

one quarter of offenders were female. However, that proportion of female offenders varied significantly for the various drug classes, with the category of sedatives and tranquillizers standing out as the one with relatively high proportions of females, for both possession for personal use and trafficking offences. This conforms with drug use data for women.

The proportion of female offenders tended to be higher for trafficking offences than for possession related to personal use, but typically only marginally so, and still far below 50 per cent. Moreover, the relative importance (ranking) of each drug class, in terms of frequency of offending by females, was quite similar for trafficking and drug-use offences.

D. OPIATES: OVERVIEW

Cultivation and production

The global area under illicit opium poppy cultivation in 2013 was 296,720 hectares (ha), the highest level since 1998 when estimates became available. An increase in cultivation was seen in both Afghanistan and Myanmar. The main increase was observed in Afghanistan, where the area of opium poppy cultivation increased 36 per cent, from 154,000 ha in 2012 to 209,000 ha in 2013. The main area of cultivation in Afghanistan was in nine provinces in the southern and western part of the country, while the major increase was observed in Helmand and Kandahar.⁸⁷ In Myanmar, the increase in the area of cultivation was not as pronounced as in Afghanistan.

In South-East Asia, the total area under cultivation in the Lao People's Democratic Republic in 2013 was estimated

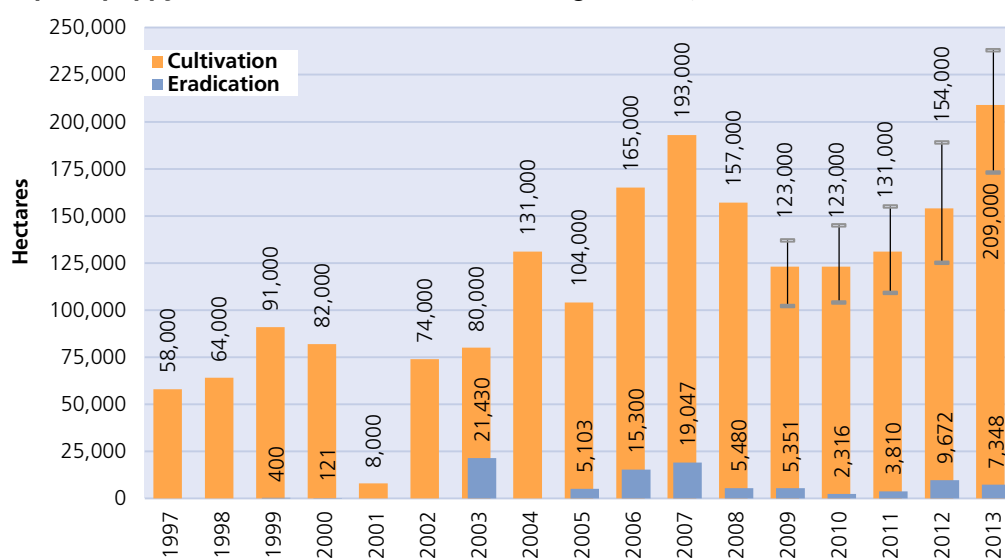
as 3,900 ha (range: 1,900-5,800 ha). However, the 2013 estimates are not comparable with the estimates of 2012 due to the varying methodology in the use of high-resolution satellite images and time of conducting the helicopter survey.⁸⁸ Myanmar continued the trend of increasing cultivation that began after 2006.⁸⁹ (See tables in annex I for details on opium poppy cultivation and production in the different countries and regions).

The potential production of opium in 2013 is estimated at 6,883 tons, which is a return to the levels observed in 2011 and 2008. The opium production in Afghanistan accounts for 80 per cent of the global opium production (5,500 tons). The potential production of heroin (of unknown purity) has also increased to 560 tons, comparable to 2008 estimates of 600 tons (see figure 16).

Seizures

Globally, seizures of heroin and illicit morphine went down 19 per cent in 2012. The main declines in opiate seizures were reported in South-West Asia and Western and Central Europe, where seizures declined by 29 per cent and 19 per cent, respectively (from 117 tons in 2011 to 82 tons in 2012 in South-West Asia, and from 6 tons in 2011 to 4.85 tons in 2012 in Western and Central Europe). A substantial increase in heroin seizures, however, was reported in Eastern and South-Eastern Europe (15.98 tons in 2012 compared with 9.88 tons in 2011), mainly as a result of increased quantities reported seized in Turkey. Heroin seizures also increased substantially in Australia and New Zealand (1.09 tons in 2012 compared with 0.61 tons in 2011) and in South Asia (1.3 tons in 2012 compared with 0.723 tons reported in 2011). In North America, heroin seizures declined by 58 per cent in Mexico but increased

Fig. 15. Opium poppy cultivation and eradication in Afghanistan, 1997-2013



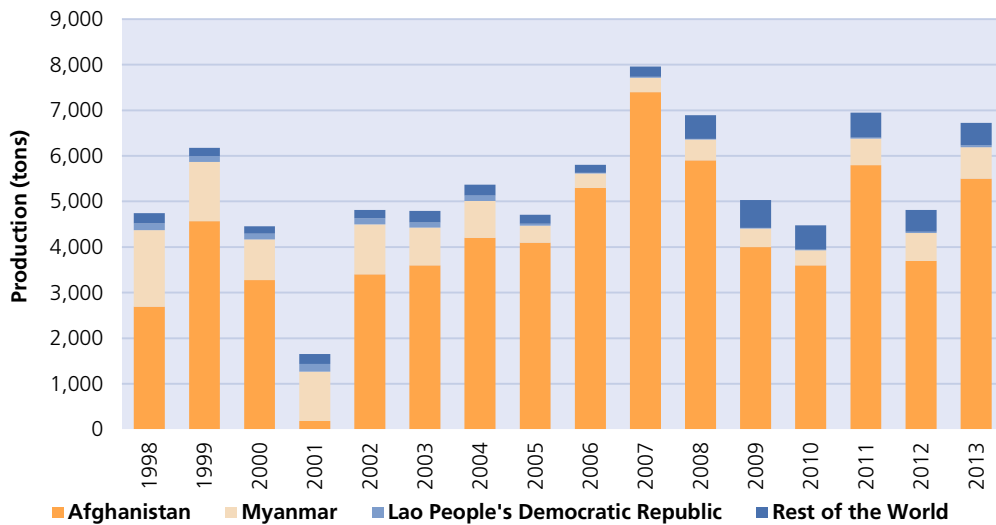
Source: 1997-2002: UNODC; since 2003: National Illicit Crop Monitoring System supported by UNODC.

⁸⁷ UNODC and Ministry of Counter Narcotics of Afghanistan, "Afghanistan opium survey 2013: summary findings", November 2013.

⁸⁸ UNODC, *Southeast Asia Opium Survey 2013* (Bangkok, 2013).

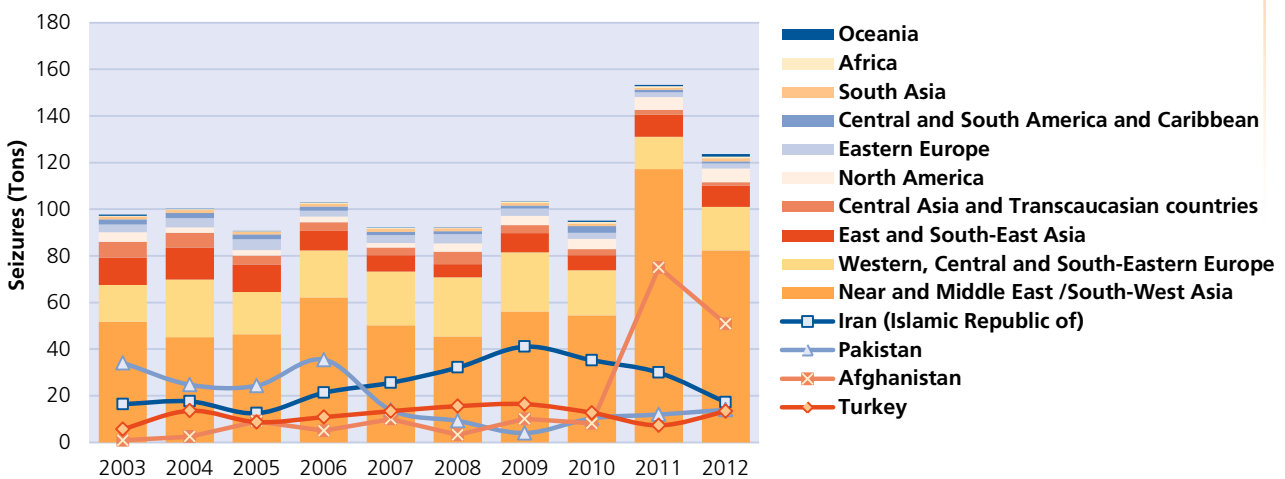
⁸⁹ *Ibid.*

Fig. 16. Global potential opium production, 1998-2013



Source: 1997-2002: UNODC; since 2003: National Illicit Crop Monitoring System supported by UNODC.

Fig. 17. Seizures of heroin and illicit morphine, in selected countries and by region, 2003-2012



Source: UNODC data from annual report questionnaire and other official sources.

in the United States, to 5.5 tons in 2012, compared with 4.8 tons in 2011. However, overall heroin seizures in North America have remained stable over the previous year.

