

COMMENTS ON THE REPORTED STATISTICS ON NARCOTIC DRUGS

Summary

Since the beginning of 2020, the coronavirus disease (COVID-19) pandemic has put to the test the ability of the international community to ensure adequate access to and the availability of internationally controlled drugs for those in need. The global supply chain of medicines has been affected as a result of both the disruption in the manufacturing of key starting materials of active pharmaceutical ingredients and of the ingredients themselves in some major manufacturing countries and the logistical challenges arising from border closures and other social distancing policies adopted by a number of countries. The Board, in its annual report for 2020, alerted the international community to this. The consolidated statistics on narcotic drugs for some countries in 2020 confirm that there has been an increase in the consumption, manufacturing and stocks of some substances (specifically fentanyl and its analogues), largely driven by significant increases in the need to provide pain relief and sedation for patients with COVID-19 admitted into intensive care units.

Regional analysis of the overall consumption of opioid analgesics for the treatment of pain confirms the persistence of disparities between regions in the consumption of those drugs. Almost all consumption is concentrated in developed countries in Europe and North America, while the level of consumption in other regions is often insufficient for the medical needs of the population.

The regional imbalance is not due to the lack of opiate raw materials. Apart from opium, the production of which has been declining for a number of years, overall utilization of poppy straw and concentrate of poppy straw derived from both the morphine-rich and the thebaine-rich varieties remained high in 2020, and stocks increased, indicating that the supply is more than sufficient to satisfy demand, even though the demand expressed by a number of countries might not reflect the actual medical needs of the population.

A major problem in many low-income countries is limited access to affordable opioid analgesics, such as morphine. In 2020, 239.7 tons of morphine (77.6 per cent of global production) was converted into other narcotic drugs or into substances not covered by the 1961 Convention as amended. Only 35.3 tons (11.4 per cent, up from 9.4 per cent in 2019), the greatest amount registered in the last 20 years, was used for direct consumption, mainly for palliative care. A smaller amount, 8.1 tons (2.6 per cent of global production), was used to manufacture preparations in Schedule III, while the remaining amount was used for other purposes. Of the amount of morphine consumed for the management of pain and suffering (35.3 tons, or 11.4 per cent of global production), only 16.9 per cent was available for use by most of the world population (82.6 per cent) – mainly, those living in low- and middle-income countries. Most of the total direct consumption of morphine (83.1 per cent), excluding preparations in Schedule III, continued to be in a small number of countries, mainly in Europe and North America.

Oxycodone is the semi-synthetic opioid that has been most associated with overdose deaths in recent years, in particular in North America. Manufacture of oxycodone has increased, but consumption, after having increased sharply between 2001 and 2013, gradually decreased, falling to 88.1 tons in 2020. Oxycodone consumption was concentrated in North America, Western and Central Europe, Australia and China. Both consumption and manufacture of hydro-morphone, another potent opioid, increased, with most of the consumption being in Canada

and the United States. Consumption of heroin for medical purposes remained relatively stable at 658.4 kg in 2020; Switzerland, the Netherlands and Germany, in that order, were the main consumer countries.

Among synthetic opioids, fentanyl is, after oxycodone, the other opioid associated with overdose deaths in recent years. After increasing for several years, manufacture of fentanyl peaked in 2010 and has followed a volatile decreasing trend since then, dropping to 2.5 tons in 2020. Also in this case, the downward trend may be associated with continued concerns about overdose deaths attributed to the abuse of fentanyl or fentanyl-type substances. Consumption of the fentanyl analogues alfentanil, remifentanil and sufentanil, which are used mainly as anaesthetics, and their use increased during the COVID-19 pandemic in some countries for analgesia and the suppression of respiratory activity in mechanically ventilated patients in intensive care and to provide analgesic cover for painful manoeuvres.

No manufacture of dextropropoxyphene or ketobemidone was reported in 2020. Diphenoxylate continued to be manufactured in much smaller quantities than before. In 2020, the manufacture of tilidine decreased further, falling to 27.4 tons. The manufacture of pethidine and trimeperidine continued to follow a volatile pattern. The manufacture and the consumption of methadone increased to 44.1 tons and 59 tons, respectively.

The licit cultivation, production and use of cannabis have been increasing considerably since 2000, when more countries from all regions started to use cannabis and cannabis extracts for medical purposes, as well as for scientific research. The total licit production of cannabis in 2020 was 650.8 tons. Since the licit cultivation of cannabis plant for medical and scientific purposes has increased considerably in recent years and the yield and manufacturing processes are not standardized, some data are being clarified with the relevant Governments in order to ensure consistency.

Peru is the only country to have exported coca leaf for the global market since 2000. In 2020, its exports amounted to 148.9 tons, all of which were imported by the United States to be utilized for the extraction of flavouring agents and the manufacture of cocaine as a by-product. The Plurinational State of Bolivia reported the production of 30,954 tons in 2020 for the use allowed in the country, in accordance with the reservation made by that State in 2013, when it reaccessed to the 1961 Convention as amended. In 2020, licit global manufacture of cocaine decreased considerably, to 18.3 kg, while licit consumption remained relatively stable at 396.4 kg.

Introduction to the comments on the reported statistics on narcotic drugs

1. The present comments are intended to facilitate the use of the statistical information on the licit production, manufacture, consumption,¹ utilization² 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. Unless otherwise indicated, the comments refer to developments during the period 2001–2020.

¹For the purposes of the Single Convention on Narcotic Drugs of 1961 as amended by the 1972 Protocol, 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, of the Convention).

²Pursuant to article 20 of the 1961 Convention as amended, the parties 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 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 IV and V of the present report contain data furnished by Governments to the International Narcotics Control Board (INCB) in accordance with article 20 of the Single Convention on Narcotic Drugs of 1961 as amended by the 1972 Protocol.³ The most recent statistical data reflected in the comments are those relating to 2020. The failure by some Governments to submit reports or to provide precise and complete reports, which in some cases has been notable, may have a bearing on the accuracy of some of the information presented in this report.⁴ The most pertinent conclusions and recommendations of INCB based on the analysis of statistical data are included in chapter II of its annual report.⁵

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

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

⁵E/INCB/2021/1.

Opiate raw materials

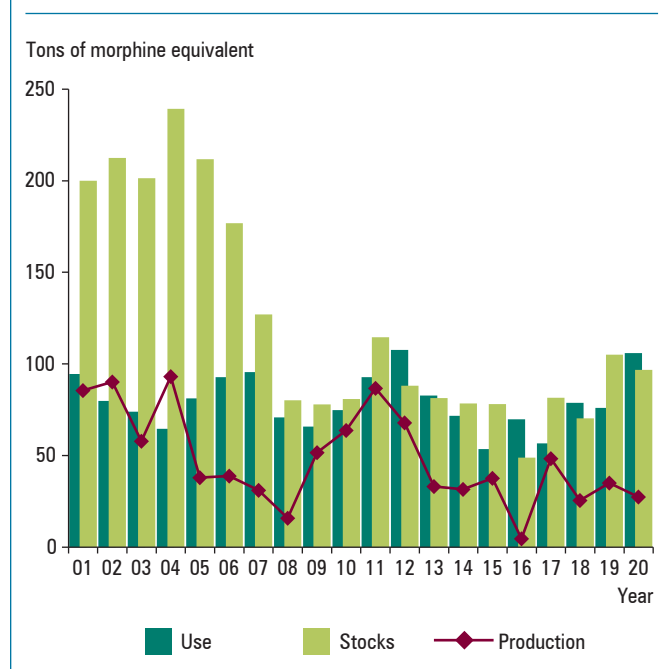
3. Opium and poppy straw are the raw materials obtained from the opium poppy plant (*Papaver somniferum*), from which alkaloids such as morphine, thebaine, codeine and oripavine are extracted. Concentrate of poppy straw is a product obtained in the process of extracting alkaloids from poppy straw. It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

Opium

4. Opium (also called “raw opium”) is the latex obtained by making incisions on the green capsules of opium poppy plants. For statistical and comparison purposes, data on the production of and trade in opium are reported at 10 per cent moisture content. When appropriate, the data on opium are also expressed in morphine equivalent,⁶ in order to enable comparison between opium and poppy straw. Figure 1 shows the licit production, stocks and use (consumption and utilization) of opium during the period 2001–2020, expressed in morphine equivalent.

⁶The 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 using the appropriate conversion rates, whenever the Board has been informed of their extraction in commercially significant quantities.

Figure 1. Opium: global production, stocks,^a and use (consumption and utilization),^b in morphine equivalent, 2001–2020



^aStocks as at 31 December of each year.

^bIncluding the use of seized opium in Iran (Islamic Republic of) and Myanmar.

5. Opium production was over 1,300 tons in 2000 (147.6 tons in morphine equivalent), but since then, production has followed a strong overall downward trend, going as low as 143.7 tons in 2008 (15.8 tons in morphine equivalent). There was a steady increase until 2011 when it

reached 789.1 tons in gross weight (86.8 tons in morphine equivalent), but subsequently, production continued to decrease, falling to its lowest level in 20 years, 42.3 tons (4.6 tons in morphine equivalent) in 2016. Production increased again in 2017, to 439.3 tons (48.3 tons in morphine equivalent), and subsequently decreased again, reaching 250.1 tons (27.5 tons in morphine equivalent) in 2020. India was the main producer, and the only licit exporter, of raw opium in 2020, accounting for 245 tons of production (26.9 tons in morphine equivalent) or 98 per cent of total global production. It was followed by China, which produced 4.7 tons (0.5 tons in morphine equivalent), which was 1.9 per cent of the global total. However, in China, poppy straw has replaced opium as the main raw material used in the manufacture of alkaloids since 2000. Small quantities were also produced by the Democratic People's Republic of Korea and Japan, together accounting for 0.1 per cent of the global total.

6. Imports of opium from India (see figure 2) have continued the sharp downward trend that started in 2015. Compared with the imports of 11.3 tons (1.2 tons in morphine equivalent) reported in 2019, imports in 2020 decreased to 1.6 tons (0.1 tons expressed in morphine equivalent). This is the lowest level of imports in 20 years and a very significant decrease compared with 2001 (550.9 tons, or 60.6 tons in morphine equivalent). The main countries importing opium in 2020 were Spain

(0.7 tons, or 44.5 per cent of all imports), followed by Germany (0.5 tons, or 33.7 per cent) and Switzerland (0.1 tons, or 7.5 per cent). A number of other countries imported quantities less than 0.1 tons. It should be noted that in 2019 Japan ceased importing opium altogether and switched to importing concentrate of poppy straw. That, in turn, had an impact on the decreases in both imports and exports, as well on the increase in stocks held by India.

7. As in previous years, the bulk of opium was used for the extraction of alkaloids, with only a small amount (13.1 tons, or 1.4 tons in morphine equivalent) being used for the manufacture of Schedule III preparations. Utilization (including the utilization of seized opium in Iran (Islamic Republic of) and Myanmar) in 2020 increased from 666 tons (73.2 tons in morphine equivalent) in 2019 to 942.3 tons (103.6 tons in morphine equivalent) in 2020. In 2020, similar to 2019, the main countries reporting utilization of opium for the extraction of alkaloids were the Islamic Republic of Iran (770.3 tons, or 84.7 tons in morphine equivalent), India (147.5 tons, or 15.6 tons in morphine equivalent) and Japan (23.7 tons, or 2.5 tons in morphine equivalent) (see figure 3). The origin of opium reported as utilized by the Islamic Republic of Iran was seized material. The Democratic People's Republic of Korea reported the utilization of opium in the amount of 0.4 tons (0.05 tons in morphine equivalent), and the United States reported utilization of 0.2 tons (0.02 tons in morphine

Figure 2. Opium: imports from India, in morphine equivalent, 2001–2020

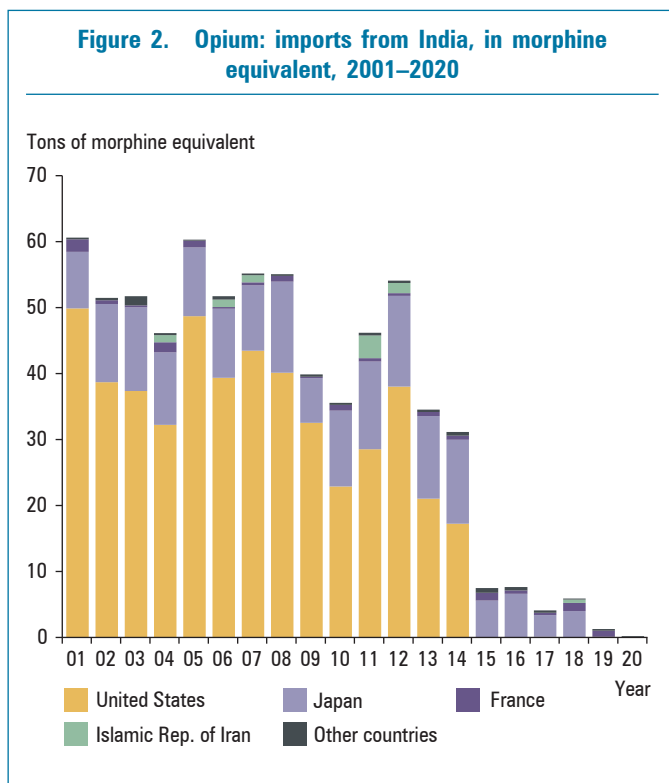
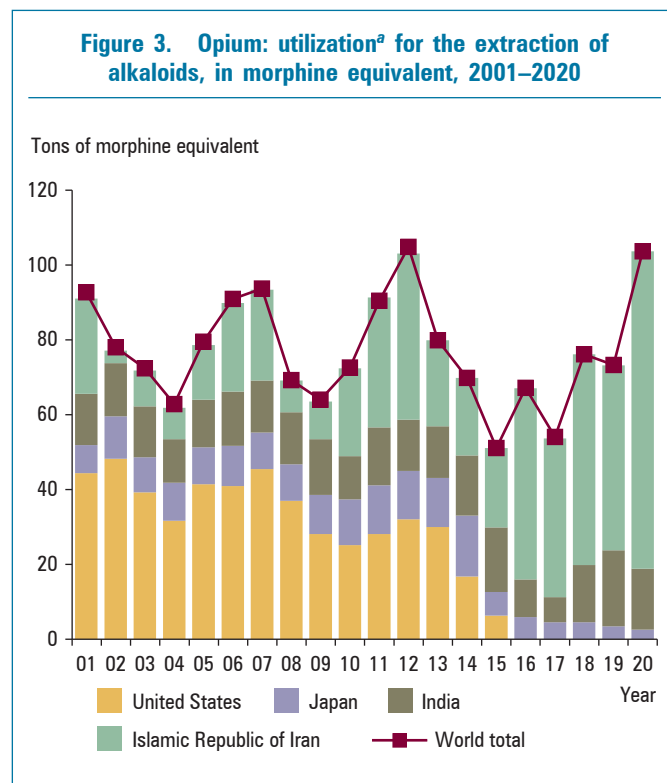


Figure 3. Opium: utilization^a for the extraction of alkaloids, in morphine equivalent, 2001–2020



^aIncluding the utilization of seized opium in Iran (Islamic Republic of) and Myanmar.

equivalent). Details on the utilization of opium for the extraction of alkaloids and the alkaloids obtained are provided in table III of part four of the present publication.

