

# 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 result of the analysis depends on the quality of the data provided.

In 2014, all indicators related to opium decreased, except opium production, which was stable, albeit at a lower level. India continued to be the only licit producer of opium for export and, even though the official data had not been received at the time of drafting this report, it is clear that the role of opium as a raw material for the manufacture of narcotic drugs diminished further and that poppy straw was the raw material preferred by the industry. Over 90 per cent of the morphine and almost 100 per cent of the thebaine manufactured worldwide were obtained from poppy straw, while the remainder was extracted from opium.

Demand for the natural alkaloids obtained from the opium poppy plant (morphine, codeine, thebaine and oripavine) continued to be high in 2014, in line with the trend of the preceding 20 years, with the exception of significant decreases registered for thebaine.

Australia, France, Spain and Turkey were the main producers of poppy straw rich in morphine. The main producer of poppy straw rich in thebaine was Australia, followed, in descending order, by Spain and France. The cultivation of opium poppy rich in codeine was reported only by Australia and France.

The manufacture of morphine increased from its 2013 level, reaching 463.6 tons in 2014. Morphine, like codeine, is used in therapy and for conversion into other opioids. However, despite the increase, the consumption of morphine for palliation continued to be distributed unevenly among countries and continued to be concentrated in a small number of them.

Manufacture of codeine stood at 379.0 tons in 2014, still lower than the peak of 411.8 tons reached in 2012, the highest level ever reported. Codeine is the most commonly consumed opiate in the world in terms of the number of countries in which it is consumed. Consumption reached a record level of 286.5 tons in 2014. Most of that amount (around 98 per cent) was used for preparations in Schedule III of the Single Convention on Narcotic Drugs of 1961 as amended by the 1972 Protocol.

After many years of increases, the manufacture of thebaine dropped to 102.6 tons in 2014. The forecast is that demand will continue to be high in the medium to long term.

In 2014, semi-synthetic opioids registered diverging trends, with some decreases in manufacturing and consumption. Hydrocodone remained the narcotic drug with the highest consumption in terms of doses consumed. Global consumption of hydrocodone amounted to 43.8 tons in 2014, an increase from the level of 2013. Manufacturing and consumption of hydromorphone continued to increase. The consumption of dihydrocodeine (31.9 tons in 2014) also increased and reached a record high, while the consumption of pholcodine (10.5 tons in 2014) continued to follow an irregular pattern.

Fentanyl is the synthetic opioid with the highest consumption in terms of doses consumed. Consumption of fentanyl has followed an increasing trend, reaching 1.5 tons in 2014, almost as high as the levels reached in 2010 and 2013 (1.7 tons). Diphenoxylate consumption has

been decreasing considerably in the three preceding years, reaching 6.2 tons in 2014. Global consumption of pethidine and dextropropoxyphene continued the decreasing trend of the previous 10 years.

The generally increasing trend in the manufacture of methadone over the previous 20 years seems to have stopped; manufacture decreased to 31.0 tons in 2014. Consumption of methadone remained stable at 32.9 tons in 2014. Buprenorphine manufacture continued to increase, reaching a new high of 11.5 tons in 2014.

Global licit production of cannabis was reported to be 57.3 tons in 2014, below the record high of 77.4 tons in 2012. Since several countries are considering allowing the use of cannabis derivatives for medical purposes, it is expected that licit cannabis production will increase in the coming years.

Coca leaf production stabilized at about 2,504 tons in 2013, but data for 2014 for Bolivia (Plurinational State of) and Peru were not available. Global licit manufacture of cocaine continued to register the fluctuating trend of the previous 20 years. It decreased significantly to 168 kilograms in 2014, well below the level reported in 2012 (403 kilograms).

1. The present comments are intended to facilitate the use of the statistical information on the licit production, manufacture, consumption,<sup>1</sup> utilization<sup>2</sup> 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 129-250 and annexes III and IV, pages 305-440). Unless otherwise indicated, the comments refer to developments during the period 1995-2014.

<sup>1</sup>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).

<sup>2</sup>The parties shall furnish the International Narcotics Control Board (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.

2. The tables of reported statistics in part four and annexes III, 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.<sup>3</sup> The most recent statistical data reflected in the comments are those relating to 2014. 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.<sup>4</sup> The most pertinent conclusions and recommendations of INCB based on the analysis of statistical data are included in chapter II of its annual report.<sup>5</sup>

<sup>3</sup>United Nations, *Treaty Series*, vol. 976, No. 14152.

<sup>4</sup>Details on the submission of statistical reports by individual Governments are contained in annex I to the present publication.

<sup>5</sup>E/INCB/2015/1.

## Opiate raw materials

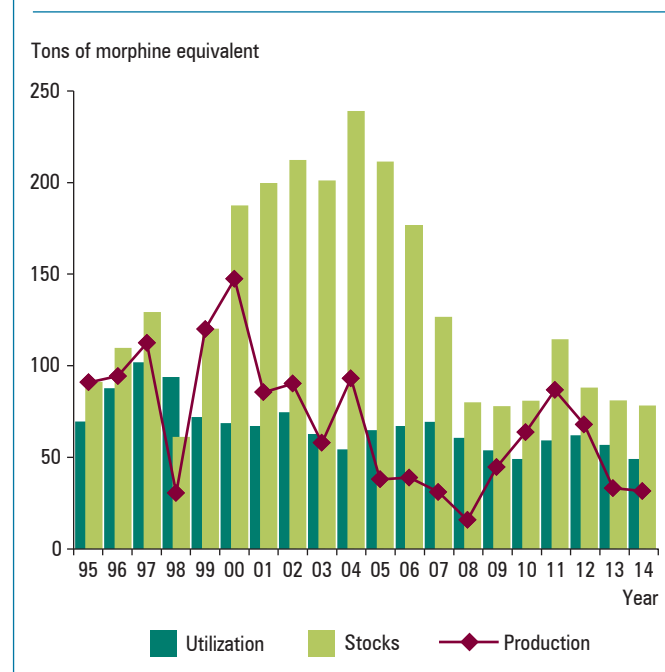
3. Opium and poppy straw are the raw materials obtained from the opium poppy plant (*Papaver somniferum*), from which alkaloids such as morphine, thebaine, codeine and oripavine are extracted. Concentrate of poppy straw is a product obtained in the process of extracting alkaloids from poppy straw. It 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,<sup>6</sup> 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 1995-2014, 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.

<sup>6</sup>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.

Figure 1. Opium: global production, stocks<sup>a</sup> and use (consumption and utilization),<sup>b</sup> in morphine equivalent, 1995-2014



<sup>a</sup>Stocks as at 31 December of each year.

<sup>b</sup>Excluding the utilization of seized opium in Iran (Islamic Republic of), Myanmar and Turkey.

5. Most opium is produced in India (98 per cent). Global opium production halved from 618.1 tons in gross weight (or 68.0 tons in morphine equivalent) in 2012 to 301.6 tons (or 33.2 tons in morphine equivalent) in 2013, and reached a record low in 2014 of 287.1 (or 31.6 tons in morphine equivalent). Imports decreased slightly from 313.7 tons (or 34.4 tons in morphine equivalent) in 2013 to 283.6 tons

(or 31.5 in morphine equivalent) in 2014. In addition, stocks of opium continued to be depleted and reached 713.1 tons (or 78.4 tons in morphine equivalent) (see figure 1). As in previous years, opium available globally was almost exclusively used for manufacturing other drugs, with only a small amount (15.8 tons, or 1.7 tons in morphine equivalent) being used for Schedule III preparations.

6. As mentioned above, India is the main producer and exporter of opium, accounting for 98 per cent of both global opium production and exports. Other countries produce smaller amounts, but do so exclusively for domestic consumption and/or utilization. China accounted for about 2 per cent (7.0 tons, or 0.7 tons in morphine equivalent) of global opium production, while Japan and Canada produced a minimal amount for scientific purposes (0.600 kilograms (kg) and 0.001 kg respectively). In China, poppy straw has replaced opium as the main raw material used for the manufacture of alkaloids since 2000.

7. India is the only licit supplier of opium to the world market, and most of the opium produced in India is destined for export. Opium exported from 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 2005-2014, decreasing significantly in 2013 and then remaining relatively stable at 283.1 tons (or about 31 tons in morphine equivalent) in 2014 (see figure 2). The main countries importing opium continued to be the United States of America, which accounted for 55 per cent of total imports in 2014, and Japan, which accounted for 41 per cent.

8. The bulk of opium is used for the extraction of alkaloids. Total utilization of licitly produced opium for the extraction of alkaloids followed a declining trend during the period under consideration. Utilization declined to 447.3 tons, or 50.7 tons in morphine equivalent, in 2014 (excluding the utilization of seized opium in the Islamic Republic of Iran)<sup>7</sup> (see figure 3). The United States, Japan and India, in descending order, are the main users of opium for the extraction of alkaloids, together accounting for over 90 per cent of the global total for 2014. The Islamic Republic of Iran reported a utilization of 187.9 tons for 2014 (20.5 tons in morphine equivalent, about 26 per cent of the global total), but this quantity is not accounted for since it concerns opium seized from illicit trafficking. The Democratic People's Republic of Korea is the only other country reporting the use of opium (less than 1 per cent) for the extraction of alkaloids in 2014. 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, 2005-2014

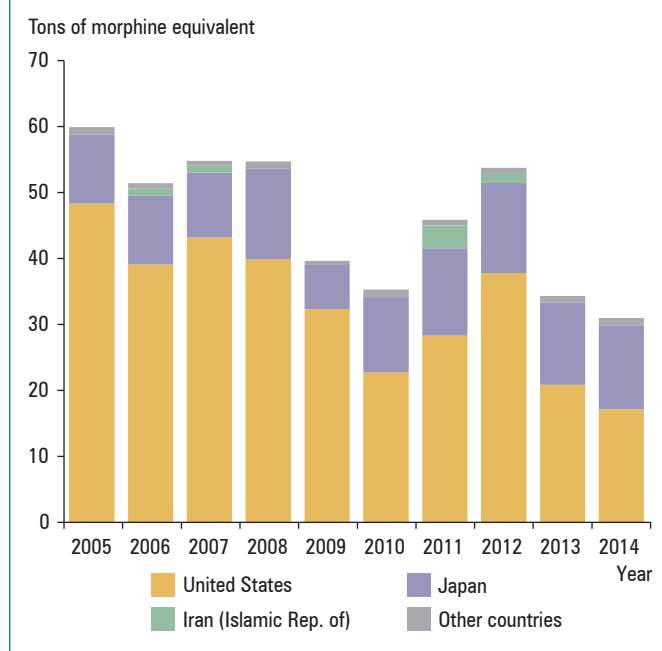
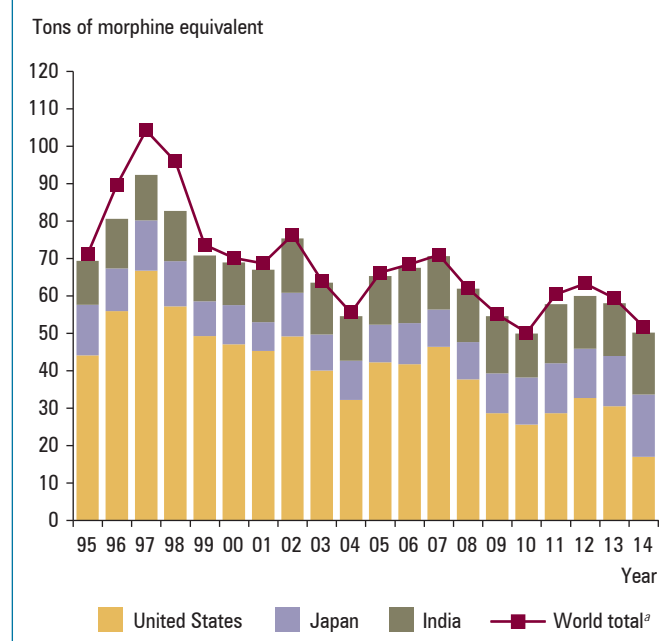


Figure 3. Opium: utilization for the extraction of alkaloids, in morphine equivalent, 1995-2014



<sup>7</sup>In the Islamic Republic of Iran, 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.

<sup>a</sup>Excluding the utilization of seized opium in Iran (Islamic Republic of), Myanmar and Turkey.

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.<sup>8</sup> Global consumption of opium has fluctuated since 2001. In 2014, total consumption decreased to 17.5 tons, which corresponds to 175 million defined daily doses for statistical purposes (S-DDD).<sup>9</sup> In 2014, the consumption and use of opium for the manufacture of preparations in Schedule III decreased to 5.9 tons (0.6 tons in morphine equivalent) in China, 4.8 tons (0.5 tons in morphine equivalent) in India and 5.1 tons (0.6 tons in morphine equivalent) in France. Myanmar also reported consuming 0.7 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 239.4 tons in morphine equivalent) and then began to decrease (see figure 1). They continued to decline, from 739.8 tons (81.3 tons in morphine equivalent) in 2013 to 713.1 tons (78.3 tons of morphine equivalent) in 2014. India holds the largest amount of opium stocks (545.5 tons, or 60.0 tons in morphine equivalent, representing 77 per cent of the global total), followed by Japan (65.3 tons, or 9.2 tons in morphine equivalent), the United States (59.1 tons, or 6.5 tons in morphine equivalent) and China (18.3 tons, or 2.0 tons in morphine equivalent).<sup>10</sup> The United States, while it had reduced its stocks by 60 per cent between 2012 and 2013 (from 137.2 tons to 55.4 tons, or, in morphine equivalent, from 15.1 tons to 6.1 tons), increased them again in 2014 (by 3.6 tons, or 0.3 tons in morphine equivalent). Nevertheless, 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)”, and poppy straw produced from varieties of opium poppy plant rich in codeine is referred to as “poppy straw (C)”. Some of those varieties contain, in addition to the main alkaloid (morphine, thebaine or codeine), other alkaloids that can be extracted, such as morphine, thebaine, codeine and oripavine.