Extent of use

Past-year use of opioids, including heroin and prescription painkillers, is estimated at between 28.6 and 38 million people globally. Compared to the global average prevalence of 0.7 per cent, opioid use remains high in North America and Oceania, with prevalence rates of 4.3 per cent and 3 per cent respectively. While opioid use has increased globally over the past year, the main increase has been observed in the United States. Although recent and reliable estimates are not available from Asia and Africa, many experts from countries in those regions also perceive an increase in opioid use. The use of opiates (heroin and opium), however, remained stable globally, with 12.8 million to 20.2

million past-year users. Opiate use at levels much higher than the global average of 0.4 per cent remain in South-West Asia (1.21 per cent), Eastern and South-Eastern Europe (0.82 per cent) and in Central Asia and Transcaucasia (0.81 per cent).

Opiates: market analysis

In comparison with other plant-based drugs, the global market for illicit opiates is perhaps the most complex. In contrast to cannabis, illicit cultivation and production feeding the illicit opiate market are limited to certain countries and regions. Consequently, illicit opiates are necessarily trafficked across large distances and through multiple countries in order to meet demand. In contrast to coca bush, illicit cultivation of opium poppy occurs on a significant scale in at least three geographically distinct areas — South-West Asia, South-East Asia and Latin America.

Moreover the historical delineations whereby the supply of illicit opiates in a given consumer market could be assumed to originate in one of those source regions — rather than from several — have blurred, with trafficking routes diversifying accordingly. Moreover, demand for illicit opiates is widespread and cannot be assumed to be concentrated in certain regions. These layers of production and consumption are intertwined. For instance, opium is consumed as is and further used to manufacture morphine, which is then used in the manufacture of heroin. Furthermore, opiates and other opioids, chemically and pharmacologically very similar, are also widely available and used as licit pharmaceutical products, resulting in an interplay that may involve diversion from licit to illicit markets at various stages of the supply chain.

Long-term assessment

In spite of the apparent complexity and the fluctuations in key supply indicators, a long-term perspective (taking 1991 as a starting point) reveals some elements of stability in the underlying fundamental indicators at a global level. As of the early 1990s, opium poppy was predominantly cultivated in South-East Asia; following a significant decline in that region, cultivation in Afghanistan increased significantly (reaching a record level in 2013), and cultivation returned to an increasing trend, as of 2007, in Myanmar. Global cultivation reached a low around 2005 and in 2013, returned for the first time to a level comparable to the high level of 1991 (even exceeding it by a small margin). However, owing to the typically higher yields in South-West Asia (disregarding transitory year-on-year fluctuations attributable to environmental factors), the overall trend over the period 1991-2013 was one of increasing production of opium poppy, even if the sharp increase in Afghanistan in 2013 is excluded.

Over the same period, seizures of illicit opiates worldwide (aggregated by assuming a conversion factor of approximately 10 kg of opium per 1 kg of heroin) increased quite steadily. This increase has a significant impact on global supply of opiates. UNODC estimates indicate that the ratio (sometimes referred to as the “interception rate”) of seizures of opiates to illicitly produced opiates present in the illicit market (both expressed in opium equivalents) increased from 4-9 per cent in 1991 to 18-30 per cent⁹⁰ in 2012.

With respect to the demand side, the earliest UNODC estimates of global consumption date to the late 1990s.

⁹⁰ These calculations are approximate and are derived by assuming that the weighted average purity of heroin seizures worldwide (among which seizures at upper levels of the supply chain, in terms of weight, are believed to be predominant) is no less than one third of the purity at the point of manufacture, and that a range of 7-10 kg of opium are needed for 1 kg of heroin at the point of manufacture. In addition, in order to account for the delay between the production of opium and seizures of derived opiates, some of which are made after processing into heroin and in locations far removed from the source, a two-year moving average of opium production is considered as a proxy for the amount of opiates present in the market.

Those estimates have always been produced on the basis of the latest available data, using a methodology that was being continually updated, and are therefore not strictly comparable. Nevertheless, they indicate a generally stable trend in terms of prevalence rate of annual use. However, since the global population has also been increasing, this means that there has been an increase in the number of users. That growth in demand appears to be weaker than the growth in supply. However, the growth trend in supply moves closer to the growth trend in demand once seizures are taken into account. Further, these estimations do not take into account any possible losses that may occur in times of excess production. If such losses did occur, it would suggest that the appropriately adjusted trend in supply would move even closer to the trend in demand. Even without that additional adjustment, and notwithstanding the large degree of fluctuation and uncertainty inherent in these estimates, the available supply of opiates (net of seizures) per opiate user appears to have increased only marginally, if at all, over the period 1998-2012.

Numerically, it would appear that the impact of opiate seizures by law enforcement authorities worldwide, while becoming more discernable in the big picture, had the effect of bringing the apparently strong growth in supply more in line with the growth in demand, which increased more slowly than opium production. However, it is not a foregone conclusion that there is in fact a causal relationship; it could possibly be the outcome of supply adjusting to the circumstances in order to keep meeting demand. In other words, one possibility is that the available supply was contained as a consequence of seizures, but the opposite cannot be excluded: that production adjusted to correct for seizures so as to keep supply stable. Most importantly, this picture is an assessment of the end result, but it is difficult to ascertain, for the purposes of comparison, what would have happened had the efforts of the international community been different. Moreover, it is important to note that the estimates on drug use are based on limited data and therefore subject to a high degree of uncertainty.

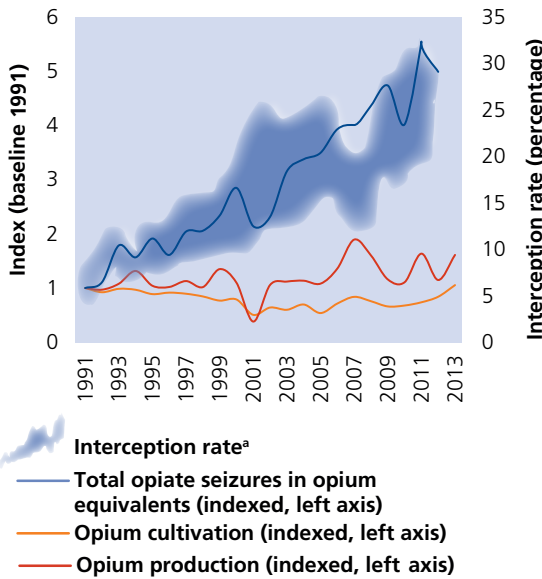
Recent trends

Although global supply and demand may be evening out globally in the long term, the illicit market for opiates is far from static, especially when shorter-term trends are taken into account. There is growing evidence of significant changes in the flows of heroin out of Afghanistan, of heroin from Afghanistan becoming more available in consumer markets other than the long-established European destinations, and of the interplay between the illicit and licit markets for opioids (including opiates).

European markets and their relationship to Afghanistan

It appears that the flow of heroin along the long-established Balkan route, from Afghanistan to Western and Central Europe via Iran (Islamic Republic of) and Turkey, has declined in recent years. Various factors may have contributed to the decline in seizures along this route, including

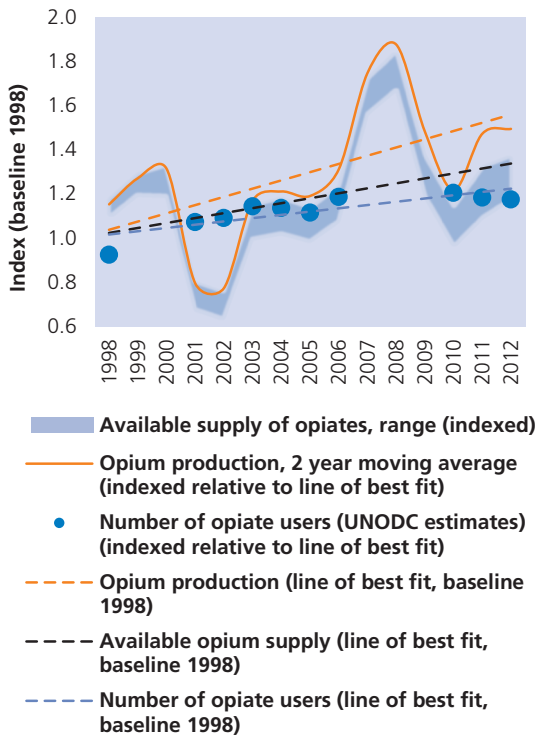
Fig. 18. Evolution of main opiate supply and supply reduction indicators, 1991-2013



a The practical significance of the “interception rate” should be approached with caution, as this concept is ultimately an abstract ratio which, depending on the context, may not always be intuitive (see footnote 90).

