COMMENTS ON THE REPORTED STATISTICS ON NARCOTIC DRUGS

Summary

The analysis in this section of the technical publication is based on statistical data furnished by Governments. The quality of the analysis depends on the data provided.

In 2015, the production of opium increased slightly in India, the only licit producer of opium for export, while in most countries stocks of opium continued to be depleted. The use of raw opium for the extraction of alkaloids has been reducing, while over 93 per cent of the industrial extraction of alkaloids came from poppy straw.

The production of poppy straw in the two main varieties (rich in morphine and rich in thebaine) was concentrated in Australia, France, Hungary, Spain and Turkey. The cultivation of opium poppy rich in codeine continued to take place in Australia and France.

The manufacture of morphine decreased in 2015 but remained above 400 tons. Most of it continued to be used for the manufacture of other drugs. The amount of morphine used for palliative care was less than 10 per cent and was unevenly distributed globally.

Global manufacture of codeine continued to decrease in 2015 to 334.4 tons, almost the same level as 2009. Codeine is used mainly in the form of preparations listed in Schedule III of the Single Convention on Narcotic Drugs of 1961. In 2015, 98 per cent of the total consumption of codeine was for this purpose.

Thebaine manufacture continued to drop, to 93.5 tons in 2015. That decrease may be due to restrictions on prescription drugs introduced in the main market (the United States of America) as a response to abuse of drugs manufactured from thebaine and the high number of overdose deaths.

In 2015, there were diverging trends in semi-synthetic opioids. Most of them—namely, ethylmorphine, hydrocodone, hydromorphone and oxycodone—registered decreases in both production and consumption, whereas both dihydrocodeine and heroin remained relatively stable in both respects. The manufacture and consumption of both dextropropoxyphene and diphenoxylate, however, continued to decrease, as a result of concerns about side effects.

Despite reports of increases in the number of overdose deaths due to abuse of fentanyl or fentanyl-type substances, mainly in North America, global manufacture of fentanyl remained high, increasing further in 2015, to 3 tons. Over the past 11 years, consumption of fentanyl, in terms of defined daily doses for statistical purposes (S-DDD), increased by 132 per cent from 114,752 S-DDD in 2005 to 266,825 S-DDD in 2015. In the same period the consumption of morphine increased by only 13 per cent, from 26,290 S-DDD to 29,708 S-DDD. While the manufacture of all fentanyl analogues (alfentanil, remifentanil and sufentanil) continued to increase, the consumption of remifentanil and sufentanil decreased and only that of alfentanil increased. Ketobemidone manufacture increased considerably, although its consumption remained stable and was limited to a few countries.

Methadone manufacture increased in 2015 after decreasing in 2014. The consumption of methadone remained stable. There was an increase in the manufacturing of buprenorphine, and its consumption remained high, despite a decline in 2015.

The licit use of cannabis has increased considerably since 2000. Since then, more and more countries have started to use cannabis and/or cannabis extracts for medical purposes, in addition to scientific research. In 2000, total production was 1.3 tons; by 2015, it had increased to 100.2 tons.

The licit production of coca leaf was concentrated in Bolivia (Plurinational State of) and Peru. While the Plurinational State of Bolivia provided a production estimate for 2016, Peru did not report any production data. However, trade data from Peru for 2015 indicated stable levels of trade of coca leaf, mostly with the United States. Cocaine manufacturing for medical use continued to fluctuate.

1. The present comments are intended to facilitate the use of the statistical information on the licit production, manufacture, consumption,[1] utilization[2] and stocks of, as well as trade in, opiate raw materials, the main opioids, including synthetic narcotic drugs under international control, and cannabis, coca leaf and cocaine that is presented in the tables of reported statistics (see pages 131-252 and annexes III and IV, pages 309-442). Unless otherwise indicated, the comments refer to developments during the period 1996-2015.

2. The tables of reported statistics in part four and annexes IV and V of the present report contain data furnished by Governments to the International Narcotics Control Board (INCB) in accordance with article 20 of the Single Convention on Narcotic Drugs of 1961 as amended by the 1972 Protocol.[3] The most recent statistical data reflected in the comments are those relating to 2015. The failure by some Governments to submit reports or to provide precise and complete reports may have a bearing on the accuracy of some of the information presented below.[4] The most pertinent conclusions and recommendations of INCB based on the analysis of statistical data are included in chapter II of its annual report.[5]

[1]For the purposes of the Single Convention on Narcotic Drugs of 1961, a drug is regarded as "consumed" when it has been supplied to any person or enterprise for retail distribution, medical use or scientific research; and "consumption" is construed accordingly (art. 1, para. 2).

[2]The parties shall furnish INCB with statistical returns on the utilization of narcotic drugs for the manufacture of other drugs, of preparations in Schedule III of the 1961 Convention and of substances not covered by the Convention and on the utilization of poppy straw for the manufacture of drugs.

[3]United Nations, *Treaty Series*, vol. 976, No. 14152.

[4]Details on the submission of statistical reports by individual Governments are contained in annex I to the present publication.

[5]E/INCB/2016/1.

Opiate raw materials

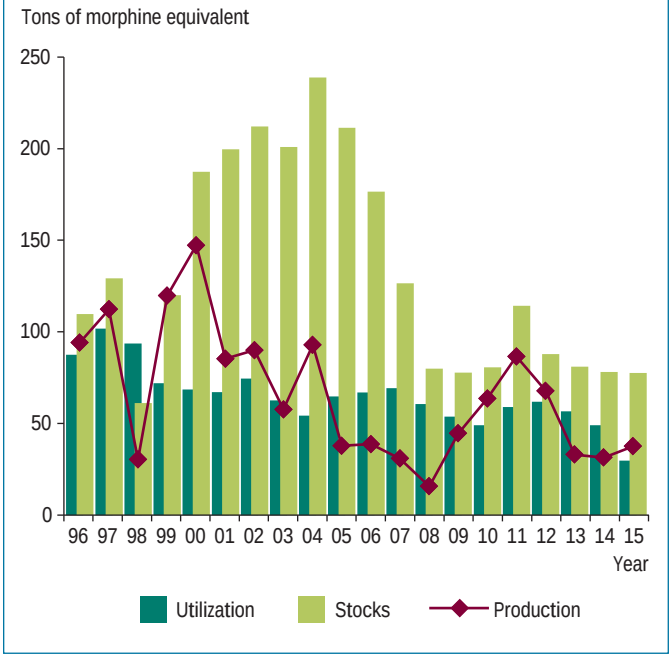
3. Opium and poppy straw are the raw materials obtained from the opium poppy plant (*Papaver somniferum*), from which alkaloids such as morphine, thebaine, codeine and oripavine are extracted. Concentrate of poppy straw is a product obtained in the process of extracting alkaloids from poppy straw. It is controlled under the 1961 Convention. Detailed information on the supply of opiate raw material and demand for opiates for medical and scientific purposes is provided in part three of the present publication.

Opium

4. Opium (also called "raw opium") is the latex obtained by making incisions on the green capsules of opium poppy plants. For statistical and comparison purposes, data on the production of and trade in opium are reported at 10 per cent moisture content. When appropriate, the data on opium are also expressed in morphine equivalent,[6] in order to enable comparison between opium and poppy straw. Figure 1 shows the licit production, stocks and use (consumption and utilization) of opium during the period 1996-2015, expressed in morphine equivalent. Not included in the data on stocks and use are the amounts of illicitly produced opium that were seized and released for licit purposes.

5. Opium production fell by more than half from 789.1 tons in gross weight (or 86.8 tons in morphine equivalent) in 2011 to 342.5 tons (or 37.6 tons in morphine equivalent) in 2015. Imports decreased from 283.1 tons (or 31.1 tons in morphine equivalent) in 2014 to 172.8 (or 19 tons in morphine) in 2015. In addition, stocks of opium continue to be depleted and decreased to 696.6 tons (or 77 tons in morphine equivalent) in 2015 (see figure 1).

Figure 1. Opium: global production, stocks[a] and use (consumption and utilization),[b] in morphine equivalent, 1996-2015



[a]Stocks as at 31 December of each year.

[b]Excluding the utilization of seized opium in Iran (Islamic Republic of) and Myanmar.

[6]The morphine or thebaine equivalent is calculated by INCB on the basis of the industrial yield of each alkaloid obtained from opium or poppy straw. Lesser alkaloids contained in opium or poppy straw that are convertible into morphine or thebaine have also been included, adjusted by appropriate conversion rates, whenever the Board has been informed of their extraction in commercially significant quantities.

6. India is the main producer and only licit exporter of opium, accounting for 335 tons (37 tons in morphine equivalent). That value represents over 98 per cent of global opium production and 92 per cent of exports in 2015. Other countries produce smaller amounts of opium, but exclusively for domestic consumption and utilization. China accounted for around 2 per cent (7.4 tons, or 0.8 tons in morphine equivalent) of global opium production, while Japan produced a minimal amount (1 kg). In China, poppy straw has replaced opium as the main raw material used for the manufacture of alkaloids since 2000.

7. Opium exported by India contains morphine in a concentration of 9.5 to 12.0 per cent, codeine in a concentration of about 2.5 per cent and thebaine in a concentration of 1.0 to 1.5 per cent. Opium imports from India fluctuated in the period 2006-2015, decreasing significantly in 2013 and in 2014 and reaching 172.8 tons in 2015 (or about 19 tons in morphine equivalent) (see figure 2). The main countries importing opium continued to be the United States of America, which accounted for 60 per cent of total imports in 2015, and Japan, which accounted for 29 per cent.

8. As in previous years, the bulk of opium was used for the extraction of alkaloids, with only a small amount (21.5 tons, or 2.3 tons in morphine equivalent) being used for Schedule III preparations. Total utilization of licitly produced opium for the extraction of alkaloids followed a declining trend during the period under consideration. Utilization declined to 271.7 tons, or 29.8 tons in morphine equivalent, in 2015 (excluding the utilization of seized opium in the Democratic People's Republic of Korea and Iran (Islamic Republic of)[7]). India, the United States and Japan, in descending order, are the main users of opium for the extraction of alkaloids, together accounting for over 58 per cent of the global total for 2015 (see figure 3). The Islamic Republic of Iran reported manufacturing over 193.2 tons (21.2 tons in morphine equivalent) for 2015 (about 41 per cent of the global total). However, if the Islamic Republic of Iran is not accounted for, India, the United States and Japan manufacture 99 per cent of opium. The cultivation of opium poppy in the Democratic People's Republic of Korea is characterized by a very low yield, which is attributed by the competent national authority to unfavourable climate conditions and a lack of fertile soil. Details on the utilization of opium for the extraction of alkaloids and the alkaloids obtained are provided in table III.

Figure 2. Opium: imports from India, in morphine equivalent, 2006-2015

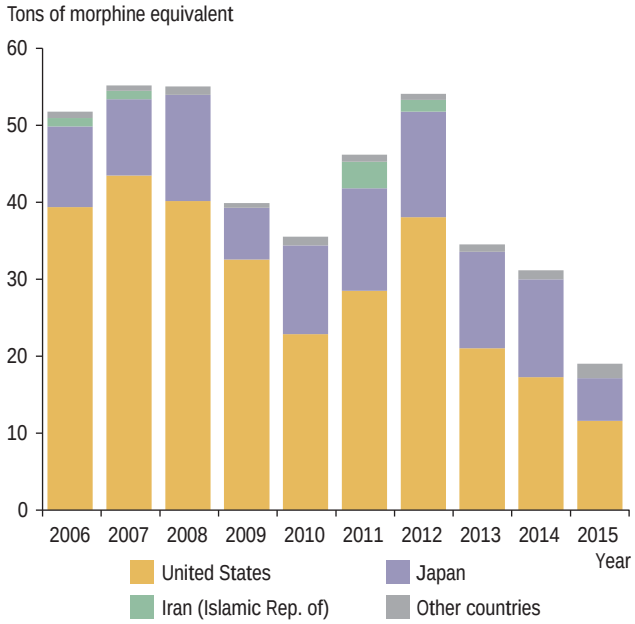
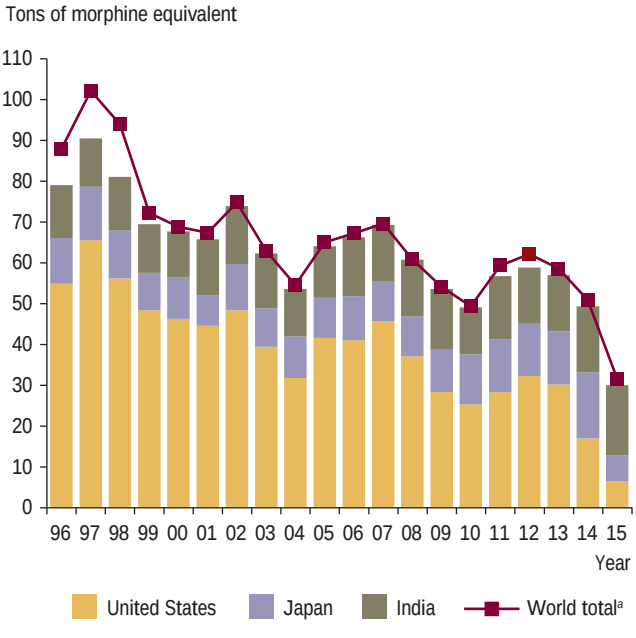


Figure 3. Opium: utilization for the extraction of alkaloids, in morphine equivalent, 1996-2015



[a]Excluding the utilization of seized opium in Iran (Islamic Republic of) and Myanmar.

[7]In the Islamic Republic of Iran, in addition to licitly produced opium imported from India (in the years 2004, 2006, 2007, 2011 and 2012 only), seized opium is released regularly in large quantities for the extraction of alkaloids. The yield of alkaloids extracted from seized opium is usually less than from licitly produced opium.

9. While the majority of opium is used for the extraction of alkaloids, opium is also consumed in some countries in the form of preparations, mainly for the treatment of diarrhoea and coughs. Most of those preparations are

included in Schedule III of the 1961 Convention.[8] Global consumption of opium has fluctuated since 2001. In 2015, total consumption increased to 22.8 tons, which corresponds to 194 million defined daily doses for statistical purposes (S-DDD).[9] In 2015, the consumption and utilization of opium for the manufacture of preparations in Schedule III amounted to 9.2 tons (1 ton in morphine equivalent) in China, 6 tons (0.7 tons in morphine equivalent) in India and 5.2 tons (0.6 tons in morphine equivalent) in France. Myanmar also reported consuming 0.2 tons of opium, but since the country does not have licit cultivation it is assumed that this originated from seizures.

10. Global stocks of opium reached a peak in 2004 (2,176.2 tons, or 239 tons in morphine equivalent) and then began to decrease (see figure 1), reaching 696.1 tons (77 tons in morphine equivalent) in 2015. India holds the largest amount of opium stocks (621.8 tons, or 68.4 tons in morphine equivalent, representing 87 per cent of the global total), followed by Japan (58.2 tons, or 6.4 tons in morphine equivalent) and China (13.5 tons, or 1.6 tons in morphine equivalent).[10] The United States has almost totally eliminated its stock from 137.2 tons in 2012 to 1.4 tons in 2015 (from 15 to 0.1 tons in morphine equivalent). The further overall reduction in global stocks and the reduction in production confirm the continuing trend towards the gradual phasing out of opium in favour of concentrate of poppy straw.