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 (C)”.

### Poppy straw produced 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 provide such information. Global production of poppy straw (M), expressed in morphine equivalent, followed an increasing trend in the two decades prior to 2014. 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, and in 2014 reached 503 tons (see figure 4). Throughout the two decades prior to 2014, Australia, France, Spain and Turkey were the main producer countries. In 2014, the leading producer was Australia (176 tons in morphine equivalent, accounting for 35 per cent of global production), followed by France (119 tons, or 24 per cent), Spain (87 tons, or 17 per cent) and Turkey (43 tons, or 9 per cent). Other main producers of poppy straw (M) in 2014 were, in descending order, Hungary, the United Kingdom of Great Britain and Northern Ireland, China, the former Yugoslav Republic of Macedonia and Slovakia, which together accounted for the remaining global production in morphine equivalent.

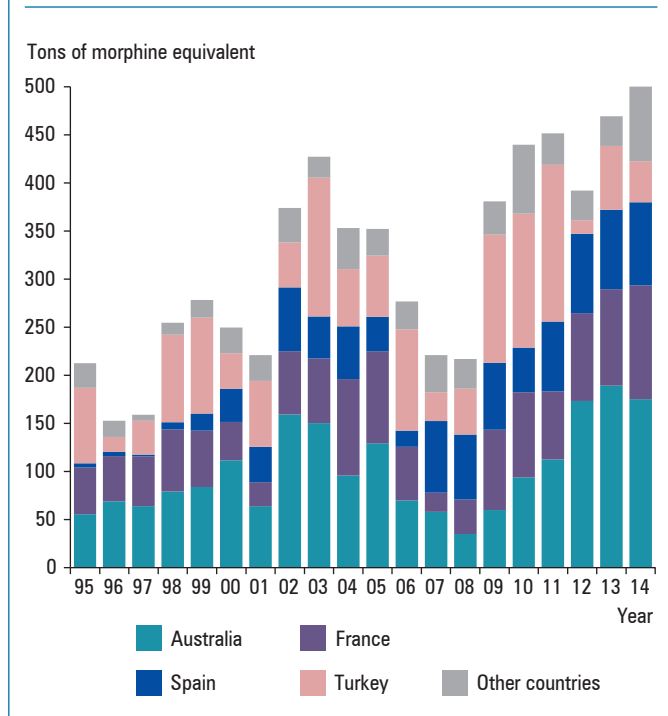
14. In 2014, production of poppy straw (M) decreased in Australia (from 190 to 176 tons) and in Turkey (from 67 tons to 43 tons), but increased in France (from 101 to 119 tons) and Spain (from 44 tons to 87 tons) (see figure 4). Changes in the area cultivated with opium poppy plant, the amounts of poppy straw (M) harvested and the yields obtained in producing countries are shown in table II.

<sup>8</sup>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.

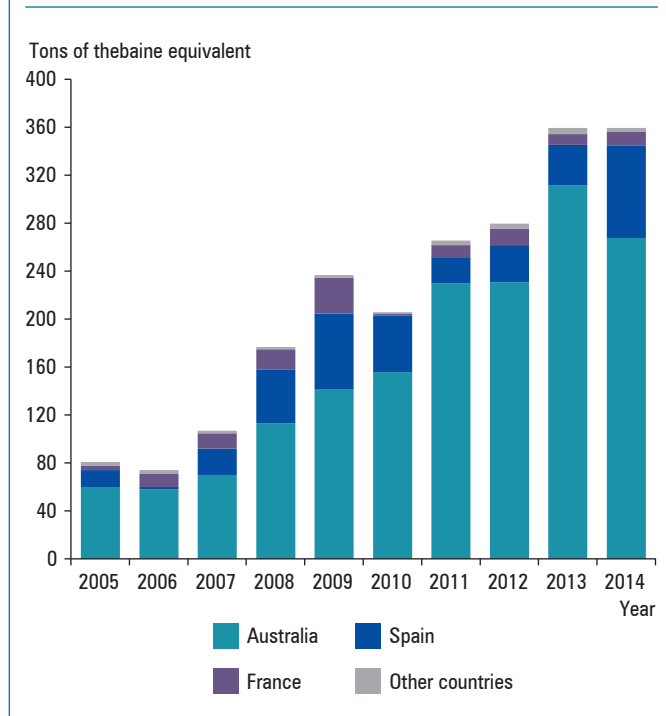
<sup>9</sup>The list of defined daily doses for statistical purposes (S-DDD) and an explanation of that concept are contained in the notes to table XIV.1.

<sup>10</sup>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”.

**Figure 4. Poppy straw (M): production in morphine equivalent, 1995-2014**



**Figure 5. Poppy straw (T): production in thebaine equivalent, 2005-2014**



15. International trade in poppy straw (M) as a raw material continues to be limited. In 2013, the Czech Republic was the main country exporting poppy straw for the purpose of extraction of alkaloids, but it was replaced by Hungary in 2014 (see annex IV, table 1). Hungary, which continued to manufacture large quantities of poppy straw, significantly increased its export. The Czech Republic, which cultivates opium poppy plants primarily for the production of seeds, 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 2014, Slovakia imported 1,664 tons (expressed in gross weight) of poppy straw (M) from the Czech Republic. At the same time, imports from Hungary increased from 187 tons in 2013 to 2,385 tons in 2014.

16. In 2014, the main countries utilizing poppy straw (M) were Turkey (20,595 tons in gross weight), Australia (6,361 tons), France (6,325 tons), Spain (5,327 tons) and Hungary (4,159 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 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 2005-2014 is shown in figure 5. In 2014, total production remained relatively stable at 360 tons in thebaine equivalent. Australia continued to be the leading producer of poppy straw (T) (268 tons expressed in thebaine equivalent, accounting for 74 per cent of global production), followed by Spain (77 tons, or 21 per cent), France (12 tons, or 3 per cent) and Hungary (2 tons, or less than 1 per cent).

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. France reported cultivation of opium poppy rich in codeine for the first time in 2013. This new variety was cultivated specifically to meet the high global demand for codeine. Expressed in gross weight, in 2010, 415.3 tons were produced; in 2011 and 2012, 1,390.0 tons were produced; in 2013, production

doubled to 2,804.6 tons; in 2014, production was stable at 2,661.3 tons. In 2014, Australia continued to be the main producer of poppy straw (C), accounting for 57 per cent (a decrease from 75 per cent in 2013). France accounted for 42 per cent of the total quantity produced.

### Poppy straw used for decorative purposes

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

### Concentrate of poppy straw

22. 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.<sup>11</sup>

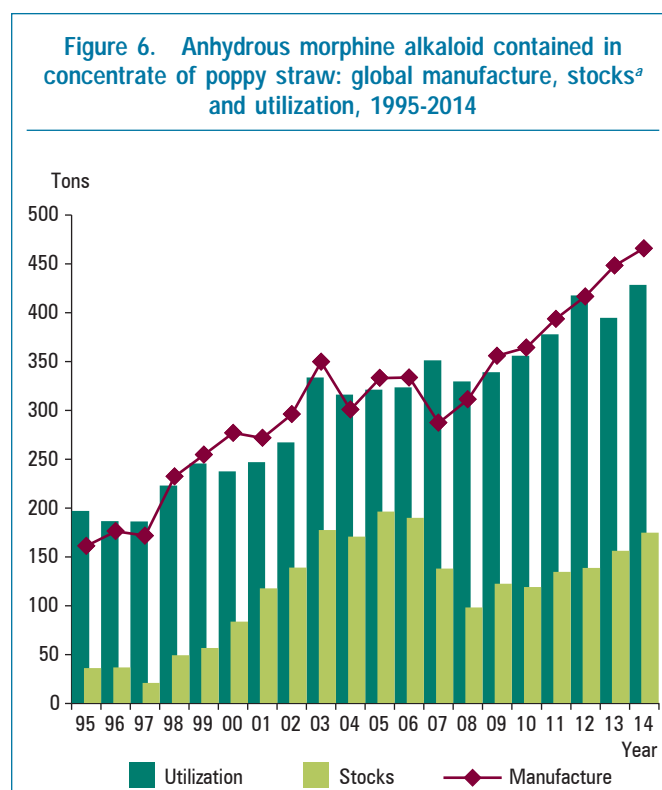
23. Since the actual content of alkaloids in concentrate of poppy straw may vary significantly, for purposes of comparison and for statistical purposes, all data referring to concentrate of poppy straw are expressed in terms of the quantity of the relevant anhydrous alkaloid contained in the material. 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.<sup>12</sup>

<sup>11</sup>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.

<sup>12</sup>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.

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

24. 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 1995-2014.

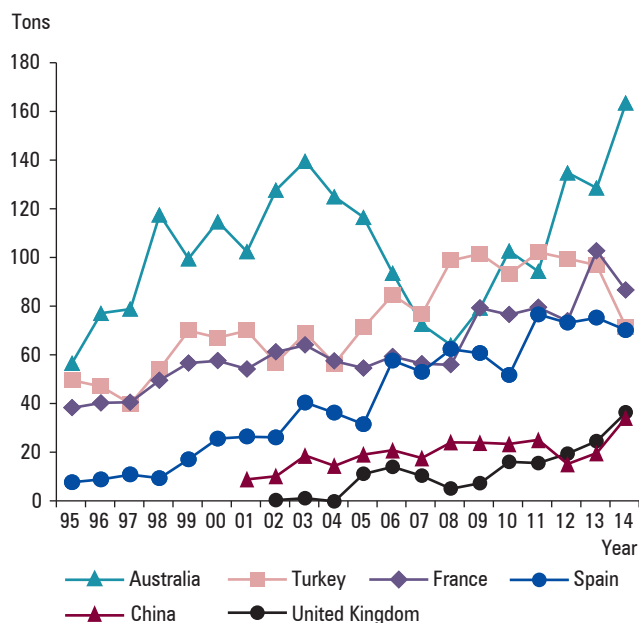


25. Global manufacture of AMA (CPS) has continuously increased since the 1990s, albeit with some fluctuations between 2003 and 2008, reaching its highest level ever in 2014 (466.1 tons). Trends in the manufacture of AMA (CPS) in the main manufacturing countries in the period 1995-2014 are presented in figure 7.

26. Over the previous decade, Australia and Turkey were the leading manufacturers of AMA (CPS). In 2014, however, while Australia reported manufacturing 163.5 tons, or 35 per cent of global manufacture, the second biggest manufacturer became France, with 86.7 tons, or 19 per cent. Turkey was third, with 71.6 tons, or 15 per cent, closely followed by Spain, with 70.2 tons, or 15 per cent. Other countries reporting manufacture of AMA (CPS) for 2014 were, in descending order, the United Kingdom, China and Belgium.

27. Global exports of AMA (CPS) continued to decrease, from 213.5 tons in 2013 to 178.7 tons in 2014. Australia was the main exporting country in 2014 (with 67.4 tons,

**Figure 7. Anhydrous morphine alkaloid contained in concentrate of poppy straw: manufacture in the main manufacturing countries, 1995-2014**

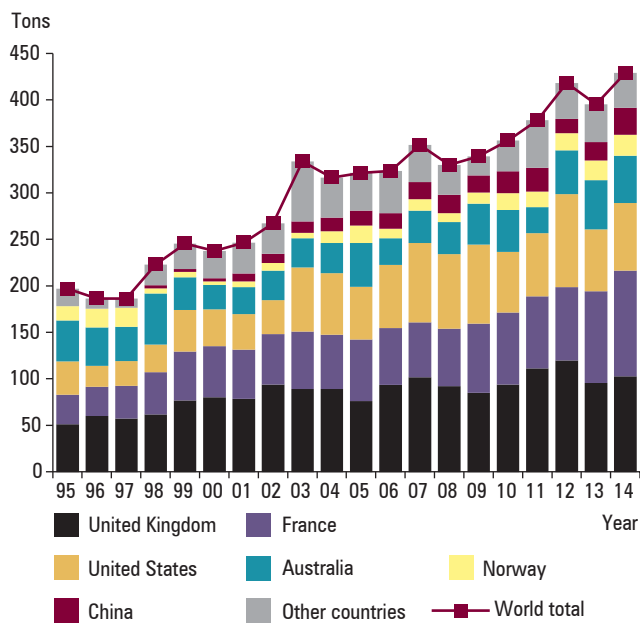


accounting for 38 per cent of global exports), followed by Turkey (63.6 tons, or 36 per cent) and Spain (44.8 tons, or 25 per cent). The United Kingdom and the United States have been the leading importers of AMA (CPS), and together they accounted for 67 per cent of the world total in 2014. Other importing countries were, in descending order, Norway, France, South Africa, Japan, Slovakia, Switzerland, Italy and Australia. Further details on international trade in AMA (CPS) can be found in annex IV, tables 1 and 2.