8. While most of the opium produced 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 as amended.⁷ Global consumption of opium for those purposes has fluctuated since 2001. In 2020, the consumption and the utilization of opium for the manufacture of preparations in Schedule III amounted to 13.1 tons (1.4 tons in morphine equivalent), including 8 tons (0.8 tons in morphine equivalent) in France, and 4.2 tons (0.4 tons in morphine equivalent) in China.

9. Global stocks of opium reached a peak in 2004 (2,176.2 tons, or 239.3 tons in morphine equivalent). They began to decrease thereafter until 2018, when they stood at 640.1 tons (70.4 in morphine equivalent). However, in 2019 the stocks increased significantly and reached a level of 954.7 tons (105.5 tons in morphine equivalent) to decrease slightly in 2020 to 879.6 tons (96.7 tons in morphine equivalent) (see figure 1). India continued to maintain the largest stocks of opium at 839.3 tons (92.3 tons in morphine equivalent), constituting 95.4 per cent of the global total. The second largest amount of stocks was held by Japan, at 25 tons (2.7 tons); Japan is continuing to gradually reduce its stocks of opium as it switches to the use of CPS for the manufacturing of opiates. France held 7.9 tons (0.8 ton in morphine equivalent). The last among the four greatest holders of opium stocks is China, with 5.5 tons (0.6 tons in morphine equivalent).⁸

Poppy straw

10. Poppy straw consists of all parts of the opium poppy plant after mowing except the seeds. Morphine is the predominant alkaloid found in the varieties of opium poppy plant cultivated in most producing countries. Commercial cultivation of the opium poppy plant with high thebaine content started in the second half of the 1990s. In the present publication, poppy straw produced from varieties of opium poppy plant rich in morphine is referred to as “poppy straw (M)”, poppy straw produced from varieties of opium poppy plant rich in thebaine is referred to as “poppy straw (T)”, poppy straw produced from varieties of opium poppy plant rich in codeine is referred to as “poppy

straw (C)”, poppy straw produced from varieties of opium poppy plant rich in oripavine is referred to as “poppy straw (O)”, and poppy straw produced from varieties of opium poppy plant rich in noscapine is referred to as “poppy straw (N)”. Some of those varieties contain, in addition to the main alkaloid (morphine, thebaine, codeine, oripavine or noscapine), other alkaloids that can be extracted.

11. 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 2009 and in France in 2013.

Poppy straw produced mainly from opium poppy rich in morphine⁹

12. Although the submission of statistics on the production of poppy straw is voluntary, most countries cultivating opium poppy plants for the extraction of alkaloids provided such statistics in 2020. Global production of poppy straw (M) expressed in morphine equivalent followed an increasing trend in the two decades prior to 2020. Over the years, production fluctuated sharply, mainly because of unstable weather conditions and in response to the demand in manufacturing countries. It reached about 430 tons in morphine equivalent in 2003, decreased to about 218 tons in 2008, but then increased again significantly, reaching 586 tons in 2015 before decreasing again, falling to 304 tons in 2018, and rising to 421 tons in 2019 and decreasing again in 2020 at 387 tons. Throughout the two decades prior to 2019, Australia, France, Spain and Turkey had been the main producer countries. In 2020, the leading producer was Spain (113 tons in morphine equivalent), followed by Turkey (69 tons), France and Australia (35 tons each) and Hungary (6 tons) (see figure 4). Other producers of poppy straw (M) together accounted for the remaining global production in 2020. For accounting purposes, quantities of poppy straw (C), rich in codeine, were included in the calculation of the quantities in morphine equivalent. Such quantities have become more significant in recent years. 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 of part four.

⁷Preparations included in Schedule III of the 1961 Convention as amended are exempt from several control measures that are otherwise mandatory for preparations containing narcotic drugs, including reporting on their consumption and international trade.

⁸For further information on the production and stocks of and demand for opium, see part three of the present publication.

⁹Morphine and codeine alkaloids (expressed in morphine equivalent) contained in other varieties of poppy straw such as poppy straw (T) and poppy straw (C) are also included in the total production figures in this subsection, where applicable.

Figure 4. Total anhydrous morphine alkaloid contained in all poppy straw varieties: production in the main producing countries, in morphine equivalent, 2011–2020

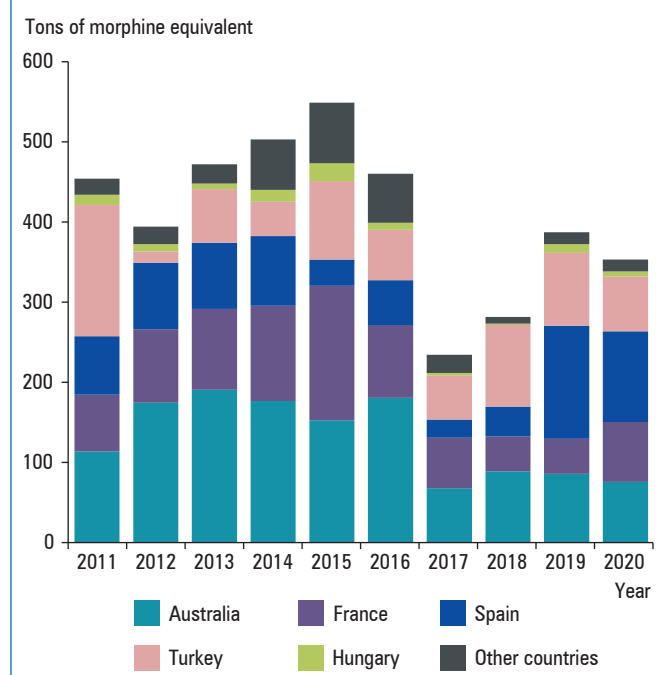
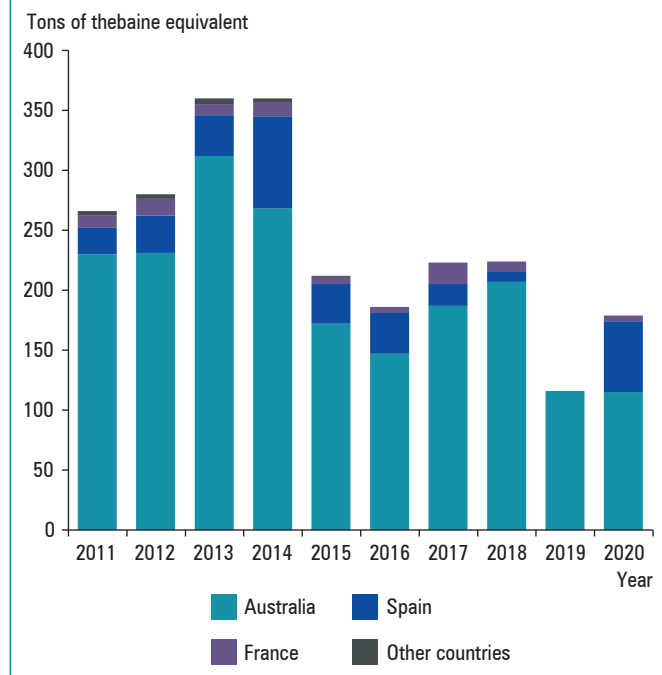


Figure 5. Total anhydrous thebaine alkaloid contained in all poppy straw varieties: production in the main producing countries, in thebaine equivalent, 2011–2020



13. International trade in poppy straw (M) as a raw material continues to be limited. In 2020, Hungary was the main exporter of poppy straw (M) for the extraction of alkaloids (76.3 per cent), followed by Slovakia (23.5 per cent) and Austria, Slovenia and Australia, which exported very small amounts (see annex IV, table 1).

14. The utilization of poppy straw (M) in 2020 fell to the amount of 2018. The main countries utilizing poppy straw (M) in 2020 were Turkey (21,252 tons in gross weight), Spain (5,282 tons), France (3,749 tons), Slovakia (2,424 tons), Australia (2,211 tons) and China (1,687 tons). Hungary and North Macedonia utilized smaller amounts. Further details on the utilization of poppy straw (M) for the extraction of alkaloids and the yields obtained are contained in table IV.

15. Stocks of poppy straw (M) in 2020 amounted to 6.8 tons, of which 89.3 per cent were held by Spain, 10.5 per cent by Australia and less than 1 per cent by Belgium and Hungary.

Poppy straw produced mainly from opium poppy rich in thebaine¹⁰

16. 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. Canada, China, Hungary and New Zealand have reported sporadic production in recent years. More details on the production of poppy straw (T) can be found in table II.

17. Production of poppy straw (T) in the main producing countries during the period 2011–2020, expressed in thebaine equivalent, is shown in figure 5. Total production decreased by half, going from 230 tons in 2018 to 119 tons in 2019, and then increasing again in 2020 to 182 tons as expressed in thebaine equivalent. In 2020, Australia was the main producer, with 115 tons in thebaine equivalent, at the same level as 2019 but nevertheless a considerable decrease compared with 2018 (207 tons). Spain reported producing 59 tons, and France, 5 tons (see figure 5).

18. 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. Stocks of poppy straw (T) were at 12.8 tons in 2020, with Australia holding 47.1 per cent of the global total, followed by Spain (31.5 per cent) and France (21.3 per cent).

Poppy straw produced from opium poppy rich in codeine

19. Australia reported the cultivation of poppy straw (C), rich in codeine, for commercial purposes for the first time in 2009 and France in 2013. This new variety was cultivated

¹⁰The quantities in thebaine equivalent of the thebaine and oripavine alkaloids contained in other varieties of poppy straw such as poppy straw (M) and poppy straw (C) are also included in the total production figures in this subsection, where applicable.

specifically to meet the high global demand for codeine. Its production increased steadily, from 415.3 tons (expressed in gross weight) in 2010 to 6,706.9 tons in 2015, but dropped considerably, to 1,313.2 tons, in 2016, subsequently increasing in 2017 and 2018, and it increased considerably, to 7,851.6 tons, in 2020. Australia produced 55.3 per cent of poppy straw (C), while Spain produced the remaining 44.7 per cent. Spain accounted for most of its utilization (62 per cent), while Australia utilized the remaining 38 per cent. Stocks of poppy straw (C) were held by Spain (3,121.7 tons, or 45 per cent), Australia (2,170.5 tons, or 31.3 per cent) and France (1,631 tons, or 23.5 per cent).

Poppy straw produced from opium poppy rich in noscapine

20. In recent years, an increase in the cultivation of poppy straw (N) had been reported in some countries. Noscapine is not under international control, but this variety contains opiates under international control, and it needs to be monitored in accordance with the requirements of the 1961 Convention as amended. In 2020, Australia with a total production of 359.1 tons of poppy straw (expressed in gross weight), Spain (159.2 tons) and France (0.8 tons) were the only countries to report production of poppy straw (N). In 2020, 1,276.5 tons of poppy straw (N) (expressed in gross weight) were reported. Australia held stocks of 898.6 tons, followed by Spain (314.6 tons), Hungary (47.4 tons) and France (15.7 tons).

Poppy straw used for decorative purposes

21. In some countries, the poppy plant is cultivated for purposes other than the production or manufacture of narcotic drugs, such as culinary and decorative purposes. In 2020, the countries that reported such use of poppy straw were Austria, Czechia, Germany and Hungary.

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

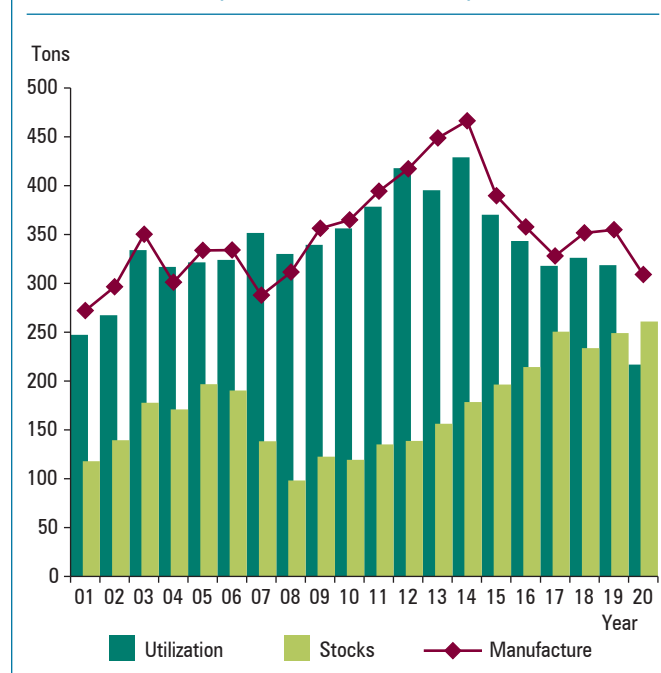
extracted in industrial processes. The different types of concentrate of poppy straw are distinguished by the main alkaloid contained in them.¹¹

23. Since the actual content of alkaloids in concentrate of poppy straw may vary significantly, for the 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.