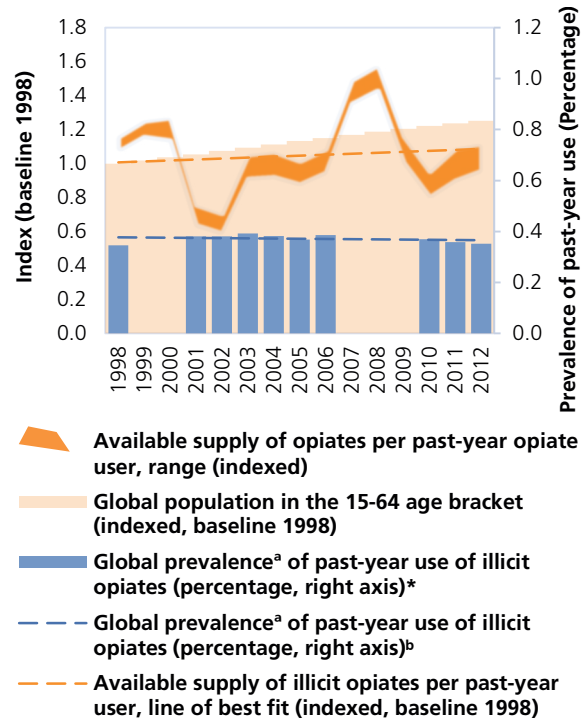
Source: UNODC estimates based on annual report questionnaire and national illicit crop monitoring systems supported by UNODC, supplemented by other official data.

Fig. 19. Comparison of growth rates in supply of and demand for illicit opiates, 1998-2012



Source: UNODC estimates based on annual report questionnaire and national illicit crop monitoring systems supported by UNODC, supplemented by other official data.

Fig. 20. Global prevalence of illicit opiate use and supply of illicit opiates per user, 1998-2012



Source: UNODC estimates based on annual report questionnaire, national illicit crop monitoring systems supported by UNODC and UNPD population data, supplemented by other official data.

Note: Comparable data is not available for 1999, 2000 and 2007-2009.

the success of law enforcement authorities in key transit countries and a decline in demand in the destination market.

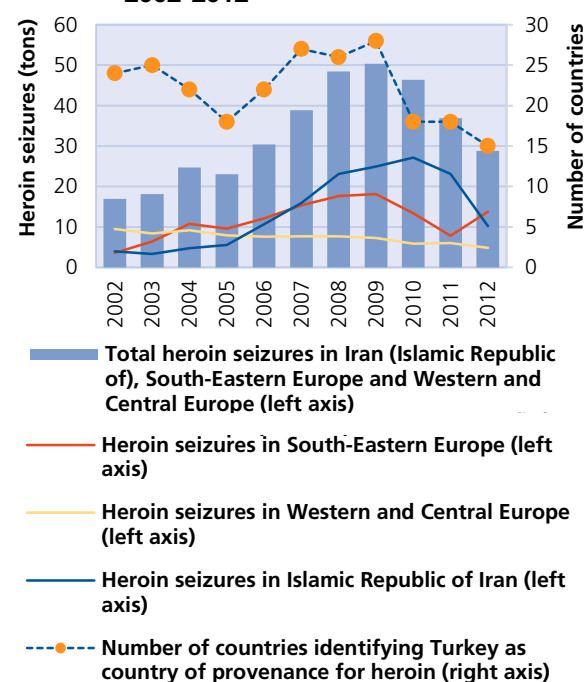
Based on UNODC estimates, the number of past-year users of opiates in Western and Central Europe may have declined by almost one third between 2003 and 2012 (from 1.6 million to 1.13 million). This is also observed for example, in the data from Germany, where the number of people arrested for the first time for heroin use fell steadily between 2003 and 2012 — overall, by more than one half. Even so, in 2011 and 2012, there may have been a certain deficiency in the available supply of heroin (which may yet be corrected), as the purity-adjusted price of heroin underwent a distinct transition between 2010 and 2011, and maintained the increased level in 2012. Indeed, the decline in heroin flowing on the Balkan Route appears to have been too sudden to be accompanied by a corresponding drop in demand. The ensuing shortfall may have helped trigger the development of routes serving as alternatives to the Balkan route — whose emergence is suggested by other evidence — to supply Europe, possibly via the Near and Middle East and Africa, as well as directly from Pakistan, suggesting that the so called Southern Route is expanding.⁹¹

91 UNODC, *The illicit drug trade through South-Eastern Europe*, 2014.

In the replies to the annual report questionnaires for the reporting years 2002-2011, Africa was only sporadically indicated as a region of provenance for heroin reaching Europe; in contrast, in 2012, East Africa which had previously never been identified by a European country as an area of provenance, was among the more prominent such regions in terms of number of mentions, following the Near and Middle East/South-West Asia (including Afghanistan) and South-Eastern Europe (including Turkey). Among East-African countries, the United Republic of Tanzania, which throughout the period 2010-2012 registered annual levels of seizures significantly higher than in previous years, appears to be the most prominent as a country of provenance, although Ethiopia, Kenya and Uganda were also mentioned. Italy in particular appears to be affected by this flow to a significant extent.

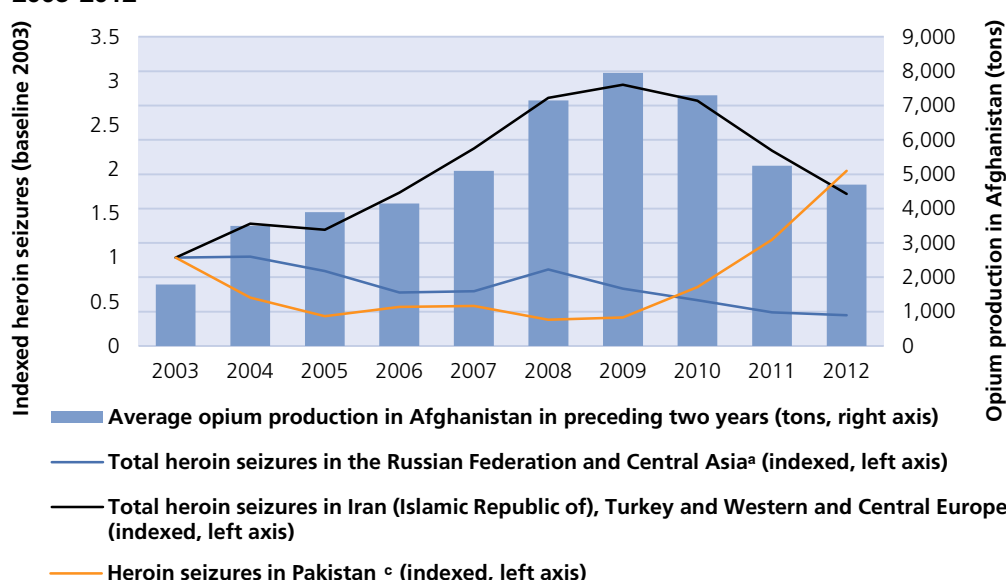
In an analysis of 120 cases in the period June 2006-October 2012 in which heroin was seized from air passengers on itineraries involving Europe,⁹² Pakistan was the second most cited country of provenance, second only to Turkey and followed by Kenya. While the role of Turkey as a transit country appeared to be on the decline over that time period, the cases involving Kenya related almost exclusively to the year 2012. In addition to European countries, other countries from Africa, including East and West Africa, as well as the Near and Middle East, also appeared as countries of provenance in those itineraries.

Fig. 22. Heroin seizures in key locations along the Balkan route and prominence of Turkey as a transit country for heroin, 2002-2012



Source: Seizure data: UNODC annual report questionnaire supplemented by other official data.

Fig. 21. Heroin seizure trends in key countries and regions along the Balkan and northern routes, compared with heroin seizure trends in Pakistan and opium production in Afghanistan, 2003-2012



Seizure data: UNODC annual report questionnaire supplemented by other official data.

Production: National illicit crop monitoring system supported by UNODC.

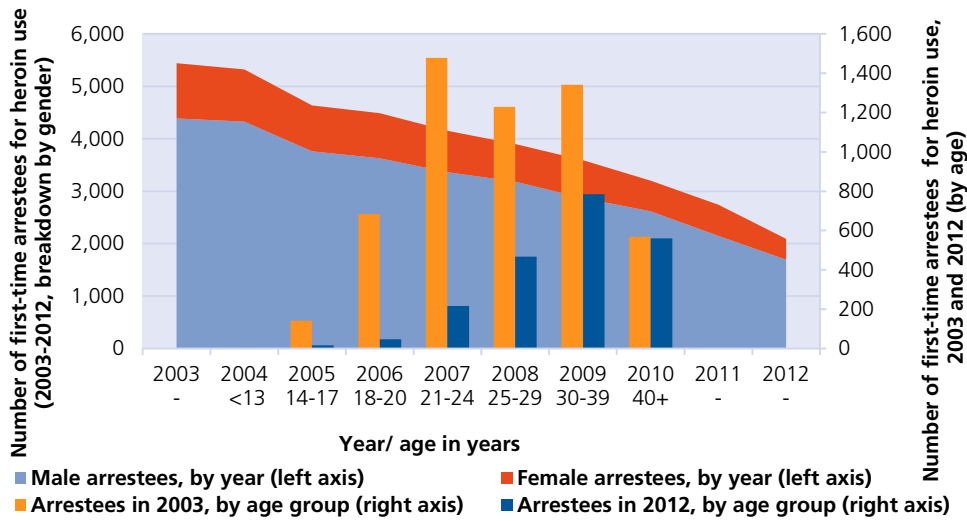
^a Taken as representative of the northern route.

^b Taken as representative of the Balkan route.

^c Possibly representative of the southern route.