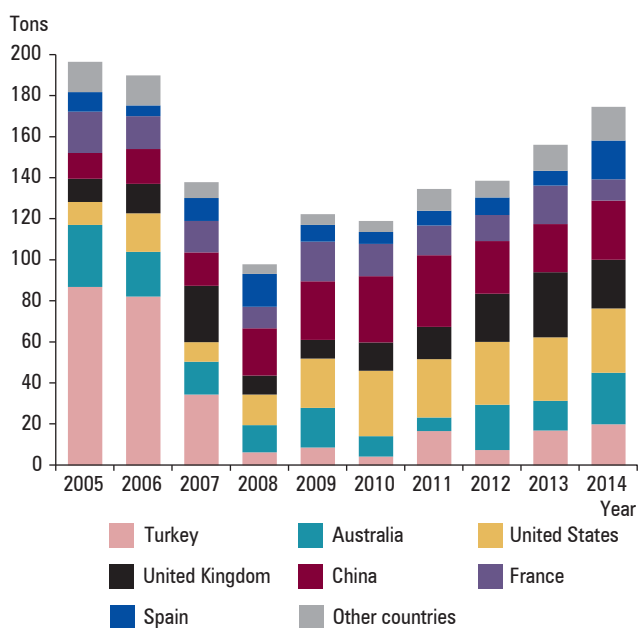
28. AMA (CPS) is an intermediate product for the manufacture of morphine. It is also used in continuous manufacturing processes for the manufacture of codeine. Utilization of AMA (CPS) increased steadily until 2003 and has continued to increase with some fluctuations since then (see figure 8). In 2014, total world utilization amounted to 428.7 tons, an increase from the 395.0 tons registered the previous year. France, at 113.5 tons, accounted for 26 per cent of the global utilization of AMA (CPS), followed by the United Kingdom (103.1 tons, or 24 per cent), the United States (72.5 tons, or 17 per cent) and Australia (50.5 tons, or 12 per cent).

29. Global stocks of AMA (CPS) increased to 174.5 tons in 2014 (see figure 9). The United States held the largest stocks in 2014 (31.2 tons, or 18 per cent), followed by China (28.8 tons, or 17 per cent), Australia (25.1 tons, or 14 per cent), the United Kingdom (23.7 tons, or 14 per cent) and Turkey (20.0 tons, or 11 per cent). Stocks below 20.0 tons were held, in descending order, by Spain, France, Norway, South Africa and Italy.

**Figure 8. Anhydrous morphine alkaloid contained in concentrate of poppy straw: utilization for the manufacture of opiates, 1995-2014**



**Figure 9. Anhydrous morphine alkaloid contained in concentrate of poppy straw: stocks,<sup>a</sup> 2005-2014**



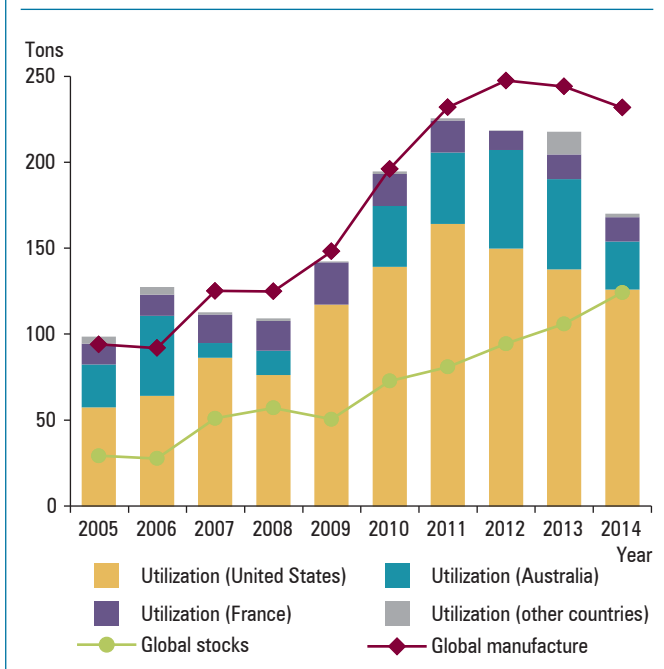
<sup>a</sup>Stocks as at 31 December of each year.

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

30. Figure 10 provides an overview of the manufacture, stocks and utilization of ATA (CPS) during the period 2005-2014. Industrial manufacture of ATA (CPS), which started in 1998, increased rapidly before levelling off in 2012 and decreasing slightly to 232.1 tons from 2013 to 2014



**Figure 10. Anhydrous thebaine alkaloid contained in concentrate of poppy straw: utilization, global manufacture and stocks,<sup>a</sup> 2005-2014**



<sup>a</sup>Stocks as at 31 December of each year.

(a decrease of 12.2 tons). The only countries manufacturing ATA (CPS) in 2014 were Australia, which accounted for 83 per cent of the global total, Belgium (9 per cent), France (5 per cent), and Spain (2 per cent). Australia was also the main exporter, accounting for 121.0 tons, or 84 per cent, of global exports in 2014. The United States has been the leading importer of ATA (CPS) for many years; in 2014 it accounted for 84 per cent of total imports.

31. ATA (CPS) is an intermediate product for the manufacture of thebaine. Global utilization of ATA (CPS) increased sharply from 2000 to 2011, when it peaked at 225.9 tons, and then it decreased considerably, to 170.4 tons in 2014. This trend reflects a temporary reduction in the demand for thebaine (see paras. 55 to 57 below). In 2014, the United States continued to be the main user of thebaine

(accounting for 74 per cent of global utilization); it was followed by Australia (16 per cent) and France (8 per cent). Global stocks of ATA (CPS) stood at 124.5 tons in 2014. The United States (59.3 tons) and Australia (52.1 tons) together accounted for 89 per cent of global stocks.

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

32. Manufacture of AOA (CPS) in commercially usable quantities started in 1999. Australia was the main manufacturing country in 2014, with almost 95 per cent of the world total of 64.1 tons. Smaller quantities were manufactured by Belgium (2.7 tons) and Spain (0.6 ton). Total utilization of AOA (CPS) in 2014 amounted to 34.7 tons. AOA (CPS) was used in the United States (79 per cent) and Switzerland (21 per cent) for the manufacture of other drugs. Global stocks of AOA (CPS) had been fluctuating since 2001. In 2014, they increased considerably, to 86.0 tons (up from 16.1 tons in 2013), of which 78 per cent was held in Australia, 12 per cent in the United States and 4 per cent in Belgium.

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

33. Manufacture of ACA (CPS) amounted to 57.6 tons in 2014. ACA (CPS) manufacturing has been increasing for some years. The only countries that manufactured ACA (CPS) in 2014 were Australia (56 per cent of the global total), France (36 per cent), Turkey (7 per cent) and Spain (1 per cent). ACA (CPS) is used for the extraction of codeine. Global utilization of ACA (CPS) amounted to 31.5 tons in 2014, of which 77 per cent was accounted for by France and 23 per cent by the United States. Global stocks of ACA (CPS) in 2014 stood at 10.1 tons, most of which was held in the United States (3.3 tons), Australia (2.5 tons), France (1.3 tons), Turkey (1.0 tons), Denmark (0.9 tons), the United Kingdom (0.5 tons) and Norway (0.2 tons).

## Opiates and opioids

34. “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.<sup>13</sup>

<sup>13</sup>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.

35. Opioids are used mostly for their analgesic properties to treat severe pain (fentanyl, hydromorphone, methadone, morphine and pethidine), moderate to severe pain (buprenorphine<sup>14</sup> 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 remifentanyl).

<sup>14</sup>Buprenorphine is controlled under the Convention on Psychotropic Substances of 1971. Comments on its licit movement are contained in para. 97 below.

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 addiction to opioids (buprenorphine and methadone).

## Natural alkaloids

36. 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

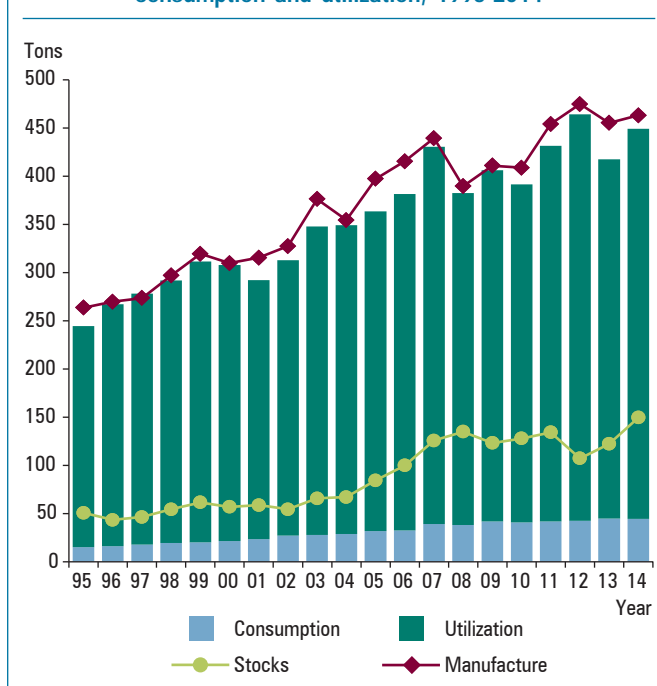
37. In the 20-year period 1995-2014, the manufacture<sup>15</sup> of morphine doubled from 263.8 tons in 1995 to 463.6 tons in 2014 (see figure 11). Since 2011, those levels have remained relatively stable. About 80 per cent of the morphine manufactured globally is converted into other narcotic drugs or into substances not covered by the 1961 Convention (see paras. 42-44 below). The rest is used for medical purposes.

38. In 2014, the leading morphine manufacturing country was France (94.3 tons, or 20 per cent of global manufacture), followed closely by the United Kingdom (94.2 tons, or 20 per cent), the United States (67.6 tons, or 14 per cent), Australia (51.0 tons, or 11 per cent), China (24.4 tons, or 5 per cent) and Norway (23.2 tons, or 5 per cent). Together, these six countries accounted for 76 per cent of global manufacture. Five other countries reported the manufacture of morphine for 2014 in quantities of more than 10.0 tons: Japan, Hungary, Islamic Republic of Iran, India, Slovakia, and Spain, in descending order.

39. Exports of morphine amounted to 33.0 tons in 2014, an increase of 7.4 tons from 2013. The leading exporting country was Slovakia (29 per cent of global exports) followed closely by the United Kingdom (27 per cent), France (7 per cent), the Netherlands (7 per cent), Australia

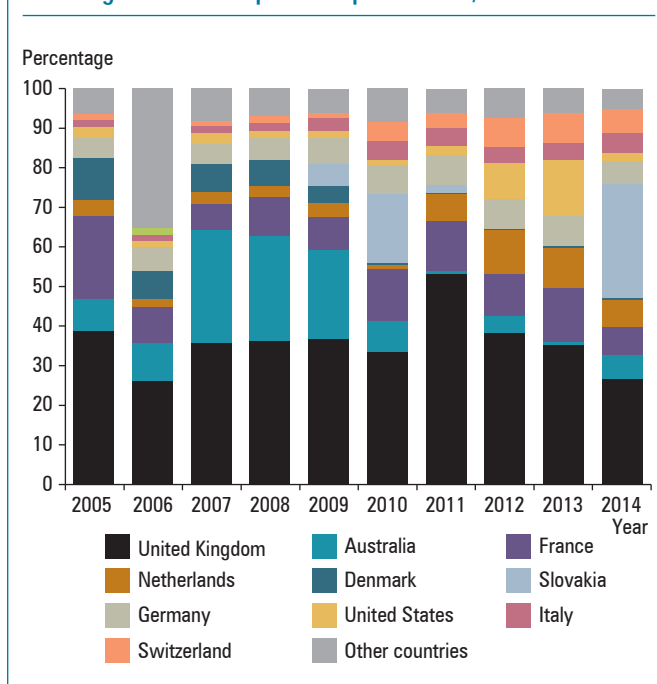
<sup>15</sup>In Australia, Brazil, China, Iran (Islamic Republic of), Italy, Norway, Turkey and the United Kingdom, concentrate of poppy straw is used in continuous industrial processes for the manufacture of other narcotic drugs, without first separating morphine. For statistical and comparative purposes, 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 11. Morphine: global manufacture, stocks,<sup>a</sup> consumption and utilization, 1995-2014

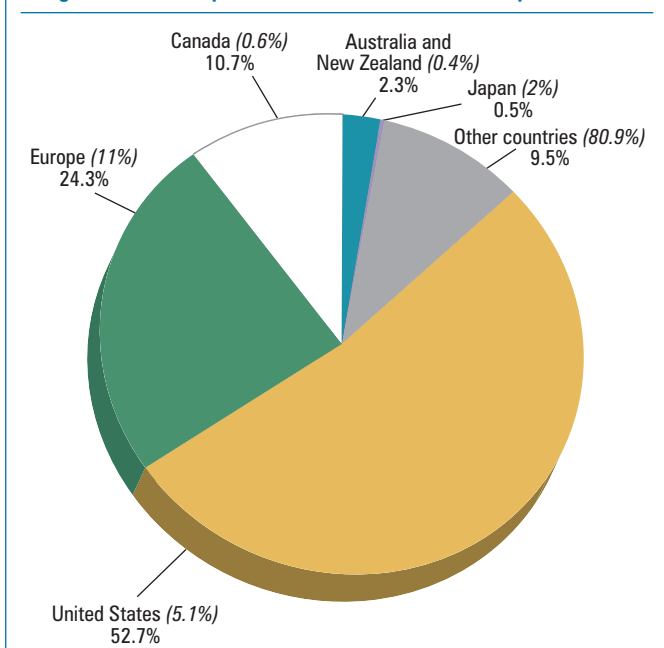


<sup>a</sup>Stocks as at 31 December of each year.

Figure 12. Morphine: export shares, 2005-2014



(6 per cent), Switzerland (6 per cent), Germany (6 per cent), Italy (5 per cent), Hungary (2 per cent) and the United States (2 per cent) (see figure 12). The main importing countries in 2014 were Germany (3.9 tons), Austria (2.5 tons), the Netherlands (2.3 tons), Canada (2.2 tons), the United Kingdom (1.5 tons) and Brazil (1.0 ton). Further details on exports and imports of morphine can be found in annex IV, tables 3 and 4.