Poppy straw

11. Poppy straw consists of all parts of the opium poppy plant after mowing, except the seeds. Morphine is the predominant alkaloid found in the varieties of opium poppy plant cultivated in most producing countries. Commercial cultivation of the opium poppy plant with high thebaine content started in the second half of the 1990s. In the present publication, poppy straw produced from varieties of opium poppy plant rich in morphine is referred to as "poppy straw (M)", poppy straw produced from varieties of opium poppy plant rich in thebaine is referred to as "poppy straw (T)", poppy straw produced from varieties of opium poppy plant rich in codeine is referred to as "poppy straw (C)" and poppy straw produced from varieties of opium poppy plant rich in noscapine is referred to as "poppy straw (N)". Some of those varieties contain, in addition to the main alkaloid (morphine, thebaine, codeine or noscapine), other alkaloids that can be extracted.

12. The concentration of alkaloids in poppy straw varies significantly among the producing countries. Production levels of poppy straw among those countries can be compared only by use of a common denominator, which is the morphine or thebaine equivalent of the quantity of poppy straw produced in each country. Commercial cultivation of the opium poppy plant with a high codeine content started in Australia in 2010 and in France in 2013. For statistical purposes, the quantities of poppy straw produced from that variety of opium poppy are recorded under "poppy straw (M)".

Poppy straw produced mainly[11] from opium poppy rich in morphine (poppy straw (M))

13. Although the submission of statistics on the production of poppy straw is voluntary, most countries cultivating opium poppy plants for the extraction of alkaloids provided such information in 2015. Global production of poppy straw (M) expressed in morphine equivalent followed an increasing trend in the two decades prior to 2015. Over the years, production fluctuated sharply, mainly because of weather conditions and in response to the demand in manufacturing countries. It reached about 430 tons in morphine equivalent in 2003, declined to about 218 tons in 2008, but then increased again significantly, reaching 549 tons in 2015 (see figure 4). Throughout the two decades prior to 2015, Australia, France, Spain and Turkey were the main producer countries. In 2015, the leading producer was France (168 tons in morphine equivalent, accounting for 30 per cent of global production), followed by Australia (152 tons, or 28 per cent), Turkey (98 tons, or 18 per cent), Spain (33 tons, or 6 per cent) and Hungary (22 tons, or 4 per cent). Other main producers of poppy straw (M) in 2015 were, in descending order, China, the United Kingdom of Great Britain and Northern Ireland and Slovakia, which together accounted for the remaining 14 per cent of global production. In the case of Australia and France, for accounting purposes quantities of poppy straw (C) were included in the calculation of the quantities in morphine equivalent. Such quantities have become more significant in recent years. For example, out of the 152 tons in morphine equivalent reported by Australia, 59 tons were from poppy straw (C). In France, out of 168 tons reported, 35 tons were from poppy straw (C).

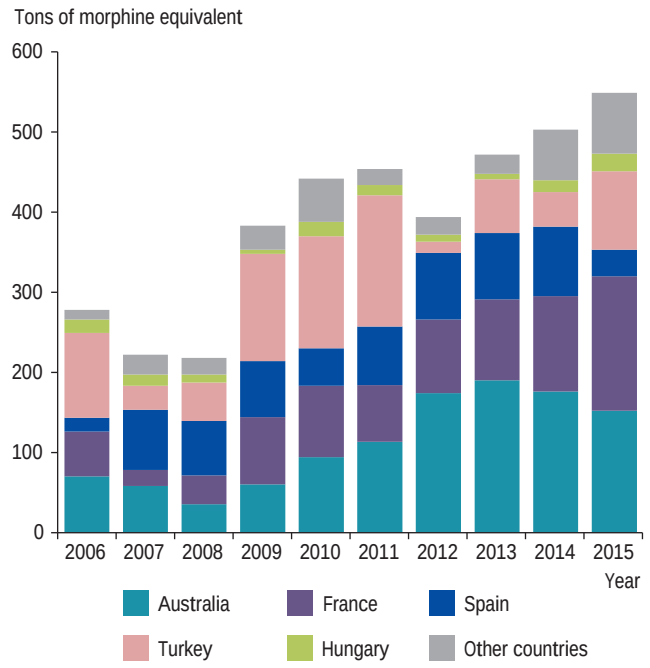
[8] Preparations included in Schedule III of the 1961 Convention are exempt from several control measures that are otherwise mandatory for preparations containing narcotic drugs, including reporting on their consumption and international trade.

[9] The list of defined daily doses for statistical purposes (S-DDD) and an explanation of that concept are contained in the notes to tables XIV.1.a-i, XIV.2 and XIV.3..

[10] For production of, stocks of and demand for opium, see also part three of the present publication, entitled "Supply of opiate raw materials and demand for opiates for medical and scientific purposes".

[11] The morphine equivalent quantities of the morphine and codeine alkaloids contained in other varieties of poppy straw such as poppy straw (T) and poppy straw (C) are also included in the total production figures in this paragraph, where applicable.

Figure 4. Total anhydrous morphine alkaloid contained in all poppy straw varieties: production in main producing countries, in morphine equivalent, 2006-2015



14. In 2015, the production of opiate raw material (calculated in morphine equivalent) mostly from poppy straw (M) decreased from 2014 in Australia (from 176 to 152 tons) and in Spain (from 87 to 33 tons), but increased in France (from 119 to 168 tons) and Turkey (from 43 to 98 tons) (see figure 4). Changes in the area cultivated with opium poppy plant, the amounts of poppy straw (M) harvested and the yields obtained in producing countries are shown in table II.

15. International trade in poppy straw (M) as a raw material continues to be limited. In 2015, Czechia was the main exporter of poppy straw (M) for the extraction of alkaloids, followed by Hungary, which had been the main exporter in 2014 (see annex IV, table 1). Hungary, which continued to manufacture large quantities of poppy straw, significantly increased its export since 2013. Czechia, which cultivates opium poppy plants primarily for the production of seeds for culinary purposes, produces poppy straw as a by-product and exports it to Slovakia, where it is used for the extraction of alkaloids. Such poppy straw has a significantly lower morphine content than poppy straw obtained from opium poppy plants cultivated for the production of alkaloids. In 2015, Slovakia imported a total of 4,349 tons (expressed in gross weight) of poppy straw (M) from Czechia and Hungary.

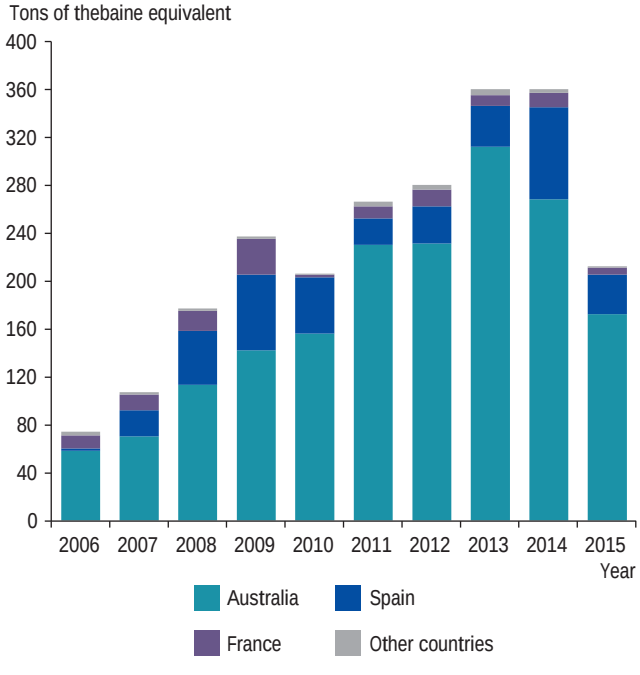
16. In 2015, the main countries utilizing poppy straw (M) were Turkey (27,314 tons in gross weight), France (5,306 tons), Spain (5,135 tons), Australia (4,674 tons) and Hungary (363 tons). Further details on the utilization of poppy straw (M) for the extraction of alkaloids and the yields obtained are contained in table IV.

Poppy straw produced mainly[12] from opium poppy rich in thebaine (poppy straw (T))

17. Australia and France started to report the production of poppy straw (T) to INCB in 1999. Spain reported the production of poppy straw (T) for the first time in 2004. China and Hungary have reported sporadic production in recent years. More details on the production of poppy straw (T) can be found in table II.

18. Global production of poppy straw (T) expressed in thebaine equivalent during the period 2006-2015 is shown in figure 5. In 2015, total production decreased to 216 tons in thebaine equivalent from 360 tons in 2014. In 2015, Australia remained the leading producer with 172 tons in thebaine equivalent, a significant decrease from 268 tons in 2014. It was followed by Spain whose production diminished from 77 tons in 2014 to 33 tons in 2015. France reported no production in 2015, since it did not cultivate such a variety; however, it extracted the thebaine alkaloid from poppy straw (M), which amounted to 6 tons that year. Hungary cultivated only 24 hectares and therefore produced a marginal amount of poppy straw (T) (0.1 tons).

Figure 5. Total anhydrous thebaine alkaloid contained in all poppy straw varieties: production in main producing countries, in thebaine equivalent, 2006-2015



[12]The thebaine equivalent quantities of the thebaine and oripavine alkaloids contained in other varieties of poppy straw such as poppy straw (M) and poppy straw (C) are also included in the total production figures in this paragraph, where applicable.

19. All poppy straw (T) is used in the producing and manufacturing countries for the extraction of alkaloids. The quantities used, the alkaloids obtained from poppy straw (T) and the yields are shown in table V.

Poppy straw produced from opium poppy rich in codeine (poppy straw (C))

20. Australia reported the cultivation of poppy straw (C) for commercial purposes for the first time in 2009 and France in 2013. This new variety was cultivated specifically to meet the high global demand for codeine. Its production has been increasing steadily, from 415 tons (expressed in gross weight) in 2010 to 6,706 tons in 2015. Australia produced 66 per cent of poppy straw (C) and France the remaining 34 per cent. Similar proportions were reported for utilizations and stocks for both countries.

Poppy straw produced from opium poppy rich in noscapine (poppy straw (N))

21. In recent years, an increase in the cultivation of opium poppy rich in noscapine (poppy straw (N)) in some producing countries was reported. In 2015, Hungary was the only country that reported the cultivation of poppy straw (N). The area harvested in Hungary in 2015 was 592 hectares, resulting in a total production of 257 tons (expressed in gross weight).

Poppy straw used for decorative purposes

22. In some countries, the poppy plant is cultivated for culinary and decorative purposes, mainly Austria, Czechia, Germany, the Netherlands, Poland and Ukraine.

Concentrate of poppy straw

23. Most countries using poppy straw for the extraction of alkaloids first manufacture an intermediate product called "concentrate of poppy straw", although in some countries morphine or thebaine is manufactured directly from poppy straw in a continuous process, which may involve a number of other intermediate products (for details, see tables IV and V). Until the second half of the 1990s, only concentrate of poppy straw containing morphine as the main alkaloid was manufactured. Since then, concentrate of poppy straw containing mainly thebaine, oripavine or codeine has started to be manufactured. Concentrate of poppy straw may contain a mixture of alkaloids, and more alkaloids than just the principal alkaloid may be extracted in industrial processes. The different types of concentrate of poppy straw are referred to by the main alkaloid contained in them.[13]

24. Since the actual content of alkaloids in concentrate of poppy straw may vary significantly, for purposes of comparison and for statistical purposes, all data referring to concentrate of poppy straw are expressed in terms of the quantity of the relevant anhydrous alkaloid contained in the material. The quantities of anhydrous morphine alkaloid contained in concentrate of poppy straw are referred to as AMA (CPS), those of anhydrous thebaine alkaloid as ATA (CPS), those of anhydrous oripavine alkaloid as AOA (CPS) and those of anhydrous codeine alkaloid as ACA (CPS). The totals of all the individual alkaloids contained in concentrate of poppy straw are examined below, expressed in terms of 100 per cent of anhydrous alkaloid content.[14]

Anhydrous morphine alkaloid contained in concentrate of poppy straw (AMA (CPS))

25. AMA (CPS) continues to be the most important and most widely used of the alkaloids contained in concentrate of poppy straw. Figure 6 shows the trends in its manufacture, stocks and utilization during the period 1996-2015.

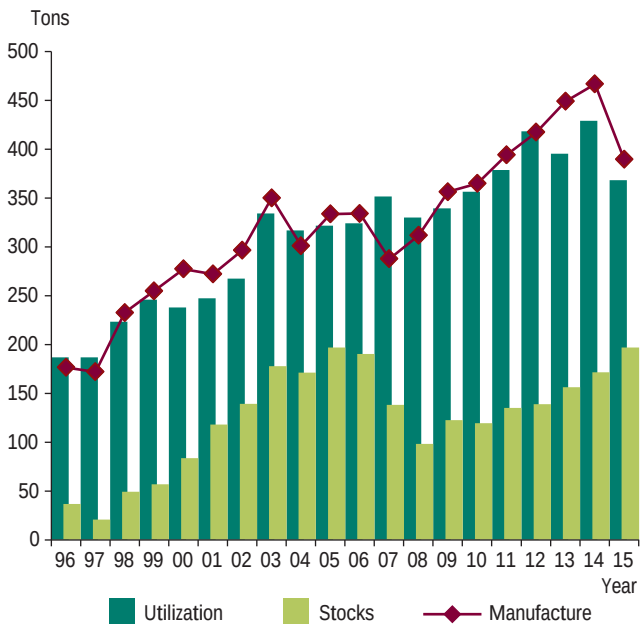
26. Global manufacture of AMA (CPS) has continuously increased since the 1990s, albeit with some fluctuations between 2003 and 2008, reaching its highest level ever in 2014 (466.3 tons). Its manufacture decreased in 2015 to 389.3 tons. Trends in the manufacture of AMA (CPS) in the main manufacturing countries in the period 1996-2015 are presented in figure 7.

27. Over the previous decade, Australia and Turkey were the leading manufacturers of AMA (CPS). In 2015, Turkey reported the largest quantity manufactured (90.7 tons, or 23.3 per cent of global manufacture), followed by France, Australia and Spain (76.5, 76.2 and 74.3 tons, respectively). Other countries reporting manufacture of AMA (CPS) for 2015 were the United Kingdom (35.1 tons), China (27.4 tons) and Belgium (8.5 tons).

[13] Currently, the following types are traded: *(a)* concentrate of poppy straw containing morphine as the main alkaloid; *(b)* concentrate of poppy straw containing thebaine as the main alkaloid; *(c)* concentrate of poppy straw containing oripavine as the main alkaloid; and *(d)* concentrate of poppy straw containing codeine as the main alkaloid.

[14] The comments on concentrate of poppy straw in this publication are not directly comparable with comments on concentrate of poppy straw contained in editions of this publication prior to 2005, since at that time concentrate of poppy straw was expressed in terms of 50 per cent of the main alkaloid contained therein.

Figure 6. Total anhydrous morphine alkaloid contained in all varieties of concentrate of poppy straw: global manufacture, stocks[a] and utilization, 1996-2015



[a]Stocks as at 31 December of each year.