92 Data from the database on illicit drug seizures with relation to European airports, Germany Customs.

Fig. 23. First-time arrestees for heroin use in Germany, 2003-2012



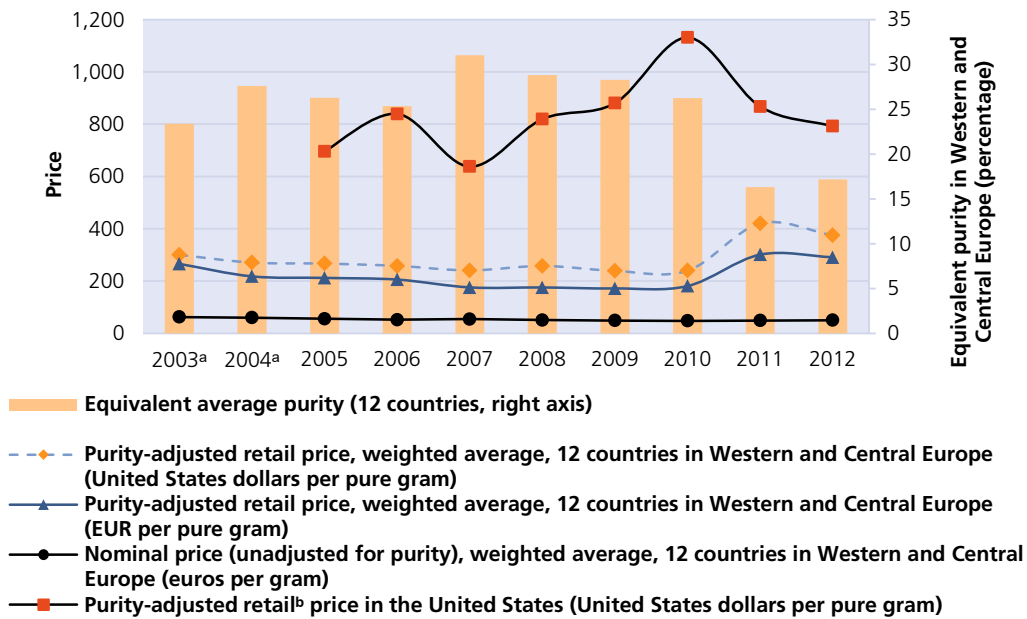
Source: Germany Bundeskriminalamt.

Data on individual heroin seizure cases⁹³ from Pakistan up to the first quarter of 2012 also confirm a recently increasing frequency of use of airports in Europe (notably the United Kingdom), the Near and Middle East (notably, in 2012, Oman and Saudi Arabia) and Bangladesh (although that increasing mention of Bangladesh was offset by decreasing mention of other countries in South Asia) as a destination for heroin couriers leaving Pakistan by air. However, consignments trafficked via passenger aircraft are necessarily small, and it is not clear to what extent such trafficking can affect the flow of heroin; these emerging

patterns are likely most significant to the extent that they reflect a broader tendency to source heroin from a given region using maritime or land transportation. The number of heroin seizure cases involving sea transport reported by Pakistan was much more limited; however, since 2009 the only such cases with a known destination were predominantly of shipments being sent to West and Central Africa, with all others destined for Western and Central Europe.

A distinct market for heroin, also supplied for several years by heroin from Afghanistan, is that of Eastern Europe,

Fig. 24. Heroin retail prices in Western and Central Europe and the United States, 2003-2012



Source: For European countries, UNODC annual report questionnaire, EMCDDA, European Police Office (Europol). For the United States, Office of National Drug Control Policy, United States.

^a For 2003 and 2004, comparable price data for the United States were unavailable.

^b Purchases recorded in the System to Retrieve Information from Drug Evidence (STRIDE) database of the United States Drug Enforcement Agency.

93 UNODC IDS database.

Fig. 25. Number of cases of heroin being seized from air passengers recorded in selected European airports with selected countries of provenance, 2007-2012



Source: Database on illicit drug seizures with relation to European airports IDEAS, German Customs.

^a Data for 2012 were incomplete.

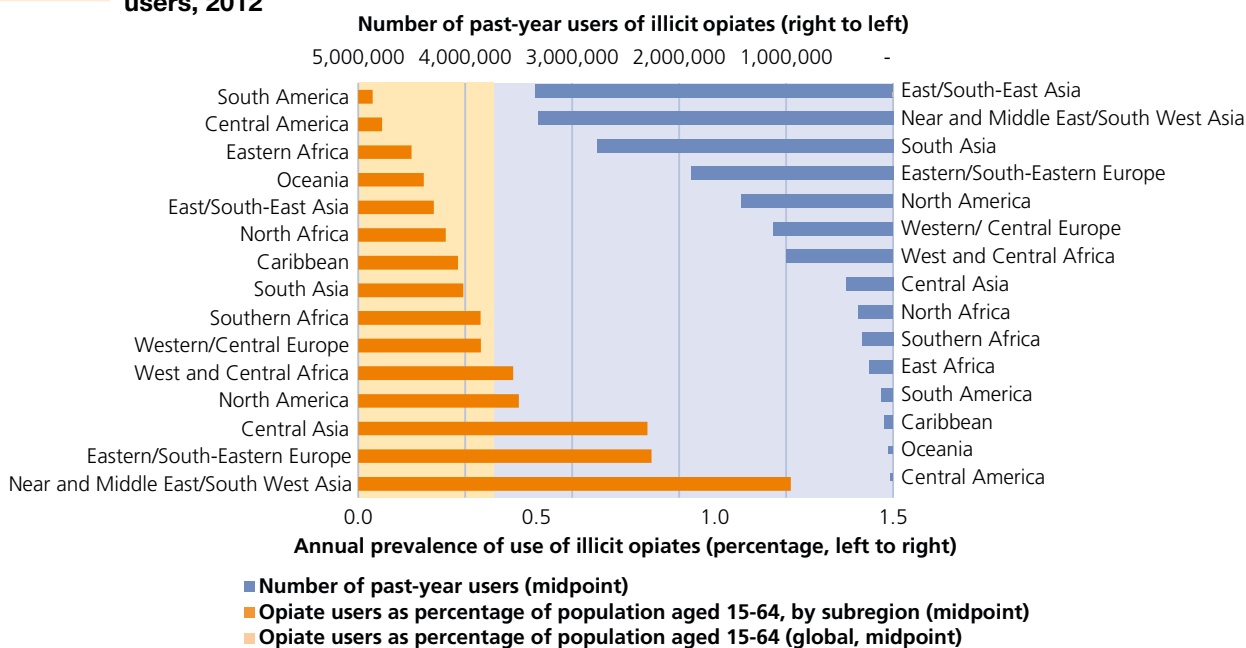
where the levels of opiate use are significantly higher than the global average. The Russian Federation remains a major consumer market for illicit opiates, with significant quantities of heroin flowing northwards from Afghanistan via Central Asia. A marked increase in total heroin seizures in the Russian Federation and Central Asia together (representative of that northern route) was observed between 1998 and 2004. Since then, overall seizures declined, but it is plausible that the increased availability may have stimulated a demand for opioids, which was met by alternative sources when the influx of heroin subsequently declined. If that is the case, it would be yet another instance of the

interaction between the licit and illicit markets for opioids. In 2011 and 2012,⁹⁴ in addition to seizures of heroin, the Russian Federation reported seizures of desomorphine — a substitute for heroin that can be derived relatively easily from pharmaceutical products — amounting to 100 kg in 2011 and 95 kg in 2012. Although these quantities are small in comparison with the quantities of seized heroin, in terms of number of cases, in 2012 there was approximately one desomorphine seizure for every three heroin seizures in the Russian Federation. (For comparison, in 2011, there had been approximately three desomorphine seizures for every four heroin seizures in that country.) The fact that the average quantity per seizure of desomorphine was low (8.2 g in 2012 and 3.5 g in 2011, compared with 65 g of heroin in 2012 and 55 g in 2011) confirms that desomorphine is typically home-made and not usually trafficked in large quantities.

Other markets and new flows through Pakistan

Approximately one fifth of illicit opiate users worldwide live in the subregion of the Near and Middle East/South-West Asia, in spite of the fact that the region accounts for only 6 per cent of the global population aged 15-64 years. Although opiate use, particularly the use of opium, is not new in that region, it is plausible that the high levels of production in Afghanistan may have brought about an increase in the use of opiates (and, by association, possibly other opioids) close to this major source of illicit opium. In Pakistan, the annual prevalence of regular opiate use is estimated to have risen from 0.7 per cent in 2006 to 1.0 per cent in 2013.⁹⁵ With reference to the period 21 March

Fig. 26. Ranking of past-year use of illicit opiates by subregion, based on prevalence and number of users, 2012



Source: UNODC estimates based on annual report questionnaire and UNPD population data, supplemented by other official sources.

94 UNODC, annual report questionnaire, replies submitted by the Russian Federation for 2012.

95 UNODC and Pakistan, Ministry of Narcotics Control, “Drug use in Pakistan, 2013: technical summary report”.

2011-19 March 2012,⁹⁶ experts in the Islamic Republic of Iran, a country with relatively high rates of opium use, perceived an increase in both opium and heroin use.