Anhydrous morphine alkaloid contained in concentrate of poppy straw

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 2001–2020.

Figure 6. Total anhydrous morphine alkaloid contained in all varieties of concentrate of poppy straw: global manufacture, stocks^a and utilization, 2001–2020



^aStocks as at 31 December of each year.

¹¹Currently, 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.

Figure 7. Total anhydrous morphine alkaloid contained in all varieties of concentrate of poppy straw: manufacture in the main manufacturing countries, 2001–2020

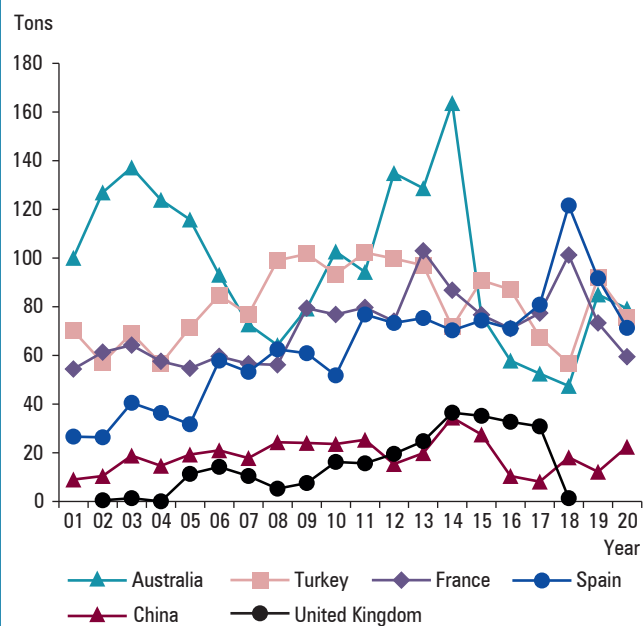
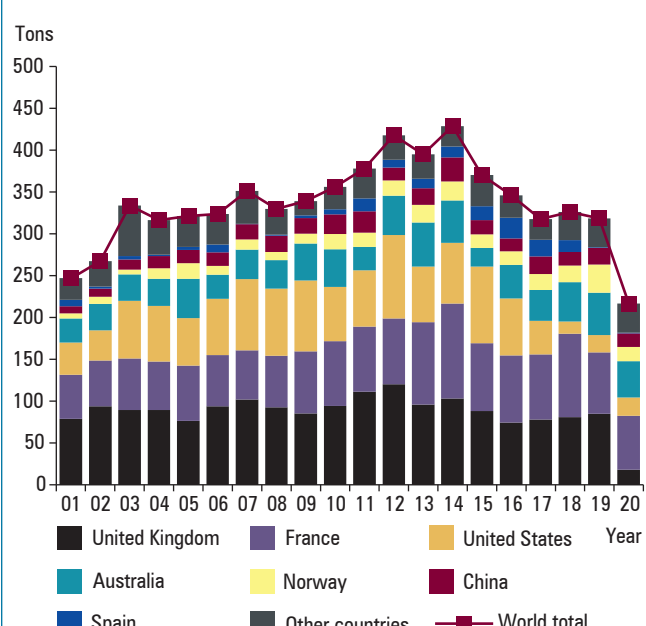


Figure 8. Total anhydrous morphine alkaloid contained in all varieties of concentrate of poppy straw: utilization for the manufacture of opiates, 2001–2020



25. Global manufacture of AMA (CPS) increased steadily after 2001, reaching its highest level ever in 2014 (466 tons). Since then, manufacture of AMA (CPS) has decreased gradually, falling to 327 tons in 2017. However, since 2017, manufacture has been increasing again, reaching 331 tons in 2019 but later falling to 308 tons in 2020 (see figure 6). Trends in the manufacture of AMA (CPS) in the main manufacturing countries in the period 2001–2020 are presented in figure 7.

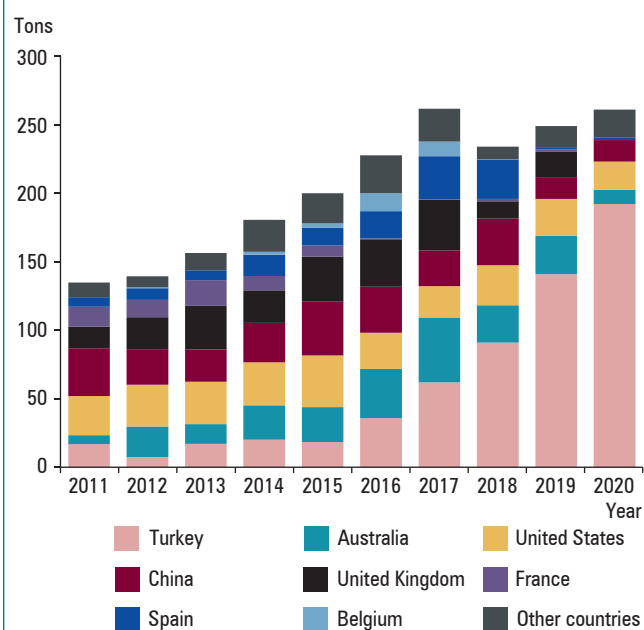
26. Australia was the leading manufacturers of AMA (CPS) in 2020, reporting 79.2 tons (25.6 per cent of global manufacture), followed closely by Turkey at 75.6 tons (24.5 per cent), Spain at 71.3 tons (23.1 per cent), France at 59.4 tons (19.2 per cent), China at 22.5 tons (7.2 per cent) and North Macedonia at 0.5 tons (0.1 per cent) (see figure 7).

27. After reaching a record high of 239 tons in 2012, global exports of AMA (CPS) have decreased and they stand at 84 tons. Spain exported the largest quantity of AMA (CPS) in 2020 (32.8 tons, or 39.1 per cent), followed by Australia (25.5 tons, or 30.4 per cent), Turkey (19.6 tons, or 23.3 per cent) and France (5.9 tons, or 7.1 per cent). Norway was the main importer of AMA (CPS), accounting for 29.9 per cent of global imports, followed by Japan (25 per cent), the United States (20.1 per cent), South Africa (16.6 per cent), Switzerland (5 per cent) and Denmark and Italy (1 per cent). 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) continued an increasing trend until 2014 but has decreased since then (see figure 6). In 2020, the total world utilization amounted to 216.5 tons, a significant decrease from 318.4 tons in 2019. In 2020, France was the country with the largest utilization of AMA (CPS), accounting for 64.5 tons, or 29.7 per cent of the global total. Australia was second with 43 tons, or 19.8 per cent, followed by the United States with 22 tons (10.1 per cent), the United Kingdom with 18 tons (8.3 per cent), Norway with 17.3 tons (8 per cent) and China with 15.9 tons (7.3 per cent) (see figure 8). Other countries that reported utilization of AMA (CPS), in descending order of the amounts utilized, are South Africa, Japan, Turkey, Slovakia, Switzerland, North Macedonia and Spain.

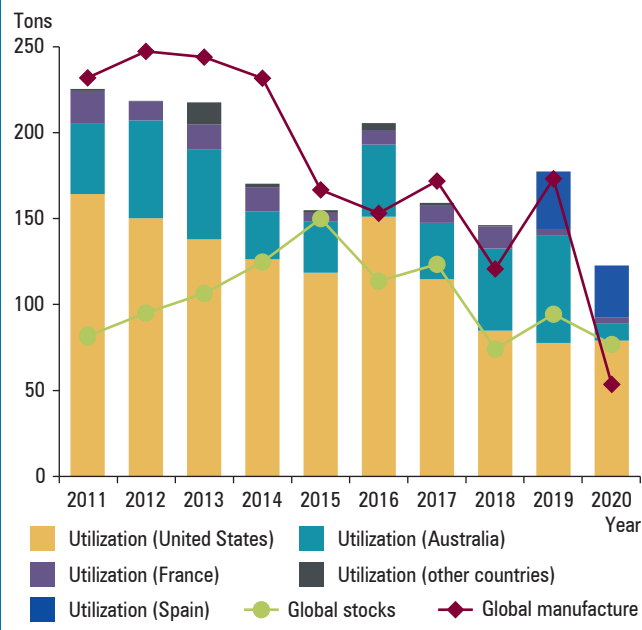
29. Global stocks of AMA (CPS) have continuously increased in the past 10 years, and in 2020 they were at 260.6 tons. Turkey held 191.8 tons in stock, or 73.6 per cent of the global total, followed by the United States (20.5 tons, or 7.8 per cent), Japan (18.8 tons, or 7.23 per cent), China (15.6 tons, or 6 per cent), Australia (10.5 tons, or 4 per cent) and Spain (1.7 tons, or 0.6 per cent) (see figure 9). Other countries holding stock together account for less than 1 per cent of global stocks, in descending order, are Norway, Slovakia, Belgium and North Macedonia.

Figure 9. Total anhydrous morphine alkaloid contained in all varieties of concentrate of poppy straw: stocks,^a 2011–2020



^aStocks as at 31 December of each year.

Figure 10. Total anhydrous thebaine alkaloid contained in all varieties of concentrate of poppy straw: utilization, global manufacture and stocks,^a 2011–2020



^aStocks as at 31 December of each year.

Anhydrous thebaine alkaloid contained in concentrate of poppy straw

30. Figure 10 provides an overview of the manufacture, stocks and utilization of ATA (CPS) during the period 2011–2020. Industrial manufacture of ATA (CPS), which started in 1998, increased rapidly until 2012 and then followed a downward trend from 2013 until 2016. It has fluctuated since then, with an increase in 2017, a decrease in 2018, another increase in 2019 and a significant decrease in 2020, falling to 52.9 tons. The only countries manufacturing ATA (CPS) in 2020 were Spain (26.9 tons, or 56.7 per cent), Australia (14.2 tons, or 27 per cent), France (8 tons, or 15.3 per cent) and China (0.6 tons, or 1 per cent). Australia was the main exporter, accounting for 73.4 per cent of the global total, or 25.7 tons. Spain was the only other exporter with 26.5 per cent, or 9.2 tons. The United States has been the leading importer of ATA (CPS) for many years; in 2020 it imported 45 tons, or 93.3 per cent while Australia imported 3.2 tons, or 6.7 per cent. In 2019, it accounted for 98.8 per cent of total imports, or 91.3 tons.

31. ATA (CPS) is an intermediate product for the manufacture of thebaine. Global utilization of ATA (CPS) increased sharply from 2001 to 2011, when it peaked at 225.9 tons. After that, it decreased steadily, reaching 122.6 tons in 2020. This trend reflects the reduction in the demand for thebaine and for narcotic drugs obtained from it, such as oxycodone and hydrocodone, in particular in

the North American market. However, despite this reduction, in 2020, the United States continued to be the main user of thebaine (accounting for 64 per cent of global utilization, or 78.6 tons). It was followed by Spain (24.4 per cent, or 29.9 tons), Australia (8 per cent, or 9.8 tons), France (3.2 per cent, or 3.9 tons) and Japan (0.2 per cent, or 0.3 tons). Global stocks of ATA (CPS) decreased from 94.1 tons in 2019 to 76.3 tons in 2020, held primarily by the United States (42.7 tons, or 56 per cent), Australia (22.1 tons, or 29 per cent), France (7.2 tons, or 9.4 per cent), Spain (3.6 tons, or 4.7 per cent) and Japan (0.4 tons, or 0.6 per cent) (see figure 10).

Anhydrous oripavine alkaloid contained in concentrate of poppy straw

32. Manufacture of AOA (CPS) in commercially usable quantities started in 2001. Spain was the main manufacturing country in 2020, with a total of 8.9 tons (60.3 per cent of the global total). Australia manufactured 5.7 tons (39.7 per cent). Total utilization of AOA (CPS) in 2020 reached 29 tons, a slight decrease from the previous year's 34 tons. Global stocks of AOA (CPS) have been fluctuating since 2001. In 2020, stocks decreased to 24.5 tons from 49.2 tons in 2019. The stocks are held mainly by Australia (14.6 tons, or 60 per cent), the United States, (6.8 tons, or 28 per cent) and Switzerland (2.9 tons, or 12.1 per cent). Spain held a smaller amount of stock.

Anhydrous codeine alkaloid contained in concentrate of poppy straw

33. Manufacture of ACA (CPS) increased from 2001 until 2015, when it reached a record 108.9 tons, which was nearly double the amount manufactured (57.7 tons) in 2014. After decreasing to 56.1 tons in 2016, it increased again, reaching 85.6 tons in 2019, a notable increase over the 69.9 tons reported in 2018. In 2020, the amount manufactured reached 95.3 tons. ACA (CPS) is used for the extraction of codeine. The only countries that manufactured ACA (CPS) in 2020 were Australia (63.8 per cent of the global total), Spain (32.6 per cent) and Turkey (3.5 per cent). It is worth noting that France, which accounted for 14.3 per cent of production in 2018, reported no production of ACA (CPS) in 2020. Global utilization

of ACA (CPS) steadily increased to 79.2 tons in 2015. It then decreased notably, to 35.8 tons in 2018, but almost doubled in 2019, reaching 66 tons, and almost doubled that amount in 2020, reaching 120 tons. The United Kingdom was the main country to utilize ACA (CPS) in 2020 (49.1 per cent or 59 tons), followed by Spain (25.8 per cent, or 31 tons), the United States (14.9 per cent, or 17.9 tons), Norway (7.9 per cent, or 9.5 tons), Australia (1.9 per cent, or 2.3 tons) and Turkey (0.1 per cent, or 0.1 tons). Global stocks of ACA (CPS) increased to the highest amount ever recorded (89.2 tons) in 2020. Those stocks were held by Australia (46.1 tons, or 51.6 per cent), the United Kingdom (21.2 tons, or 23.7 per cent), Turkey (10.6 tons, or 12 per cent) and the United States (9.5 tons, or 10.6 per cent), with Spain, Norway and France holding only small amounts.