Figure 8. Total anhydrous morphine alkaloid contained in all varieties of concentrate of poppy straw: utilization for the manufacture of opiates, 1996-2015

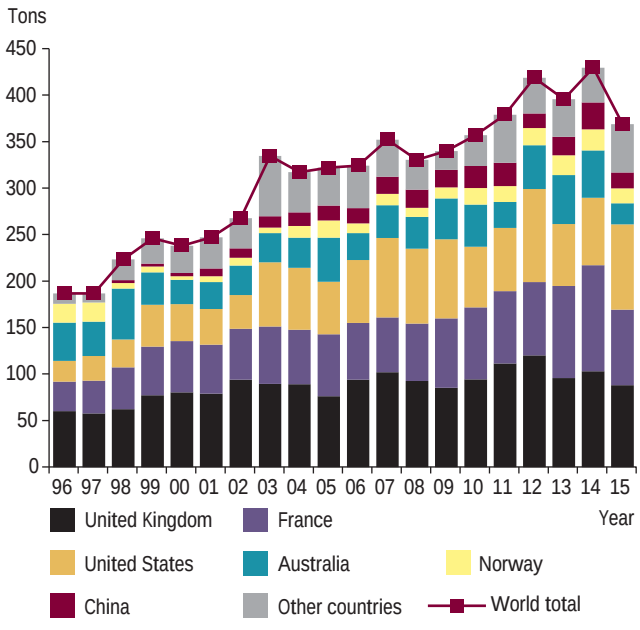
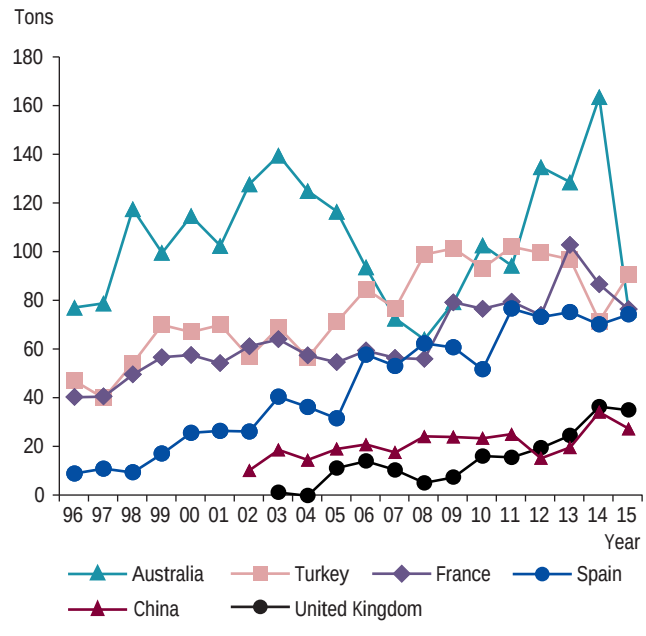


Figure 7. Total anhydrous morphine alkaloid contained in all varieties of concentrate of poppy straw: manufacture in the main manufacturing countries, 1996-2015

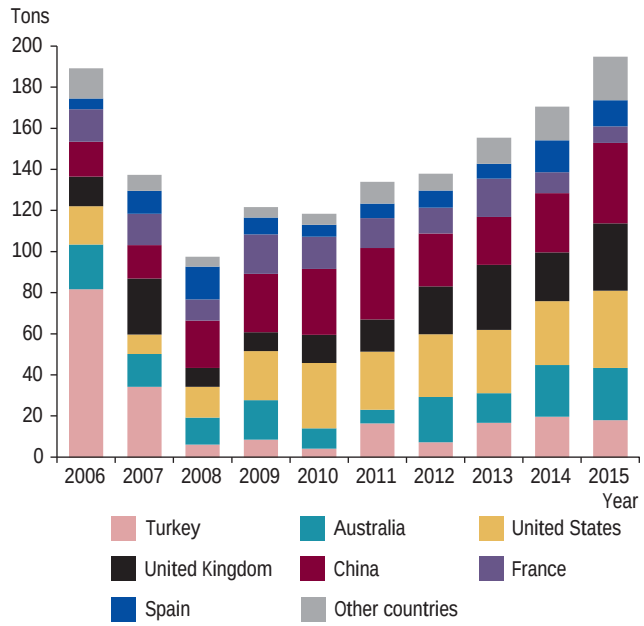


28. After decreasing again in 2014, global exports of AMA (CPS) increased from 178.7 tons in 2014 to 221.7 tons in 2015. Turkey exported the largest quantity of AMA (CPS) in 2015 (87 tons, or 39 per cent), followed by Australia, the previous top exporter (61.9 tons, or 28 per cent). Spain exported 58.8 tons, or 27 per cent. The United States and United Kingdom have been the leading importers of AMA (CPS), and together they accounted for 73 per cent of the world total in 2015. Other importing countries were, in descending order, Norway, France, South Africa, Australia, Japan, Slovakia and Switzerland. Further details on international trade in AMA (CPS) can be found in annex IV, tables 1 and 2.

29. AMA (CPS) is an intermediate product for the manufacture of morphine. It is also used in continuous manufacturing processes for the manufacture of codeine. Utilization of AMA (CPS) increased steadily until 2003 and has continued to increase with some fluctuations since then (see figure 8). In 2015, total world utilization amounted to 368 tons, a notable decrease from 428.7 tons in 2014. The United States, at 91.3 tons, accounted for 25 per cent of the global utilization of AMA (CPS), followed by the United Kingdom (88.2 tons, or 24 per cent), France (81.1 tons, or 22 per cent) and Australia (22.4 tons, or 6 per cent).

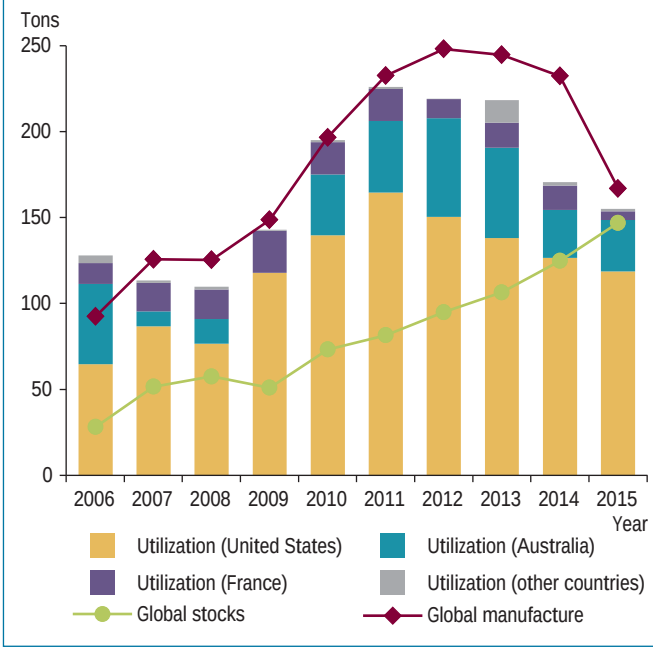
30. Global stocks of AMA (CPS) continued to increase in 2015, to 196.7 tons (see figure 9). China held the largest stocks in 2015 (39.1 tons, or 19.9 per cent), followed by the United States (37.6 tons, or 19.1 per cent), the United Kingdom (32.9 tons, or 16.8 per cent), Australia (25.6 tons, or 12 per cent), Turkey (18.2 tons, or 9.3 per cent) and Spain (12.7 tons, or 6.5 per cent). Stocks below 3.0 tons were held, in descending order, by France, Norway, Japan, South Africa and Belgium.

Figure 9. Total anhydrous morphine alkaloid contained in all varieties of concentrate of poppy straw: stocks,[a] 2006-2015



[a]Stocks as at 31 December of each year.

Figure 10. Total anhydrous thebaine alkaloid contained in all varieties of concentrate of poppy straw: utilization, global manufacture and stocks,[a] 2006-2015



[a]Stocks as at 31 December of each year.

Anhydrous thebaine alkaloid contained in concentrate of poppy straw (ATA (CPS))

31. Figure 10 provides an overview of the manufacture, stocks and utilization of ATA (CPS) during the period 2006-2015. Industrial manufacture of ATA (CPS), which started in 1998, increased rapidly before levelling off in 2012 and decreasing considerably to 167 tons in 2015, from 232.1 tons in 2014. The only countries manufacturing ATA (CPS) in 2015 were Australia, which accounted for 95 per cent of the global total, France (3 per cent) and Spain (2 per cent). Australia was also the main exporter, accounting for 134.3 tons, or 92 per cent, of global exports in 2015. The United States has been the leading importer of ATA (CPS) for many years; in 2015, it accounted for 91 per cent of total imports.

32. ATA (CPS) is an intermediate product for the manufacture of thebaine. Global utilization of ATA (CPS) increased sharply from 2001 to 2011, when it peaked at 225.9 tons, and has since decreased steadily, to 154.9 tons in 2015. This trend reflects a temporary reduction in the demand for thebaine and subsequently of narcotic drugs obtained from it, such as oxycodone and hydrocodone (see paras. 55 to 58 below). In 2015, the United States continued to be the main user of thebaine (accounting for 76 per cent of global utilization); it was followed by Australia (19 per cent) and France (3 per cent). Global stocks of ATA (CPS) stood at 146.7 tons in 2015. Australia (71.6 tons) and the United States (70.8 tons) together accounted for 97 per cent of global stocks.

Anhydrous oripavine alkaloid contained in concentrate of poppy straw (AOA (CPS))

33. Manufacture of AOA (CPS) in commercially usable quantities started in 1999. Australia was the only manufacturing country in 2015, with a total of 37.2 tons. Total utilization of AOA (CPS) in 2015 amounted to 21.8 tons. AOA (CPS) was used in the United States (93 per cent) and Switzerland (7 per cent) for the manufacture of other drugs. Global stocks of AOA (CPS) had been fluctuating since 2001. In 2015, they decreased to 62.0 tons, held by Australia (63 per cent) and the United States (37 per cent).

Anhydrous codeine alkaloid contained in concentrate of poppy straw (ACA (CPS))

34. Manufacture of ACA (CPS) nearly doubled in 2015 to 105.8 tons from 57.6 tons in 2014. ACA (CPS) manufacturing has been increasing during the past five years. ACA (CPS) is used for the extraction of codeine. The only countries that manufactured ACA (CPS) in 2015 were France (62 per cent of the global total), Australia (33 per cent) and Spain (5 per cent). Global utilization of ACA (CPS) increased from 31.5 tons in 2014 to 79.1 tons in 2015, which was accounted for by France (77 per cent), the United Kingdom (12 per cent) and the United States (11 per cent). Global stocks of ACA (CPS) in 2015 stood at 33.3 tons, most of which was held in Australia (10.6 tons), the United States (8.4 tons), France (6.1 tons), Turkey (0.8 tons), Denmark (0.6 tons) and Norway (0.2 tons).

Opiates and opioids

35. "Opiate" is the term generally used to designate drugs derived from opium and their chemically related derivatives, such as the semi-synthetic alkaloids, while "opioid" is a more general term for both natural and synthetic drugs with morphine-like properties, although the chemical structure may differ from that of morphine.[15]

36. Opioids are used mostly for their analgesic properties to treat severe pain (fentanyl, hydromorphone, methadone, morphine and pethidine), moderate to severe pain (buprenorphine[16] and oxycodone) and mild to moderate pain (codeine, dihydrocodeine and dextropropoxyphene), as well as to induce or supplement anaesthesia (fentanyl and fentanyl analogues such as alfentanil and remifentanil). They are also used as cough suppressants (codeine, dihydrocodeine and, to a lesser extent, pholcodine and ethylmorphine), to treat gastrointestinal disorders, mainly diarrhoea (codeine and diphenoxylate) and to treat opioid dependence (buprenorphine and methadone).

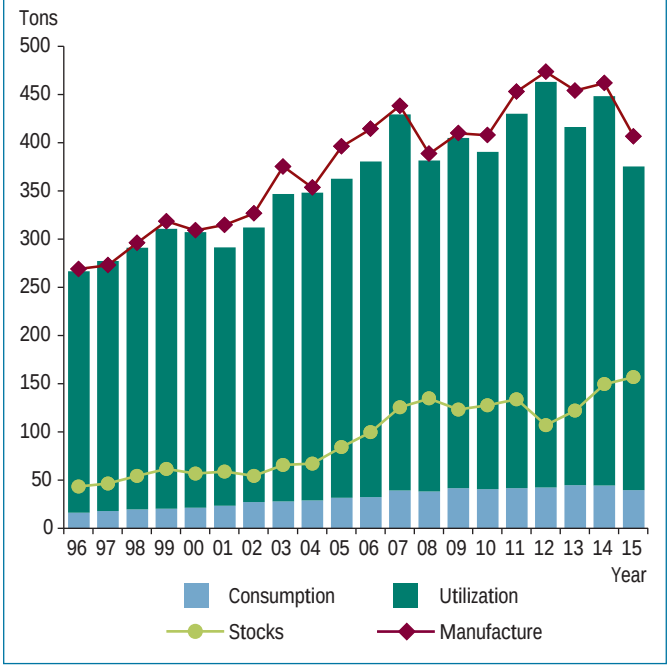
Natural alkaloids

37. Morphine, codeine, thebaine, noscapine, oripavine, papaverine and narceine are alkaloids contained in opium or poppy straw. Morphine and codeine are under international control because of their potential for abuse, while thebaine and oripavine are under such control because of their convertibility into opioids subject to abuse. Noscapine, papaverine and narceine are not under international control. Morphine is the prototype of natural opiates and many opioids and, because of its strong analgesic potency, it is used as a reference parameter for comparative purposes.

Morphine

38. In the 20-year period 1996-2015, the manufacture[17] of morphine increased considerably from 270 tons in 1996. Since 2011, those levels have remained relatively stable at around 450 tons, but in 2015, there was a decrease to 408.2 tons (see figure 11). Around 80 per cent of the morphine manufactured globally is converted into other narcotic drugs or into substances not covered by the 1961 Convention (see paras. 43-45 below). The rest is used directly for medical purposes, mainly for palliative care.

Figure 11. Morphine: global manufacture, stocks,[a] consumption and utilization, 1996-2015



[a]Stocks as at 31 December of each year.

39. In 2015, the leading morphine manufacturing country was the United Kingdom (83.2 tons, or 20.4 per cent of global manufacture), followed closely by the United States (81.9 tons, or 20 per cent), France (75.7 tons, or 18.6 per cent), Japan (27.7 tons, or 6.8 per cent), the Islamic Republic of Iran (27.6 tons, or 5 per cent), Australia (24.2 tons, or 6 per cent), China (19.1 tons, or 4.7 per cent). Together, these seven countries accounted for 80 per cent of global manufacture. Four other countries reported the manufacture of morphine for 2015 in quantities of more than 10 tons (listed in descending order): Norway, Spain, Slovakia and India.

40. Exports of morphine amounted to 34.5 tons in 2015, an increase of 1.3 tons from 2014. In 2015, the leading exporting country was Slovakia (30 per cent of global exports) followed closely by the United Kingdom (29 per cent), the Netherlands (10 per cent), France (10 per cent), Germany (6 per cent), Switzerland (5 per cent), Hungary (2 per cent), Italy (1 per cent) and the United States (1 per cent) (see figure 12). The main importing countries in 2015 were France (10.6 tons), Germany (5 tons), the Netherlands

[15]From a clinical point of view, opioids may be classified according to their actions compared with those of morphine: similar affinity (agonist), competitive (antagonist) or mixed (agonist/antagonist) for the same receptor sites (the so-called opioid receptors) in the central and peripheral nervous system.

[16]Buprenorphine is controlled under the Convention on Psychotropic Substances of 1971. Comments on its licit movement are contained in para. 99 below.

[17]In Australia, Brazil, China, Iran (Islamic Republic of), Italy, Norway, Portugal, Turkey and the United Kingdom, concentrate of poppy straw is used in continuous industrial processes for the manufacture of other narcotic drugs, without first separating morphine. For statistical and comparative purposes, the theoretical quantity of morphine involved in such conversions is calculated by INCB and included in the present publication in the statistics on global manufacture and utilization of morphine.