With respect to Afghanistan, a recent study⁹⁷ conducted by the United States Government found high (in comparison with other countries) levels of use or exposure in the urban population of Afghanistan (overall and among both men and women), with 2.6 per cent of the urban test population (of all ages) testing positive for opioids (including pharmaceutical opioids). Users of opioids in the form of opium and heroin were predominantly men, while women predominantly used codeine. Even a relatively high proportion of children tested positive for opioid use (including heroin): the study indicates that some 1.3 per cent of urban children were exposed to an opioid present in their physical environment or had been given the drug by an adult.

Although the annual prevalence of use of illicit opiates in East and South-East Asia is estimated to be significantly below the global average, this subregion accounts for approximately one fifth of all users globally, mainly by virtue of the large population of China. In the past, the heroin market in China was supplied mainly from South-East Asia; although Myanmar in particular continues to be a major source country for heroin reaching China, it appears that around 2006, a surplus of heroin from Afghanistan started to find its way to China, via Pakistan and other countries in South-East Asia.⁹⁸ By 2007, the number of registered heroin users in China, which had declined in 2005, was on the increase, and heroin seizures in China followed a similar pattern, with a slight delay, which could be attributable to a time lag as law enforcement authorities adjusted their efforts to the changing flow.

This evidence does not immediately translate into a conclusion that heroin use in China is on the rise, especially since some of these indicators could reflect drug supply and demand reduction efforts rather than supply itself; indeed, the latest UNODC estimates suggest that annual prevalence of opiate use in China (in 2012) is lower than previously thought (0.19 per cent of the general population aged 15-64, compared with 0.25 per cent in 2005). However, it seems clear that the share of heroin in the Chinese market originating in South-West Asia continues to increase, as has also been indicated by Chinese authorities,⁹⁹ who detected 98 instances of heroin trafficking from South-West Asia in 2012 and 148 cases in 2013.¹⁰⁰ Heroin seizures in the Chinese province of Yunnan (bordering Myanmar), continued to increase, reaching 5.4 tons in 2012, constituting 74 per cent of the

total for China for that year. It is likely that these quantities originate in Myanmar, in line with the increasing trend in opium poppy cultivation in this country in recent years.

More broadly, South-West Asia (or countries therein) has recently been mentioned as a source of heroin with increasing frequency by countries in South-East Asia, including Indonesia and Malaysia, both of which have registered increasing heroin seizures since 2006. Malaysia in particular has a significant market for heroin, with a relatively high level of heroin use (although declining according to expert perception¹⁰¹), and an increasing inflow of heroin, trafficked via sea and air cargo, facilitated by groups with ties to Pakistan (possibly in collusion with West African groups active mainly in Malaysia in the trafficking of methamphetamine and cocaine) and intended for both the local market and for onward trafficking.¹⁰²

Nevertheless, the main source for heroin in Malaysia likely continues to be Myanmar.¹⁰³ In addition to heroin, it appears that the use of morphine is, or at least was in 2010, widespread in Malaysia; moreover, in recent years, authorities have dismantled a number of clandestine laboratories processing heroin (seven in 2011), apparently producing a low purity end product.^{104,105} The fact that heroin seizures in Pakistan have increased markedly since 2009, independently of the trend in opium production in Afghanistan and in contrast to seizures in key countries along the Balkan and northern routes, suggests a major transformation in the flows out of Afghanistan, with Pakistan playing an important role.

Given the extensive coastline of Pakistan on the Indian Ocean and that maritime channels generally provide the possibility of trafficking large quantities over long distances, it is likely that significant quantities of heroin are trafficked by sea out of Iran (Islamic Republic of) and Pakistan. Seizures by the Pakistan Anti-Narcotics Force (one of several law enforcement agencies in Pakistan) at seaports reached almost 1.2 tons in 2013, more than double the annual amounts throughout the period 2010-2012.¹⁰⁶ Reports of individual seizure cases also corroborate

96 Solar Hijri calendar year 1390.

97 United States, Department of State, *Afghanistan National Urban Drug Use Survey (ANUDUS)* (December 2012).

98 *World Drug Report 2011*, pp. 73 and 74 and fig. 42.

99 China, National Narcotics Control Commission, *2013 Annual Report on Drug Control in China* (Beijing, 2013).

100 *Ibid.*, *2014 Annual Report on Drug Control in China* (Beijing, 2014).

101 UNODC, *Patterns and Trends of Amphetamine-Type Stimulants and Other Drugs: Challenges for Asia and the Pacific* (November 2013).

102 *Ibid.*

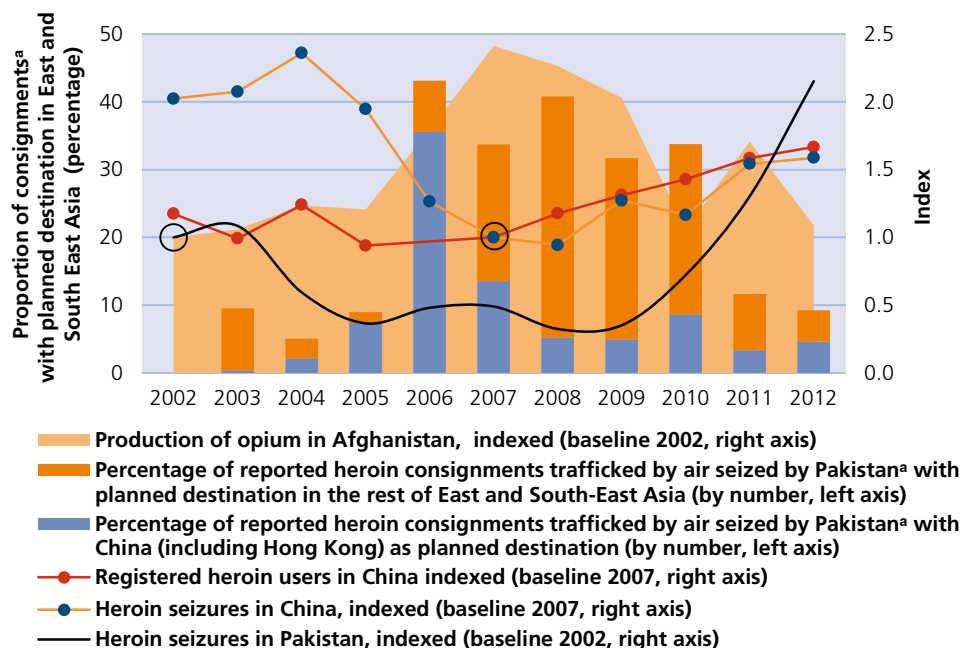
103 Malaysia assessed the proportion of seized heroin originating in Myanmar at 80 per cent in 2010. For the reporting year 2011, Malaysia mentioned the Lao People's Democratic Republic, Myanmar and Pakistan as the main countries of provenance. Over the period 2010-2012, Myanmar nationals accounted for the largest number of foreign nationals arrested for drug-related offences in Malaysia. See also UNODC, *Patterns and Trends of Amphetamine-Type Stimulants*, p. 92.

104 UNODC, *Patterns and Trends of Amphetamine-Type Stimulants* (November 2013).

105 Country report submitted by Malaysia to the Thirty-seventh Meeting of Heads of National Drug Law Enforcement Agencies, Asia and the Pacific.

106 Pakistan Anti-Narcotics Force "Heroin and precursors trafficking through southern route", presentation made at the UNODC workshop on Afghan opiate trafficking through the southern route, held

Fig. 27. Indicators of heroin use and supply in China, compared with selected indicators of opiate supply in South-West Asia, 2002-2012



Source: UNODC annual report questionnaire, National illicit crop monitoring system in Afghanistan supported by UNODC, UNODC IDS database, Office of the National Narcotics Control Commission of China (annual reports).

rate those maritime patterns of heroin trafficking. Based on a limited number of officially reported seizures of heroin consignments known to have been trafficked by sea, the proportion of total weight seized in cases for which Pakistan was mentioned as a country of provenance (including seizures made by authorities of Pakistan) rose sharply to a record level in 2009 and since then, has remained higher than in any prior year. In terms of the number of seizures, the increase was more gradual, but the proportion also climbed to record levels in 2010 and 2011. Further information from national law enforcement agencies¹⁰⁷ and international forces on specific, particularly significant seizures in the Indian Ocean, as well as in seaports and coastal regions in Africa, reinforces the evidence that heroin is being transferred for maritime conveyance on the southern coast of Iran (Islamic Republic of) and Pakistan. Laboratory analysis of several large heroin seizures (at least five seizures in excess of 100 kg each) in 2012 and 2013 made by the Combined Maritime Forces¹⁰⁸ in international waters have confirmed that Afghanistan is the country of origin for the heroin trafficked in those cases.¹⁰⁹

on 24 and 25 March 2014.

107 Presentations by the Drug Control Commission of the United Republic of Tanzania on heroin trafficking in the country and by the National Drug Law Enforcement Agency of Nigeria on “heroin trafficking: Nigeria’s experience”, made at the UNODC workshop on Afghan opiate trafficking, March 2014.

108 Combined Maritime Forces is a multinational naval partnership that operates in international waters, encompassing some of the world’s most important shipping lanes in the Indian Ocean and adjoining bodies of water.

