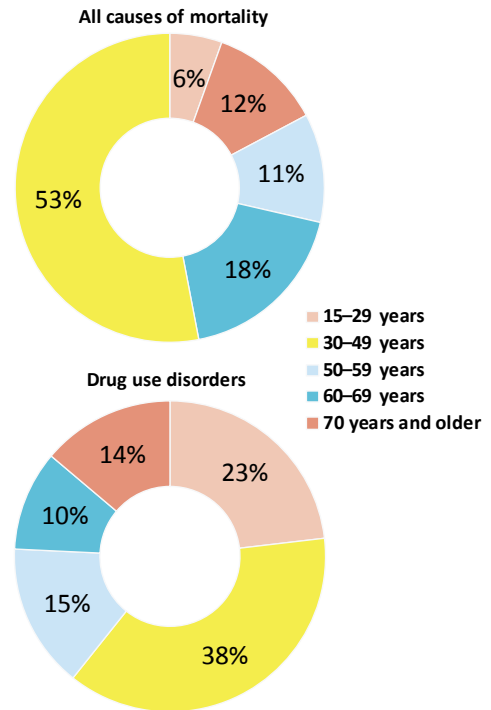
Particular and wide-ranging health issues arise from drug use by older users, in particular for those with a history of drug use disorders and dependence. Treatment for substance use is more complicated because of these concurrent mental and physical health disorders. The lack of evidence on what treatment works best for older drug users also exacerbates the situation. This is a relatively recent phenomenon and there is some concern that the infrastructure is not in place to deal with the growing numbers of older drug users and their health needs over the coming decades.

In general, the development of specific interventions or services for older drug users has yet to be considered a priority, possibly due to the lower prevalence of drug use among older people than the younger population. For example, there were no explicit references to older users in the drug strategies of European countries in 2010, and the situation has changed little since. Specialized treatment and care programmes for older drug users are rare in Europe, with most initiatives directed towards younger people.^{309, 310}

Drug-related deaths among older people who use drugs

Dying as a result of the use of drugs is clearly the most extreme outcome. Although those who die from drug use disorders (deaths that are directly caused by the use of drugs) are mostly younger people, those aged 50 and older still constitute a sizeable proportion. Among deaths from all causes of mortality globally in 2015, the largest proportion (53 per cent) occurred among those aged 70 and above. Deaths resulting from drug use disorders occur at a relatively young age, with almost one

FIG. 19 Deaths resulting from drug use disorders and from all causes of mortality, by age group, worldwide, 2015



Source: WHO, Global Health Estimates 2015: Deaths by Cause, Age, Sex, by Country and by Region, 2000–2015 (Geneva, 2016).

quarter (23 per cent) among those aged 15–29 years and a large proportion (38 per cent) occurring among those in the 30–49 age group. However, a considerable proportion of deaths worldwide from drug use disorders (39 per cent) do occur among drug users aged 50 and older.

It should be noted that for those aged 50 and older, deaths resulting from drug use disorders represent a smaller proportion of total deaths from all causes of mortality; deaths resulting from drug use disorders account for a higher proportion of mortality among younger people. As people get older, there is a greater number of age-related causes of mortality.

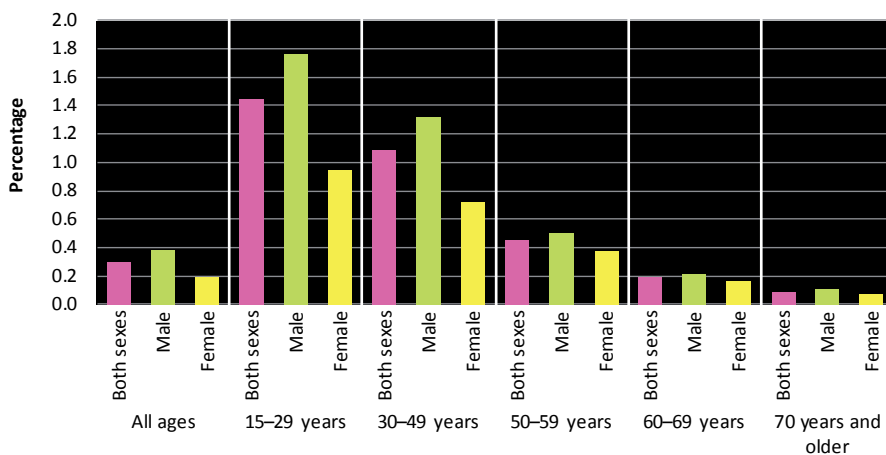
However, during the period 2000–2015, there was a rapid increase globally in the number of deaths resulting from drug use disorders among those aged 50 and older. This increase was more pronounced than among drug users under the age of 50. For those under the age of 50, deaths resulting from

308 Alessandro Pirona and others, “Ageing and addiction: challenges for treatment systems” EMCDDA Poster Series (Lisbon, September 2015).

309 *Selected Issue 2010*.

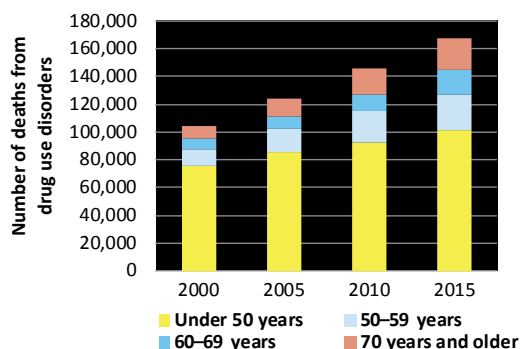
310 Johnston and others, “Responding to the needs of ageing drug users”.