Figure 12. Morphine: export shares, 2006-2015

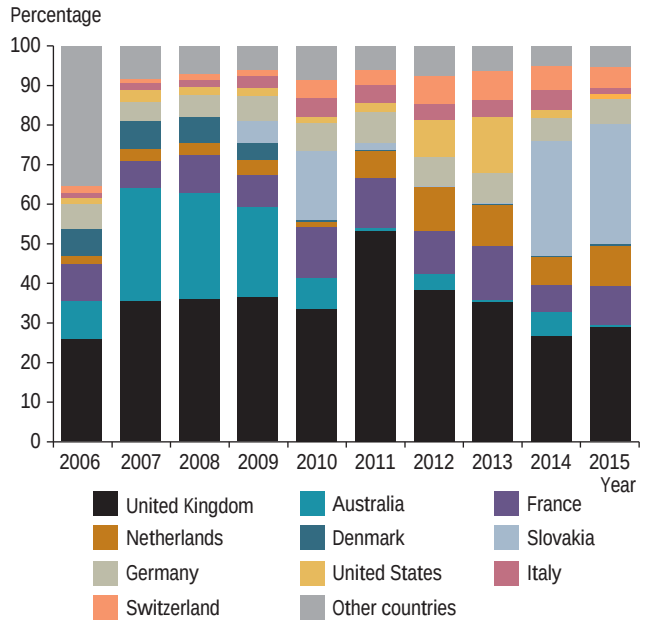
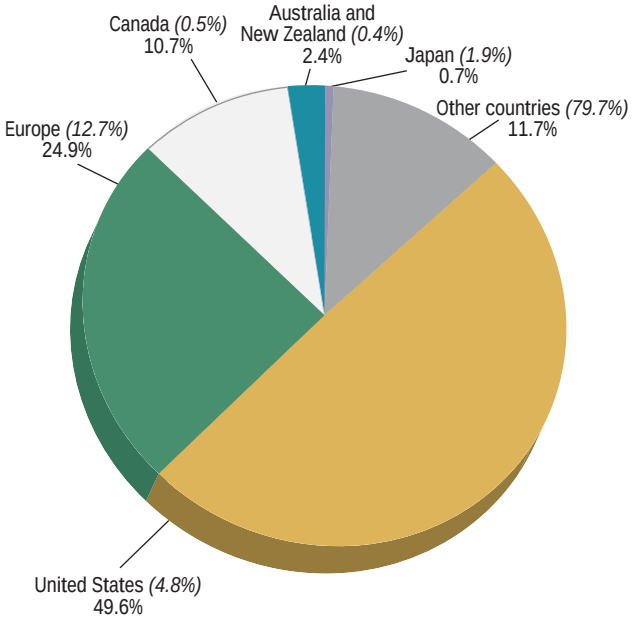


Figure 13. Morphine: distribution of consumption, 2015



Note: Percentages in parentheses refer to share of the world population (i.e. total population of all reporting countries).

(3.6 tons), the United Kingdom (3.1 tons), Canada (2.7 tons), Austria (1.9 tons) and Switzerland (1.0 ton). Further details on exports and imports of morphine can be found in annex IV, tables 3 and 4.

41. Global consumption of morphine, excluding preparations included in Schedule III of the 1961 Convention, increased considerably between 1994 (13.9 tons) and 2013 (44.7 tons), but decreased slightly in 2014 (44.5 tons) and again in 2015 (39.6 tons). The differences in consumption levels between countries continued to be very significant (see figure 13 and table XIV), owing to various economic, knowledge, regulatory and other factors influencing the use of morphine in the treatment of pain. Although 98 per cent of countries and territories reported morphine consumption in 2015, many people still had limited access to the drug. Of the morphine consumed for the management of pain and suffering in 2015, almost 80 per cent of the world population shared a small portion (11.7 per cent, a clear improvement over 9.5 per cent in 2014). The disparity in consumption of narcotic drugs for palliative care continues to be a matter of concern.

42. As in previous years, the consumption of morphine, excluding preparations included in Schedule III of the 1961 Convention, continued to be concentrated (by over two thirds) in a small number of countries located mainly in Western Europe and North America. Among these, in 2015 the United States was the country with the highest consumption of morphine (19.6 tons) followed by Canada (4.2 tons), Austria (1.8 tons), France (1.7 tons), China (1.6 tons), Germany (1.5 tons) and the United Kingdom (1.4 tons). On the basis of S-DDD consumed per million inhabitants per day, the country with the highest consumption was Austria (5,929 S-DDD), where morphine is used for the treatment of pain and in substitution treatment for opioid dependence. In five other countries, morphine consumption was over 1,000 S-DDD per million inhabitants per day in 2015: Canada (3,344 S-DDD), Denmark (2,318 S-DDD), Switzerland (1,708 S-DDD), the United States (1,703 S-DDD) and New Zealand (1,183 S-DDD).

43. In some countries, morphine is used for the manufacture of preparations included in Schedule III of the 1961 Convention. In 2015, the countries using morphine for that purpose in significant quantities were China (9.8 tons) and Italy (1.1 tons).

44. The largest share of morphine is used for conversion into other opiates, such as codeine ethylmorphine and pholcodine (see table VI), although it is important to note that codeine is increasingly obtained directly from opium poppy rich in codeine. The amounts utilized for conversion into other opiates, which fluctuated at about 200 tons per year until the beginning of the 1990s, have increased steadily since then, and remained stable in 2015 at 370 tons. Of the quantity utilized in 2015, 76 per cent was converted into codeine. The 10 main countries reporting conversion of morphine into codeine in 2015 were the United Kingdom (63.2 tons), France (53.7 tons), the United States (49.4 tons), the Islamic Republic of Iran (35.8 tons), Japan (23 tons), Australia (22.7 tons), Norway (14.8 tons), Spain (14.6 tons), India (12.6 tons) and China (10 tons).

45. Morphine is also used for the manufacture of substances not controlled under the 1961 Convention, such as noroxymorphone and apomorphine. The quantity of morphine utilized for that purpose fluctuated considerably in the period 1996-2015 and reached 1,238 kg in 2015, mostly used by France and the United Kingdom.

46. Global stocks of morphine stood at 157.3 tons in 2015, a small increase from 2014 (149.9 tons) and the highest amount in 20 years. The largest stocks were held by the United States (54.7 tons, or 35 per cent of global stocks), followed by France (32.1 tons, or 20 per cent), Hungary (21.5 tons, or 14 per cent), Japan (14.8 tons, or 9 per cent), Switzerland (8.3 tons, or 5.3 per cent) and the United Kingdom (7.6 tons, or 4.8 per cent).

Codeine

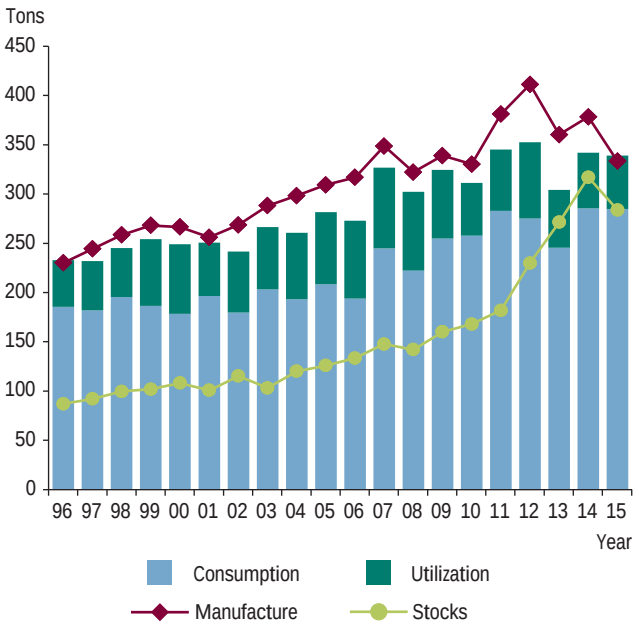
47. Codeine is a natural alkaloid of the opium poppy plant, but most of the codeine currently being manufactured is obtained from morphine through a semi-synthetic process. As reported above, there has been an increase in the cultivation of the opium poppy variety that is rich in codeine, and in the manufacture of ACA (CPS), which is used for the extraction of codeine. Codeine is used mainly for the manufacture of preparations in Schedule III of the 1961 Convention, while a smaller quantity is used for the manufacture of other narcotic drugs, such as dihydrocodeine and hydrocodone. The trends in global manufacture, consumption, utilization and stocks of codeine during the period 1996-2015 are shown in figure 14.

48. Global manufacture of codeine increased since 2001 and reached a peak of 411.8 tons in 2012. Since then, global manufacture has been decreasing, dropping to 334 tons in 2015, almost the same level of 2009. The main manufacturing countries were France (83.2 tons, or 25 per cent), the United States (65.9 tons, or 20 per cent), the United Kingdom (60.2 tons, or 18 per cent), and Australia (21.8 tons, or 7 per cent). The Islamic Republic of Iran (from seized opium and morphine), Spain, Japan, Norway, India and South Africa in descending order, manufactured smaller quantities (see figure 15). In recent years, various national and regional organizations and regulatory bodies have issued warnings related to codeine use and the occurrence of adverse effects in children. Such warnings might have been partly responsible for the decrease in manufacture.

49. Stocks available globally dropped from 317.6 tons in 2014 to 284.4 tons in 2015, returning to a level similar to 2013. The countries keeping significant quantities of codeine in stock were India (50.4 tons, or 18 per cent), France (43.2 tons, or 15 per cent), the United States (33.6 tons, or 12 per cent), the United Kingdom (32.5 tons, or 11 per cent), Australia (22.1 tons, or 8 per cent), Canada (13.2 tons, or 5 per cent) and Japan (11 tons, or 4 per cent).

50. In 2015, world exports of codeine mirrored the decreasing trend in manufacturing, falling slightly to 155.1 tons from 162.5 tons in 2014 and far from the peak at 176.4 tons recorded in 2012 (see figure 16). France continued to be the leading exporting country for codeine in 2015, exporting 50 tons or 32 per cent of the global total,

Figure 14. Codeine: global manufacture, stocks,[a] consumption and utilization, 1996-2015



[a]Stocks as at 31 December of each year.

Figure 15. Codeine: manufacture, 1996-2015

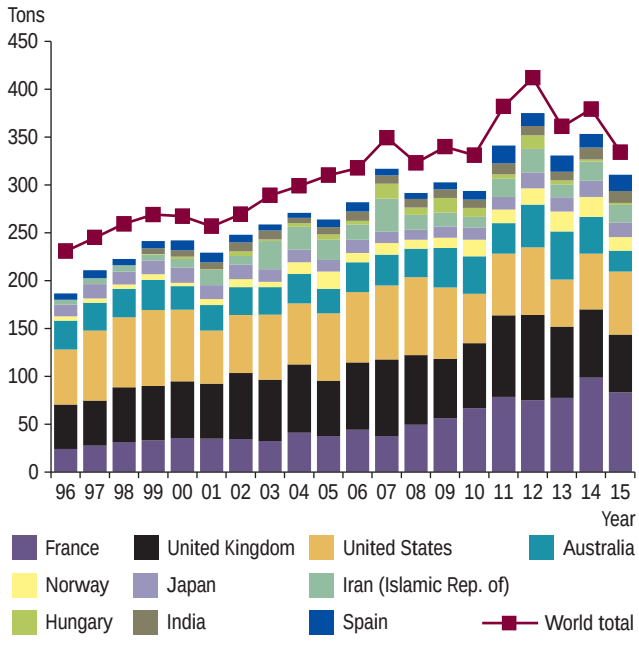


Figure 16. Codeine: exports, 1996-2015

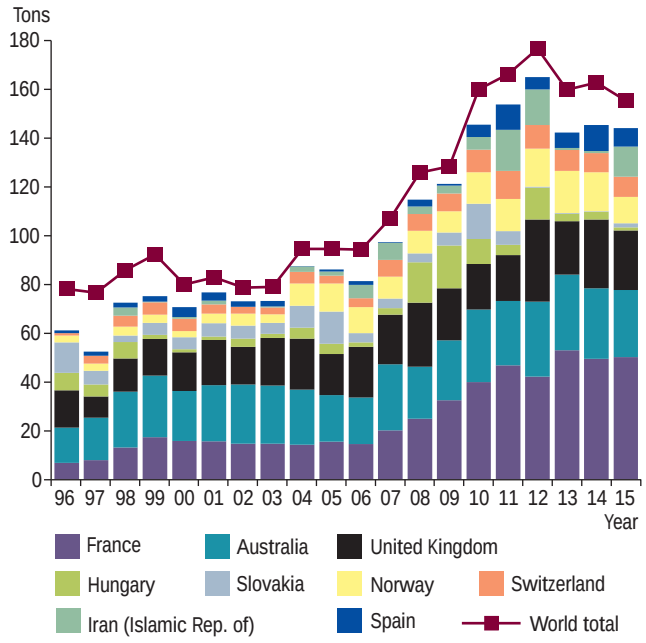
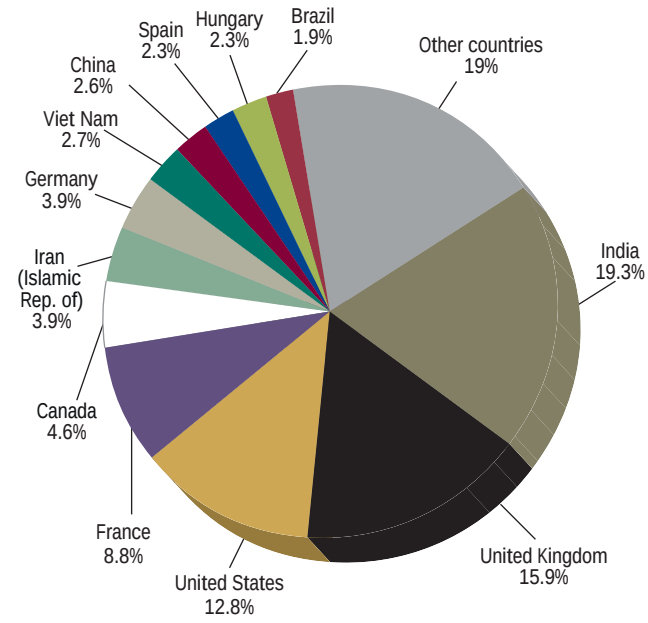


Figure 17. Codeine: utilization for the manufacture of preparations listed in Schedule III of the 1961 Convention, 2015



followed by Australia (27.5 tons, or 18 per cent), the United Kingdom (24.4 tons, or 16 per cent), the Islamic Republic of Iran (12.3 tons, or 8 per cent), Norway (10.8 tons, or 7 per cent) and Switzerland (8.1 tons, or 5 per cent).

51. The main importing countries for codeine in 2015 were India (51.9 tons), Germany (13.7 tons), Canada (13.4 tons), Brazil (8.2 tons), Viet Nam (7.6 tons), Hungary and Switzerland (both at 6.4 tons). More details on the international trade in codeine can be found in annex IV, tables 3 and 4.

52. In 2015, codeine used for the manufacture of preparations listed in Schedule III accounted for 98 per cent of the global consumption[18] of codeine. The use of codeine for this purpose grew from 170.9 tons in 1996 to 279.4 tons in 2015 (see figure 14), corresponding to 2.8 billion S-DDD. Countries reporting the utilization of codeine for the manufacture of such preparations are not necessarily the countries where those preparations are consumed. The countries manufacturing those preparations in larger quantities for subsequent export are reflected in figure 17.