**Figure 13. Morphine: distribution of consumption, 2014**

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

40. Global consumption of morphine, excluding preparations included in Schedule III of the 1961 Convention, increased considerably between 1995 (15.2 tons) and 2013 (44.7 tons), but decreased marginally in 2014 (44.5 tons). The differences in consumption levels between countries continued to be very significant (see figure 13 and table XIV.1), owing to various economic, knowledge, regulatory and other factors influencing the use of morphine in the treatment of pain.

41. 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 2014 the United States was the country with the highest consumption of morphine (23.4 tons) followed by Canada (4.7 tons), the United Kingdom (3.1 tons), France (1.8 tons), Austria (1.7 tons), China (1.4 tons) and Germany (1.1 tons). On the basis of S-DDD consumed per million inhabitants per day, the country with the highest consumption was Austria (5,746 S-DDD), where morphine is used for the treatment of pain and in substitution treatment for opioid addiction. In five other countries, morphine consumption was over 1,000 S-DDD per million inhabitants per day in 2014: Canada (3,768 S-DDD), Denmark (2,342 S-DDD), United States (2,034 S-DDD), United Kingdom (1,372 S-DDD) and New Zealand (1,188 S-DDD). As shown in figure 13, a large part of the world population (81 per cent) has just 10 per cent of the amount of morphine available globally at its disposal to manage pain and suffering. The disparity in consumption of narcotic drugs for palliative care continues to be a matter of concern.

42. In some countries, morphine is used for the manufacture of preparations included in Schedule III of the 1961 Convention. In 2014, the countries using morphine for that purpose in significant quantities were China (7.5 tons) and Italy (0.9 tons).

43. The largest share of morphine is used for conversion into other opiates, such as codeine, ethylmorphine and pholcodine (see table VI). The amounts utilized for that purpose, which fluctuated at about 200 tons per year until the beginning of the 1990s, have increased steadily since then, and remained stable in 2014 at 405.3 tons. Of the quantity utilized in 2014, more than 90 per cent was converted into codeine. The eight main countries reporting conversion of morphine into codeine in 2014 were France (81.1 tons), the United Kingdom (74.5 tons), the Islamic Republic of Iran (49.0 tons), Australia (40.1 tons), the United States (30.7 tons), Norway (21.8 tons), Japan (16.3 tons) and China (14.2 tons).

44. 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 1995-2014 and reached 1,657 kg in 2014, solely used by the United States, the United Kingdom and France.

45. Global stocks of morphine stood at 149.8 tons in 2014, an increase from the level of 2013 (122.0 tons) and the highest amount in 20 years. The largest stocks were held by the United States (58.6 tons, or 39 per cent of global stocks), Hungary and France (21.4 tons, or 14 per cent, each), Japan (11.0 tons, or 7 per cent) and the United Kingdom (6.9 tons, or 5 per cent).

## Codeine

46. 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 1995-2014 are shown in figure 14.

47. Global manufacture of codeine reached a peak of 411.9 tons in 2012 and then decreased, to 379.0 tons in 2014. That level was almost the same as in 2011 (381.7 tons). The main manufacturing country was France (98.4 tons,

or 26 per cent), followed by the United Kingdom (71.5 tons, or 19 per cent), the United States (57.9 tons, or 15 per cent) and Australia (38.0 tons, or 10 per cent). Norway, the Islamic Republic of Iran, Japan, Spain, China and India, in descending order, each manufactured quantities above 10.0 tons (see figure 15).

48. Stocks available globally continued to increase, reaching 308.0 tons in 2014. The countries keeping significant quantities of codeine in stock were the United Kingdom (60.3 tons, or 20 per cent), India (53.0 tons, or 17 per cent), France (36.3 tons, or 12 per cent), Australia (33.9 tons, or 11 per cent) and the United States (31.3 tons, or 10 per cent).

49. In 2014, world exports of codeine mirrored the developments in manufacturing and went up slightly to 162.6 tons, after having peaked in 2012 (176.5 tons) at the highest level ever reported (see figure 16). France continued to be the leading exporting country for codeine in 2014, exporting 49.4 tons, or 30 per cent, of the global total, followed by Australia (28.9 tons, or 18 per cent), the United Kingdom (28.1 tons, or 17 per cent), Norway (16.0 tons, or 10 per cent) and Spain (10.7 tons, or 7 per cent).

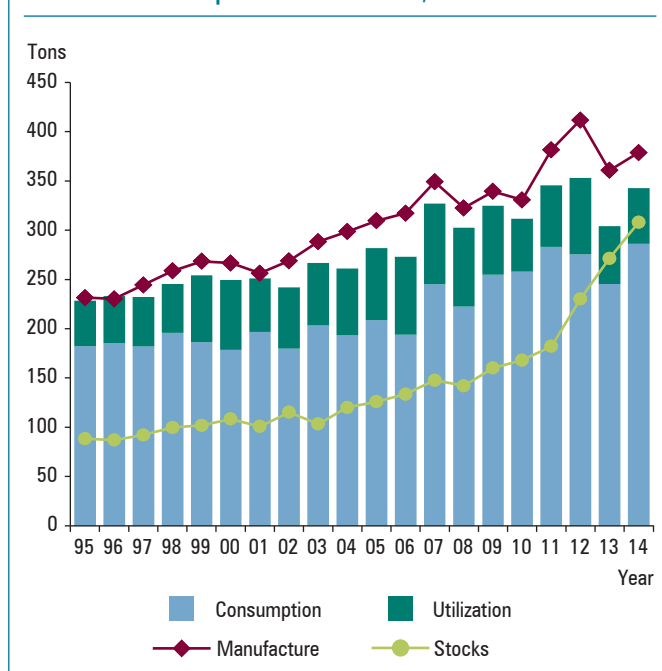
50. The main importing countries for codeine in 2014 were India (40.5 tons), Canada (15.7 tons), Germany (14.0 tons), Italy (13.6 tons), Switzerland (10.4 tons), Viet Nam (9.4 tons)<sup>16</sup> and Brazil (8.7 tons). More details on the international trade in codeine can be found in annex IV, tables 3 and 4.

51. Codeine is used mainly in the form of preparations listed in Schedule III of the 1961 Convention. In 2014, preparations listed in Schedule III accounted for 98 per cent of the total consumption of codeine. The consumption of codeine grew from 182.6 tons in 1995 to 286.5 tons in 2014 (see figure 14), making it the second most widely used opiate in medical practice globally in terms of S-DDD (2.9 billion S-DDD). Countries reporting the utilization of codeine for the manufacture of preparations listed in Schedule III are not necessarily the countries where those preparations are consumed. Large quantities of those preparations are exported from some of those countries.

52. Codeine is consumed almost exclusively (99 per cent) in the form of preparations listed in Schedule III. In 2014, the main countries reporting utilization for the manufacture of preparations listed in Schedule III were India (48.1 tons), the United Kingdom (47.9 tons), France (31.1 tons), the United States (24.0 tons), the Islamic Republic of Iran (20.1 tons) and Canada (16.2 tons). Other major user countries were, in descending order of quantity used, Viet Nam, China, Germany and Spain (see figure 17).

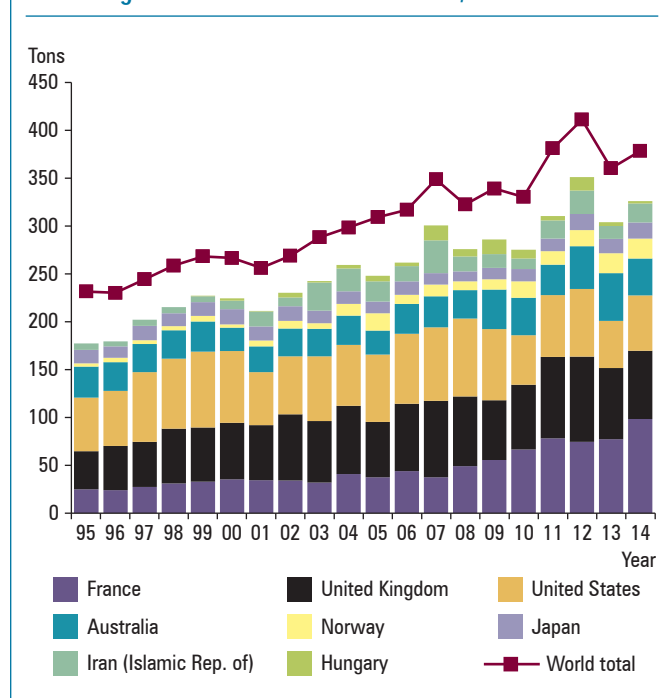
53. Utilization of codeine for the manufacture of other narcotic drugs, mainly dihydrocodeine and hydrocodone, increased steadily until reaching its highest level in 2007 (81.8 tons). Utilization has gradually declined and stood at 56.4 tons in 2014. Of the amount reported for 2014, 20.9 tons were used in the United States, 14.4 tons in Japan and 11.0 tons in the United Kingdom. Other major user countries were, in descending order of quantity used, Italy, Belgium and Slovakia.

Figure 14. Codeine: global manufacture, stocks,<sup>a</sup> consumption and utilization, 1995-2014



<sup>a</sup>Stocks as at 31 December of each year.

Figure 15. Codeine: manufacture, 1995-2014



<sup>16</sup>The figures for Viet Nam were calculated by INCB using available data series and are being clarified with the Government.

Figure 16. Codeine: exports, 1995-2014

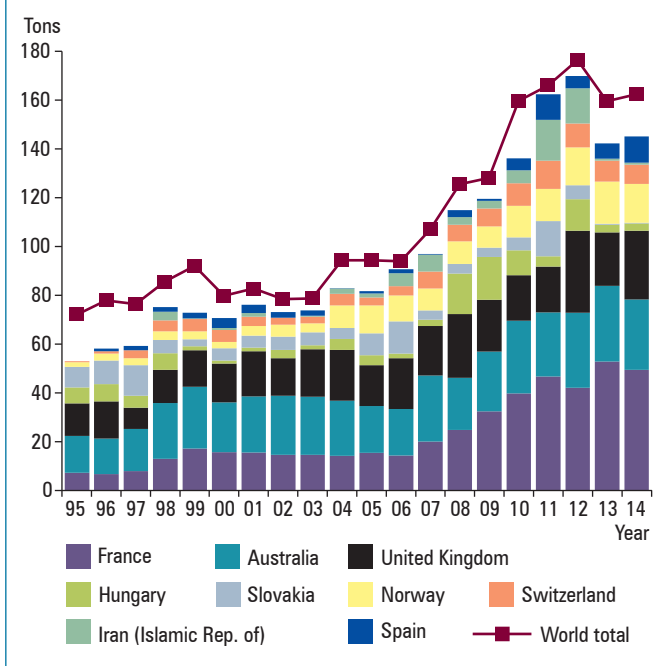
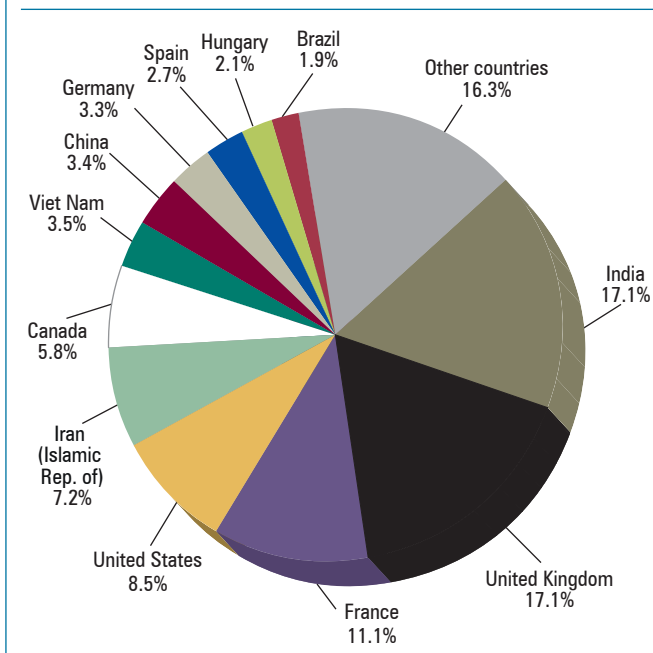


Figure 17. Codeine: utilization for the manufacture of preparations listed in Schedule III of the 1961 Convention, 2014



## Thebaine

54. 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, 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 1971),<sup>17</sup> as well as of substances not under international control, such as the derivatives naloxone, naltrexone, nalorphine and nalbuphine.