Opiates and opioids

34. “Opiate” is the term generally used to designate drugs derived from opium and their chemically related derivatives, such as 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.¹²

35. Opioids are used mostly for their analgesic properties to treat severe pain (fentanyl, hydromorphone, methadone, morphine and pethidine), moderate to severe pain (buprenorphine¹³ and oxycodone) and mild to moderate pain (codeine, dihydrocodeine and dextropropoxyphene), as well as to induce or supplement anaesthesia (fentanyl and fentanyl analogues such as alfentanil and remifentanil). They are also used as cough suppressants (codeine, dihydrocodeine and, to a lesser extent, pholcodine and ethylmorphine), to treat gastrointestinal disorders, mainly diarrhoea (codeine and diphenoxylate) and to treat opioid dependence (buprenorphine and methadone).

Natural alkaloids

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 they can be converted 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, is used as a reference parameter for comparative purposes.

Morphine

37. In the 20-year period 2001–2020, the manufacture¹⁴ of morphine increased considerably, from 315.8 tons manufactured in 2001 to 475.3 tons in 2012, when the global morphine manufacture reached its peak. After 2012, global production decreased, falling to 308.8 tons in 2020, the lowest level since 2002. In 2020, the global production of morphine was 308.8 tons, a considerable decrease from the 380 tons manufactured in 2019 (see figure 11). In 2020, 77.6 per cent of the morphine manufactured globally was converted into other narcotic drugs or into substances not covered by the 1961 Convention as amended (see paras. 44–45 below). The rest was used directly for medical purposes (for direct consumption and for the utilization to manufacture preparations listed in Schedule III), mainly for palliative care.

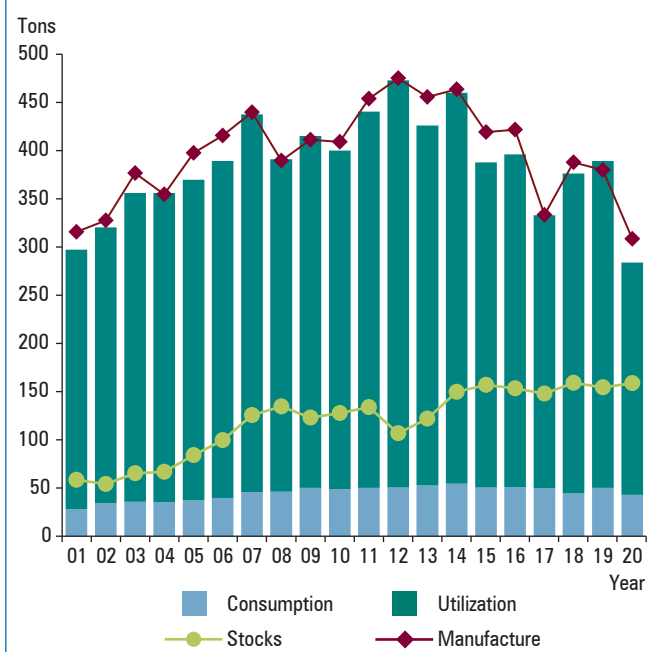
38. In 2020, France (62.4 tons of morphine, or 20.2 per cent) and Australia (58.6 tons, or 19 per cent) were the leading morphine manufacturing countries. The United Kingdom (17.8 tons, or 5.8 per cent in 2020), which had been alternating with France as the leading morphine

¹²From 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 systems.

¹³Buprenorphine is controlled under the Convention on Psychotropic Substances of 1971. Comments on its licit movement are contained in paragraph 102 below.

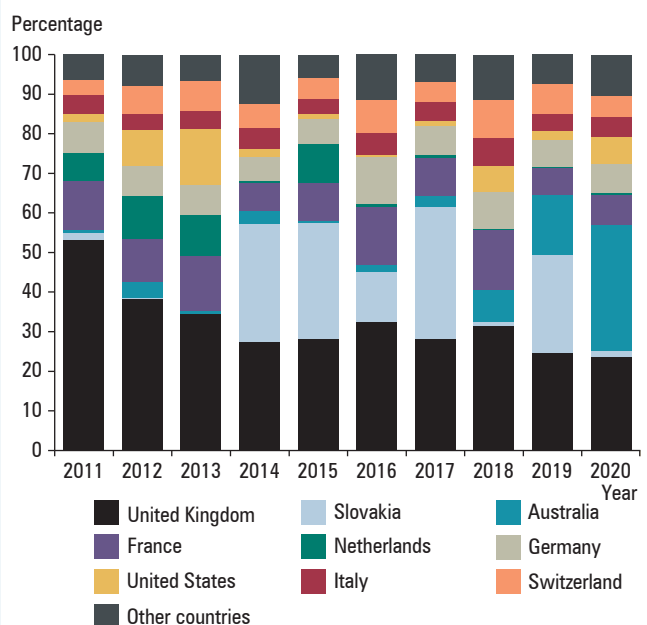
¹⁴In Australia, China, Italy, Norway, Turkey and the United Kingdom, concentrate of poppy straw is used in continuous industrial processes for the manufacture of other narcotic drugs, without first separating morphine. For statistical and comparative purposes, the theoretical quantity of morphine involved 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,^a consumption and utilization, 2001–2020



^aStocks as at 31 December of each year.

Figure 12. Morphine: percentage share of total exports, by main exporting countries, 2011–2020



manufacturing country since 2016, was only fifth, after the Islamic Republic of Iran (47.6 tons, or 15.4 per cent) and Norway (26.8 tons, or 8.7 per cent). After the United Kingdom, the main manufacturing countries were China (17.5 tons, or 5.7 per cent), the United States (15.7 tons, or 5.1 per cent), Slovakia (13 tons or 4.2 per cent), India (12.9 tons, or 4.2 per cent), Japan (12.2 tons, or 4 per cent) and South Africa (10.4 tons, or 3.6 per cent). Together, those 11 countries accounted for 95.7 per cent of global manufacture.

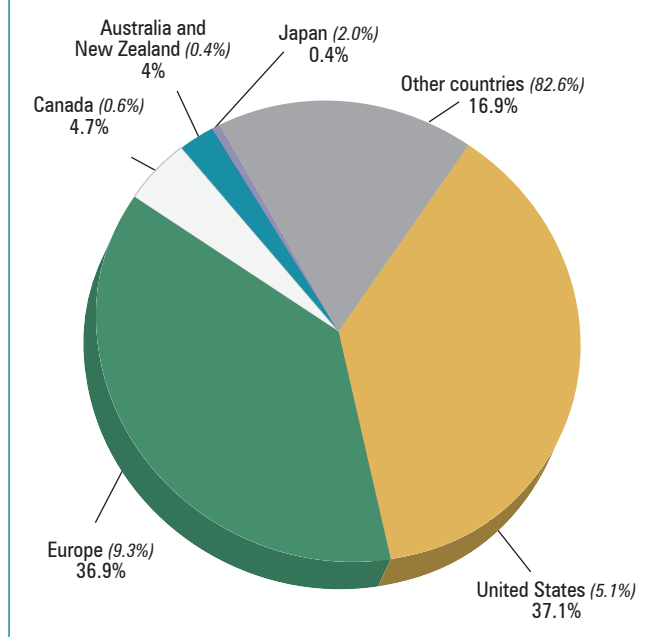
39. Following the decrease in manufacture, exports of morphine decreased slightly, from an all-time high level of 39.7 tons in 2019 to 37.2 tons in 2020. Prior to that, exports had decreased from 28 tons in 2017 to 24.7 tons in 2018. The main exporting countries in 2020 were Australia (32.1 per cent), the United Kingdom (23.7 per cent), France (7.6 per cent), Germany (7.2 per cent), the United States (6.8 per cent), Switzerland (5.3 per cent), Italy (5.1 per cent) and Spain (3.6 per cent). Other countries each exported less than 2 per cent of the total (see figure 12).

40. The main importing countries in 2020 were Hungary (30.4 per cent), Germany (14.4 per cent), South Africa (8.2 per cent), Austria (6.1 per cent), the United Kingdom (6 per cent), Switzerland (4.3 per cent), Canada (4 per cent), Australia, (3.5 per cent) and Denmark (3.4 per cent). Other countries imported less than 2 tons. Further details on exports and imports of morphine can be found in annex IV, tables 3 and 4.

41. In 2001, morphine used for direct consumption amounted to 23.4 tons, or 7.4 per cent of the total morphine manufactured; 20 years later, in 2020, it stood at 35.3 tons, or 11.4 per cent – the greatest percentage used for direct consumption in recent years. That percentage of morphine used for direct consumption was an increase from 9.4 per cent in 2019. Nevertheless, many countries continue to report having difficulties procuring medications containing morphine, which is surprising as opiate raw materials are available in sufficient quantities. The differences in consumption levels between countries continued to be very significant (see figure 13 and table XIV), owing to various economic, knowledge, regulatory and other factors influencing the use of morphine for the treatment of pain. Although most countries and territories reported morphine consumption in 2020, many people still had limited access to it.

42. Over the past 20 years, from 2001 to 2020, of the total amount of morphine utilized globally, on average only 9 per cent was reported to have been used for palliative care directly. A smaller amount has been used for the manufacture of Schedule III preparations containing morphine and substances not covered by the 1961 Convention as amended (9.2 per cent and 1.6 per cent on average, respectively). The majority (83.9 per cent on average) has been converted into other narcotic drugs (mostly codeine). Smaller amounts were utilized for substances not covered by the 1961 Convention as amended or other uses. Further details on the utilization of morphine can be found in part four, table VI.

Figure 13. Morphine: distribution of consumption in relation to share of world population, 2020



Note: Percentages in parentheses refer to share of the total population of all countries worldwide reporting morphine consumption.

43. In 2020, 82.6 per cent of the world population, mainly in low- and middle-income countries, consumed only 16.9 per cent of the total amount of morphine used for the management of pain and suffering. The remaining 83.1 per cent of the total consumption of morphine, excluding Schedule III preparations, continued to be concentrated in a small number of countries located mainly in Europe and North America. The share of morphine used for direct consumption has not changed considerably in the past 20 years and the disparity in the consumption of narcotic drugs for palliative care continues to be a matter of concern, particularly in relation to access and availability of affordable opioid analgesics such as morphine. In 2020, nine countries alone accounted for 82.1 per cent of the morphine used for the management of pain and suffering; those countries reported consumption between 1.3 tons and 13.1 tons. The United States continued to be the greatest consumer at 13.1 tons, followed by the United Kingdom (3.6 tons), Austria (2.1 tons) and China (2 tons). All other countries consumed less than 2 tons in 2020.

44. In some countries, morphine is used for the manufacture of preparations included in Schedule III of the 1961 Convention as amended. In 2020, the countries using morphine for that purpose in significant quantities were China (6.7 tons, or 82.5 per cent of total) and Italy (1.3 tons, or 17 per cent).

45. The largest share of morphine is used for conversion into other opiates, such as codeine, ethylmorphine and pholcodine (see table VI), although it is important to note

that codeine is increasingly obtained directly from opium poppy rich in codeine. The amounts utilized for conversion into other opiates, which fluctuated at around 200 tons per year until the beginning of the 1990s, increased steadily until 2012, but have been decreasing, amounting to 281.4 tons in 2017. That amount started to increase once again in 2018 (329.9 tons) and reached 336.7 tons in 2019 but decreased in 2020 (239.7 tons). Morphine is also used for the manufacture of substances not controlled under the 1961 Convention as amended, such as noroxymorphone and apomorphine. The quantity of morphine utilized for that purpose fluctuated considerably in the period between 2001 and 2020, with a peak of 25.7 tons in 2003 and a low of 375.9 kg in 2010. In 2020, 903.6 kg of morphine were used for that purpose, almost exclusively by France.

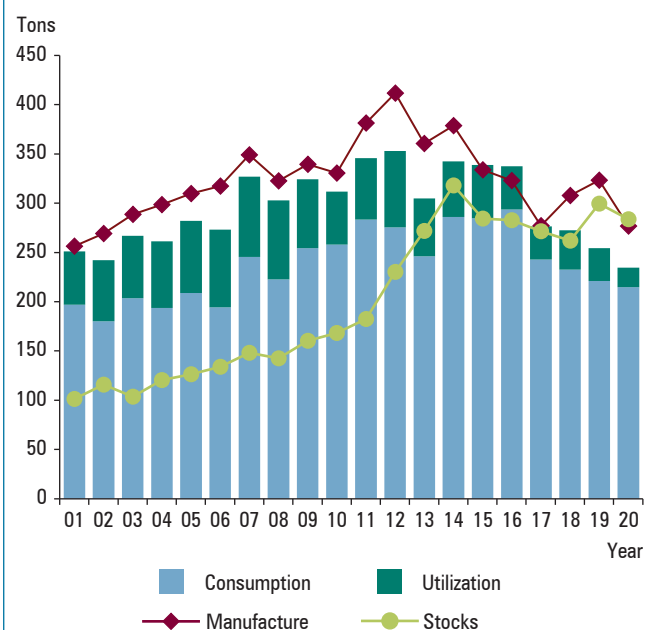
46. Global stocks of morphine stood at 159 tons in 2020, a slight increase from 154.6 tons in 2019. The largest stocks were held by France (68.2 tons, or 42.9 per cent of global stocks), followed by the United States (29 tons, or 18.3 per cent), Japan (12 tons, or 7.6 per cent), the United Kingdom (9.8 tons, or 6.2 per cent), Slovakia (6.2 tons, or 3.9 per cent), Hungary (4.9 tons, or 3.1 per cent) and Switzerland (4.3 tons, or 2.7 per cent). Other countries held stocks in quantities representing less than 2 per cent each.