53. In 2015, global consumption stood at 284.5 tons (see figure 14). The main countries that reported data in that respect were India (54.1 tons), the United Kingdom (44.6 tons), the United States (35.8 tons), France (24.7 tons), Canada (16.2 tons)[19] and the Islamic Republic of Iran (11.1 tons). Other countries with a codeine consumption of more than 6 tons were, in descending order, Germany, China, Viet Nam, Spain and Hungary, together accounting for 39 tons.

54. Utilization of codeine for the manufacture of other narcotic drugs, mainly dihydrocodeine and hydrocodone, increased steadily until reaching its highest level in 2007 (81.8 tons). Utilization has gradually declined and stood at 54 tons in 2015. Of the amount reported for 2015, 24.3 tons were used in the United States, 10.9 tons in Japan and 8.8 tons in the United Kingdom. Other major user countries were, in descending order of quantity used, Italy, Belgium, Slovakia and Hungary (see figure 14).

Thebaine

55. Until the 1990s, thebaine was manufactured mainly from opium; since 1999, it has been obtained primarily from poppy straw. Thebaine may also be obtained through the conversion of oripavine or from semi-synthetic opioids, such as hydrocodone. Thebaine itself is not used in therapy, but it is an important starting material for the manufacture of a number of opioids, mainly codeine, dihydrocodeine, etorphine, hydrocodone, oxycodone and oxymorphone (all of which are substances controlled under the 1961 Convention) and buprenorphine (which is a substance controlled under the Convention on Psychotropic Substances of

[18]Global consumption is a term used by INCB to reflect the total of the amount of a drug that is directly consumed and the amount that is utilized for the manufacture of preparations listed in Schedule III of the 1961 Convention.

[19]The figure was calculated by INCB using available data series and is being clarified with the Government.

1971),[20] as well as of substances not under international control, such as the derivatives naloxone, naltrexone, nalorphine and nalbuphine.

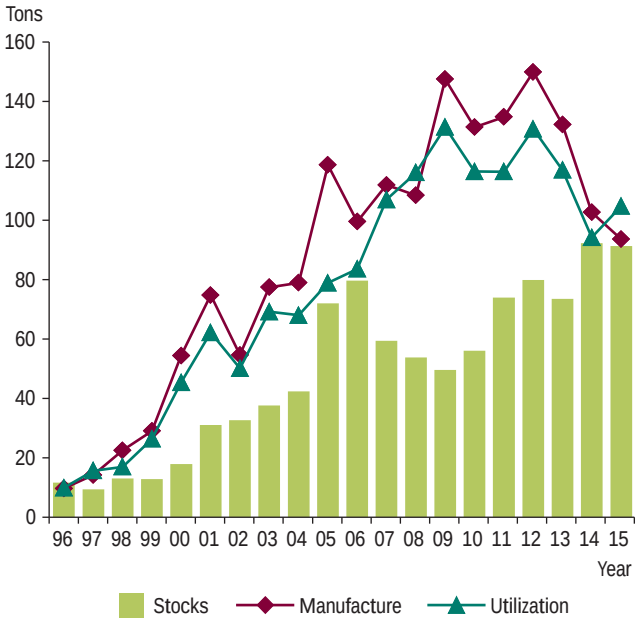
56. Global manufacture of thebaine has increased sharply since the late 1990s, as a consequence of the growing demand for oxycodone and other drugs and substances that may be derived from it. After reaching the peak of 149.8 tons in 2012, global manufacture of thebaine started to drop, reaching 93.5 tons in 2015 (see figure 18). However, this decrease may be a temporary adjustment to a trend of continuous increase that is expected to continue since the medicines derived from thebaine continue to be in high demand, despite restrictions on prescription drugs recently introduced in the main market (the United States) because of their abuse and the high number of overdose deaths they have caused. The United States had been the leading manufacturing country for many years, but was replaced in that role by Spain, which in 2015 manufactured 40.0 tons, or 43 per cent, followed by Australia (28.8 tons, or 30 per cent) and the United States (20.6 tons, or 22 per cent). Minor manufacturing countries were, in descending order, France, India, Japan, China, Hungary and Slovakia. Despite the decrease in manufacturing of thebaine, exports remained relatively high at 77.7 tons in 2015 compared with 85.6 tons in 2014. The main exporting countries in 2015 were Australia (40.7 tons) and Spain (34.6 tons). The main countries importing thebaine were France (24.8 tons), Switzerland (24.4 tons) and the United Kingdom (22.3 tons).

57. Following the main manufacturing trend, the utilization of thebaine for the manufacture of other narcotic drugs continued to decrease, to 81 tons in 2015 (see figure 19 and table VII). The United States was the main user country for thebaine during the 20-year period 1996-2015. In 2015, the United States accounted for 40 per cent of global use for that purpose, followed by the United Kingdom (25 per cent) and France (23 per cent). The quantity of thebaine reported as used for the manufacture of substances not covered under the 1961 Convention (mainly buprenorphine) fluctuated during the 10-year period 2006-2015: in 2015, it reached 23.7 tons, the highest amount ever reported and a significant increase from the 6.3 tons reported the previous year. Switzerland, the United Kingdom, Czechia and India, in descending order, accounted for 97 per cent of the world total.

58. After an overall fluctuating upward trend in the period since 1996, global stocks of thebaine remained stable in 2015 at 91.2 tons. Major stocks were held in the United States (21.1 tons), Switzerland (20.1 tons), the United Kingdom (16.3 tons), Spain (9.4 tons), France (8.5 tons), Australia (5.4 tons) and Japan (3.6 tons).

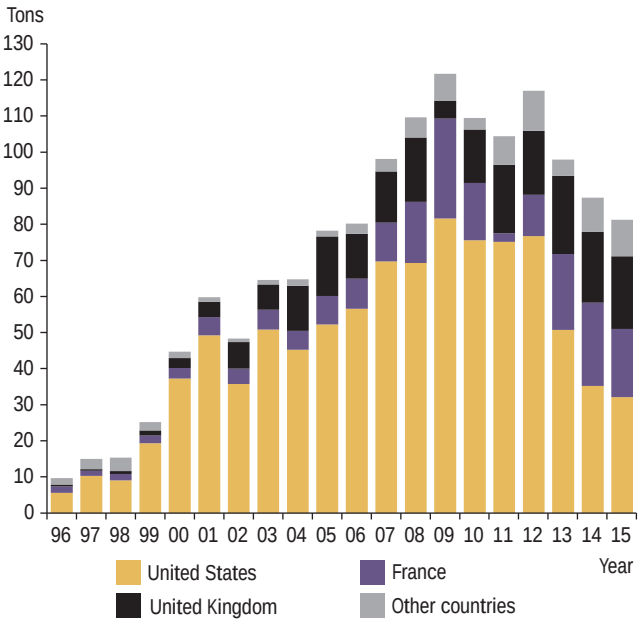
[20] United Nations, *Treaty Series*, vol. 1019, No. 14956.

Figure 18. Thebaine: global manufacture, utilization and stocks,[a] 1996-2015



[a] Stocks as at 31 December of each year.

Figure 19. Thebaine: utilization for the manufacture of opioids, 1996-2015



Oripavine

59. In 2007, oripavine was included in Schedule I of the 1961 Convention. The only countries reporting significant manufacture of oripavine in 2015 were the United States (16 tons), Spain (2.9 tons) and Switzerland (1.4 tons). The use of oripavine in significant quantities for the manufacture of other drugs was reported in 2015 by the United States (13.7 tons) and Switzerland (1.5 tons). The drugs

manufactured were mainly hydromorphone, oxymorphone and buprenorphine. In 2015, global stocks of oripavine amounted to 14.8 tons, of which 50 per cent was held in Spain, 38 per cent in the United States and 12 per cent in Switzerland.

Semi-synthetic opioids

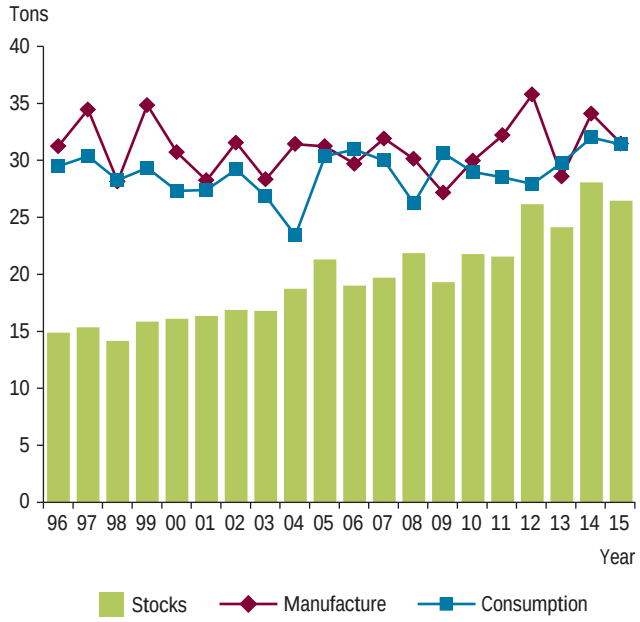
60. Semi-synthetic opioids are made by relatively simple chemical modifications of natural opiates, such as morphine, codeine and thebaine. Some examples of these derivatives are dihydrocodeine, ethylmorphine, heroin, hydrocodone, oxycodone and pholcodine. Some of the main manufacturers have reported that large losses occur during the processing of some semi-synthetic opioids.[21] Those manufacturing losses account for the difference between the total quantities of hydrocodone and oxycodone manufactured and those consumed, which are reflected in figures 22 and 23.

Dihydrocodeine

61. Global manufacture of dihydrocodeine fluctuated between 27.1 and 35.7 tons in the 20-year period 1996-2015. In 2015, the quantity manufactured worldwide stood at 31.4 tons (see figure 20). The main countries manufacturing significant quantities continued to be Japan (11.4 tons), the United Kingdom (8.7 tons) and Italy (5 tons), together accounting for 80 per cent of total manufacture in 2015. Global exports of dihydrocodeine amounted to 14.8 tons in 2015. The main exporting country was Belgium (27 per cent), followed, in descending order, by the United Kingdom (18 per cent), Hungary (15 per cent), Italy (14 per cent), France (13 per cent) and Slovakia (11 per cent). In 2015, France was the leading importing country for dihydrocodeine (4.3 tons). Other major importers were the United Kingdom (4.2 tons), India (0.9 tons) and Colombia (0.3 tons).

62. Dihydrocodeine is consumed mainly in the form of preparations included in Schedule III of the 1961 Convention, accounting for 92 per cent of total consumption. In 2015, use of dihydrocodeine reached 31.3 tons (about 305 million S-DDD). The main user countries for dihydrocodeine, in descending order, were the United Kingdom, Japan, and the Republic of Korea, together accounting for 91 per cent of total global utilization (consumption and utilization for the manufacture of preparations in Schedule III). In 2015, global stocks of dihydrocodeine amounted to 26.4 tons; major stocks were held in Japan (12.2 tons) and the United Kingdom (4.3 tons).

Figure 20. Dihydrocodeine: global manufacture, consumption and stocks,[a] 1996-2015



[a]Stocks as at 31 December of each year.

Ethylmorphine

63. The manufacture of ethylmorphine showed an overall downward trend over the 20-year period 1996-2015 and was stable at around 1 ton for several years. In 2015, the total quantity manufactured was 1.4 tons, down from 2.1 tons in the previous year and much lower than the peak of 4.6 tons, reached in 1997. The main manufacturing countries continued to be France (87 per cent of global manufacture) and Hungary (13 per cent). France continued to be the leading exporting country (601 kg), accounting for over 86 per cent of global exports. The largest importer in 2015 was Belgium, which imported almost 22 per cent of total production. Poland; Hong Kong, China; Finland; and Switzerland imported quantities smaller than 4 per cent. Ethylmorphine is consumed mainly in the form of preparations listed in Schedule III of the 1961 Convention (about 95 per cent of total consumption). Global utilization (consumption and manufacture of preparations in Schedule III) reached 1.1 tons in 2015 (22.6 million S-DDD). The main consuming countries in 2015 were Sweden (34 per cent of the world total), France (31 per cent), Belgium (11.4 per cent) and India (10 per cent). In 2015, global stocks of ethylmorphine totalled 1.9 tons; the largest holder of stocks was India (42 per cent of global stocks).

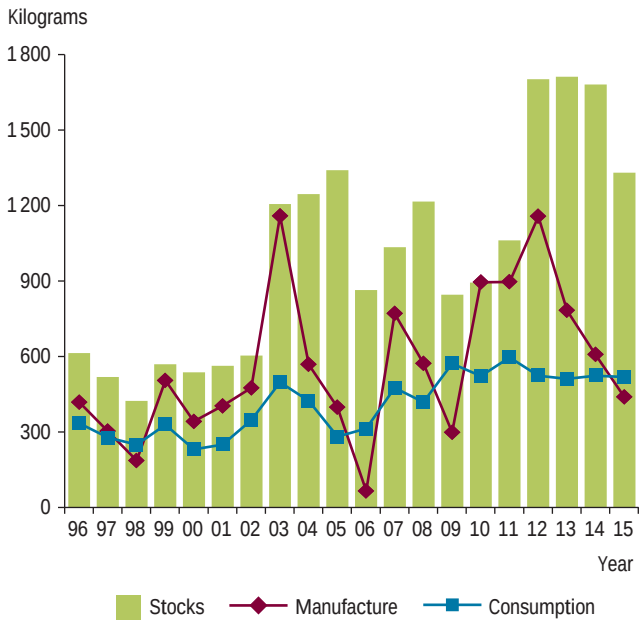
[21]Manufacturing losses are those occurring: *(a)* during the process of refining a drug; *(b)* during the process of transformation of a drug into its salts, isomers, esters and ethers, as applicable according to the Schedules; and *(c)* during the manufacture of preparations other than those included in Schedule III. They may also be due to the chemical decomposition of a drug, leakage, evaporation, quality requirements or accidents.

Heroin

64. In the past 20 years the licit manufacture of heroin fluctuated mostly between 400 kg and 800 kg, with peaks of over 1 ton in 2003 and 2012. In 2015, a total of 411.1 kg was manufactured, mostly by the United Kingdom (58 per cent) and Switzerland (42 per cent) (see figure 21). The main country exporting heroin continued to be the United Kingdom (315 kg of global exports, or 60 per cent), followed by Switzerland (196 kg, or 38 per cent). Germany and Hungary exported quantities smaller than 10 kg. In 2015, the main importing country was Switzerland (182 kg), followed by Germany (136 kg), the Netherlands (122 kg), Denmark (41 kg), the United Kingdom (24 kg) and Canada (14 kg).

65. Global consumption of heroin remained relatively stable at 521 kg in 2015. Switzerland, where heroin is prescribed for long-term opiate-dependent individuals, reported a heroin consumption of 263 kg for 2015 (or 50 per cent of global consumption). Other countries with significant heroin consumption were the Netherlands (17 per cent) and Germany (15 per cent). Global stocks of heroin dropped slightly to 1,335 kg after a considerable increase in the stock level that had occurred in the period 2011-2014. The countries holding significant stocks in 2015 were Switzerland (430 kg), the United Kingdom (323 kg), the Netherlands (223 kg), Spain (157 kg) and Germany (128 kg).