109 Presentation by the Combined Maritime Forces on counter-narcotics operations in the Indian Ocean, made at the UNODC workshop on

India, with almost 18 per cent of the world’s population in the 15-64 age bracket, is exposed to illicit opiates originating in both South-East Asia and South-West Asia. According to Indian authorities (i.e. country report submitted by India to Thirty-seventh Meeting of Heads of National Drug Law Enforcement Agencies, Asia and the Pacific, and the reply submitted by India in response to the 2011 UNODC annual report questionnaire) heroin from South-West Asia reaches India across the India-Pakistan border and tends to be trafficked onward to destinations such as Europe, the United States and South-East Asia. These destinations are presumably more lucrative markets than India, given the relatively low price of heroin in India (reported to be the equivalent of \$8.6-\$13 per gram, as of 2011, compared with a range of \$100-\$400 per gram of heroin from South-West Asia in the United States and an average price, taken from 17 countries in Western and Central Europe and weighted by population, of \$72, both in the same year). The share of heroin of South-West Asian origin as a proportion of total heroin seizures in India in 2011 was assessed at 45 per cent, while most of the remainder (54 per cent) originated in India itself (according to information submitted by India in the annual report questionnaire).

Moreover, Indian authorities also indicate illicit cultivation of opium poppy in some pockets within India, suspected diversion of opium from licit cultivation and manufacture of “brown sugar” (also referred to as “low-quality heroin”)

Afghan opiate trafficking, March 2014.

Access to pain medication

As stated in the International Narcotics Control Board (INCB) annual report for 2009, “One of the fundamental objectives of the international drug control treaties is to ensure the availability of narcotic drugs and psychotropic substances for medical and scientific purposes and to promote the rational use of narcotic drugs and psychotropic substances”.

While opioids are essential in the management of pain experienced by millions of people who might be suffering from late-stage cancers, AIDS, surgical procedures and other debilitating diseases and conditions,¹ they are also susceptible to abuse.² This means that countries face the challenging task of balancing two public health needs: ensuring the availability of these controlled substances for medical purposes and preventing their misuse and diversion.

Many countries have expressed concern about misuse, and available data show a high prevalence of misuse of prescription opioids in some countries. This includes the high-income countries,³ such as Australia, Canada and the United States that have high per capita consumption of opioids for medical purposes, and even lower-middle-income countries such as Nigeria and Pakistan, which have the lowest per capita consumption of opioids for medical purposes.⁴ That suggests that the dynamics of misuse of prescription opioids does not necessarily follow making opioids accessible or available for medical purposes.⁵

As a response to potential or real misuse of these medicines, many countries, contrary to the provisions of the drug control conventions, have laws and regulations that are unduly restrictive or burdensome,⁶ resulting in a situation where a large part of the population does not have access to most of the opioid medications commonly used for the treatment of pain and dependence syndrome.⁷

Globally, in 2011, the opioid consumption for medical purposes in morphine equivalence (ME) per person was 61.66 milligrams (mg) per person.^{8,9} This comprises six main opioids: fentanyl, hydromorphone, methadone, morphine, oxycodone and pethidine. However, there is a great disparity among levels of consumption and accessibility of pain medications. The high-income countries, which comprise 17 per cent of the global population, account for 92 per cent of the medical morphine consumed, whereas more than half of the countries that reported to INCB in 2011 had consumption levels of less than 1 mg of morphine per person.

Comparison of per capita opioid consumption in morphine equivalence among lowest and highest consumption countries, 2011

Lowest consumption countries (mg per capita of morphine equivalence)		Highest consumption countries (mg per capita of morphine equivalence)	
Nigeria	0.0141	Canada	812.1855
Myanmar	0.0152	United States	749.7859
Pakistan	0.0184	Denmark	483.1678
		Australia	427.1240

Source: Pain and Policy Studies Group, University of Wisconsin-Madison.

A survey conducted by INCB in 2011 found that the laws and regulations in place for control of pain medications in many countries were unduly restrictive or burdensome and were perceived to be a significant limitation on availability. Other impediments to accessibility to pain medication included insufficient training of health-care professionals in the recognition and management of pain, and economic and procurement impediments such as deficiencies in drug supply management due to low financial resources or low priority given to health care, among other areas.

- 1 WHO, *Ensuring Balance in National Policies on Controlled Substances: Guidance for Availability and Accessibility of Controlled Medicines* (Geneva, 2011).
- 2 UNODC, discussion paper based on a scientific workshop, entitled “Ensuring availability of controlled medications for the relief of pain and preventing diversion and abuse: striking the right balance to achieve the optimal public health” (Vienna, 2011).
- 3 Based on the World Bank classification of income levels and development.
- 4 The annual prevalence of misuse of prescription opioids is as follows: Australia, 3.1 per cent; Canada, 1 per cent; Nigeria, 3.6 per cent; Pakistan, 1.5 per cent; and United States, 5.2 per cent.
- 5 B. Fischer and others, “Non-medical use of prescription opioids and prescription opioid related harms: why so markedly higher in North America compared to the rest of the world?” *Addiction*, vol. 109, No. 2 (February 2014), pp. 177-181, and the related debate.
- 6 *Report of the International Narcotics Control Board on the availability of internationally controlled drugs: ensuring adequate access for medical and scientific purposes* (United Nations publication, Sales No. E.11.XI.7), para. 131.
- 7 UNODC, discussion paper entitled “Ensuring availability of controlled medications for the relief of pain”.
- 8 INCB data on global per capita opioid consumption, 2011.
- 9 Pain and Policy Studies Group, “Global opioid global consumption, 2011” (University of Wisconsin-Madison), available at www.painpolicy.wisc.edu/2011-global-regional-and-national-opioid-consumption-statistics-now-available.

by indigenous groups.^{110, 111} Thus, it appears that the consumer market in India is mainly supplied by heroin of domestic origin, quite plausibly derived from a minor proportion of licitly produced opium diverted into the illicit market.

Moreover, heroin originating in India also reaches other countries in South Asia, such as Bangladesh and Sri Lanka, although the flow to Sri Lanka has reportedly declined,¹¹² and both those countries have long indicated South-West Asia as being among the sources for heroin reaching their territory.¹¹³

In Africa, aside from its increasing role as a transit area,¹¹⁴ the number of past-year users of opiates is estimated at between 0.92 million and 2.29 million. That broad range is a consequence of the paucity of data from African countries, which also extends to data from law enforcement authorities. The estimated annual prevalence of heroin use in West and Central Africa is above the global average, those subregions being long associated with small-scale trafficking by air, notably through Nigeria.¹¹⁵ Based on the latest available responses to the annual report questionnaire, South Africa is also believed to be a major consumer market, deriving its heroin supply from South-West Asia via East Africa and the Near and Middle East.

In Oceania, the annual prevalence of opiate use is relatively low. However, the annual prevalence of opioid use in Oceania is estimated to be more than four times the global average. According to Australian authorities,¹¹⁶ in 2011 and in the first six months of 2012, approximately one half of heroin samples from seizures analysed by the Australian Federal Police were of South-West Asian origin.

According to the United States, in 2012, the availability of heroin continued to increase in that country, likely due to high levels of heroin production in Mexico and Mexican

traffickers expanding into “white heroin” markets.¹¹⁷ Some metropolitan areas in the United States experienced an increase in heroin overdose deaths. Apart from heroin originating in Latin America, heroin from South-West Asia may be reaching the North American market in larger quantities. Canada, which continues to identify Pakistan and India as being among the prominent countries of provenance for heroin reaching its market, mentioned an increase in the number of heroin seizures from couriers on commercial airlines in the latter part of 2012 and in early 2013, and reported that this could be due to a resurgence in the use of heroin across Canada, as well as possible export to other countries, such as the United States.¹¹⁸ However, the United States has not reported a significant flow of heroin from Canada. India and the United States both indicated that there was a flow of heroin from India to the United States; it is plausible that the flow of heroin reaching North America from India, while probably still small in relation to the size of the North American consumer market, is of South-West Asian origin (as discussed above).

In Latin America, despite illicit cultivation of opium poppy in some countries and the manufacture of heroin in Colombia and Mexico, destined mainly for the United States, the prevalence of opiate use is relatively low. South America, Central America and the Caribbean collectively accounted for less than 3 per cent of global seizures of heroin in 2012.

The interplay between illicit and pharmaceutical opioid use

At the heart of opioid addiction is the powerful rewarding effect that occurs when the active compound binds to the μ -opioid receptor, triggering a cascade of intense pleasurable responses related to the brain dopamine release. Users describe an initial rush followed by feelings of warmth, pleasure and sedation.¹¹⁹ Once regular use is established, vulnerable individuals develop an uncontrollable compulsive behaviour that is the main characteristic of opioid dependence, seeking to obtain the substance in spite of any negative consequence.

The rewarding effect is progressively modulated by tolerance until a point at which people using the opioid no longer obtain a reward but are aiming to re-establish a “normal” mood. The entire reward system is hijacked by the opioid substance, with motivational reactions no longer being driven by normal life rewards or salient stimuli but by the opioid. Once established, that mechanism is stable and persistent because it is related to significant changes in the expression of the genes of the brain cells.

110 Country Report by India to the Thirty-seventh Meeting of Heads of National Drug Law Enforcement Agencies, Asia and the Pacific, Bangkok 21-24 October 2013.