Codeine

47. Codeine is a natural alkaloid of the opium poppy plant, but most of the codeine currently being manufactured is obtained from morphine through a semi-synthetic process. As reported above, there has been an increase in the cultivation of the opium poppy variety that is rich in codeine, and in the manufacture of ACA (CPS), which is used for the extraction of codeine. Codeine is used almost entirely for the manufacture of preparations in Schedule III of the 1961 Convention as amended, 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 2001–2020 are shown in figure 14.

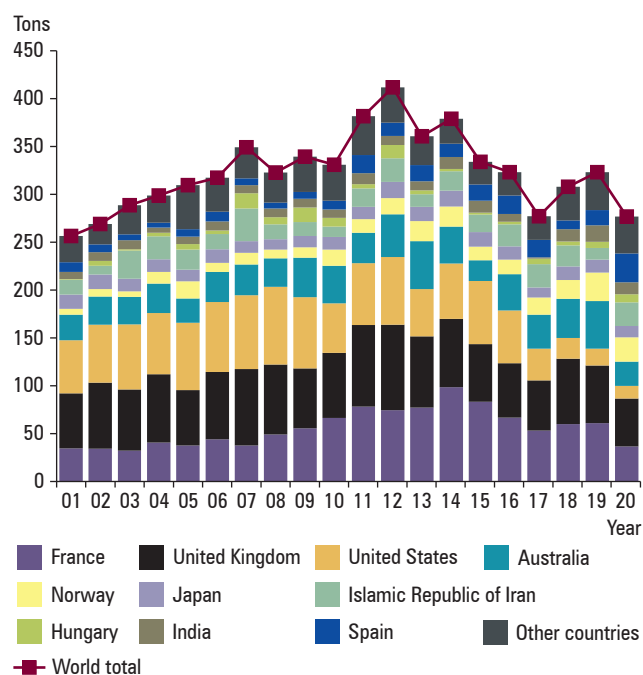
48. Global manufacture of codeine increased from 2001 until 2012, when it reached a peak of 411.9 tons. Since then, global manufacture had been decreasing, dropping to 276.8 tons in 2020. In 2020, the main manufacturing countries were the United Kingdom (50.2 tons, or 18.1 per cent), France (36.5 tons, or 13.2 per cent), Spain (30.3 tons, or 11 per cent), Norway (25.3 tons, or 9.2 per cent), Australia (25.3 tons, or 9.1 per cent), the Islamic Republic of Iran (24.8 tons, or 9 per cent), the United States (13 tons, or 4.7 per cent), India (12.6 tons, or 4.6 per cent) and Japan (11.8 tons, or 4.3 per cent). Smaller quantities (less than 10 tons) were manufactured, in descending order, in South Africa, Italy, Hungary, Slovakia, China, Turkey and North

Figure 14. Codeine: global manufacture, stocks,^a consumption and utilization, 2001–2020



^aStocks as at 31 December of each year.

Figure 15. Codeine: manufacture, 2001–2020

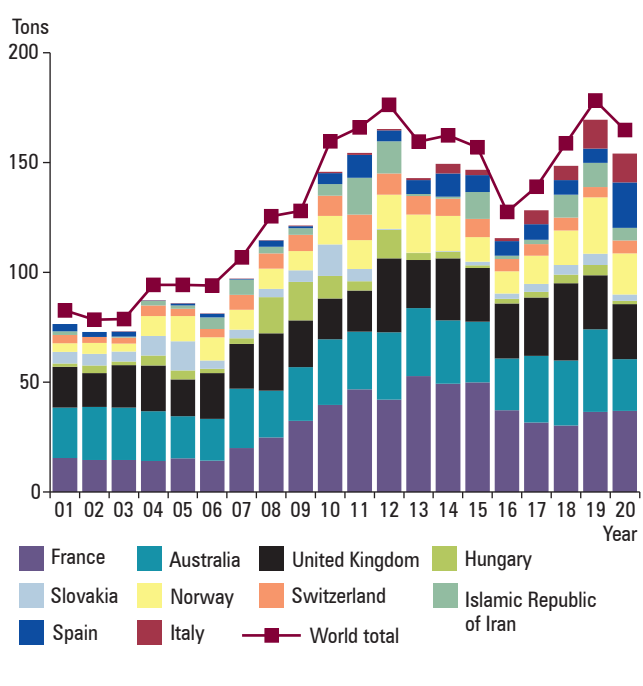


Macedonia (see figure 15). The decreasing trend in manufacturing could be partly explained by the fact that in recent years, various national and regional organizations and regulatory bodies have issued warnings related to codeine use and the occurrence of adverse effects in children. Also, there have been reports of an increase in the misuse of Schedule III preparations containing codeine in a number of countries (such as Bangladesh, India, Japan, Nigeria and the United States and in Hong Kong, China).

49. After having increased since 2001, global stocks of codeine peaked in 2014 and have been decreasing since then, amounting to 284 tons in 2020. Global stocks were mostly concentrated in the United Kingdom (65.1 tons, or 22.9 per cent), France (53 tons, or 18.7 per cent), the United States (23.2 tons, or 8.2 per cent) and Spain (20.4 tons, or 7.2 per cent). Other countries reported stocks below 20 tons.

50. In 2020, world exports of codeine decreased slightly, to 165 tons, from an all-time high of 178.4 in 2019 (see figure 16). The leading exporting country for codeine in 2020 was France (37 tons, or 22.4 per cent), followed by United Kingdom (25.1 tons, or 14.2 per cent), Australia (23.5 tons, or 14.3 per cent), Norway (18.7 tons, or 11.4 per cent), Italy (13.1 tons, or 8 per cent), Switzerland (5.8 tons, or 3.6 per cent), the Islamic Republic of Iran (5.7 tons, or 3.5 per cent), Slovakia and Germany (2.8 tons each, or 1.7 per cent) and Oman (2.5 tons, or 1.6 per cent). The remaining countries account for less than 1 per cent each of all reported exports of codeine.

Figure 16. Codeine: exports, 2001–2020

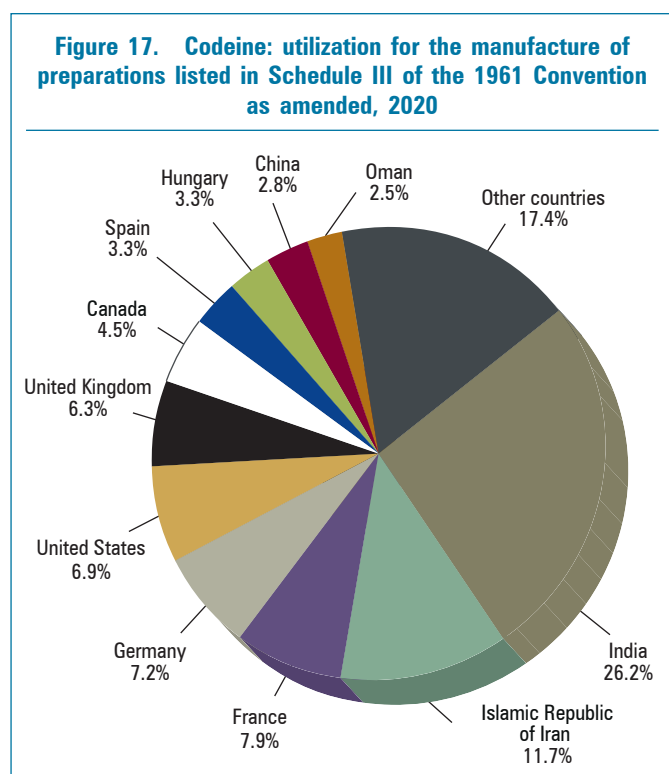


51. The 11 main countries importing codeine in 2020 were India (38 tons), Italy (18 tons), Germany (17.1 tons), the United Kingdom (12.1 tons), Switzerland (10.2 tons), Canada (9.4 tons), Hungary (8.6 tons), Brazil (4.5 tons), Ireland (2.8 tons), Romania (2.7 tons) and Denmark (2.7 tons). More details on the international trade in codeine can be found in annex IV, tables 3 and 4.

52. In 2020, codeine used for the manufacture of preparations listed in Schedule III accounted for 98.9 per cent of all consumption of codeine.¹⁵ The use of codeine for that purpose grew from 189.2 tons in 2001 to 212.5 tons in 2020 (see figure 14). Countries reporting the utilization of codeine for the manufacture of such preparations are not necessarily the countries in which those preparations are consumed. The countries manufacturing those preparations in larger quantities for subsequent export are shown in figure 17.

53. Global consumption (including Schedule III preparations) has been decreasing since it peaked in 2016 at 293.7 tons, and in 2020 it stood at 215.0 tons (see figure 14). The main countries reporting data in that respect were India (55.6 tons, or 25.9 per cent of global total), the Islamic Republic of Iran (24.8 tons, or 11.5 per cent), France (16.7 tons, or 7.8 per cent), the United States (14.5 tons, or 6.8 per cent), the United Kingdom (13.3 tons, or 6.2 per cent) and Canada (10.7 tons, or 5 per cent). Other countries with a level of codeine consumption below 10 tons, in descending order of the amounts consumed, were Spain, Hungary, China, Oman, Romania, Italy, Portugal, South Africa, Turkey, Morocco, Colombia, the Republic of Korea and Israel.

¹⁵“Global consumption” is a term used by INCB to reflect the total of the amount of a drug that is directly consumed and, in the case of cocaine, codeine, dextropropoxyphene, dihydrocodeine, diphenoxylate, ethylmorphine, morphine, opium and pholcodine, the amount that is utilized for the manufacture of preparations listed in Schedule III of the 1961 Convention as amended.



54. Utilization of codeine for the manufacture of other narcotic drugs, mainly dihydrocodeine and hydrocodone, increased steadily until reaching its highest level in 2007 (81.8 tons). Utilization has gradually declined and stood at 19.6 tons in 2020. Of the amount reported for 2020, 10.2 tons, or 52.2 per cent of global total, were used in Japan (6.5 tons, or 33.6 per cent), Italy (1.4 tons, or 7.2 per cent) and Slovakia (1.1 tons, or 5.9 per cent). Smaller quantities amounting to less than 1 per cent of global utilization were reported by Spain.

Thebaine

55. Until the 1990s, thebaine was manufactured mainly from opium; since 1999, it has been obtained primarily from poppy straw. Thebaine may also be obtained through the conversion of oripavine or from semi-synthetic opioids, such as hydrocodone. Thebaine itself is not used in therapy, but it is an important starting material for the manufacture of a number of opioids, mainly codeine, dihydrocodeine, etorphine, hydrocodone, oxycodone and oxymorphone (all of which are substances controlled under the 1961 Convention as amended) and buprenorphine (which is a substance controlled under the Convention on Psychotropic Substances of 1971¹⁶), as well as of substances not under international control, such as the derivatives naloxone, naltrexone, nalorphine and nalbuphine.

56. Global manufacture of thebaine has increased sharply since the late 1990s because of the growing demand for oxycodone and other drugs and substances that may be derived from it. In 2020, after some fluctuations in the preceding years, global manufacture of thebaine dropped to 96 tons, considerably below the record level of 156 tons in 2016 (see figure 18). The demand for medicines derived from thebaine has been fluctuating in past years due to the restrictions on prescription drugs derived from thebaine imposed in the main market (the United States) in response to their abuse and the related high number of overdose deaths. Australia was the main manufacturer in 2020 (50.6 tons, or 52.7 per cent of global total), followed by the United States (25.4 tons, or 26.5 per cent), Spain (14.3 tons, or 15 per cent), France (3.3 tons, or 3.5 per cent) and India (0.8 tons, or 0.9 per cent). Japan, China, Slovakia and Turkey manufactured smaller quantities. In 2020, exports increased to 99.8 tons, up from 64.8 tons in 2019. The only two major exporting countries in 2020 were Australia (84.6 tons, or 84.8 per cent of total exports) and Spain (12.6 tons, or 12.6 per cent). Smaller quantities were exported by France, Switzerland and the United States. The main countries importing thebaine were the United Kingdom (41.7 tons, or 45.3 per cent), France (24 tons, or 26.1 per cent), Hungary (7.4 tons, or 8.1 per cent),

¹⁶United Nations, *Treaty Series*, vol. 1019, No. 14956.

Germany (6.8 tons, or 7.4 per cent), Czechia (4.8 tons, or 5.2 per cent), Switzerland (2.2 tons, or 2.4 per cent), Slovakia (2.1 tons, or 2.4 per cent) and Denmark (1.9 tons, or 2.2 per cent). Other countries imported less than 2 per cent of the global total.

57. The utilization of thebaine for the manufacture of other narcotic drugs decreased slightly, from 95.8 tons in 2019 to 78.7 in 2020 (see figure 19 and table VII of part four). The United States was the main country to use thebaine during the 20-year period 2000–2019. In 2020, France accounted for 55.8 per cent of global use for that purpose, or 43.9 tons, followed by the United States (27.8 tons, or 35.4 per cent), Hungary (3.7 tons, or 4.8 per cent) and Slovakia (2.6 tons, or 3.4 per cent). Other countries have reported much lower quantities of utilization. The quantity of thebaine reported having been used for the manufacture of substances not covered under the 1961 Convention as amended (mainly buprenorphine) fluctuated during the period 2001–2020: from the peak of 24.9 tons in 2016, it decreased to 18.1 tons in 2020. Germany, Czechia, Switzerland, Denmark, India, the United States, Slovakia and China, in descending order, accounted for 100 per cent of the world total in 2020.