Figure 21. Heroin: global manufacture, consumption and stocks,[a] 1996-2015



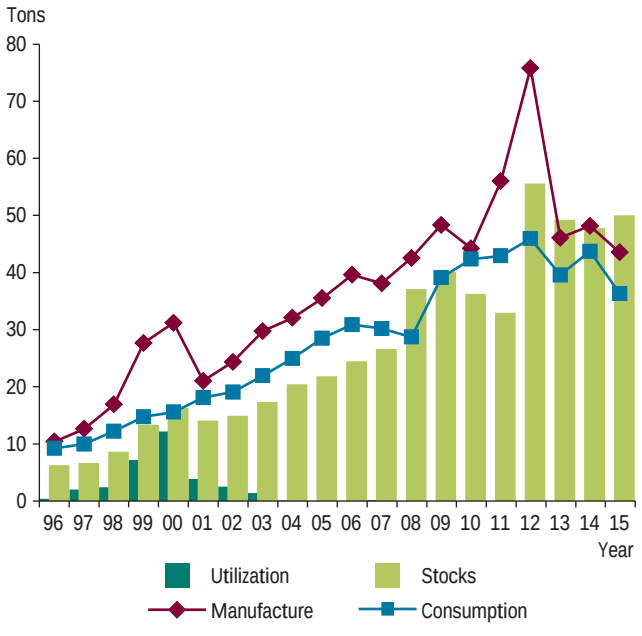
[a]Stocks as at 31 December of each year.

Hydrocodone

66. In 2015, global manufacture of hydrocodone decreased to 43.6 tons from 48.2 tons the previous year, continuing the declining trend started after the peak of 75.9 tons reached in 2012 (see figure 22). The United States accounted for almost 100 per cent of global manufacture.

67. Global consumption of hydrocodone stood at 36.4 tons in 2015 (amounting to about 24.2 billion S-DDD) down from 43.7 tons in 2014. This decrease is related to the rescheduling of hydrocodone combination products in the United States in 2014. The prescriptions for liquid and tablet formulations declined 22 per cent and 16 per cent, respectively. In 75 per cent of the cases, the elimination of the possibility to refill the prescriptions was the reason for the decline. In 2015, the country with the highest consumption of hydrocodone continued to be the United States, with 20,941 S-DDD consumed per million inhabitants per day, equivalent to 99.7 per cent of total global consumption. The high consumption in the United States makes hydrocodone the most used narcotic drug in medical practice in terms of S-DDD. In the past, hydrocodone had been used in the United States for the manufacture of thebaine for the purpose of manufacturing other narcotic drugs; no such use was reported after 2003, as direct extraction of thebaine from poppy straw had gradually replaced the use of hydrocodone in the manufacture of thebaine since the late 1990s. In 2015, global stocks of

Figure 22. Hydrocodone: global manufacture, consumption, utilization[a] and stocks,[b,c] 1996-2015



[a]Utilization for the manufacture of other drugs.
[b]Stocks as at 31 December of each year.
[c]Considerable losses occur in the manufacturing process of this substance. This explains some gaps between manufacture and consumption/stocks.

hydrocodone stood at 50 tons, more than 99 per cent of which was held by the United States.

Hydromorphone

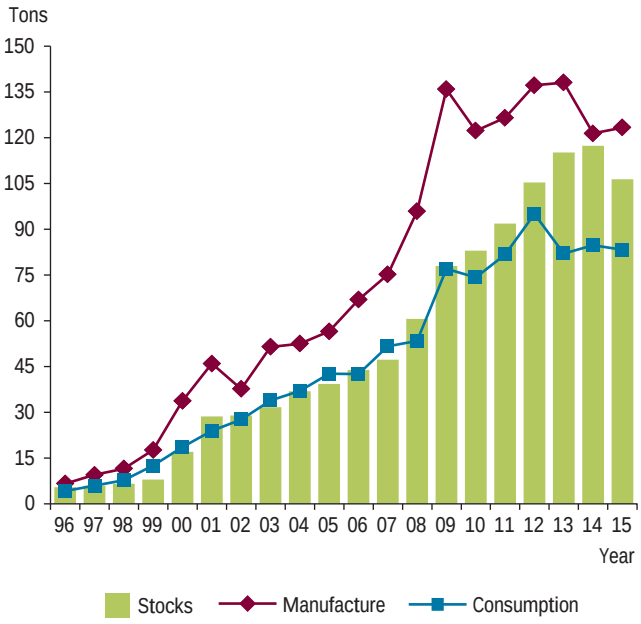
68. Global manufacture of hydromorphone has increased sharply over recent years, reaching 7.3 tons in 2014, the highest level ever registered, but dropped to 5.1 tons in 2015. The leading manufacturing countries in 2015 were the United States (64.7 per cent of the global total), the United Kingdom (27.5 per cent) and Belgium (6.4 per cent). Total exports of hydromorphone declined by almost 10 per cent to 3.2 tons in 2015. The leading exporting countries were the United Kingdom (38 per cent of world exports) and the United States (20 per cent). In 2015, Canada continued to be the main importing country (1.3 tons); it was followed by Germany (0.7 tons), France (0.3 tons) and Switzerland (0.2 tons).

69. In 2015, consumption of hydromorphone decreased to 5.2 tons (262 million S-DDD). The United States continued to be the main consumer country in 2015 (45 per cent of global consumption); it was followed by Canada (36 per cent) and Germany (11 per cent). Ranked according to S-DDD consumed per million inhabitants per day, the countries with the highest consumption of hydromorphone in 2015 were Canada (7,414 S-DDD), Austria (1,835 S-DDD), the United States (1,033 S-DDD) and Germany (929 S-DDD). Global stocks of hydromorphone declined to 6.6 tons in 2015, of which 61 per cent was held in the United States, 14 per cent in Canada and 6 per cent in Germany.

Oxycodone

70. Oxycodone is one of the drugs commonly associated with overdose deaths in relation to prescription drug abuse, in particular in North America. Global manufacture of oxycodone has increased sharply over recent years, reaching a record high of 138.0 tons in 2013. However, after a considerable decrease in 2014 to 121.4 tons, manufacture of oxycodone in 2015 stood at 123.3 tons (see figure 23). The considerable decrease in manufacture since 2013 may be attributable to stricter control measures introduced in some countries where the risk of overdose deaths and abuse of oxycodone is significant. In 2015, the United States accounted for 63 per cent of total world manufacture, followed by France (15 per cent), the United Kingdom (12 per cent) and Switzerland (6 per cent). Exports remained stable above 30 tons (31.9 tons) in 2015. The United Kingdom continued to be the main exporting country in 2015 (53 per cent of world exports), followed by the Netherlands (11 per cent), France (8 per cent), the United States (8 per cent) and Switzerland (7 per cent).

Figure 23. Oxycodone: global manufacture, consumption and stocks,[a,b] 1996-2015



[a]Stocks as at 31 December of each year.
[b]Considerable losses occur in the manufacturing process of this substance. This explains some gaps between manufacture and consumption/stocks.

Major countries of destination were the United Kingdom (16 per cent), Germany (15 per cent), Canada (13 per cent) and the Netherlands (12 per cent). Further details on exports and imports of oxycodone are contained in annex IV, tables 3 and 4.

71. Along with the slight increase in manufacture in 2015, global consumption of oxycodone decreased slightly, from 84.7 tons in 2014 to 83.3 tons (equivalent to over 1.1 billion S-DDD). Consumption of oxycodone is concentrated in the United States (69 per cent of the world total). Other major consumer countries in 2015, in descending order, were Canada, Germany, Australia, France and Italy. Ranked according to S-DDD consumed per million inhabitants per day, the countries with the highest consumption of oxycodone in 2015 were the United States (7,236 S-DDD), Australia (3,996 S-DDD), Canada (3,678 S-DDD), Norway (2,170 S-DDD) and Sweden (2,165 S-DDD). Global stocks of oxycodone reached 106.3 tons, with the United States accounting for 68 per cent of the world total.

Pholcodine

72. During the 15-year period 2001-2015, pholcodine manufacture and consumption was characterized by a volatile trend. Manufacture of pholcodine dropped from 10 tons in 2013 to 7 tons in 2015 (see figure 24). The fluctuations may be related to concerns that the use of pholcodine puts people at risk of developing anaphylaxis (severe

allergic reactions) to neuromuscular blocking agents used during surgery. In some countries those concerns led to the withdrawal of pholcodine from the market. However, a review carried out in 2012 by the European Medicines Agency concluded that the evidence for such a risk was weak and that it was outweighed by the benefits of pholcodine. The Agency therefore recommended that all marketing authorizations for medicines containing pholcodine should be maintained throughout the European Union. In 2015, renewed concerns were raised by anaesthetists in Australia and New Zealand campaigning for pholcodine-containing cough medicines to become prescription-only products. The main manufacturing countries in 2015 were France (3.2 tons), the United Kingdom and Norway (both with 1 ton) and Hungary (0.9 tons). Total exports of pholcodine decreased to 5.9 tons in 2015. Exports originated mostly in France (38 per cent of the global total), the United Kingdom (21 per cent), Hungary (20 per cent), Norway (10 per cent) and Italy (7 per cent). The main destinations were Pakistan (1.2 tons), Hong Kong, China (1 ton), Italy (0.9 tons) and China (0.6 tons). Further details on exports and imports of pholcodine are provided in annex IV, tables 3 and 4.

73. Almost all pholcodine (97 per cent) is consumed in the form of preparations listed in Schedule III of the 1961 Convention. In 2015, global consumption of pholcodine amounted to 9.2 tons (approximately 183 million S-DDD). In 2015, the main consumer countries and territories were Hong Kong, China (19 per cent of global consumption); China (14.3 per cent); Pakistan (13 per cent); France (12 per cent) and Italy (11 per cent). In 2015, global stocks of pholcodine decreased slightly to 8.3 tons. Major stocks were held by Hong Kong, China (29 per cent of global stocks); France (11 per cent); Hungary; Norway and Slovakia (10 per cent each).

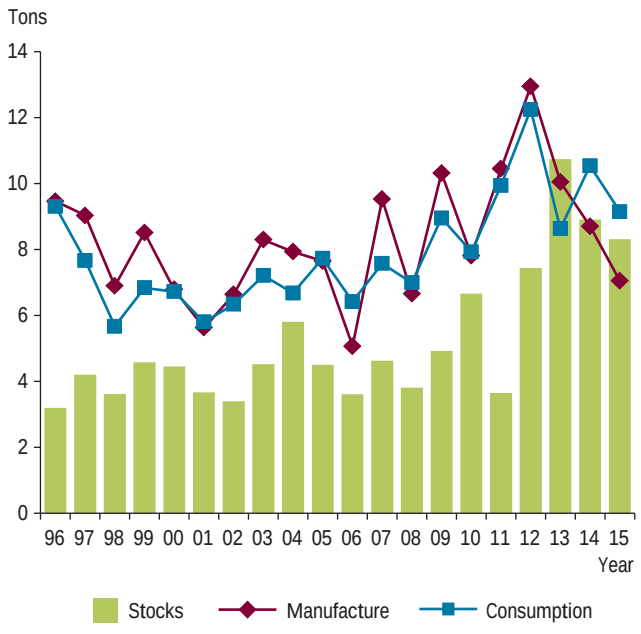
Synthetic opioids

74. Synthetic opioids are used in the treatment of chronic, moderate or severe pain. They are also used for the induction of general anaesthesia and in the treatment of specific conditions such as gastrointestinal disorders. In addition, methadone is used in treatment related to drug dependency.

Dextropropoxyphene

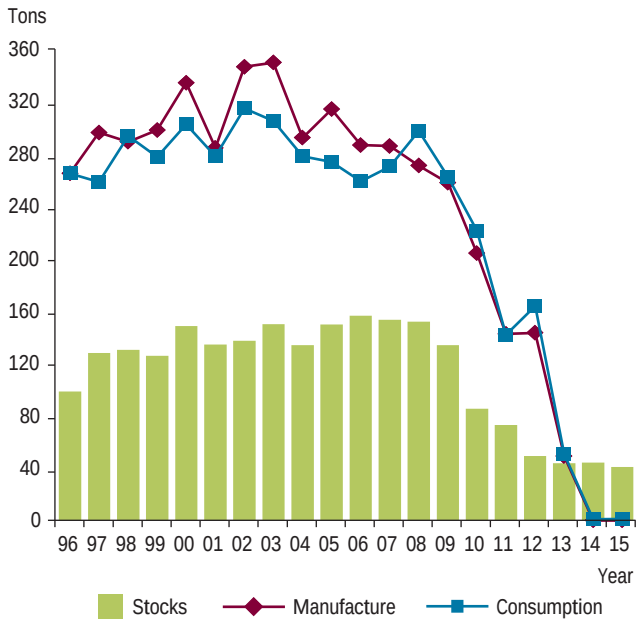
75. Global manufacture of dextropropoxyphene has followed a downward trend since 2003, when 349.6 tons were manufactured. This decline is attributed to the fact that the substance has been banned in several countries owing to concerns over serious side effects. In May 2013, the Ministry of Health and Family Welfare of India issued a gazette notification suspending the manufacture, sale and distribution of dextropropoxyphene and formulations containing dextropropoxyphene in the country. Manufacturing, nearly all of which was concentrated in India, therefore declined, to 49.1 tons in 2013. According to the reports received by INCB, in 2014 and 2015 there

Figure 24. Pholcodine: global manufacture, consumption and stocks,[a] 1996-2015



[a]Stocks as at 31 December of each year.

Figure 25. Dextropropoxyphene: global manufacture, consumption and stocks,[a] 1996-2015



[a]Stocks as at 31 December of each year.

was no manufacturing of dextropropoxyphene (see figure 25). Despite this, there was an export of 1.4 tons for the purpose of destruction from Ireland to the United Kingdom.

76. Dextropropoxyphene is consumed mainly in the form of preparations listed in Schedule III of the 1961 Convention (92 per cent of total consumption in 2015). Global use of dextropropoxyphene peaked at 314.6 tons in 2002 and has fallen since. In 2015, global reported consumption declined sharply to 1.1 tons (about 144 million S-DDD). Global stocks of dextropropoxyphene continued to decrease, to 40.8 tons in 2015 from 44.2 tons in 2014. In 2015, stocks were held by India (38.8 tons), Turkey (0.4 tons) and Mexico (0.3 tons); in addition, a number of countries kept smaller amounts.

Diphenoxylate

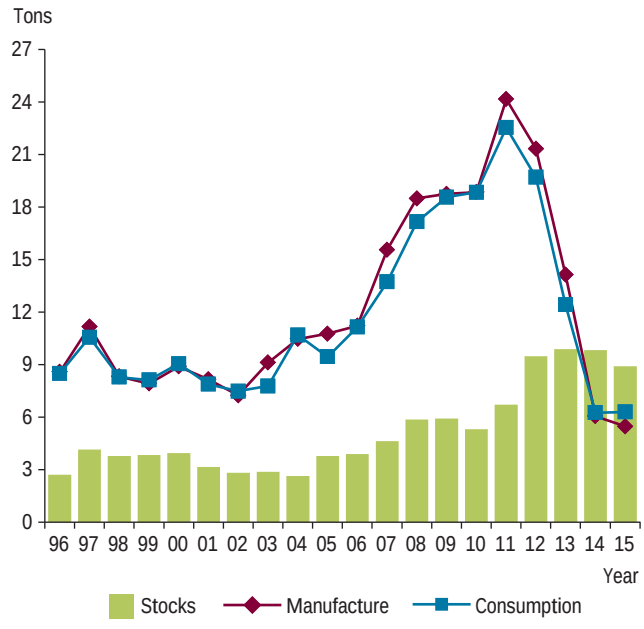
77. Diphenoxylate is used mostly as an antidiarrhoeal agent. It works by decreasing bowel activity. Global manufacture of diphenoxylate increased after 2003, reaching a peak of 24.1 tons in 2011, but dropped afterwards, reaching a low of 5.4 tons in 2015 (see figure 26). Most of that drop was accounted for by India, where over 57 per cent of diphenoxylate was manufactured. It may have been related to certain regulatory measures introduced in India following concerns related to potential abuse. In 2015, India manufactured 3.1 tons, followed by China (1.8 tons) and the United States (0.4 tons). India also exported the largest amount of diphenoxylate (1 ton, or 93 per cent of the global total). The main importing country in 2015 was Pakistan (452 kg, or 50 per cent of the global total), followed by Singapore (188 kg, or 20 per cent).