111 Country Report by India to the Thirty-sixth Meeting of Heads of National Drug Law Enforcement Agencies, Asia and the Pacific, Bangkok 30 October – 2 November 2012.

112 Country Report by India to the Thirty-seventh Meeting of Heads of National Drug Law Enforcement Agencies, Asia and the Pacific, Bangkok 21-24 October 2013.

113 UNODC, annual report questionnaire, replies submitted by Bangladesh, India and Sri Lanka; and country report submitted by India to the Thirty-seventh Meeting of Heads of National Drug Law Enforcement Agencies, Asia and the Pacific.

114 See UNODC, *World Drug Report 2013*, pp. 33-35.

115 Each year of the period 2002-2012, Nigeria consistently ranked between eighth and twelfth among all countries mentioned in the annual report questionnaire as countries of provenance of trafficked heroin. Over the period 2000-2011, Pakistan reported 681 heroin consignments trafficked by air with Nigeria as a destination; expressed as a percentage of all such seizure cases with a known destination other than Pakistan, this number peaked at 51 per cent in 2004 and declined to 3 per cent by 2011. Nigeria assessed the percentage of heroin on its territory that had been trafficked by air in 2004 to be 90 per cent; in 2012, the corresponding proportion was 25 per cent for inbound seizures and 70 per cent for outbound seizures.

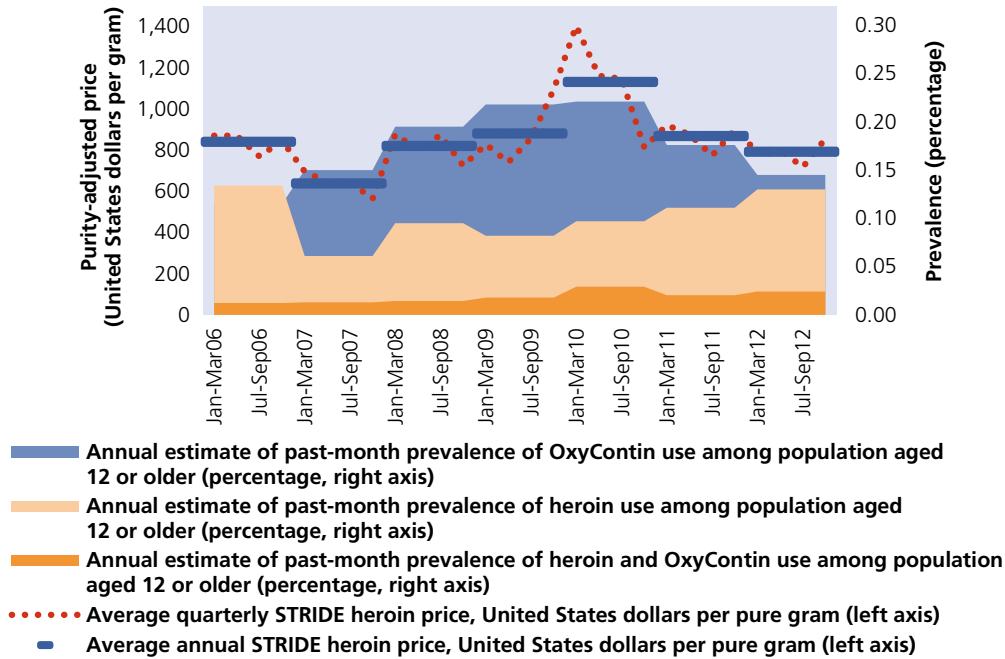
116 Australian Crime Commission, *Illicit Drug Data Report 2011-12*.

117 UNODC, annual report questionnaire, replies submitted by the United States for 2012.

118 UNODC, annual report questionnaire, replies submitted by Canada for 2012.

119 EMCDDA, Drug profiles, heroin. Available from www.emcdda.europa.eu.

Fig. 28. Price of heroin and past-month prevalence of use of OxyContin and heroin in the United States, January 2006–December 2012



Source: Office of National Drug Control Policy, US Government and data from National Surveys on Drug Use and Health (NSDUH) of the Substance Abuse and Mental Health Services Administration and extracted from SAMHDA (Substance Abuse and Mental Health Data Archive) hosted by the Inter-university Consortium for Political and Social Research at the University of Michigan.

The use of multiple opioids is common among dependent users, who may choose one or the other depending on factors such as the local accessibility, availability and price of the opioids.

In the United States, where over 5 million people abused prescription pain relievers in 2010,¹²⁰ those with the most severe dependency on pharmaceutical opioids were found to be 7.8 times more likely to have used heroin in the past year.¹²¹ In 2012, people in the United States who had ever used heroin were almost five times more likely to have used pain relievers, for other than medical purposes, than people in the general population, and about one third had misused OxyContin, a commercial brand of oxycodone. Conversely, among people who had ever used OxyContin, almost one quarter had also used heroin.¹²² Another study compared admissions rates for overdoses from prescription opioids and heroin between the years 1993 and 2009 and found that overdose from one strongly predicted an overdose from the other — evidence that the markets of heroin

and prescription opioids are strongly interconnected.¹²³

In the United States, the shift in the opioid market towards heroin is also evidenced by high availability and lower prices of heroin. Also, fluctuations in the heroin market, reflected in the price of heroin since 2007, appear to have compensated for the use of other opioids, notably OxyContin, with the price of heroin correlating strongly with the past-month use of OxyContin (see figure 28).

In line with these findings, according to the United States Drug Enforcement Agency, law enforcement officials nationwide have noted prescription opioid abusers switching to heroin because it was cheaper and/or more easily obtained than prescription drugs. Given the variable levels of heroin purity, the replacement of heroin with prescription opioids is also fraught with risks of overdose. In several places in the United States, heroin overdoses have increased substantially. For example, in Minneapolis-Saint Paul, overdoses tripled in the span of one year, rising from 16 overdoses in 2010 to 46 overdoses in 2011.¹²⁴

These changes in the heroin market have been concurrent with national measures to control the misuse of prescription drugs. In 2010, OxyContin was modified to make it a controlled-release formulation so that it could no longer

120 United States, Department of Health and Human Services, National Institute on Drug Abuse, "Topics in Brief: Prescription Drug Abuse" (December 2011), available at www.drugabuse.gov/publications/topics-in-brief/prescription-drug-abuse.

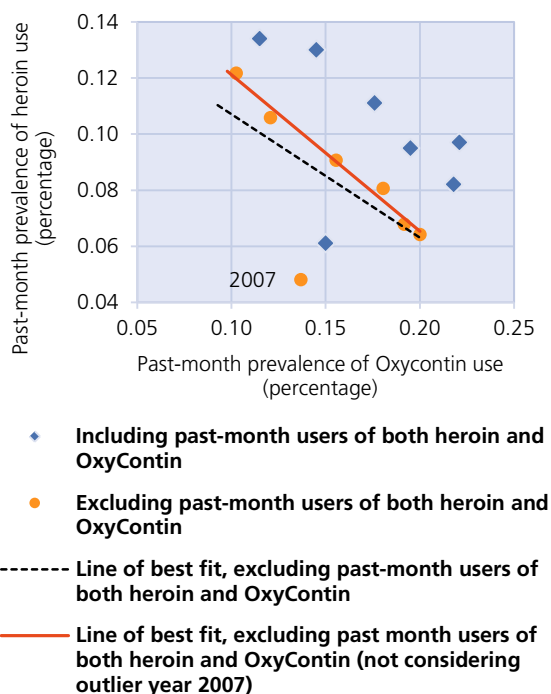
121 C. M. Jones, "Heroin use and heroin use risk behaviors among non-medical users of prescription opioid pain relievers — United States, 2002–2004 and 2008–2010", *Drug and Alcohol Dependence*, vol. 132, Nos. 1 and 2 (September 2013), pp. 95–100.

122 UNODC estimates based on data from the National Survey on Drug Use and Health of the Substance Abuse and Mental Health Services Administration and extracted from the Substance Abuse and Mental Health Data Archive, hosted by the Inter-university Consortium for Political and Social Research at the University of Michigan.

123 G. J. Unick and others, "Intertwined epidemics: national demographic trends in hospitalizations for heroin-and opioid-related overdoses, 1993–2009", *PLOS ONE*, vol. 8, No. 2 (2013).

124 United States, Department of Justice, Drug Enforcement Administration, "National Drug Threat Assessment Summary" (November 2013).