FIG. 20 Proportion of deaths resulting from drug use disorders among deaths from all causes, by age group, worldwide, 2015



Source: WHO, Global Health Estimates 2015: Deaths by Cause, Age, Sex, by Country and by Region, 2000–2015 (Geneva, 2016).

FIG. 21 Deaths resulting from drug use disorders, by age group, worldwide, 2000–2015



Source: WHO, Global Health Estimates 2015: Deaths by Cause, Age, Sex, by Country and by Region, 2000–2015 (Geneva, 2016).

drug use disorders increased by one third, but for those aged 50 and older, the number more than doubled. Those 50 and older also accounted for an increasing proportion of deaths resulting from drug use disorders: while in 2000, 27 per cent of all deaths from drug use disorders were among people aged 50 and older, by 2015 that proportion had risen to 39 per cent.

The increasing number of deaths resulting from drug use disorders among those aged 50 and older, and the increasing proportion of all such deaths represented by that age group, is consistent across

all regions. In particular, in the Western Pacific³¹¹ and in the Americas, deaths resulting from drug use disorders among those aged 50 and older rose more than threefold over the period 2000–2015.

In Europe, the number of overdose deaths increased between 2006 and 2013 for those aged 40 and older, but declined for those under 40, in part a manifestation of the ageing population of opioid users.³¹² In the United Kingdom, which accounts for almost one third of overdose deaths reported in Europe,³¹³ there has been a sharp rise in the total number of deaths involving heroin and/or morphine since 2012. An ageing cohort of heroin users, increased purity and availability of the drug and changes in the specific drugs taken alongside heroin and/or morphine have contributed to this rise.³¹⁴

Globally, three quarters of deaths resulting from drug use disorders among those 50 and older are associated with the use of opioids. Deaths associated

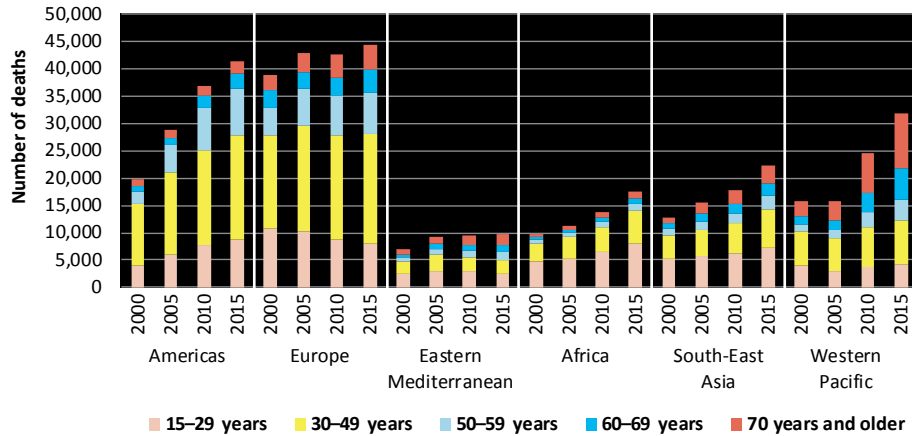
311 In the WHO classification, the Western Pacific region includes Cambodia, China, Japan, Malaysia, Mongolia, the Philippines, the Republic of Korea and Viet Nam, as well as Australia and New Zealand and the Pacific island countries.

312 Pirrona and others, “Ageing and addiction”.

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

314 United Kingdom, Office for National Statistics, “Deaths related to drug poisoning in England and Wales, 2015 registrations”, Statistical Bulletin (September 2016).

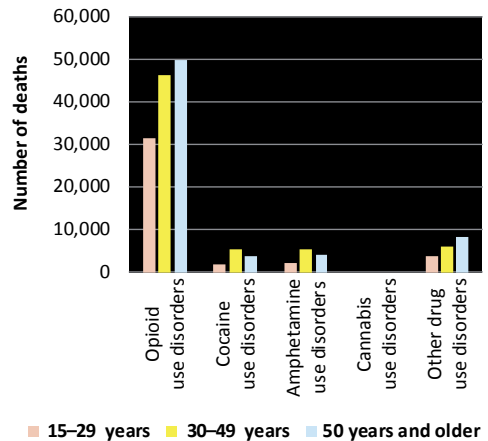
FIG. 22 | Deaths resulting from drug use disorders, by age group and region, 2000–2015



Source: WHO, Global Health Estimates 2015: Deaths by Cause, Age, Sex, by Country and by Region, 2000–2015 (Geneva, 2016).
 Note: Regions correspond to the classifications used by WHO.

with cocaine use disorders and amphetamine use disorders each account for about 6 per cent, and those associated with the use of other drugs make up the remaining 13 per cent.³¹⁵ This distribution is a reflection of a number of factors: the ability to identify different substances as the underlying cause of death, different historical patterns of drug use and the size of the populations using different drugs, and the availability and effectiveness of treatment options that may extend the life of drug users.

FIG. 23 | Deaths resulting from drug use disorders, by main drug categories and age, worldwide, 2015



Source: WHO, Global Health Estimates 2015: Deaths by Cause, Age, Sex, by Country and by Region, 2000–2015 (Geneva, 2016).

315 WHO, Global Health Estimates 2015: Deaths by Cause, Age, Sex, by Country and by Region, 2000–2015 (Geneva, 2016).



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 20th 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