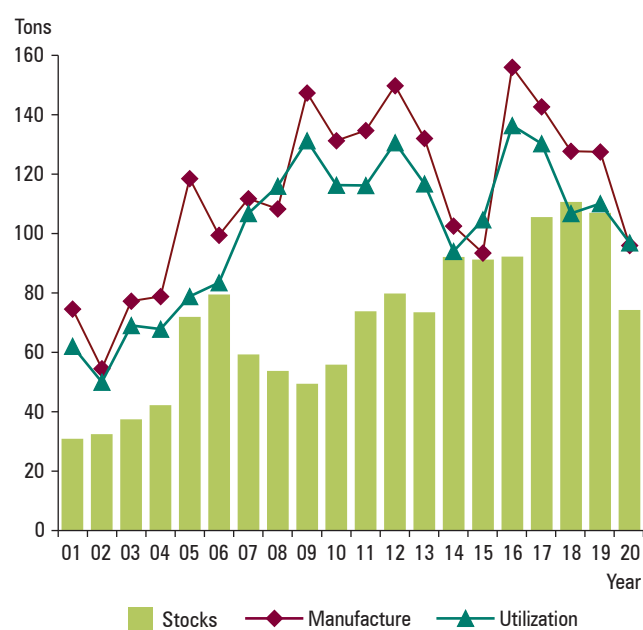
58. After an overall fluctuating upward trend in the period since 2000, in 2020 global stocks of thebaine decreased to 74.2 tons, after the record level of 110.6 tons in 2018. Major stocks were held in the United Kingdom (23.6 tons, or 31.9 per cent), Australia (13.4 tons, or

18.1 per cent), the United States (10.4 tons, or 14.1 per cent), France (7.2 tons, or 9.7 per cent), Hungary (5.3 tons, or 7.2 per cent) and Switzerland (4.5 tons, or 6.2 per cent). Other countries reported stocks that each represented less than 6 per cent of the global total.

Oripavine

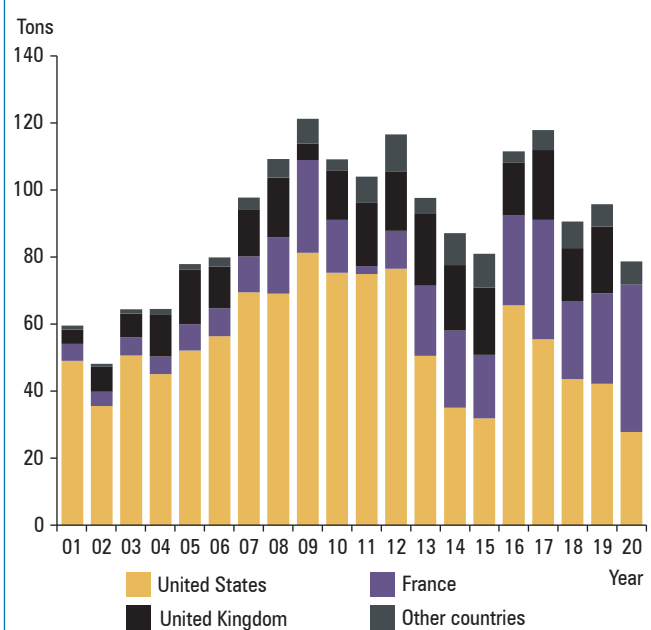
59. In 2007, oripavine was included in Schedule I of the 1961 Convention as amended. The amount of oripavine manufactured globally has been increasing since 2008 and peaked in 2018 with 33.9 tons, decreasing to 28.2 tons in 2020. Two manufacturing countries produced 99.8 per cent of the global total in 2020. They were the United States (22.4 tons, or 79.5 per cent of global manufacture) and Spain (5.7 tons, or 20.2 per cent), while Australia manufactured only 66 kg. The use of oripavine in significant quantities for the manufacture of other drugs was reported in 2020 by the main producer, the United States (22.6 tons, or 84.4 per cent) and Germany (4.1 tons, or 15.6 per cent), used mainly to manufacture oxymorphone. In 2016, global stocks of oripavine reached their highest level, 18.1 tons. Since then, global stocks of oripavine have been decreasing and in 2020 stood at 8.5 tons. Of the stocks reported for 2020, Germany held 4.7 tons, or 55.7 per cent, followed by Italy (1.7 tons, or 20.5 per cent) and the United States (1.5 tons, or 17.8 per cent). Quantities smaller than 1 ton were held by Switzerland and Spain, and marginal quantities were held by a number of other countries.

Figure 18. Thebaine: global manufacture, utilization and stocks,^a 2001–2020



^aStocks as at 31 December of each year.

Figure 19. Thebaine: utilization for the manufacture of opioids, 2001–2020



Semi-synthetic opioids

60. Semi-synthetic opioids are made by means of relatively simple chemical modifications of natural opiates such as morphine, codeine and thebaine. Some examples of semi-synthetic opioids are dihydrocodeine, ethylmorphine, heroin, hydrocodone, oxycodone and pholcodine. Some of the main manufacturers have reported that large losses occur during the processing of some semi-synthetic opioids.¹⁷ Those manufacturing losses account for the difference between the total quantities of hydrocodone and oxycodone manufactured and those consumed, which are reflected in figures 22 and 23, respectively.

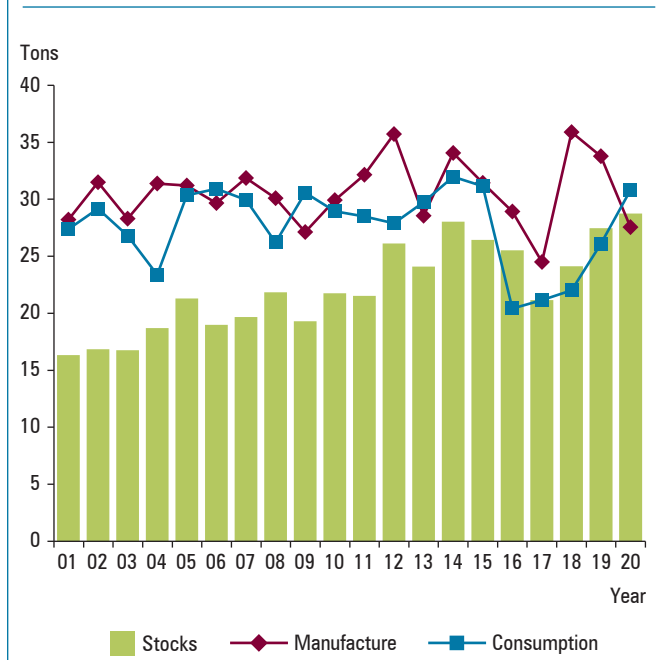
Dihydrocodeine

61. Global manufacture of dihydrocodeine remained relatively stable during the last 20 years at an average of about 30 tons a year and peaked in 2018 at 35.9 tons. In 2020, the quantity manufactured worldwide decreased to 27.5 tons (see figure 20). The main countries manufacturing significant quantities continued to be Japan (9.8 tons, or 35.8 per cent), the United Kingdom (7.6 tons, or 27.8 per cent), Italy (6.6 tons, or 24 per cent), Slovakia (1.2 tons, or 4.5 per cent) and Hungary (1.1 tons, or 4.2 per cent), together accounting for 96.5 per cent of total global manufacture in 2020. Global exports of dihydrocodeine amounted to 10.2 tons in 2020. The main exporting country was Italy (6.5 tons, or 63.8 per cent of total exports), followed by the United Kingdom (1.3 tons, or 12.8 per cent), Hungary (0.9 tons, or 9.3 per cent) and Slovakia (0.7 tons, or 6.6 per cent). Other countries exported less than 2 per cent of the global total. In 2020, the United Kingdom continued to be the leading importing country for dihydrocodeine (5.3 tons, or 52.1 per cent), followed by the Republic of Korea (2.6 tons, or 26.2 per cent). China imported 0.6 tons, or 6.3 per cent, and India 0.4 tons, or 4.4 per cent. Other countries imported less than 4 per cent of the global total.

62. Dihydrocodeine is consumed mainly in the form of preparations included in Schedule III of the 1961 Convention as amended, which accounted for 86 per cent of total consumption in 2020. The main user countries for this purpose, in descending order of the amounts used, were Japan, the United Kingdom, the Republic of Korea and China. These four countries together accounted for 94.6 per cent of the global total. In 2020, direct consumption of dihydrocodeine amounted to 4.3 tons, or 14 per cent, the

¹⁷Manufacturing 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.

Figure 20. Dihydrocodeine: global manufacture, consumption and stocks,^a 2001–2020



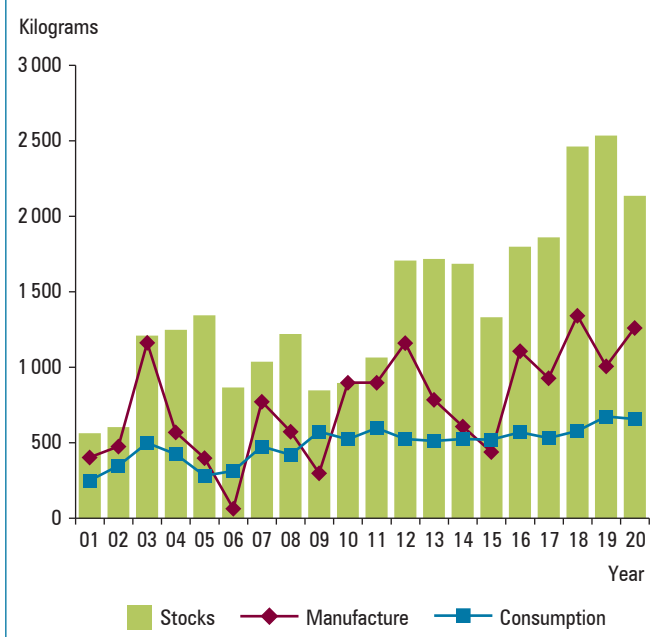
^aStocks as at 31 December of each year.

highest level since 2001. Global stocks of dihydrocodeine amounted to 28.8 tons, a small increase from 27.4 tons in 2019. Major stocks were held in Japan (9.9 tons, or 34.8 per cent), the United Kingdom (9.2 tons, or 32.2 per cent), Italy (3.2 tons, or 11.3 per cent), the Republic of Korea (2.9 tons, or 9.9 per cent) and Slovakia (1.1 tons, or 3.8 per cent).

Ethylmorphine

63. The manufacture of ethylmorphine has fluctuated over the 20-year period 2000–2020, with a global yearly average of 1.5 tons. In 2020, global manufacture decreased considerably, falling to 0.4 tons from 1.7 tons in 2019. France, Turkey and Germany were the only manufacturing countries in 2020. France produced 0.3 tons, or 78.9 per cent and Turkey produced 0.1 tons, or 21.1 per cent. Germany produced a marginal amount. As the main manufacturer, France, was also the leading exporting country (0.3 tons), accounting for over 82.9 per cent of global exports. As in the past, the largest importer in 2020 was Sweden, which imported 0.21 tons, or 50.9 per cent of the total, followed by Belgium with 0.08 tons, or 20.9 per cent. About 94.6 per cent of total consumption of ethylmorphine is in the form of preparations listed in Schedule III of the 1961 Convention as amended. Global consumption (consumption and utilization for manufacture of preparations in Schedule III) decreased slightly, to 518.1 kg in 2020. The main consuming countries in 2020 were Sweden (189 kg, or 36.6 per cent of total global consumption) and Belgium (124.4 kg, or 24 per

Figure 21. Heroin: global manufacture, consumption and stocks,^a 2001–2020



^aStocks as at 31 December of each year.

cent), followed by France, Hungary, Poland India and Hong Kong, China, in descending order, which all had a consumption below 100 kg but higher than 10 kg. In 2020, global stocks of ethylmorphine totalled 2.2 tons; the largest holder of stocks was France (1.2 tons). India, Sweden, Turkey and Hungary, in descending order, held between 50 kg and 1 ton and, together with France, accounted for 92.4 per cent of global stocks.

Heroin

64. Over the past 20 years, licit manufacture of heroin averaged 700 kg, with peaks of over 1,000 kg in 2003, 2012, 2016, 2018, 2019 and 2020. In 2020, a total of 1.2 tons were manufactured, mostly by the United Kingdom (626.9 kg, or 49.9 per cent), Switzerland (548.3 kg, or 43.4 per cent) and Spain (84.3 kg, or 6.7 per cent) (see figure 21). Those were also the three main countries exporting heroin in 2020, with the United Kingdom exporting 347.6 kg, or 50.4 per cent of global exports; Switzerland, 272.3 kg, or 39.5 per cent; and Spain, 69.5 kg, or 10.1 per cent. In 2020, the main importing country was Switzerland (303.9 kg, or 40.9 per cent), followed by Germany (207.1 kg, or 27.9 per cent), the Netherlands (108.6 kg, or 14.6 per cent), Canada (80.6 kg, or 10.9 per cent), the United Kingdom (12.1 kg, or 1.6 per cent) and Luxembourg (9.3 kg, or 1.3 per cent).