78. Diphenoxylate is consumed mainly in the form of preparations listed in Schedule III of the 1961 Convention (more than 99 per cent of total consumption in 2015). Global use in 2015 reached 6.2 tons, corresponding to 419 million S-DDD. The countries reporting the highest utilization (consumption and manufacture of preparations in Schedule III) in 2015 were India (48 per cent of the global total), China (32 per cent) and Pakistan (7 per cent). In 2015, stocks of diphenoxylate decreased to 8.9 tons, the majority of which (86 per cent) was held by India.

Fentanyl

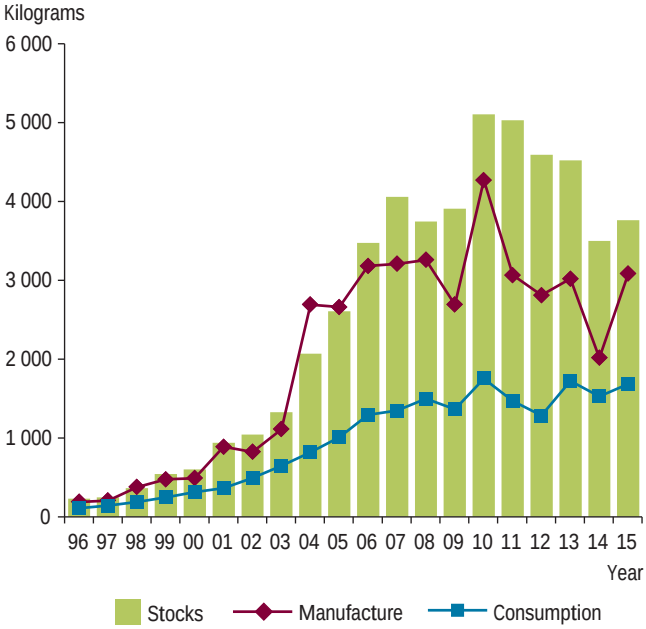
79. Fentanyl, when used as an analgesic, is about 100 times as potent as morphine and is therefore used only in very small doses (for example, 0.005-0.1 mg in injectable form). Until the 1980s, fentanyl was used mainly for the induction of anaesthesia and, in combination with other substances, for balanced anaesthesia in short-term surgical interventions. Since the early 1990s, however, controlled-release preparations (patches) of fentanyl and new delivery methods, including a sublingual spray for cancer patients, have been increasingly used in all parts of the world for the treatment of severe pain.

Figure 26. Diphenoxylate: global manufacture, consumption and stocks,[a] 1996-2015



[a]Stocks as at 31 December of each year.

Figure 27. Fentanyl: global manufacture, consumption and stocks,[a] 1996-2015



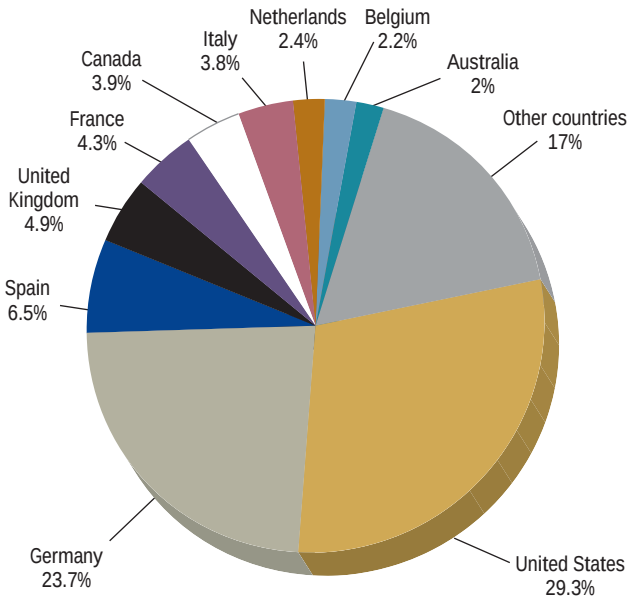
[a]Stocks as at 31 December of each year.

80. Global manufacture of fentanyl increased rapidly in the period 2000-2010, reaching a record level of 4.3 tons in 2010. It then decreased to 2.0 tons in 2014 (see figure 27) and increased again in 2015 to 3.1 tons. In 2015, the United States was the main manufacturing country for fentanyl (64 per cent of global manufacture); it was followed by Germany (19 per cent), South Africa (7 per cent) and Belgium (6 per cent). The principal exporting countries were Germany (27 per cent), the United States (25 per cent), Belgium (19 per cent) and South Africa (15 per cent). In 2015, Germany was the leading importing country for fentanyl (744 kg of the global total), followed by Spain (113 kg), the United Kingdom (110 kg) and Canada (76 kg). Further details on exports and imports of fentanyl are contained in annex IV, tables 3 and 4.

81. Global consumption of fentanyl has increased from 1.5 tons in 2014 to 1.6 tons in 2015. Although lower than the peaks of consumption recorded in 2010 (1.7 tons) and in 2013 (1.7 tons), the 2015 consumption reflects the continuation of an overall increasing trend in consumption of fentanyl over the past decade. In 2015, global consumption of fentanyl remained at the levels similar to those of the past five years, at 1.7 tons (corresponding to 2.8 billion S-DDD), which confirmed fentanyl as the synthetic opioid with the highest consumption in terms of S-DDD. In 2015, most of the global consumption of fentanyl (1.5 tons, or 93 per cent) was concentrated in 20 countries. Among these, the United States (29 per cent) and Germany (24 per cent) were also the two largest consumers in 2005 (see figure 28). In 2015, other major consumers of fentanyl were, in descending order, Spain, the United Kingdom, France, Canada, Italy, the Netherlands, Belgium, Australia, Japan, Austria, Republic of Korea (not a major consumer in 2005), Greece (not a major consumer in 2005), Switzerland, Poland, Sweden, Israel (not a major consumer in 2005), Brazil (not a major consumer in 2005) and Saudi Arabia (not a major consumer in 2005).

82. The global reported consumption of fentanyl in 2005 was 1,007 kg. In terms of S-DDD, consumption of fentanyl has increased by 132 per cent, from 114,752 S-DDD in 2005 to 266,825 S-DDD in 2015. In the same period, the consumption of morphine increased only 13 per cent, from 26,290 S-DDD to 29,708 S-DDD. Ranked according to S-DDD consumed per million inhabitants per day, the countries and territories with the highest consumption of fentanyl in 2015 were Norfolk Island (23,162 S-DDD), Germany (22,176 S-DDD), Belgium (15,804 S-DDD), Gibraltar (13,734 S-DDD) and Austria (11,864 S-DDD). In 2015, global stocks of fentanyl stood at 3.7 tons, a small increase from the previous year (3.4 tons) but still lower than the level of 2013 (4.5 tons). The largest stocks were held by the United States (48 per cent of global stocks), Germany (27 per cent) and Belgium (12 per cent). Recently there have been reports of increases in the number of overdose deaths due to abuse of fentanyl or fentanyl-type substances, mainly in North America. However, those substances have been illicitly manufactured and trafficked and not diverted from licitly prescribed medications.

Figure 28. Fentanyl: distribution of consumption, 2015



Fentanyl analogues

83. The fentanyl analogues alfentanil, remifentanil and sufentanil are used mainly as anaesthetics.

Alfentanil

84. In 2015, global manufacture of alfentanil more than tripled from 15.2 kg in 2014 to 51.1 kg in 2015, repeating the patterns of large fluctuations over the previous 15 years. In 2012, global manufacture peaked at 78.3 kg, while in 2009 only 5.5 kg were manufactured. The principal manufacturers in 2015 were Belgium (95 per cent of global manufacture) and Slovakia (5 per cent).

85. In 2015, global consumption of alfentanil (18.4 kg) increased slightly from the level of the previous year. The United Kingdom was the main consumer country for alfentanil (50 per cent of global consumption), followed by Italy (9 per cent), Germany (7 per cent), France and Brazil (both at 6 per cent). Detailed information on the consumption of fentanyl analogues is provided in table XIII.1. In 2015, global stocks of alfentanil increased from 166 to 183 kg. The United Kingdom was the main holder of alfentanil for the second year with 105 kg in stock. Belgium, in previous years the main holder of stocks, reported 59.9 kg. Italy, Germany, Slovakia and the United States held smaller quantities.

Remifentanil

86. Remifentanil is a potent, short-acting synthetic opioid analgesic given to patients during surgery to relieve pain and as an adjunct to an anaesthetic. It is approximately twice as potent as fentanyl, and 100 to 200 times as potent as morphine. In 2001, 27 kg of remifentanil were manufactured. Manufacture has been fluctuating considerably since 2001, peaking at 93 kg in 2011 and, after a considerable decrease to 65.9 kg in 2014, increasing slightly to 73 kg in 2015. Belgium continued to be the main manufacturing country, with 33 per cent of global manufacture (down from 68 per cent), followed by China (24 per cent), the United Kingdom (21 per cent), Spain and Argentina (both at 8 per cent). Belgium, Italy and the United Kingdom were the main exporting countries. Italy was also the main importing country, with 33 per cent of global imports; it was followed by Germany (14 per cent) and Japan (9 per cent). Despite the increase in manufacturing, there was a decrease in consumption, from 77 kg in 2014 to 66 kg in 2015. The main consumers were China (16 per cent of global consumption), Italy (11 per cent) and Japan (10 per cent). In 2015, global stocks of remifentanil decreased to 103 kg, of which 25 per cent were held by Italy, 20 per cent by China, 12 per cent by Hungary, 11 per cent by Germany and 8 per cent by the United Kingdom.

Sufentanil

87. In 2015, global manufacture of sufentanil increased to 8.6 kg, continuing its long-term increasing trend. The main countries manufacturing sufentanil were China (52 per cent), the United States (26 per cent), Belgium (13 per cent) and the United Kingdom (8 per cent). The main countries exporting sufentanil were the United States (39 per cent), Belgium (31 per cent) and the United Kingdom (17 per cent). In 2015, global consumption of sufentanil decreased to 3 kg, back to the level recorded in 2013. The largest consumers of sufentanil were, in descending order, China, France, Canada, the United States, Germany and Italy, together accounting for 82 per cent of the global total. In 2015, global stocks of sufentanil totalled 21 kg, most of which was held by the United States (31 per cent), Germany (24 per cent) and China (23 per cent).

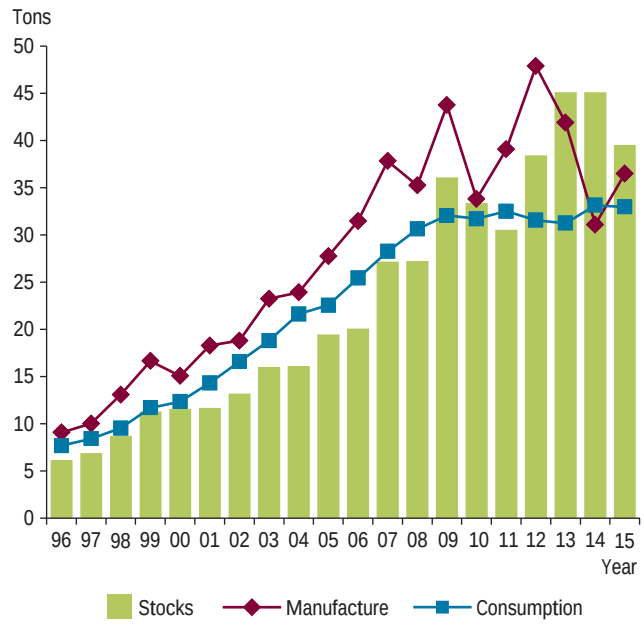
Ketobemidone

88. Ketobemidone is a powerful opioid analgesic with a similar effectiveness against pain as morphine. Its manufacture and use is concentrated in a small number of European countries. Overall, its consumption has been decreasing from year to year; in 2015, consumption reached its lowest point in decades (57 kg). Similarly, stocks have been dwindling, from 142 kg in 2013 to 88 kg in 2014, but they increased sharply to 187 kg in 2015. Global manufacture showed an even greater increase in 2015, reaching 365 kg after previous levels of 49 kg in 2014 and 3 kg in 2013. In 2015, Germany accounted for 100 per cent of global ketobemidone manufacture and was also the main exporter (82 per cent of global exports); it was followed by France (16 per cent), which re-exported a large part of its imports. Germany held 87 per cent of global stocks of ketobemidone (164 kg). It was followed by Denmark and Norway (both with 5 per cent), and Sweden (3 per cent).

Methadone

89. Methadone, together with buprenorphine, which is controlled under the 1971 Convention, is used for pain management, but it is primarily used in the treatment of opioid dependence. As shown in figure 29, the trends related to the consumption, manufacture and stocks show a steady increase over the 20-year period 1996-2015, with some fluctuations. In 2015, the manufacture of methadone increased to 36.4 tons from 31.1 tons in 2014. The main producing countries were the United States (49 per cent) and Switzerland (34 per cent). Smaller quantities were manufactured by China and Germany (both with 4 per cent), India and Spain (both with 3 per cent). Switzerland continued to be the main exporter of methadone (10.6 tons, or 60 per cent) in 2015; it was followed by the United States (2.1 tons, or 12 per cent). The main importing countries were the United Kingdom (14 per cent of the global total), Canada (10 per cent), Viet Nam (9 per cent), the Netherlands (8 per cent) and France (7 per cent). Stocks

Figure 29. Methadone: global manufacture, consumption and stocks,[a] 1996-2015



[a]Stocks as at 31 December of each year.

of methadone were concentrated in Switzerland (32 per cent) and the United States (26 per cent).

90. Consumption of methadone was concentrated in a few countries, and there were large differences in global consumption patterns. The main consuming countries were the United States (47 per cent), the United Kingdom and Germany (both with 6 per cent), Canada (5 per cent), China and Viet Nam (both with 4 per cent), Italy and France (both with 3 per cent). In some cases, the different levels of consumption were related to the presence or absence of people who inject drugs. In other cases, even though there were a certain number of such people, little or no methadone (and buprenorphine) seemed to be consumed, and few, if any, opiate substitution treatment services seemed to be available.