Fig. 29. Correlation of heroin use versus OxyContin use in the United States, past-month prevalence among population aged 12 or older, 2006-2012



Source: UNODC estimates based on data from National Surveys on Drug Use and Health (NSDUH) of the Substance Abuse and Mental Health Services Administration and extracted from SAMHDA (Substance Abuse and Mental Health Data Archive) hosted by the Inter-university Consortium for Political and Social Research at the University of Michigan.

be crushed and snorted or injected. Tangible impacts of these measures can also be seen in a study over the transition period (2009-2011), during which OxyContin users were found to be switching to other opioids, including heroin. A United States-based study of 2,566 patients undergoing treatment for opioid dependence before and after the formulation change found that it had led to a decrease in OxyContin misuse among the clients (from 35.6 per cent to 12.8 per cent), but as a replacement, fentanyl and hydromorphone use went up and heroin use had doubled.¹²⁵

In contrast, the declining availability of heroin in parts of Europe appears to have resulted in an increase in the use of prescription opioids. In Estonia, over the past decade, injecting drug users have switched from home-made opiates and heroin to illicitly manufactured fentanyl and amphetamine;¹²⁶ in 2012, 87.5 per cent of the clients in treatment listed fentanyl as their primary drug.¹²⁷ Also,

between 2011 and 2012, there was a 38 per cent increase in overdose deaths in Estonia, 80 per cent of which were related to fentanyl and its derivatives.¹²⁸ INCB now reports that fentanyl and buprenorphine have displaced heroin in Estonia and Finland.¹²⁹ Similarly, in the Russian Federation, decreased availability of heroin led to its partial replacement with local and readily available substances such as acetylated opium and desomorphine, a home-made preparation made from over-the-counter medicines containing codeine.¹³⁰

A similar trend can be observed in Australia and New Zealand. In 2001, the heroin market in Australia underwent a supply drop and a consequent change in consumption patterns,¹³¹ in which most indicators of heroin use declined and some consumers resorted to prescription opioids as a substitute. In particular, use of oxycodone increased significantly, displacing morphine in some cases.¹³² A comparison of price data for heroin and oxycodone in Queensland, Australia, in 2011 and 2012 shows that a tablet containing 60 mg of oxycodone cost 20-30 Australian dollars, while an equivalent amount of heroin at retail prices would have cost 40-50 Australian dollars.¹³³ Price data from New Zealand suggest that domestically produced “home bake” — a locally produced substance made from a chemical process involving prescription painkillers — remains a cheaper alternative to costly imported heroin.¹³⁴

These trends in the overlap of heroin and prescription opioid use can be observed in other regions for which

128 EMCDDA, “Drugnet Europe 85” (January-March 2014).

129 *Report of the International Narcotics Control Board for 2012* (E/INCB/2012/1).

130 *World Drug Report 2013*.

131 Amanda Roxburgh and others, *Trends in Drug Use and Related Harms in Australia, 2001 to 2013* (Sydney, National Drug and Alcohol Research Centre, University of New South Wales, 2013).

132 Assessment based on data on morphine and oxycodone injection surveyed in the Australian Illicit Drug Reporting System, presented in *Trends in Drug Use and Related Harms in Australia, 2001 to 2013*, p. 69. Similar trends also emerge from data — which cannot be differentiated into appropriate prescribing use and non-medical use — on medical prescriptions of these substances. See Amanda Roxburgh and others, “Prescription of opioid analgesics and related harms in Australia”, *Medical Journal of Australia*, vol. 195, No. 5 (2011), pp. 280-284.

133 This comparison is based on a price of 100 Australian dollars for a quarter of a gram of heroin in Queensland, taking into account a purity in Queensland of 18.1 per cent (median) at the retail level (for quantities not larger than 2 g), and a potency for heroin of 2.67-3.33 times that of oxycodone. Under those assumptions, 0.25 g of heroin would be equivalent to 121-151 mg of pure oxycodone, which is higher than the relevant purchase unit for oxycodone (60 mg, net of bulking agents). The comparison does not correct for the “bulk discount” possibly arising from this discrepancy, but such a correction (if it could be quantified) would render the price of heroin even higher relative to oxycodone. Price and purity data from the Australian Crime Commission, *Illicit Drug Data Report 2011-12*.

134 New Zealand reported a price of 1,000 New Zealand dollars per gram (approximately 807 United States dollars, using 2012 exchange rates) of imported heroin during the reporting years 2011 and 2012, which was double the per-unit price of “homebake” (50 New Zealand dollars per 100 mg), despite the greater size of the purchase unit of the former.

125 Cicero T. J., Ellis M. S. and Surratt H. L., “Effect of abuse-deterrent formulation of OxyContin”, *New England Journal of Medicine*, vol. 367 (2012), pp. 187-189.

126 EMCDDA, “Fentanyl in Europe: EMCDDA trendspotter study” (Lisbon, November 2012).

127 Information provided by Estonia in the annual report questionnaire (2012).

limited data are available. In Afghanistan, a survey in urban households showed that over half the women surveyed who reported opioid use (64 per cent) were combining heroin and/or opium with pharmaceutical painkillers, and 9 per cent of opioid-using women used only a prescription opioid.¹³⁵ In recent years, the misuse of tramadol (a lower potency opioid) has also been reported.¹³⁶ in parts of Africa, the Middle East and Asia.

What is clear is that the people who are dependent on opioids will move between the different opioids, interchanging one for another, all the while increasing their risks of serious health consequences. However, in the presence of accessible and evidence-based treatment, the situation can be prevented, while supply reduction efforts alone are likely to induce a balloon effect where one controlled substance is replaced by another.

E. COCAINE: OVERVIEW

Cultivation and production

Coca bush cultivation, which remains limited to Plurinational State of Bolivia, Colombia and Peru, continued to decline in 2012 with the net area under coca bush cultivation on 31 December 2012 totalled 133,700 ha, a decline of 14 per cent from the previous year's estimates and the lowest levels since the beginning of available estimates in 1990. That decline was driven mainly by a 25 per cent decline in coca bush cultivation in Colombia, from an estimated 64,000 ha in 2011 to 48,000 ha in 2012. However, those figures refer to the net area under coca cultivation on 31 December of the year given. In 2012, the Colombian Government manually eradicated 34,486 ha of cultivation and conducted aerial spraying of 100,549 ha. The addition of geographical data available on the presence of coca bush cultivation shows that 135,000 ha had been under cultivation at some point during 2012.¹³⁷ The greatest reduction in coca bush cultivation in Colombia took place in the departments of Nariño, Putumayo, Guaviare and Cauca.¹³⁸ The decline in coca bush cultivation observed in the Plurinational State of Bolivia continued in 2012 (25,300 ha in 2012 compared with 27,200 ha in 2011) and in Peru, where it declined to 60,400 ha from 62,500 ha in 2011. As a result, the estimated global production of cocaine has also declined. In Colombia, the potential production of pure cocaine was estimated at 309 tons, the lowest level since 1996. (For details see tables on coca bush cultivation and production estimates in annex.)

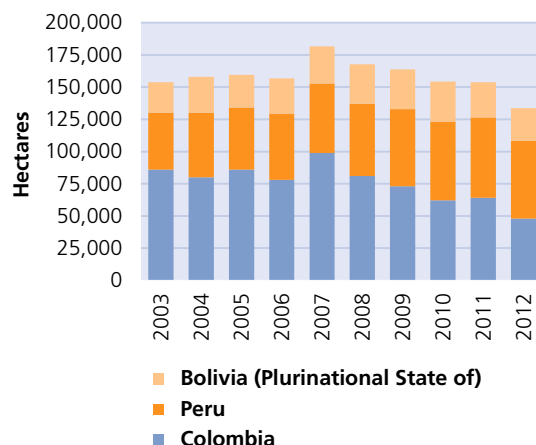
135 United States, Department of State, Bureau for International Narcotics and Law Enforcement, Demand Reduction Program Research Brief, "Afghanistan National Urban Drug Use Survey" (December 2012).

136 *World Drug Report 2013 and Report of the International Narcotics Board Control for 2012* (E/INCB/2012/1).

137 UNODC, Government of Colombia, *Colombia: Coca cultivation survey 2012* (June 2013).

138 Ibid.

Fig. 30. Coca bush cultivation 2003-2012

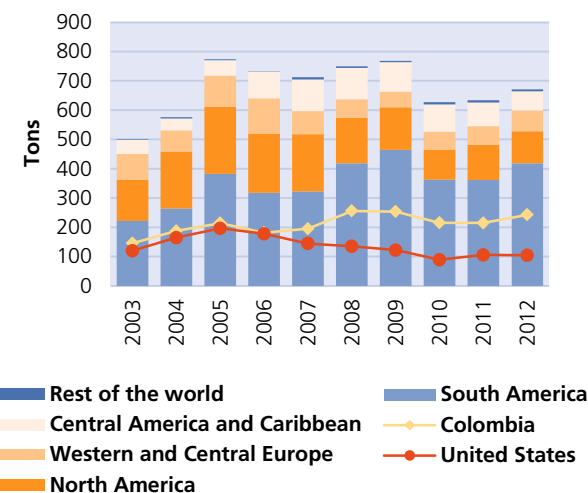


Source: Bolivia: 2002: CICAD and US Department of State, INCSR. Since 2003: National Illicit Crop Monitoring System supported by UNODC. Colombia: National Illicit Crop Monitoring System supported by UNODC. Peru: National Illicit Crop Monitoring System supported by UNODC.

Seizures

Globally, cocaine seizures have slightly increased over the past year, going up to 671 tons in 2012, compared with 634 tons in 2011, driven largely by increased seizures in South America¹³⁹ (418 tons in 2012 compared with 362 tons in 2011) and in Western and Central Europe, another major cocaine market, where seizures increased from 63 tons in 2011 to 71.2 tons in 2012.

Fig. 31. Seizures of cocaine worldwide and in selected countries, 2003-2012



Source: UNODC annual report questionnaire and other official sources.

Note: Includes seizures of cocaine salts, coca paste, cocaine base and crack cocaine.

139 However, there remains the possibility of double-counting of quantities of cocaine seized, considering that there are joint operations conducted by national agencies together with agencies of other countries.