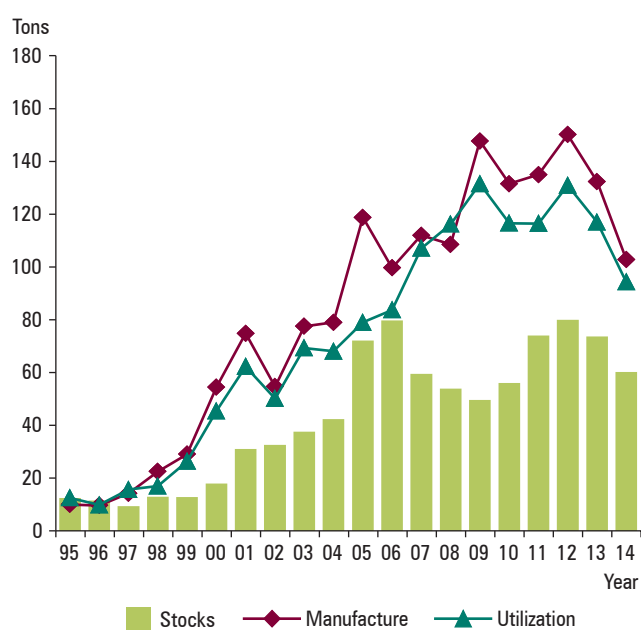
55. Global manufacture of thebaine has increased sharply since the late 1990s, as a consequence of the growing demand for oxycodone and other drugs and substances that may be derived from it. In 2014, global manufacture dropped further, to 102.6 tons, down from the peak of 149.9 tons reached in 2012 (see figure 18). However, this decrease may be a temporary adjustment to a trend of continuous increase that is expected to continue. The reason is that 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 2014 manufactured 35.0 tons, or 34 per cent. The United States followed closely with 30.5 tons (30 per cent) and Australia with 28.1 tons, or 27 per cent. Smaller amounts were manufactured, in descending order, by France, Japan, Hungary, India and Slovakia. Despite the decrease in manufacturing of thebaine, there was a large increase in exports, from 48.4 tons in 2013 to 85.7 tons in 2014. The only countries exporting industrial amounts in 2014 were Australia (52.2 tons) and Spain (33.4 tons). The main country importing thebaine was the United Kingdom (42.6 tons).

56. Utilization of thebaine for the manufacture of other narcotic drugs decreased to 87.1 tons in 2014. The United States was the main user country for thebaine during the 20-year period 1995-2014. In 2014, it accounted for 40 per cent of global use, followed by France (26 per cent) and the United Kingdom (22 per cent) (see figure 19 and table VII). The quantity of thebaine reported as utilized for the manufacture of buprenorphine<sup>18</sup> fluctuated during the 10-year period 2005-2014: in 2014, it amounted to 7.0 tons, a considerable decrease from the 19.1 tons of the previous year. The Czech Republic, Switzerland, Denmark and India, in descending order, together accounted for 83 per cent of the world total. The utilization of thebaine for the manufacture of substances not covered under the 1961 Convention, such as noroxymorphone, naltrexone and naloxone, fluctuated sharply in the last years, between 0.3 tons and 9.3 tons. In recent years, those substances were manufactured intermittently to replenish stocks.

<sup>17</sup>United Nations, *Treaty Series*, vol. 1019, No. 14956.

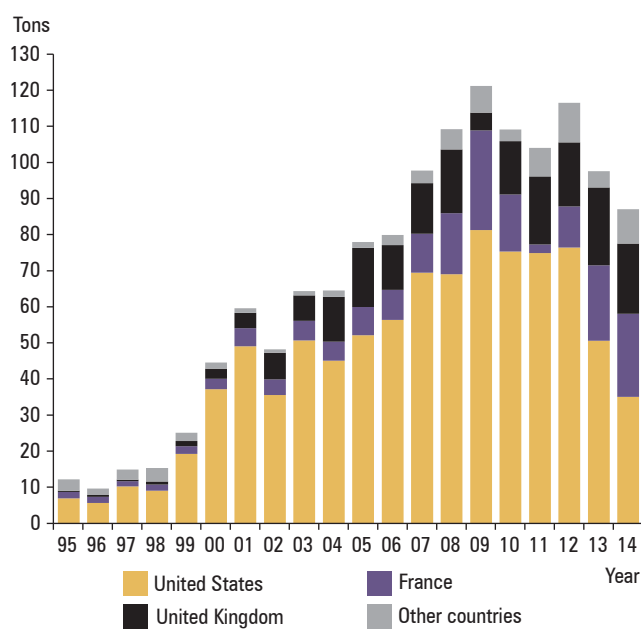
<sup>18</sup>Buprenorphine is controlled under the Convention on Psychotropic Substances of 1971. Comments on its licit movement are contained in para. 97 below.

**Figure 18. Thebaine: global manufacture, utilization and stocks,<sup>a</sup> 1995-2014**



<sup>a</sup>Stocks as at 31 December of each year.

**Figure 19. Thebaine: utilization for the manufacture of opioids, 1995-2014**



57. Global stocks of thebaine decreased from 72.9 tons in 2013 to 60.1 tons in 2014. Major stocks were held in the United Kingdom (18.9 tons), Switzerland (18.7 tons), Japan (4.3 tons) and Spain (3.9 tons).

## Oripavine

58. In 2007, oripavine was included in Schedule I of the 1961 Convention. The only countries reporting significant

manufacture of oripavine in 2014 were the United States (20.4 tons), Spain (3.0 tons), Switzerland (1.7 tons) and Italy (0.3 tons). The use of oripavine in significant quantities for the manufacture of other drugs was reported in 2014 by the United States (16.2 tons for manufacture of other drugs and 1.5 ton for the manufacture of non-controlled drugs) and Switzerland (0.6 tons for the manufacture of other drugs and 0.1 tons for the manufacture of non-controlled drugs). The drugs manufactured are mainly hydromorphone, oxycodone and buprenorphine. In 2014, global stocks of oripavine amounted to 11.4 tons, of which 45 per cent was held in the United States, 40 per cent in Spain and 16 per cent in Switzerland.

## Semi-synthetic opioids

59. 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. Large losses have been reported as occurring during the processing of some semi-synthetic opioids by some of the major manufacturers.<sup>19</sup> These 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.

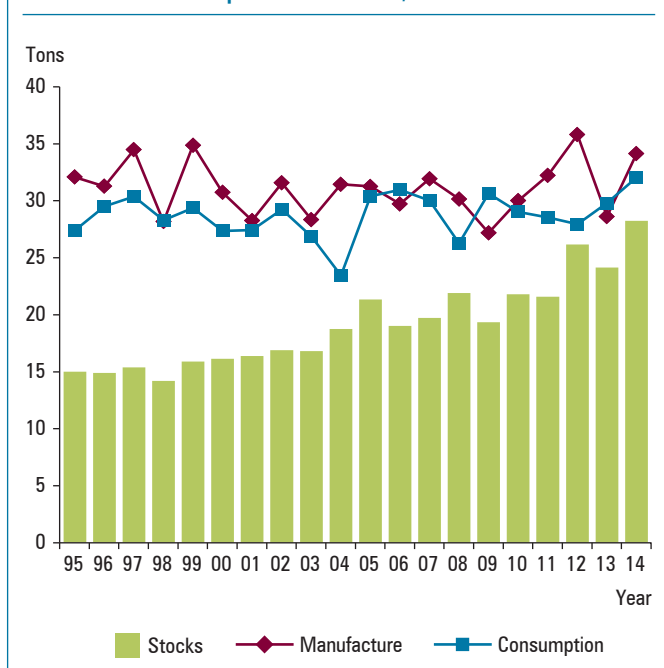
## Dihydrocodeine

60. Global manufacture of dihydrocodeine was relatively stable, although it fluctuated between 27.1 and 35.7 tons in the 20-year period 1995-2014. In 2014, the quantity manufactured worldwide stood at 34.0 tons (see figure 20). The main countries manufacturing significant quantities continued to be Japan (13.7 tons), the United Kingdom (10.9 tons) and Italy (4.2 tons), together accounting for almost 85 per cent of total world dihydrocodeine manufacture in 2014. Global exports of dihydrocodeine amounted to 12.0 tons in 2014. The main exporting country continued to be Italy, accounting for 35 per cent of world exports, followed, in descending order, by the United Kingdom, France and Belgium. In 2014, the United Kingdom also continued to be the leading importing country for dihydrocodeine (3.3 tons); other major importers were the Republic of Korea (3.2 tons), France (1.2 tons) and Hungary (1.0 ton).

<sup>19</sup>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.

61. Dihydrocodeine is consumed mainly in the form of preparations included in Schedule III of the 1961 Convention, accounting for 93 per cent of total consumption. In 2014, global consumption of dihydrocodeine reached 32.0 tons (about 320 million S-DDD). The main consuming 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 consumption (consumption and utilization for the manufacture of preparations in Schedule III). In 2014, global stocks of dihydrocodeine amounted to 28.2 tons; major stocks were held in Japan (13.1 tons) and the United Kingdom (5.4 tons).

Figure 20. Dihydrocodeine: global manufacture, consumption and stocks,<sup>a</sup> 1995-2014



<sup>a</sup>Stocks as at 31 December of each year.

## Ethylmorphine

62. The manufacture of ethylmorphine showed an overall downward trend over the 20-year period 1995-2014 and was stable at around 1 ton for several years. In 2014, the total quantity manufactured went back up to 2.1 tons, still a far cry from the peak of 4.6 tons reached in 1997. The main manufacturing countries continued to be France, which accounted for 74 per cent of global manufacture, India (18 per cent) and Hungary (5 per cent). France, at 496 kg, continued to be the leading exporting country, accounting for over 90 per cent of global exports. The two largest importers in 2014, Sweden and Belgium, imported almost 90 per cent of total world imports. 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 consumption and utilization for the manufacture of Schedule III preparations stood at

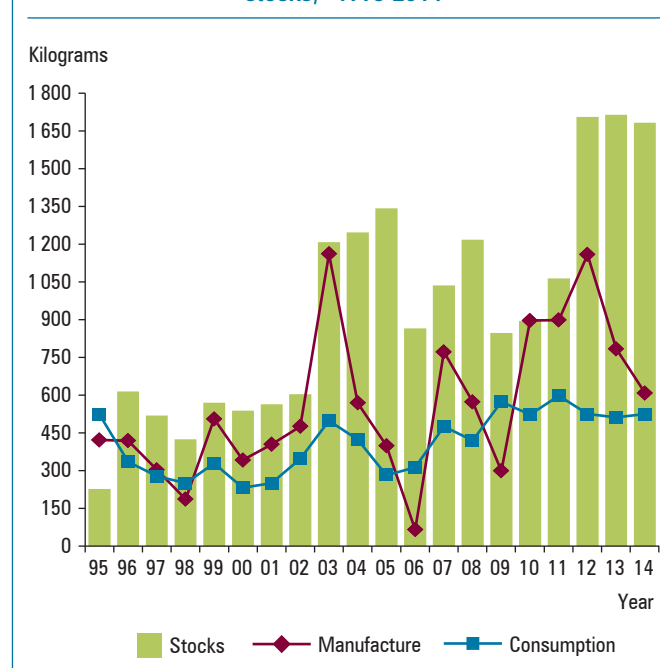
0.9 tons in 2014. The main consuming countries in 2014 were Sweden (29 per cent of the world total), France (27 per cent) and Belgium (17 per cent). In 2014, global stocks of ethylmorphine totalled 2.2 tons; the largest holder of stocks were India (41 per cent of global stocks) and France (36 per cent).

## Heroin

63. Licit manufacture of heroin fluctuated mostly between 400 and 800 kg, with peaks of over 1 ton in 2003 and 2012. In 2014, a total of 610 kg was manufactured (see figure 21), mostly by the United Kingdom (44 per cent), Switzerland (30 per cent) and Spain (26 per cent). The main country exporting heroin continued to be the United Kingdom (242 kg of global exports, or 54 per cent), followed by Switzerland (181 kg, or 40 per cent). Other exporters of heroin in amounts exceeding 10 kg were Germany and Hungary. In 2014, the main importing country was Switzerland (151 kg), followed by Germany (148 kg), the Netherlands (71 kg), the United Kingdom (28 kg) and Denmark (27 kg).

64. Global consumption of heroin amounted to 526 kg in 2014. Switzerland, where heroin is prescribed for long-term opiate addicts, reported heroin consumption of 241 kg for 2014 (or 46 per cent of global consumption). Other countries with significant heroin consumption were the Netherlands (26 per cent) and Germany (14 per cent). Global stocks of heroin remained stable at 1,600 kg after the considerable increase that had occurred in 2012. The

Figure 21. Heroin: global manufacture, consumption and stocks,<sup>a</sup> 1995-2014



<sup>a</sup>Stocks as at 31 December of each year.

countries holding significant stocks in 2014 were Switzerland (601 kg), the United Kingdom (575 kg) and the Netherlands (196 kg).

## Hydrocodone

65. In 2014, global manufacture of hydrocodone remained stable at 48.2 tons, confirming the declining trend that followed the peak of 75.9 tons reached in 2012 (see figure 22). The United States accounted for almost 100 per cent of global manufacture. The declining trend was probably influenced by stricter controls over hydrocodone products in the United States, which had been imposed with a view to reducing prescription drug abuse.

66. Global consumption of hydrocodone stood at 43.8 tons in 2014, amounting to about 29.2 billion S-DDD. In 2014, the country with by far the highest consumption of hydrocodone continued to be the United States, with 25,246 S-DDD consumed per million inhabitants per day, equivalent to nearly 100 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

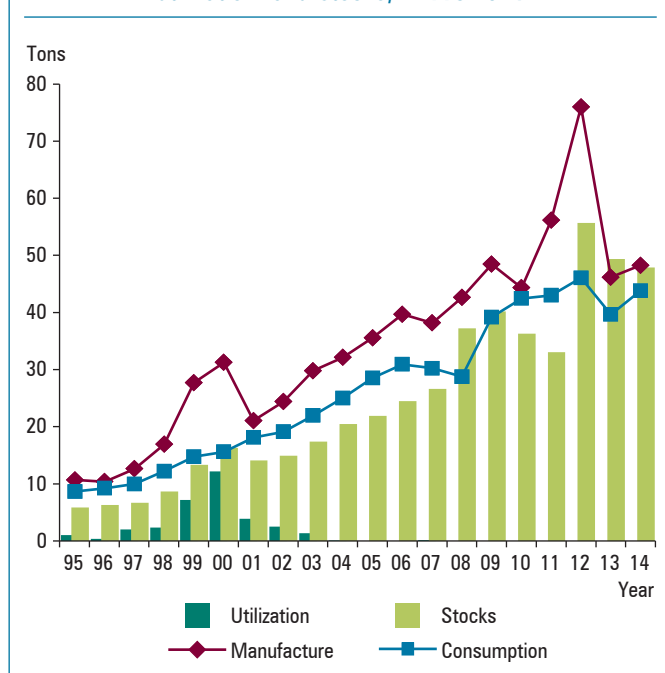
late 1990s. In 2014, global stocks of hydrocodone stood at 47.8 tons, more than 99 per cent of which was held by the United States.