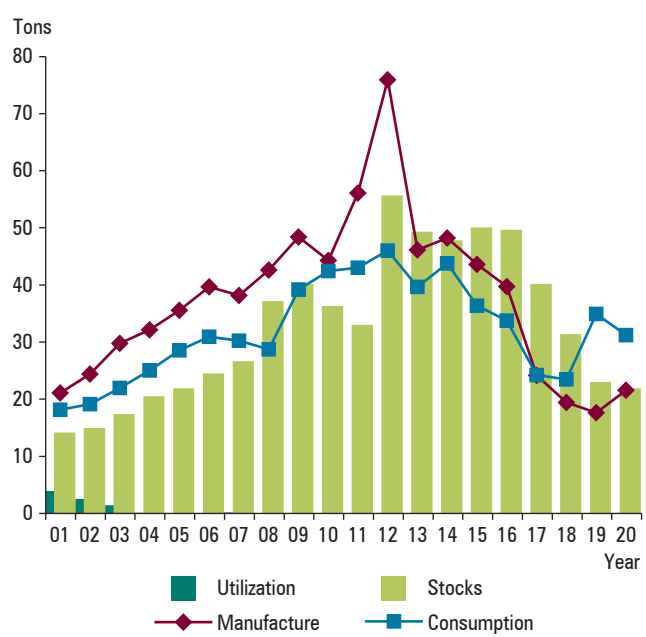
65. Global consumption of heroin decreased slightly, from 675.5 kg in 2019 to 658.4 kg in 2020. Switzerland, where heroin is prescribed for individuals with long-term

opiate dependency, reported heroin consumption of 361.8 kg for 2020 (55 per cent of global consumption). Other countries with significant heroin consumption for medical purposes in 2020 were the Netherlands (121.6 kg, or 18.5 per cent), Germany (120 kg, or 18.2 per cent), Canada (25.8 kg, or 3.9 per cent), the United Kingdom (16.6 kg, or 2.5 per cent) and Luxembourg (9.5 kg, or 1.5 per cent). Global stocks of heroin decreased to 2.1 tons in 2020, down from the highest level ever of 2019 (2.5 tons). The countries holding significant stocks in 2020 were Switzerland (1.2 tons, or 59.9 per cent), the United Kingdom (353.8 kg, or 16.6 per cent), the Netherlands (201.6 kg, or 9.4 per cent), Spain (108.7 kg, or 5.1 per cent), Germany (107.3 kg, or 5 per cent) and Canada (68.2 kg, or 3.2 per cent). Other countries each held stocks amounting to less than 1 per cent of the global total.

Hydrocodone

66. In 2020, global manufacture of hydrocodone increased to 21.5 tons, up from the lowest point in the 20-year trend since 2000 (17.6 tons) in the previous year. But, manufacture nevertheless remained far from the peak of 75.9 tons manufactured in 2012 (see figure 22). The United States accounted for almost all (99.2 per cent) of global manufacture. Other countries, manufacturing smaller quantities of less than 1 per cent of the global total, included, in descending order, Colombia, China, Canada, the Republic of Korea and Guatemala.

Figure 22. Hydrocodone: global manufacture, consumption, utilization^a and stocks,^{b,c} 2001–2020



^aUtilization for the manufacture of other drugs.

^bStocks as at 31 December of each year.

^cConsiderable losses occur in the manufacturing process of this substance. This explains some gaps between the figures for manufacture and those for consumption/stocks.

67. In 2020, global consumption of hydrocodone decreased slightly, to 31.2 tons, from 34.9 tons in 2019. In 2014, hydrocodone combination products were rescheduled in the United States, and the number of prescriptions for liquid and tablet formulations decreased. The United States accounted for almost all (99.2 per cent) of global consumption in 2020. Colombia consumed 193.8 kg, or 0.6 per cent, of the global total, followed by China (25.8 kg, or 0.1 per cent) and Canada (14.6 kg, or 0.1 per cent), and a combined total of 17 kg was consumed in six other countries in 2020.

68. In the past, hydrocodone had been used in the United States in 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 has gradually replaced the use of hydrocodone in the manufacture of thebaine since the late 1990s. While most consumption took place in the United States, some quantities of hydrocodone were exported by the United States (268 kg, or 94 per cent of the global total exports), the Islamic Republic of Iran (12.2 kg, or 4.3 per cent), Switzerland (4.8 kg, or 1.7 per cent) and Slovakia (0.2 kg, or less than 0.1 per cent). The United States held 98.7 per cent of global stocks.

Table 1. Consumption of heroin for medical purposes in assisted treatment programmes, 2011–2020

<i>Assisted treatment programmes involving the consumption of heroin for medical purposes</i>								
	<i>Canada^a</i>	<i>Denmark</i>	<i>Germany</i>	<i>Luxembourg^b</i>	<i>Netherlands</i>	<i>Spain</i>	<i>Switzerland</i>	<i>United Kingdom^c</i>
Year of establishment of programme	2003	2009	2000	2017	1998	2002	1994	1920s
Number of persons enrolled in programme (in year given)	110 (2016)	450 (2015)	628 (2016)	n/a	668 (2019)	n/a	1 644 (2015)	n/a
Form of dosage	Injection, tablet	Injection	Injection, tablet	Tablet, inhalation	Tablet, inhalation	Injection	Injection, tablet	Injection, tablet
Maximum daily dosage	n/a	110-600 mg	1 000 mg	n/a	1 000 mg	600 mg	450 mg	n/a
<i>Amount of heroin consumed in assisted treatment programmes (kg)</i>								
2011	..	29.755	29.028		134.684	1.745	237.872	160.000
2012	4.742	26.101	52.835		138.019	2.181	250.459	47.511
2013	10.661	30.998	75.311		137.129	8.391	242.002	7.821
2014	5.468	31.190	71.840		134.344	1.746	240.554	39.585
2015	14.030	30.216	78.850		91.561	1.819	263.631	40.346
2016	13.664	41.699	60.732		159.865	2.467	255.712	36.792
2017	14.533	20.904	90.183	1.292	114.537	0.873	256.884	32.432
2018	6.640	28.261	110.930	4.605	111.314	1.061	281.848	34.258
2019	25.419	28.895	124.140	5.915	135.717	1.747	318.484	35.000 ^d
2020	25.842	..	120.079	9.555	121.668	1.751	361.851	16.616

Note: The annotation “n/a” signifies that information for this item was not available. Two dots (..) signify that statistical information was furnished but data were not submitted for this specific item.

^a After the trials of the North American Opiate Medication Initiative (NAOMI) and the Study to Assess Longer-term Opioid Medication Effectiveness (SALOME), patients applied for diacetylmorphine through the Canadian special access scheme.

^b Heroin-assisted treatment is conducted in the framework of the “Traitement assisté à la diacétylmorphine” (TADIAM) pilot project, for which the first activity report has not yet been published.

^c In 2017, the United Kingdom launched new heroin-assisted programmes at the demand of the Advisory Council on the Misuse of Drugs and as a decision of the Glasgow City Integration Joint Board. In the United Kingdom, heroin is also used to relieve the severe acute pain caused by injuries, in cases of myocardial infarction and pulmonary oedema and in palliative care.

^d This figure was calculated by INCB using available data series. It is being followed up with the Government.

Hydromorphone

69. Global manufacture of hydromorphone rose sharply in 2020, to 7.9 tons, up from 2.7 tons in 2019. The leading manufacturing countries in 2020 were the United Kingdom (3.2 tons, or 41.2 per cent of the global total), the United States (3 tons, or 38.5 per cent), Denmark (0.6 tons, or 7.7 per cent), Slovakia (0.5 tons, or 7.3 per cent) and Switzerland (0.3 tons, or 4.2 per cent). Despite the increase in manufacturing, total exports of hydromorphone decreased to 2.7 tons in 2020. The leading exporting countries were the United Kingdom (1 ton, or 39.5 per cent of global exports), the United States (0.4 tons, or 17.7 per cent), Switzerland (0.3 tons, or 12.4 per cent), Slovakia (0.2 tons, or 10.1 per cent), Germany (0.1 tons, or 6 per cent) and Italy (0.1 tons, or 4.45 per cent). In 2020, Germany was the main importing country (1.1 tons, or 38.4 per cent), followed by Canada (0.7 tons, or 25.7 per cent), Switzerland (0.4 tons, or 14.1 per cent) and other countries with less than 0.1 tons.

70. In 2020, consumption of hydromorphone increased to 3.4 tons from 2.9 tons in 2019. The United States continued to be the main consumer country in 2020 (1.6 tons, or 46.7 per cent of global consumption), followed by Canada (0.7 tons, or 23.2 per cent). Global stocks of hydromorphone in 2020 were at 7.6 tons, of which 2.8 tons (37.1 per cent) were held in the United States, followed by Germany with 1.1 tons (15.1 per cent), the United Kingdom with 0.9 tons (12.1 per cent) and Canada with 0.8 tons (11 per cent).

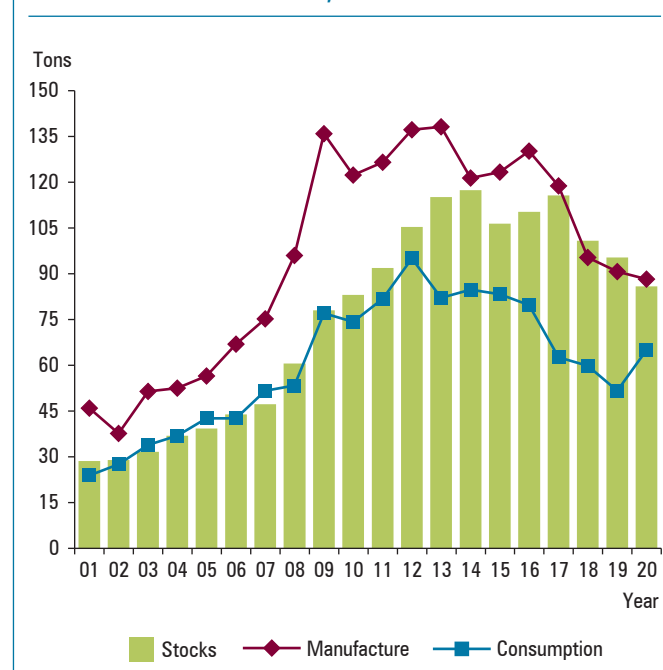
Oxycodone

71. 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 the last 20 years, reaching a record high of 138.1 tons in 2013. Since then, manufacture has decreased gradually (except for 2015 and 2016), and in 2020 it reached 88.1 tons (see figure 23). The fluctuations in manufacture in recent years may be attributable to stricter control measures introduced in some countries where the risk of overdose deaths and abuse of oxycodone is significant. In 2020, the United States accounted for 46.1 per cent of total global manufacture, or 40.6 tons, followed by France (27 tons, or 30.7 per cent), the United Kingdom (14 tons, or 16 per cent), Hungary (3.2 tons, or 3.6 per cent) and Slovakia (2.3 tons, or 2.7 per cent). After reaching a record high of 41.1 tons exported globally in 2018, in 2020 exports decreased to 37.7 tons. The United Kingdom continued to be the main exporting country in 2020 (15.5 tons, or 41 per cent of global exports), followed by the United States (7.6 tons, or 20.4 per cent), Switzerland (3.6 tons, or 9.7 per cent), France (2.7 tons, or

7.2 per cent), Germany (1.7 tons, or 4.6 per cent), Bulgaria (1.5 tons, or 4.1 per cent), the Netherlands (1.5 tons, or 4 per cent) and Austria (0.9 tons, or 2.5 per cent). The 11 most significant importing countries were Germany (6.1 tons, or 17.2 per cent), the United Kingdom (5.3 tons, or 14.9 per cent), Switzerland (3 tons, or 8.6 per cent), Canada (2.4 tons, or 6.7 per cent), France (2.2 tons, or 5.6 per cent), the Netherlands (2 tons, or 5.6 per cent), Austria (1.8 tons, or 5 per cent), China (1.7 tons, or 4.8 per cent), Australia (1.7 tons, or 4.8 per cent), Bulgaria (1.3 tons, or 3.9 per cent) and Italy (1.3 tons, or 3.8 per cent). Further details on exports and imports of oxycodone are contained in annex IV, tables 3 and 4.

72. Despite the decrease in manufacture in recent years, global consumption of oxycodone also increased, from 51.6 tons in 2019 to 64.9 tons in 2020. Consumption of oxycodone was concentrated in the United States (44.3 tons, or 68.2 per cent of the global total). Other major consumer countries in 2020, in descending order of the amounts consumed, were Germany (3.3 tons, or 5.2 per cent), Canada (2.3 tons, or 3.7 per cent), France (1.9 tons, or 3.1 per cent), China (1.8 tons, or 2.8 per cent), Australia (1.5 tons, or 2.4 per cent) and the United Kingdom (1.3 tons, or 2 per cent). Global stocks of oxycodone decreased further, to 85.9 tons, with the United States holding 38.3 tons, or 44.7 per cent of the world total, followed by France (11.7 tons, or 13.6 per cent), the

Figure 23. Oxycodone: global manufacture, consumption and stocks,^{a,b} 2001–2020



^aStocks as at 31 December of each year.

^bConsiderable losses occur in the manufacturing process of this substance. This explains some gaps between the figures for manufacture and those for consumption/stocks.

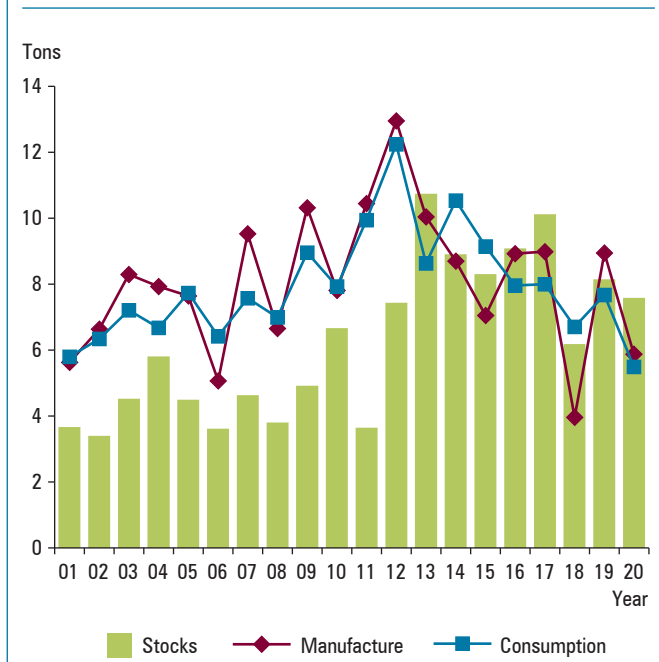
United Kingdom (7.8 tons, or 9.2 per cent) and other countries holding stocks of less than 6 tons.