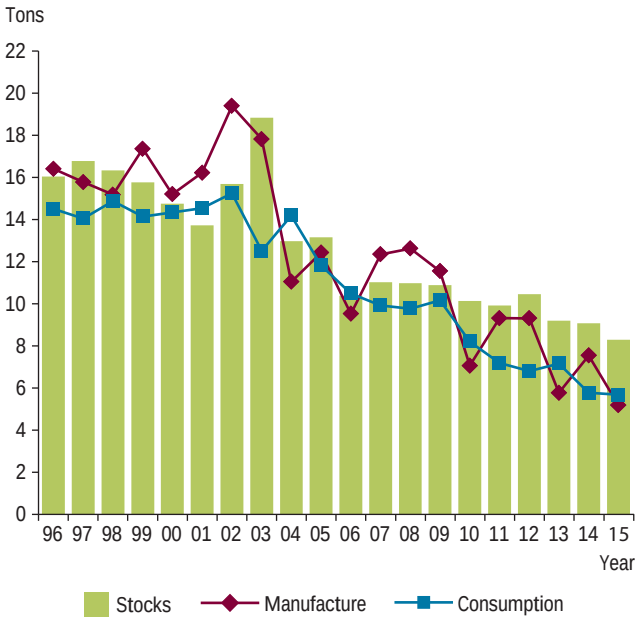
Pethidine

91. The manufacture of pethidine has continued to show a fluctuating decline since 1995. Manufacture increased slightly in 2014 to 7.6 tons, only to drop again in 2015 to 5.1 tons, reaching its lowest point in the period 1996-2015 (see figure 30). Consumption of pethidine, which stood at 15.3 tons in 2002, has been declining steadily since then but stabilized for the second year in a row at 5.7 tons in 2015. Pethidine is mostly used for pain relief in childbirth. The decline in consumption is attributable to several factors, such as its low potency, short duration of action and unique toxicity (i.e. seizures, delirium and other neuropsychological effects), as compared with other available opioid analgesics. It is considered an effective analgesic for acute pain but not useful for chronic pain. For these reasons several countries have put strict limits on its use, but some physicians continue to use it as a strong first-line opioid.

92. In 2015, manufacture of pethidine was concentrated in Spain (41 per cent), Slovakia (21 per cent), China (19 per cent) and the United States (7 per cent). The main exporting country was Spain (1.6 tons), followed by Slovakia (1.1 tons) and the United Kingdom (0.4 tons). The main countries importing pethidine were Brazil (10 per cent), the United Kingdom (8 per cent), South Africa (7 per cent) and Canada (6 per cent). A number of other countries (Indonesia, the Islamic Republic of Iran, Germany, Turkey, the Republic of Korea and Poland, in descending order) imported lower quantities (between 5 and 3 per cent each of the global total). Further details on exports and imports of pethidine are contained in annex IV, tables 3 and 4.

93. Pethidine consumption amounted to 5.6 tons in 2015 (corresponding to 14 million S-DDD). The main consumer countries were the United States (20 per cent of the global total) and China (12 per cent). Other countries consumed smaller quantities; those included South Africa (7 per cent), Brazil (5 per cent), Spain and Canada (both with 4 per cent). As a consequence of the overall decline in manufacture and consumption, stocks of pethidine also continued to decline, reaching 8.2 tons in 2015. The largest stocks were held by the United States (27 per cent of global stocks), Germany (12 per cent) and Slovakia (9 per cent).

Figure 30. Pethidine: global manufacture, consumption and stocks,[a] 1996-2015



[a]Stocks as at 31 December of each year.

Tilidine

94. Germany continued to be the only manufacturer of tilidine in 2015. Manufacture of tilidine continued to fluctuate and amounted to 50 tons in 2015, almost double the amount of the previous year. Exports of tilidine increased to 53 tons in 2015. Because it was the sole manufacturer, Germany also continued to be the principal exporting country in 2015, accounting for 52 per cent of global exports. That was still a considerable reduction from the level of 2012, when Germany accounted for 98 per cent of exports. Serbia was the second exporting country in 2015, with 45 per cent of reported exports.

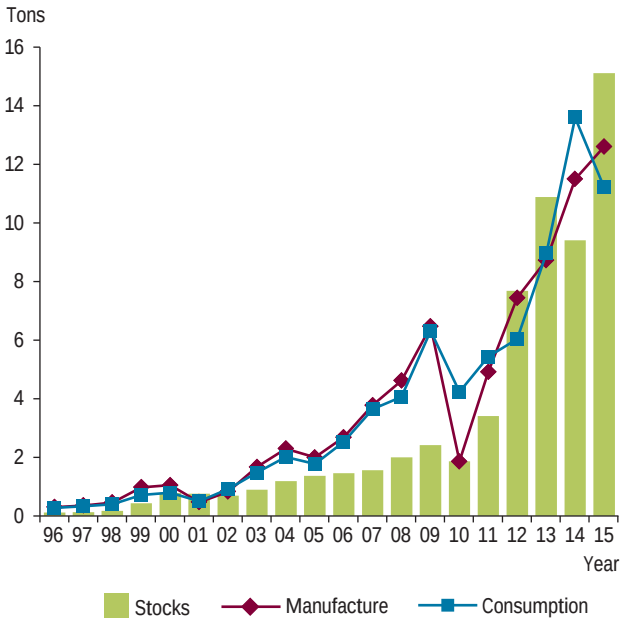
95. After reaching a record level of 59.1 tons in 2012, consumption of tilidine dropped to 20 tons in 2013, but rose again to 25.8 tons in 2014 and 29.7 tons in 2015. Most tilidine is consumed in Germany (94 per cent), followed by Belgium (5 per cent). Nearly all global stocks of tilidine (43.5 tons in 2015) were held by Germany (99 per cent of the global total).

Trimeperidine

96. Before 2012, the quantity of trimeperidine manufactured fluctuated considerably for a number of years; from 2012 to 2015, it was more or less stable at around 200 kg. Manufacture in 2015 was 203 kg. The only manufacturers of trimeperidine were the Russian Federation (67 per cent of the global total), Ukraine (24 per cent) and India (9 per cent). Trimeperidine was discovered around 1945 in the Union of Soviet Socialist Republics (USSR), and historically consumption was concentrated there. After the collapse of the USSR, the post-Soviet states continued to be the main consumers and importers. In 2015, the main exporter was Ukraine (42 per cent of global exports), followed by India (33 per cent), the Russian Federation (11 per cent) and Latvia (9 per cent). The main importing countries in 2015 were the Russian Federation (34 per cent of global imports), Belarus (30 per cent), Latvia (13 per cent), Slovakia (9 per cent) and Uzbekistan (8 per cent), with other countries importing smaller quantities.

97. In terms of S-DDD per million inhabitants, the countries with the highest consumption were Tajikistan (59 S-DDD), Ukraine (22 S-DDD), Belarus and Latvia (both with 19 S-DDD), Kazakhstan (18 S-DDD) and the Russian Federation (11 S-DDD). In 2015, stocks remained relatively stable at 301 kg; they were mainly held by the Russian Federation (59 per cent), Kazakhstan (18 per cent) and Belarus (10 per cent). Other consumer countries kept smaller amounts.

Figure 31. Buprenorphine: global calculated consumption,[a] reported manufacture and stocks,[b] 1996-2015



[a]Approximate calculated global consumption, determined on the basis of statistical data submitted by Governments.
[b]Stocks as at 31 December of each year; data are provided on a voluntary basis and may therefore be incomplete.

Opioid analgesics controlled under the 1971 Convention

98. Buprenorphine and pentazocine are opioid analgesics controlled under the 1971 Convention. Brief information on these opioids is included in the present publication; more detailed comments on statistics on buprenorphine and pentazocine can be found in the INCB technical report on psychotropic substances.[22]

Buprenorphine

99. Buprenorphine is an opioid agonist used as an analgesic and in detoxification and substitution treatment for opioid dependence. Buprenorphine produces effects similar to other opioids, but not as strong as those of heroin. For this reason, buprenorphine is used to produce a sufficient agonist effect to enable opioid-dependent individuals to discontinue the misuse of opioids without experiencing withdrawal symptoms. Since the late 1990s, global manufacture of buprenorphine has increased (with the exception of 2010, when there was a sharp decrease), reaching a peak of 12.6 tons in 2015 (see figure 31). The main manufacturing countries in 2015 were the United Kingdom (8.1 tons), Belgium (2.2 tons), Czechia and the United States (both with 0.7 tons) and Switzerland (0.4 tons). In 2015, the main exporters were, in descending order, the United Kingdom, Czechia, Germany, France and Australia. The main countries importing buprenorphine in 2015 were Germany, France, Spain and Japan, in descending order.

Pentazocine

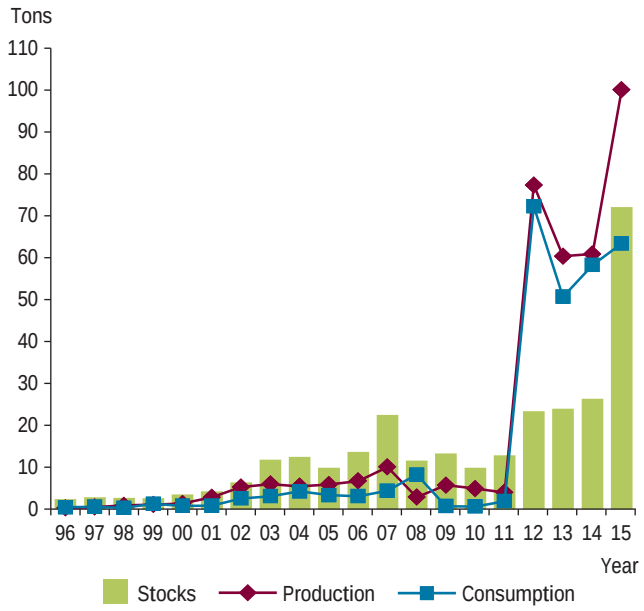
100. Pentazocine is an opioid analgesic with properties and uses similar to those of morphine. In 2015, global manufacture of pentazocine increased to 3 tons. Most of that was accounted for by India (2.1 tons). Italy manufactured 837 kg. India was also the world's leading exporter of pentazocine in 2015 with 1.5 tons. The main importers were Nigeria (767 kg), Pakistan (559 kg), the United States (475 kg) and India (445 kg).

[22]E/INCB/2016/3.

Cannabis

101. The licit use of cannabis has been increasing considerably since 2000. Before 2000, licit use was restricted to scientific research and was reported only by the United States. Since 2000, more and more countries have started to use cannabis and cannabis extracts[23] for medical purposes, in addition to scientific research. In 2000, total production was 1.4 tons; by 2015 it had increased to 100.2 tons (see figure 32). In 2015, Canada continued to be the main producer with 48.4 tons (48.4 per cent of the total), mostly intended for domestic consumption, followed by the United Kingdom with 41.7 tons[24] (41.6 per cent of the total). They were followed by Israel (7.7 tons), the Netherlands (1.1 tons) and the United States (0.5 tons) (see table below). The United Kingdom continued to be the main exporter of cannabis (2 tons, or 73 per cent of the total); it was followed by the Netherlands (0.4 tons or 14 per cent) and Austria (0.2 tons or 7 per cent). Countries exporting less than 0.1 tons each were Denmark and Germany. In 2015, the United States imported 25.1 tons (68 per cent of the global total). Much smaller quantities were imported by Germany (16 per cent), Italy (4 per cent), and Canada and Spain (both with 3 per cent). The large majority of the stocks were held by the United Kingdom (54.4 tons, or 75 per cent) followed by Canada (13.2 tons, or 18 per cent) and Israel (1.5 tons, or 2 per cent).

Figure 32. Cannabis: global production, consumption and stocks,[a] 1996-2015



[a]Stocks as at 31 December of each year.

Table 1. Cultivation of cannabis plant and production of cannabis, 2015

Country[a]	Area harvested (hectares)	Quantity produced (kilograms)
Austria	0.04	59
Canada	. .	48 491
Chile	. .	36
Israel	7.45	7 758
Japan	0.57	. .
Netherlands	0.50	1 100
Portugal	15.00	169
Switzerland	. .	315
United Kingdom	. .	41 706
United States	. .	566

Note: Two dots (. .) signify that a statistical information was furnished but data were not submitted for this specific item.

[a]In addition to the 10 countries listed for 2015, Australia, Colombia, Czechia and Italy have furnished estimates for 2016 and/or 2017 on the cultivation of cannabis plant and the production of cannabis.

[23]In statistical reports to INCB, data on cannabis extracts are expressed in terms of cannabis, using the conversion factors published by INCB in the list of narcotic drugs under international control ("Yellow List").

[24]The figure was calculated by INCB using available data series and is being clarified with the Government.

Coca leaf and cocaine

Coca leaf

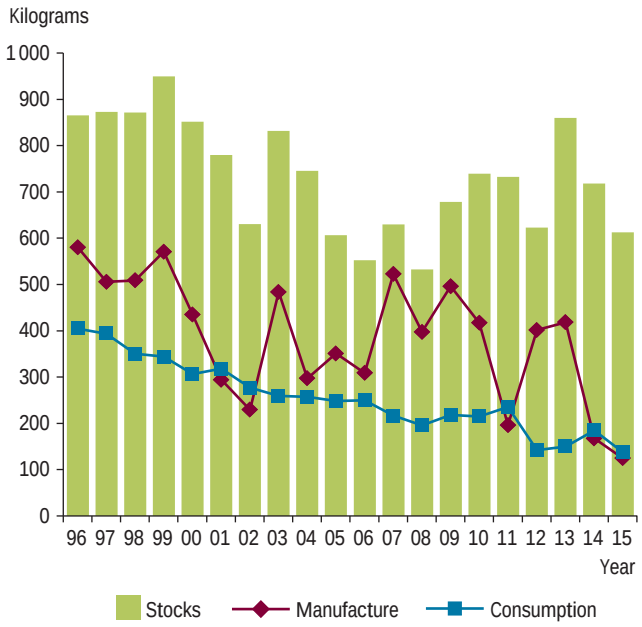
102. Peru has been the only country exporting coca leaf for the global market since 2000. At the time of preparing this report, Peru had not provided production data for 2015, but had reported an export volume of 136 tons, in line with previous years. The United States was the only importing country and accounted for the largest amount utilized (135.2 tons, or 100 per cent). The United States utilizes coca leaf for the extraction of flavouring agents and the manufacture of cocaine as a by-product. Imports by the United States have been fluctuating considerably, but in 2014 and 2015 were stable at around 136 tons. Most of the stocks of coca leaf are maintained by the United States

(84 per cent) and Peru (15 per cent). The other major licit producer of coca leaf, the Plurinational State of Bolivia, provided information to the Board on the estimated cultivation (14,705 ha) and preliminary production data (23,217 tons) for 2016. The cultivation of coca bush in that country for the chewing of coca leaf and the consumption and use of coca leaf in its natural state for cultural and medicinal purposes, such as preparing infusions, is allowed in accordance with the reservation expressed in 2013, when the country reacceded to the 1961 Convention, as amended by the 1972 Protocol.

Cocaine

103. The global licit manufacture of cocaine continued to fluctuate as it has for more than 20 years, and dropped from 178 kg in 2014 to 125 kg in 2015 (see figure 33), the lowest level since 1995. The main manufacturing countries continued to be Peru (91 kg, or 74 per cent of the global total), followed by the United States (32 kg, or 26 per cent). The main exporting country in 2015 was the United Kingdom (70 kg), followed by Peru (21 kg) and the Netherlands (14 kg). Peru exports low-purity cocaine to the United Kingdom, where it is purified. Denmark, Norway and Switzerland exported quantities smaller than 3 kg. The Netherlands was the main importing country (28 kg), accounting for one quarter of the total imports of cocaine in 2015, followed by Japan (20 kg), Canada (8 kg) and Australia (7 kg). The licit consumption of cocaine, which had been declining for a number of years, in particular since 2011, decreased to 138 kg in 2015, 25 per cent less than in 2014. The United States continued to be the main consumer (41 kg, or 30 per cent), followed by Canada (17 kg, or 13 per cent), the Netherlands (15 kg, or 11 per cent), Australia (9 kg, or 7 per cent) and Belgium (8 kg, or 6 per cent). The largest stocks were held by Peru (315 kg, or 51 per cent), the United Kingdom (72 kg, or 12 per cent) and the Russian Federation (49 kg, or 8 per cent).

Figure 33. Cocaine: global manufacture, consumption and stocks,[a] 1996-2015



[a]Stocks as at 31 December of each year.