## Hydromorphone

67. Global manufacture of hydromorphone has increased sharply over recent years, reaching 7.3 tons in 2014, the highest level ever registered. The leading manufacturing countries in 2014 were the United States (63 per cent of the global total) and Canada (20 per cent). Total exports of hydromorphone rose steadily, reaching 3.6 tons in 2014. The leading exporting countries were the United Kingdom (34 per cent of world exports) and the United States (31 per cent). In 2014, Canada continued to be the main importing country (1.3 tons); it was followed by Germany (0.8 tons) and Switzerland (0.6 tons).

68. In 2014, consumption of hydromorphone increased steadily, reaching 5.7 tons (286 million S-DDD). The United States continued to be the main consumer country in 2014 (53 per cent of global consumption); it was followed by Canada (31 per cent) and Germany (9 per cent). Ranked according to S-DDD consumed per million inhabitants per day, the countries with the highest consumption of hydromorphone in 2014 were Canada (6,986 S-DDD), Austria (1,768 S-DDD) and the United States (1,308 S-DDD). Global stocks of hydromorphone reached 7.5 tons in 2014, of which 63 per cent was held in the United States, 11 per cent in Canada and 7 per cent in Switzerland.

**Figure 22. Hydrocodone: global manufacture, consumption, utilization<sup>a</sup> and stocks,<sup>b,c</sup> 1995-2014**



<sup>a</sup>Utilization for the manufacture of other drugs.

<sup>b</sup>Stocks as at 31 December of each year.

<sup>c</sup>Hydrocodone is subject to losses during the manufacturing process. This explains some gaps between manufacture and consumption/stocks.

## Oxycodone

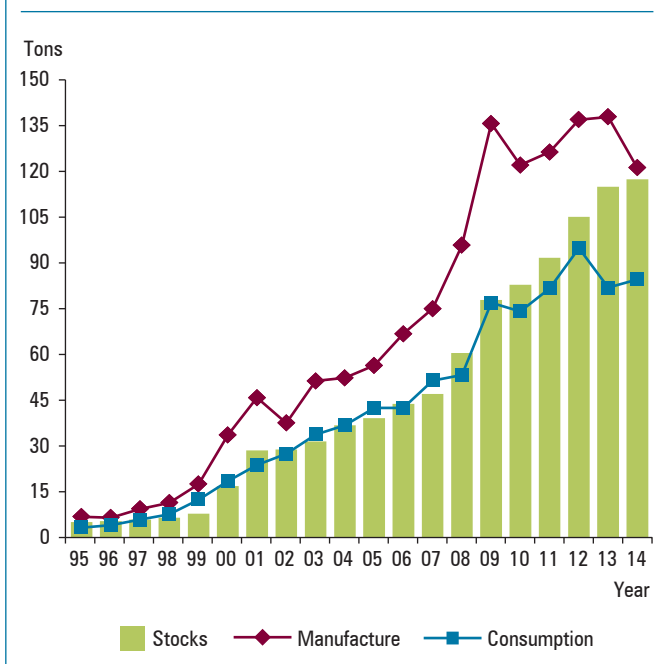
69. Oxycodone is one of the drugs commonly associated with overdose deaths in relation to prescription drug abuse, in particular in North America. Global manufacture of oxycodone has increased sharply over recent years, reaching a record high of 138.0 tons in 2013. However, in 2014 it registered a decrease to 121.4 tons (see figure 23). That decrease may have been related to stricter control measures introduced in some countries where the risk of overdose deaths and abuse of oxycodone was significant. In 2014, the United States accounted for 66 per cent of total world manufacture, followed by France (15 per cent), the United Kingdom (10 per cent) and Switzerland (6 per cent). Despite the slight decrease in the manufacture of oxycodone, exports continued to increase, reaching 32.4 tons in 2014. The United Kingdom continued to be the main exporting country in 2014 (44 per cent of world exports), followed by the United States (23 per cent), the Netherlands (10 per cent), Switzerland (7 per cent) and France (6 per cent). Major countries of destination were the United Kingdom (19 per cent), Germany (15 per cent), Canada (13 per cent) and the Netherlands (11 per cent). Further



details on exports and imports of oxycodone are contained in annex IV, tables 3 and 4.

70. Global consumption of oxycodone remained relatively stable at 84.8 tons (equivalent to over 1.1 billion S-DDD). Consumption of oxycodone is concentrated in the United States (73 per cent of the world total). Other major consumer countries in 2014, in descending order, were the United Kingdom, Australia, Canada and Germany. Ranked according to S-DDD consumed per million inhabitants per day, the countries with the highest consumption of oxycodone in 2014 were the United States (7,163 S-DDD), Australia (5,670 S-DDD), the United Kingdom (3,434 S-DDD) and Canada (3,178 S-DDD). Global stocks of oxycodone reached 117.6 tons in 2014—the highest level ever recorded—with the United States accounting for 73 per cent of the world total.

**Figure 23. Oxycodone: global manufacture, consumption and stocks,<sup>a,b</sup> 1995-2014**



<sup>a</sup>Stocks as at 31 December of each year.

<sup>b</sup>Oxycodone is subject to losses during the manufacturing process. This explains some gaps between manufacture and consumption/stocks.

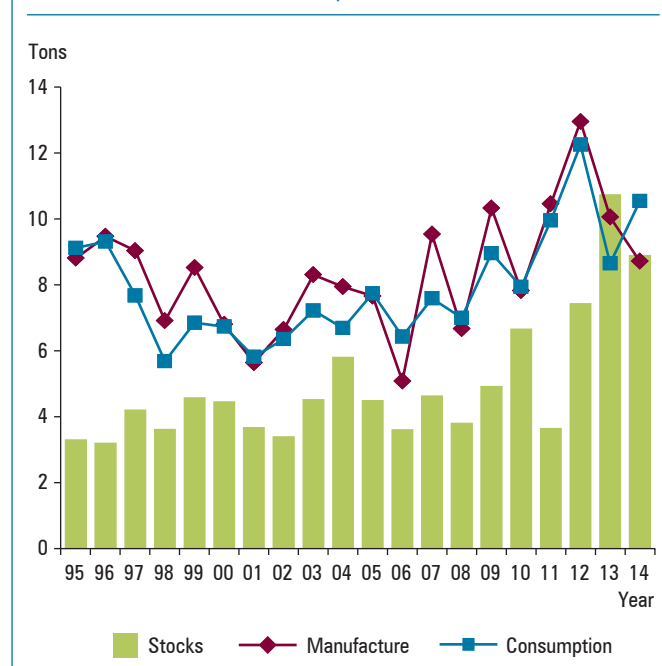
## Pholcodine

71. Pholcodine manufacture and consumption continued the volatile trend that characterized the 15-year period 2000-2014. Manufacture of pholcodine dropped from 10.0 tons in 2013 to 8.7 tons in 2014 (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. Recently, 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 2014 were France (3.3 tons), Norway (1.5 tons), and Hungary and the United Kingdom (both with 1.3 tons). Total exports of pholcodine reached 9.3 tons in 2014. Exports originated mostly from the United Kingdom (34 per cent of the global total), France (29 per cent), Norway (15 per cent) and Italy (11 per cent). The main destinations were Hong Kong, China (3.1 tons), Pakistan (1.3 tons) and Algeria (1.0 ton). Further details on exports and imports of pholcodine are provided in annex IV, tables 3 and 4.

72. Almost all pholcodine (95 per cent) is consumed in the form of preparations listed in Schedule III of the 1961 Convention. In 2014, global consumption of pholcodine amounted to 10.5 tons (approximately 207 million S-DDD). In 2014, the main consumer countries and territories were Hong Kong, China (29 per cent of global consumption), Pakistan (13 per cent), and Italy and China (both with 9 per cent). In 2014, global stocks of pholcodine decreased slightly to 9.0 tons. Major stocks were held by Hong Kong, China (24 per cent of global stocks), Hungary (13 per cent), and the United Kingdom and France (both with 12 per cent).

**Figure 24. Pholcodine: global manufacture, consumption and stocks,<sup>a</sup> 1995-2014**



<sup>a</sup>Stocks as at 31 December of each year.

## Synthetic opioids

73. 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

74. 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, such as cardio-respiratory toxicity. 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 again, to 49.1 tons in 2013, and ceased completely in 2014, (see figure 25). Therefore, based on the available information, Pakistan was the only exporting country (825 kg). All of its exports went to Australia.

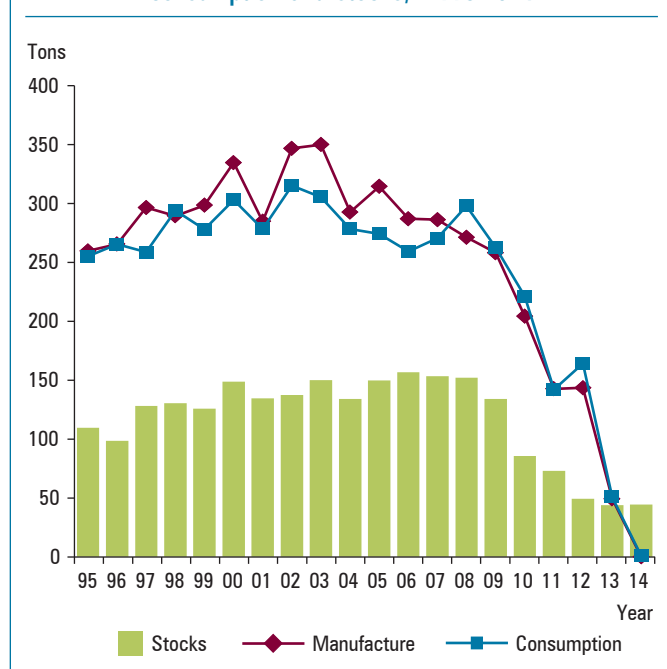
75. Dextropropoxyphene is consumed mainly in the form of preparations listed in Schedule III of the 1961 Convention (99 per cent of total consumption in 2014). Global consumption of dextropropoxyphene peaked at 314.6 tons in 2002 and, in general, has fallen since. In 2014, reported

global consumption stood at 0.9 tons (about 195 million S-DDD). The countries reporting the highest overall consumption and manufacture of preparations in Schedule III in 2014 were Argentina, the United Kingdom and Ireland, totalling 751 kg (88 per cent of the global total). Global stocks of dextropropoxyphene remained almost at the same level (43.9 tons in 2013 against 44.2 tons in 2014). In 2014, almost all the global stocks were held by India (39.3 tons), Ireland (1.2 tons), and Israel and Australia (0.7 tons each); in addition, a number of countries kept smaller amounts.

### Diphenoxylate

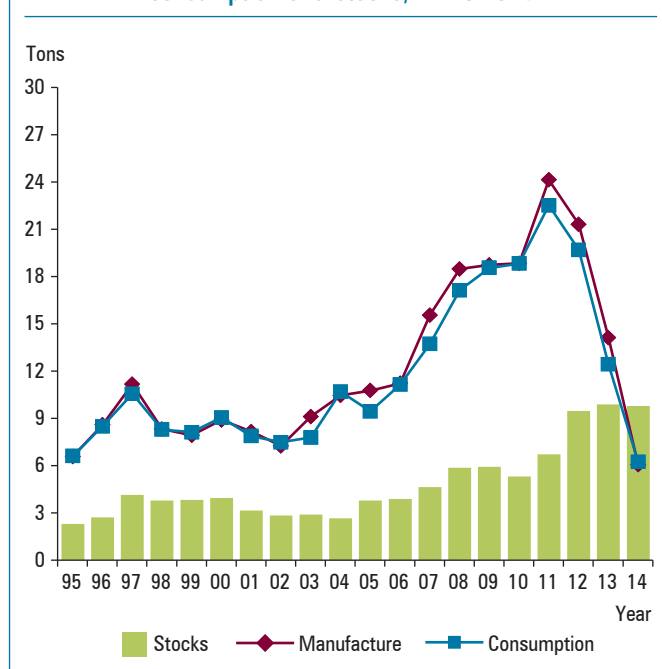
76. Diphenoxylate is used mostly as an antidiarrhoeal agent. It works by decreasing bowel activity. Global manufacture of diphenoxylate increased after 2003, reaching a peak of 24.1 tons in 2011, but dropped afterwards, reaching a record low of 6.1 tons in 2014 (see figure 26). Most of that drop was accounted for by India, where over 56 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 2014, India manufactured 3.4 tons (56 per cent) of the global total; it was followed by China (33 per cent) and the United States (12 per cent). India also exported the largest amount of diphenoxylate (682 kg, or 49 per cent of the global total); it was followed closely by the Islamic Republic of Iran (635 kg, or 46 per cent). The main importing country in 2014 was Pakistan (427 kg, or 47 per cent of the global total), followed by the Islamic Republic of Iran (270 kg, or 29 per cent) and Singapore (94 kg, or 10 per cent).

Figure 25. Dextropropoxyphene: global manufacture, consumption and stocks,<sup>a</sup> 1995-2014



<sup>a</sup>Stocks as at 31 December of each year.

Figure 26. Diphenoxylate: global manufacture, consumption and stocks,<sup>a</sup> 1995-2014



<sup>a</sup>Stocks as at 31 December of each year.

77. 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 2014). Global use in 2014 reached 6.2 tons, corresponding to 416 million S-DDD. The countries reporting the highest utilization (consumption and manufacture of preparations in Schedule III) in 2014 were India (44 per cent of the global total), China (31 per cent) and the United States (11 per cent). In 2014, stocks of diphenoxylate increased to 9.8 tons; 88 per cent of that amount was held by India.

## Fentanyl

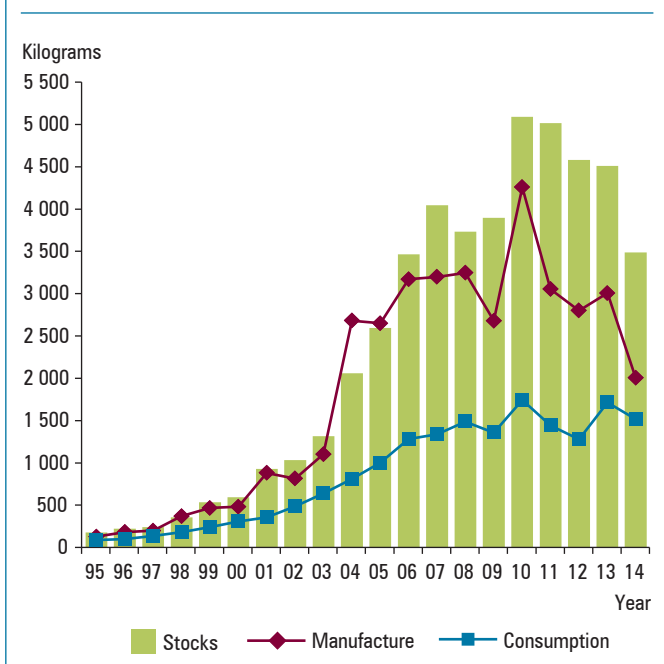
78. Fentanyl, when used as an analgesic, is about 100 times as potent as morphine and is therefore used only in very small doses (for example, 0.005-0.1 mg in injectable form). Until the 1980s, fentanyl was used mainly for the induction of anaesthesia and, in combination with other substances, for balanced 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.

79. Global manufacture of fentanyl increased rapidly in the 15-year period 2000-2014, reaching a record level of 4.3 tons in 2010. It then decreased to 2.0 tons in 2014 (see figure 27). In 2014, the United States was the main manufacturing country for fentanyl (73 per cent of global

manufacture); it was followed by Belgium (17 per cent) and South Africa (8 per cent). The principal exporting countries were Germany (25 per cent), South Africa (23 per cent), the United States (21 per cent) and Belgium (20 per cent). In 2014, Germany was also the leading importing country for fentanyl (720 kg of the global total, or 47 per cent), followed by the United Kingdom (113 kg), Spain (106 kg) and Canada (93 kg). Further details on exports and imports of fentanyl are contained in annex IV, tables 3 and 4.

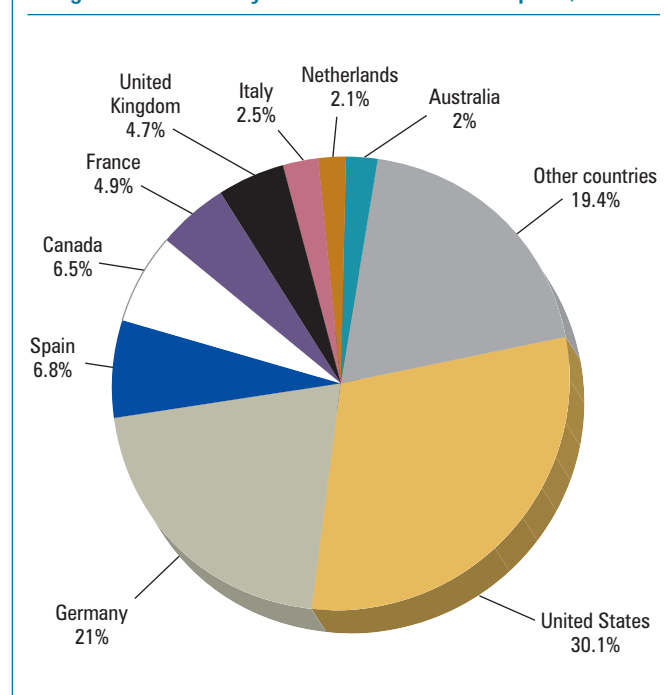
80. In 2014, global consumption of fentanyl followed a steadily increasing trend and remained high, at 1.6 tons (corresponding to 2.6 billion S-DDD), which confirmed fentanyl as the synthetic opioid with the highest consumption in terms of S-DDD. The United States continued to be the main consumer country in 2014, with 457 kg, or 30 per cent of the global total. Germany came second with 21 per cent, followed by Spain and Canada (both with 7 per cent) and France (5 per cent) (see figure 28). Ranked according to S-DDD consumed per million inhabitants per day, the countries and territories with the highest consumption of fentanyl in 2014 were Germany (17,795 S-DDD), Gibraltar (13,349 S-DDD) and Canada (13,349 S-DDD). In 2014, global stocks of fentanyl stood at 3.5 tons, which was lower than the level of 2013 (4.5 tons). The largest stocks were held by the United States (40 per cent of global stocks) and Belgium (23 per cent). Recently there have been reports of increases in the number of overdose deaths due to abuse of fentanyl, mainly in North America.

Figure 27. Fentanyl: global manufacture, consumption and stocks,<sup>a</sup> 1995-2014



<sup>a</sup>Stocks as at 31 December of each year.

Figure 28. Fentanyl: distribution of consumption, 2014



## Fentanyl analogues

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

### Alfentanil

82. In 2014, global manufacture of alfentanil remained stable at 15 kg, having been subject to large fluctuations over the previous 15 years. In 2012, global manufacture peaked at 78.3 kg, while in 2009 only 5.5 kg was manufactured. The principal manufacturers in 2014 were the United States (59 per cent of global manufacture), Slovakia (22 per cent) and Brazil (18 per cent).

83. In 2014, global consumption of alfentanil (16.8 kg) remained at the level of 2013. The United Kingdom was the main consumer country for alfentanil (39 per cent of global consumption), followed by Italy (13 per cent), Brazil (10 per cent), France (8 per cent) and Germany (7 per cent). Detailed information on the consumption of fentanyl analogues is provided in table XIII.1. of part four of the present publication. In 2014, global stocks of alfentanil more than doubled, from 71 kg in 2013 to 166 kg in 2014. Belgium, which held the largest amount of alfentanil in stock in 2013 (42.6 kg) reduced its stock and held only 18.4 kg in 2014. In 2014, the main holder of alfentanil stocks became the United Kingdom, with 104 kg (62 per cent), followed by Belgium and, at a considerable distance, the United States, Slovakia, Italy and Germany.

### Remifentanil

84. 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 was manufactured. Manufacture has been fluctuating considerably since 2001, peaking at 91 kg in 2011 and decreasing again to 66 kg in 2014. Belgium continued to be the main manufacturing country with 69 per cent of global manufacture, followed by the United Kingdom (11 per cent), Spain (7 per cent) and South Africa (5 per cent). Belgium, Italy and the United Kingdom were the main exporting countries, together accounting for 91 per cent of global exports. Italy was also the main importing country, with 55 per cent of global imports; followed by Japan (7 per cent) and Germany (6 per cent). Despite the reduction in manufacturing, there was a sharp increase in consumption, from 57 kg in 2013 to 78 kg in 2014. The main consumers were Belgium (18 per cent of global consumption), Italy (14 per cent) and China (12 per cent). In 2014, global stocks of remifentanil decreased to 109 kg, of which 25 per cent was held

by Italy, 14 per cent by Hungary, 12 per cent each by China and the United Kingdom, and 10 per cent by Germany.

### Sufentanil

85. In 2014, global manufacture of sufentanil increased slightly to 7.3 kg, confirming its long-term increasing trend. Of the global total, 93 per cent was manufactured by the following countries: United States (36 per cent), China (29 per cent), Belgium (15 per cent) and Slovakia (13 per cent). The main countries exporting sufentanil were Belgium (34 per cent), the United States (33 per cent), and Italy (14 per cent). In 2014, global consumption of sufentanil rose to 4.6 kg, after a decrease to 3.3 kg was recorded in 2013. The largest consumers of sufentanil were, in descending order, China, Germany, France and Spain, together accounting for 71 per cent of the global total. In 2014, global stocks of sufentanil totalled 15 kg, most of which was held by the United States (45 per cent), China (14 per cent) and Germany (11 per cent).

### Ketobemidone

86. Ketobemidone is a powerful opioid analgesic whose effectiveness against pain is similar to that of 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 2014, consumption reached its lowest point in decades (58 kg). In parallel, stocks have been dwindling; in 2014 they reached 88 kg, down from 142 kg in 2013. After ceasing in 2012, global manufacture resumed in 2013 at a very low level (3 kg). In 2014, it increased to 49 kg, with Germany accounting for almost 100 per cent of global ketobemidone manufacture. In 2014, Germany was also the main exporter (81 per cent of global exports), followed by France (18 per cent), which probably exported a part of its stocks. Even though Germany considerably reduced its stocks of ketobemidone (from 109 kg in 2013 to 64 kg in 2014), it continued to hold the largest stocks (72 per cent of the global total). It was followed by Denmark (11 per cent), and Sweden and Norway (both with 5 per cent).

### Methadone

87. Methadone, together with buprenorphine, which is controlled under the 1971 Convention, is used for pain management. It is also used extensively in the treatment of opioid dependence. As shown in figure 29, the trends related to the consumption, manufacture and stocks of both substances show a steady increase over the 20-year period 1995-2014, with some fluctuations. In 2014, the manufacture of methadone continued to decrease, to

31.0 tons (10.8 tons less than in 2013). The main producing countries were the United States (48 per cent) and Switzerland (34 per cent). Smaller quantities were manufactured by Germany (6 per cent), China (5 per cent), Spain (3 per cent) and India (2 per cent). Also in 2014, Switzerland continued to be the main exporter of methadone (10.3 tons, or 70 per cent); it was followed by the United States (1.4 tons, or 10 per cent). The main importing countries were Italy (14 per cent of the global total), Canada (12 per cent), the United Kingdom (10 per cent), the Netherlands (9 per cent), France (6 per cent) and the Islamic Republic of Iran (5 per cent). The biggest stocks of methadone were held by the United States (30 per cent of the global total) and Switzerland (28 per cent).

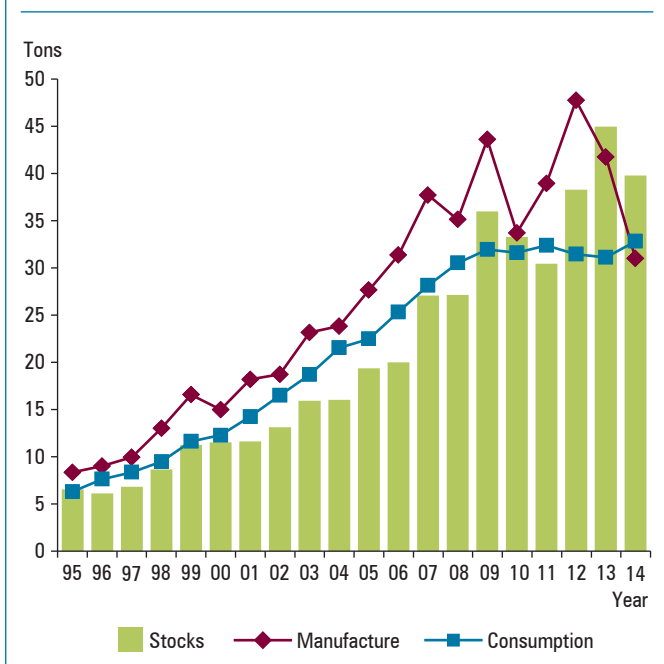
88. Consumption of methadone was concentrated in a few countries, and there were large differences in global consumption patterns. The main consuming countries were the United States (48 per cent), the United Kingdom (8 per cent), Canada (6 per cent), China (5 per cent), Germany and Italy (both with 4 per cent), France and Spain (both with 3 per cent), and Australia, the Islamic Republic of Iran and Viet Nam (2 per cent each). 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

89. The manufacture of pethidine has shown a continued decline since 1995, reaching its lowest point in 2013 (5.8 tons) (see figure 30). Manufacture increased slightly in 2014 (to 7.5 tons), while consumption of pethidine continued to decline, from 7.2 tons in 2013 to 5.8 tons in 2014. Pethidine is used mostly in child delivery. The decline in consumption is attributable to several factors, such as its low potency, short duration of action and unique toxicity, 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.

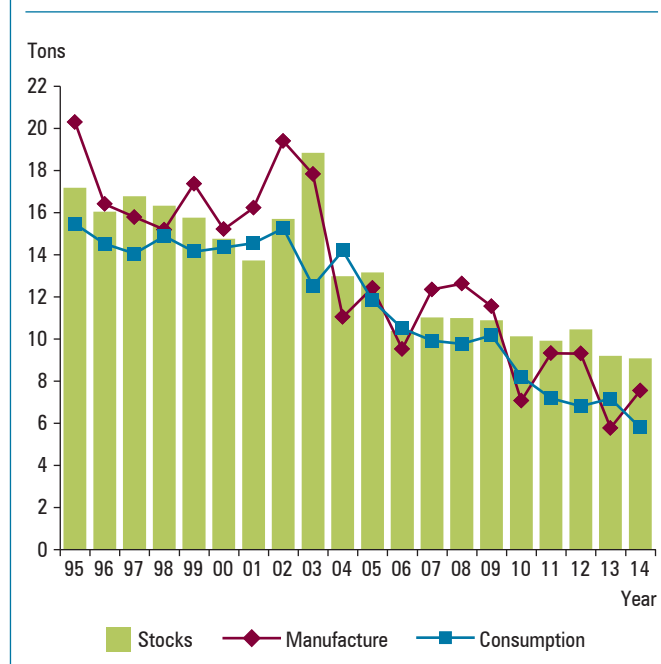
90. In 2014, manufacture of pethidine was concentrated in the United States (42 per cent), Spain (32 per cent), Slovakia (13 per cent) and China (11 per cent). The main exporting country was Spain (2.5 tons), followed by Slovakia (0.9 tons) and Germany (0.6 tons). The main countries importing pethidine were the United Kingdom (17 per cent), South Africa (12 per cent) and Brazil (10 per cent). A number of other countries (Canada, Germany, Austria, Saudi Arabia, Turkey, the Republic of Korea and the Islamic Republic of Iran, in descending order) imported lesser quantities (ranging from 5 to 2 per cent each of the global total). Further details on exports and imports of pethidine are contained in annex IV, tables 3 and 4.

Figure 29. Methadone: global manufacture, consumption and stocks,<sup>a</sup> 1995-2014



<sup>a</sup>Stocks as at 31 December of each year.

Figure 30. Pethidine: global manufacture, consumption and stocks,<sup>a</sup> 1995-2014



<sup>a</sup>Stocks as at 31 December of each year.

91. Pethidine consumption amounted to 5.7 tons in 2014 (corresponding to 14.5 million S-DDD). The main consumer countries were the United States (25 per cent of the global total) and China (13 per cent). Other countries consumed smaller quantities; those included Canada (8 per cent), Brazil (7 per cent), Saudi Arabia and South Africa (both with 5 per cent) and Spain (3 per cent). As a consequence of the overall decline in manufacture and consumption, stocks of pethidine also continued to decline, reaching 9.1 tons in 2014. The largest stocks were held by the United States (39 per cent of global stocks), Germany (13 per cent) and Slovakia (8 per cent).

### Tilidine

92. Germany continued to be the only manufacturer of tilidine in 2014. Manufacture of tilidine continued to fluctuate, and in 2014 it amounted to 27.6 tons. Exports of tilidine remained stable at 32.0 tons in 2014. Germany continued to be the principal exporting country in 2014, accounting for 57 per cent of global exports, still a considerable reduction from the level of 2012, when it accounted for 98 per cent. Serbia was the second exporting country in 2014, with 43 per cent of reported exports.

93. After reaching a record level of 59.1 tons in 2012, consumption of tilidine dropped to 19.9 tons in 2013, but rose again to 25.8 tons in 2014. Most tilidine is consumed in Germany (94 per cent), followed by Belgium (5 per cent). Almost all stocks of tilidine (38.3 tons in 2014) were held by Germany (99.7 per cent).

### Trimeperidine

94. Before 2012, the quantity of trimeperidine manufactured fluctuated considerably for a number of years; from 2012 to 2014, it was stable at about 200 kg. Manufacture in 2014 was 151 kg, well below the level reported in 2013 (240 kg). The only manufacturers of trimeperidine were the Russian Federation (55 per cent of the global total), Ukraine (26 per cent) and India (19 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 2014, the main exporter was India (65 per cent of global exports), followed by Ukraine (21 per cent), and the Russian Federation and Latvia (both with 7 per cent). The main importing countries in 2014 were Belarus (34 per cent of global imports), Latvia (28 per cent), Uzbekistan (14 per cent), the Republic of Moldova (9 per cent) and Kyrgyzstan (6 per cent), with other countries importing smaller quantities.

95. In terms of S-DDD per million inhabitants, the countries with the highest consumption of trimeperidine 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 2014, global stocks stood at 365 kg, held mainly by the Russian Federation (59 per cent), Kazakhstan (17 per cent) and Ukraine (10 per cent). Eleven other consumer countries kept smaller amounts.

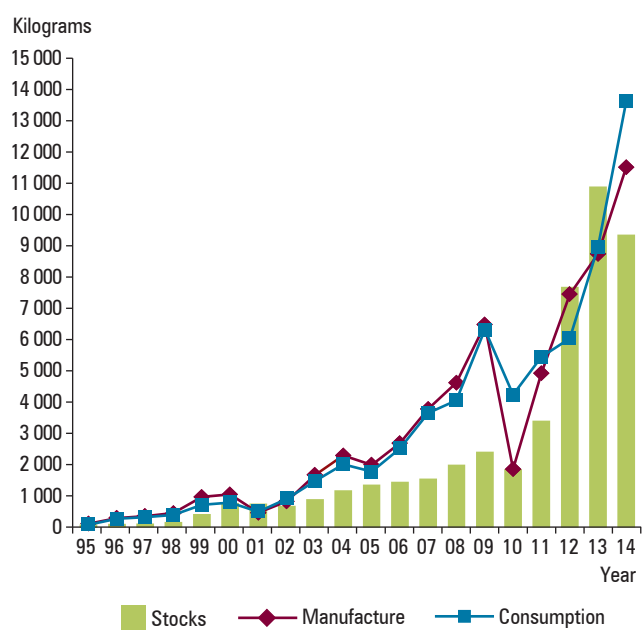
## Opioid analgesics controlled under the 1971 Convention

96. 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.<sup>20</sup>

### Buprenorphine

97. 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.

Figure 31. Buprenorphine: global calculated consumption,<sup>a</sup> reported manufacture and stocks,<sup>b</sup> 1995-2014



<sup>a</sup>Until 2009, approximate calculated global consumption, determined on the basis of statistical data submitted by Governments.

<sup>b</sup>Stocks as at 31 December of each year; data are provided on a voluntary basis and may therefore be incomplete.

<sup>20</sup>E/INCB/2014/3.

For this reason buprenorphine is used to produce sufficient agonist effects to enable opioid-addicted individuals to discontinue the misuse of opioids without experiencing withdrawal symptoms. Since the late 1990s, global manufacture of buprenorphine has increased steadily (with the exception of 2010, when there was a sharp decrease), reaching a peak of 11.5 tons in 2014 (see figure 31). The main manufacturing countries in 2014 were the United Kingdom (7.7 tons), the United States (1.8 tons), Switzerland (0.9 tons), the Czech Republic (0.6 tons), Belgium (0.4 tons), and Germany (0.1 tons). In 2014, the volume of trade in buprenorphine was relatively stable at 7.5 tons. The main exporters were, in descending order, the United Kingdom, Belgium, Germany and the Czech Republic. The main countries importing buprenorphine in 2014 were the

United States, Germany, France and the United Kingdom, in descending order.

## Pentazocine

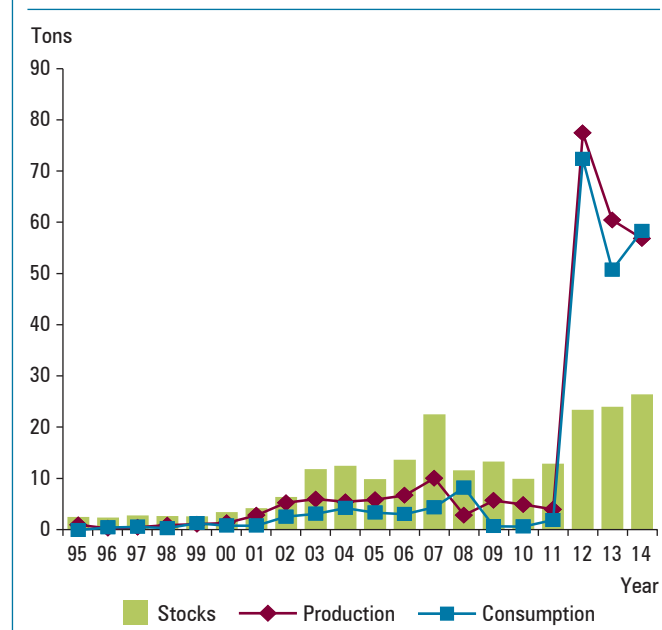
98. Pentazocine is an opioid analgesic with properties and uses similar to those of morphine. In 2014, global manufacture of pentazocine remained relatively stable at 1.1 tons. Most of that was accounted for by Italy (0.8 tons) and the United States (0.1 tons). The world's leading exporters of pentazocine in 2014, in descending order, were India, Italy, Switzerland and Portugal. In 2014, the main importers, in descending order, were Nigeria, Pakistan, India and the United States.

## Cannabis

99. 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/or cannabis extracts<sup>21</sup> for medical purposes, in addition to scientific research. In 2000, total production was 1.3 tons; by 2014 it had increased to 56.9 tons (see figure 32). For 2014, data from Canada, the main producer in 2013, were being clarified with the Government at the time of drafting this report. Other producing countries were Israel (6.9 tons), and the Netherlands and the United States, (both with 0.6 tons). The United Kingdom continued to be the main exporter of cannabis (1.8 tons, or 76 per cent), followed by the Netherlands (0.3 tons). Countries exporting less than 0.1 tons each were Austria, Denmark and Germany. The United States imported 2.8 tons in 2014, over half of the global total. Much smaller quantities were imported by Germany (16 per cent of the global total), Italy (10 per cent) and Canada (7 per cent). The large majority of the stocks were held by the United Kingdom (19.5 tons, or 78 per cent)

followed by Israel (1.4 tons, or 6 per cent) and Canada (1.2 tons, or 5 per cent).

Figure 32. Cannabis: global production, consumption and stocks,<sup>a</sup> 1995-2014



<sup>a</sup>Stocks as at 31 December of each year.

<sup>21</sup>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").

## Coca leaf and cocaine

### Coca leaf

100. 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

2014, but had reported an export volume of 135.0 tons, a considerable increase from 2013 (113.5 tons). The United States was the only importing country and accounted for the largest amount utilized (173.6 tons, or 92 per cent). The United States utilizes coca leaf mainly for the

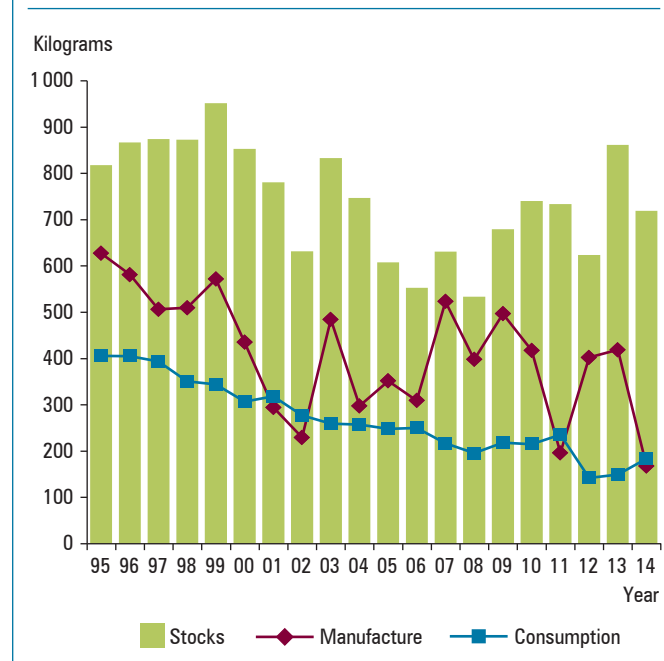
extraction of a flavouring agent and obtains cocaine as a by-product. Imports by the United States have been fluctuating considerably, but in 2013 and 2014 were stable at about 135 tons (134.5 tons in 2014). Most of the stocks of coca leaf are maintained by the United States (84 per cent) and Peru (15 per cent). The other major licit producer of coca leaf, the Plurinational State of Bolivia, had not provided information to the Board at the time of drafting the present report. 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 reaccessed to the 1961 Convention as amended by the 1972 Protocol.

## Cocaine

101. In 2014, global licit manufacture of cocaine continued to fluctuate as it has for more than 20 years, but dropped considerably from 419 kg in 2013 to 168 kg, the lowest level since 1995 (see figure 33). The only manufacturing countries continued to be Peru (92 kg, or 54 per cent of the global total) and the United States (76 kg, or 45 per cent). At the time the present report was being prepared, Peru had not reported any exports for 2014, nor had any importing countries reported any imports from Peru for 2014. Therefore, based on the available information, the main exporting countries in 2014 were the United Kingdom (63 kg), followed by the Netherlands (10 kg), and Germany, Switzerland and Denmark (about 2 kg each). The Netherlands (11 kg), Australia and Canada (both with 8 kg), and Switzerland (7.1 kg) were the main importers. The licit consumption of cocaine, which had been declining for a number of years, in 2014 increased slightly (from

150 kg in 2013 to 185 kg in 2014). However, licit consumption still remained considerably lower than the peak of 400 kg registered in 1995. The United States continued to be the main consumer (54 kg, or 30 per cent), followed by the United Kingdom (27 kg, or 15 per cent), Canada (26 kg, or 14 per cent), the Netherlands (14 kg, or 7 per cent), Belgium (9 kg, or 5 per cent) and Australia (7 kg, or 4 per cent). The largest stocks were held by Peru (315 kg, or 44 per cent), the United Kingdom (162 kg, or 23 per cent) and the United States (62 kg, or 9 per cent).

Figure 33. Cocaine: global manufacture, consumption and stocks,<sup>a</sup> 1995-2014



<sup>a</sup>Stocks as at 31 December of each year.