Pholcodine

73. During the 20-year period 2001–2020, pholcodine global manufacture and consumption was characterized by a volatile trend. Manufacture dropped from its peak of 13 tons in 2012 to 3.9 tons in 2018, increased again to 8.9 tons in 2019 but dropped again to 5.8 tons in 2020 (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 have led to the withdrawal of pholcodine from the market. However, a review carried out in 2012 by the European Medicines Agency concluded that the evidence for such a risk was weak and that it was outweighed by the benefits of pholcodine. The Agency therefore recommended that all marketing authorizations for medicines containing pholcodine should be maintained throughout the European Union. In 2015, renewed concerns were raised by anaesthetists in Australia and New Zealand, who campaigned for cough medicines containing pholcodine to become prescription-only products. The main manufacturing countries in 2020 were France (1.8 tons, or 31.6 per cent), Slovakia (1.5 tons, or 26.2 per cent) and Hungary (1.5 tons, or 25.9 per cent). Other countries that manufactured less than 1 ton were, in descending order, Norway, the United Kingdom, India, China and North Macedonia. Total exports of pholcodine decreased from 7.3 tons in 2019 to 5.7 tons in 2020. Exports were mostly from the United Kingdom (1.4 tons, or 25.6 per cent), France (1.3 tons, or 23 per cent), Slovakia (1.3 tons, or 22.6 per cent) and Hungary (0.8 tons, or 14 per cent). Italy (0.4 tons, or 7.2 per cent) and Norway (0.2 tons, or 4.9 per cent). The main destinations were Hong Kong, China (1.2 tons, or 29.3 per cent), Australia (0.6 tons, or 15.3 per cent) and Italy (0.4 tons, or 11.2 per cent). The other importing countries each imported less than 10 per cent of the global total. Further details on exports and imports of pholcodine are provided in annex IV, tables 3 and 4.

74. In 2020, global consumption of pholcodine (consumption and utilization for the manufacture of preparations in Schedule III) decreased to 5.4 tons, from 7.6 tons in 2019. The main consumers were Hong Kong, China (1.4 tons, or 26.9 per cent), Italy (0.7 tons, or 14 per cent) and Australia (0.6 tons, or 12 per cent). Only nine countries reported direct consumption of pholcodine in 2020, and the main countries of direct consumption were Italy (0.4 tons, or 33.9 per cent), the United Kingdom (0.4 tons, or 33.3 per cent) and Egypt (0.3 tons, or 29.6 per cent). In 2020, global stocks of pholcodine decreased to 7.5 tons, from 8.1 tons in 2019. Major stocks were held by

Figure 24. Pholcodine: global manufacture, consumption and stocks,^a 2001–2020



^aStocks as at 31 December of each year.

the United Kingdom (1.3 tons, or 18.4 per cent), Hungary (1.2 tons, or 16.1 per cent) and Slovakia (1 ton, or 14.3 per cent). A number of other countries held stocks of less than 1 ton.

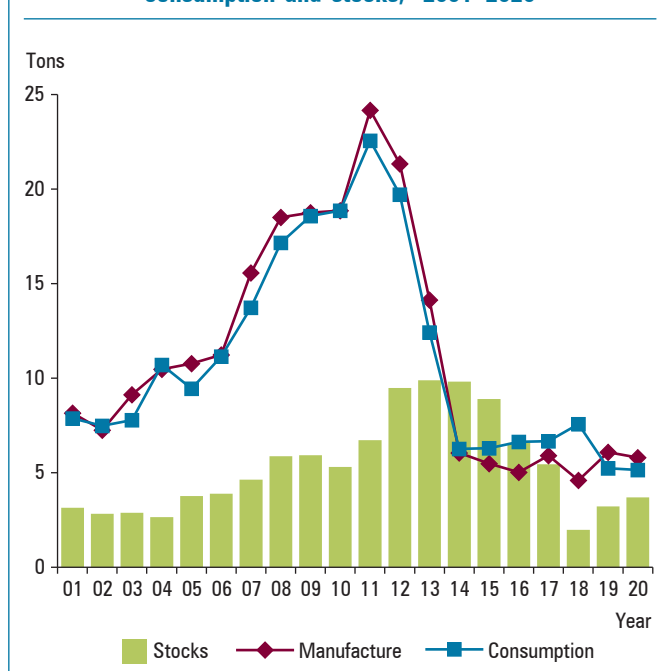
Synthetic opioids

75. Synthetic opioids are used in the treatment of chronic, moderate and 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

76. Global manufacture of dextropropoxyphene followed a strong downward trend from 2005, when 314 tons were manufactured, to 2014, when there was no reported manufacture of that substance. Since then, global manufacture has continued to be nil or negligible, and this trend continued in 2019, with only 20 grams reported having been manufactured in the United States. In 2020, no manufacturing was reported. That development is attributable to the fact that the drug has been withdrawn from the market in several countries owing to concerns over serious side effects, including the risk of death from overdose. Consequently, little or no consumption, export or import have been reported, while 15.7 tons were held in stock, mostly by India (93.3 per cent).

Figure 25. Diphenoxylate: global manufacture, consumption and stocks,^a 2001–2020



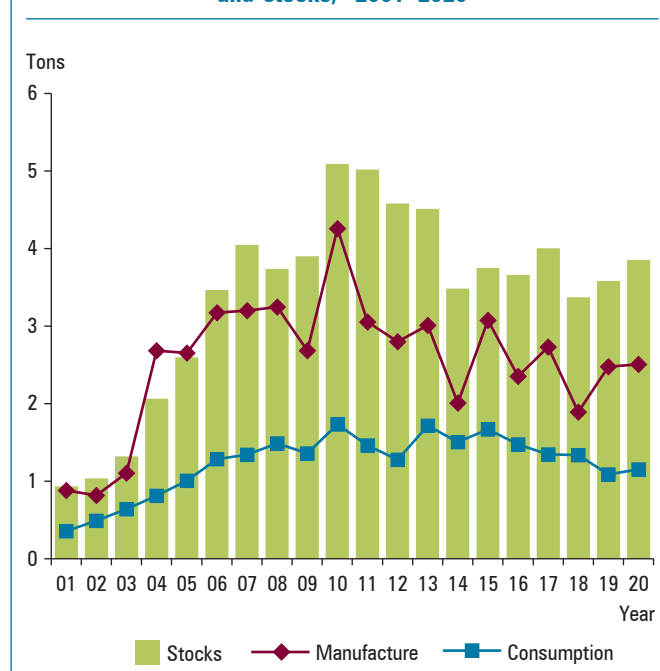
^aStocks as at 31 December of each year.

Diphenoxylate

77. Diphenoxylate is used mostly as an antidiarrhoeal agent. It works by decreasing bowel activity. Global manufacture of diphenoxylate trended upward after 2003, reaching a peak of 24.2 tons in 2011, dropping significantly in 2014 and staying at an annual level of manufacture of about 5 tons. In 2020, global manufacture was at 5.8 tons (see figure 25). Most of the drop in the manufacture over the period 2011–2020 may be attributable to a regulatory measure introduced in India following concerns related to potential abuse. In 2020, most global manufacture was reported by India (4 tons, or 70 per cent), China (1.2 tons, or 22.3 per cent) and the United States (0.4 tons, or 7.7 per cent). India remained the leading exporter of diphenoxylate (0.8 tons, or 90 per cent of the global total). The main importing countries in 2020 were Pakistan (0.3 tons, or 44 per cent of the global total) and the Islamic Republic of Iran (0.2 tons, or 30.8 per cent).

78. Diphenoxylate was consumed in the form of preparations listed in Schedule III of the 1961 Convention as amended. Global use in 2020 remained fairly stable, at 5.16 tons, a slight decline from the 5.24 tons reported for 2019. The countries reporting the highest utilization (consumption and the utilization for the manufacture of preparations in Schedule III) in 2020 were India (2.8 tons, or 55.1 per cent of the global total) and China (1.3 tons, or 25.8 per cent). In 2020, global stocks of diphenoxylate increased to 3.7 tons, most of which was held by China (2 tons, or 54.2 per cent), followed by India (0.8 tons, or 23.8 per cent).

Figure 26. Fentanyl: global manufacture, consumption and stocks,^a 2001–2020



^aStocks as at 31 December of each year.

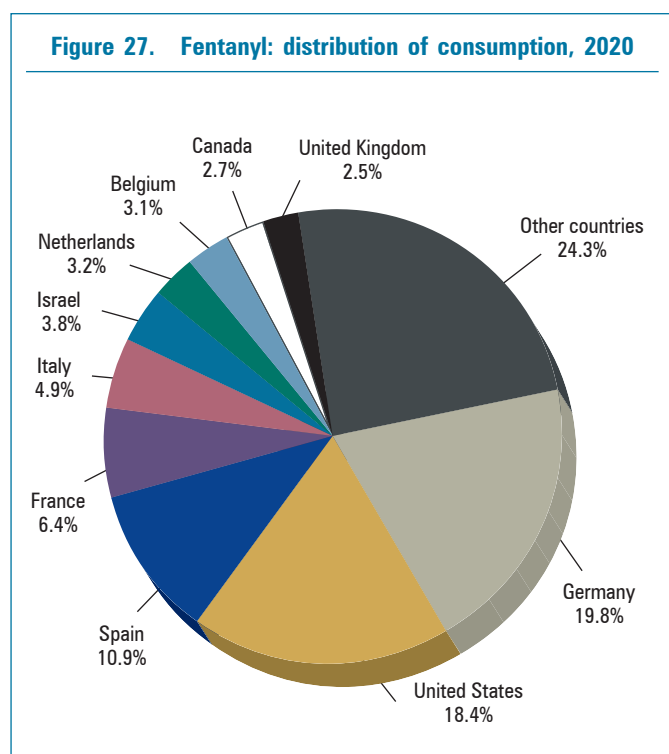
Fentanyl

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

80. Global manufacture of fentanyl increased rapidly in the period 1999–2010, reaching a record level of 4.3 tons in 2010. Since then, manufacture has decreased over the years, to 1.9 tons in 2018, but showed an increase in 2019 and in 2020, when 2.5 tons were reported having been manufactured in each of those years (see figure 26). The United States was the main manufacturing country for fentanyl in 2020 (852.9 kg, or 34 per cent of the global total), followed by Germany (543.3 kg, or 21.7 per cent), South Africa (525.8 kg, or 21 per cent), Belgium (304.6 kg, or 12.2 per cent) and the United Kingdom (213.4 kg, or 8.5 per cent). The principal exporting countries were Germany (411.8 kg, or 24.7 per cent), the United States (391.1 kg, or 23.4 per cent), South Africa (331.6 kg, or 19.9 per cent), Belgium (224.7 kg, or 13.5 per cent) and the United Kingdom (143.6 kg, or 8.6 per cent). Germany was also the principal importing country for fentanyl in 2020 (779.3 kg of the global total, or 46.8 per cent), followed

by Spain (123.8 kg, or 7.4 per cent), France (82.9 kg, or 5 per cent), the United Kingdom (78.5 kg, or 4.7 per cent) and Italy (66.3 kg, or 4 per cent). Further details on exports and imports of fentanyl are contained in annex IV, tables 3 and 4.

81. Since 2005, global consumption of fentanyl has fluctuated between 1 ton and 1.7 tons. In 2020, global consumption amounted to 1.1 tons, at the same level of 2019. The consumption reported seems to indicate that the demand for strong opioid analgesics, such as fentanyl, remained relatively stable despite the needs due to the treatment of COVID-19 cases. The downward trend since 2013, when global consumption peaked at 1.7 tons, may be associated with continued concerns about the number of overdose deaths attributed to abuse of fentanyl or fentanyl-type substances, mainly in North America. Although in many cases, the substances causing overdose deaths are illicitly manufactured and trafficked and not necessarily diverted licitly prescribed medications, national authorities have placed restrictions on the prescription of fentanyl. In 2020, 10 countries accounted for most of the global consumption of fentanyl (75.7 per cent); they are all high-income countries (see figure 27). The three largest consumers were Germany (228.1 kg, or 19.8 per cent), the United States (212.4 kg, or 18.4 per cent) and Spain (126 kg, or 10.9 per cent). Other major consumers of fentanyl were, in descending order of the amounts of consumption, France, Italy, Israel, the Netherlands, Belgium, Canada and the United Kingdom.



82. In 2020, global stocks of fentanyl stood at 3.8 tons, a slight increase from 2019 (3.5 tons) and significantly lower than the peak reached in 2010 (5.1 tons). The largest stocks were reported by Germany (1.7 tons, or 44.1 per cent), the United States (0.6 tons, or 17.2 per cent) and Belgium (0.4 tons, or 12.6 per cent).

Fentanyl analogues

83. The fentanyl analogues alfentanil, remifentanil and sufentanil are used mainly as anaesthetics. Their use increased in some countries during the COVID-19 pandemic, as reported below.

Alfentanil

84. Alfentanil is a potent opioid analgesic indicated for analgesia and suppression of respiratory activity in mechanically ventilated patients in intensive care and to provide analgesic cover for painful manoeuvres. This use increased during the COVID-19 pandemic in some countries and this is reflected in the data provided by countries.

85. The manufacture of alfentanil has fluctuated significantly in the last 20 years. In 2012, global manufacture peaked at 78.3 kg; in 2009 it reached its lowest level, when only 5.6 kg were manufactured. Global manufacture of alfentanil more than tripled in 2015 compared with 2014, rising to 51.2 kg from 15.2 kg, but dropped to 17.2 kg in 2016 and stabilized at that level in the following years, reaching 18.2 kg in 2019. In 2020, 68.4 kg were manufactured, and the increase could have been due to the increasing demand related to the use of alfentanil for the treatment of people affected by COVID-19 in intensive care. Most of the manufacture in 2020 was reported by Belgium (40.7 kg, or 59.4 per cent), Slovakia (16.6 kg, or 24.4 per cent), the United Kingdom (9.2 kg, or 13.4 per cent) and China (1.8 kg, or 2.7 per cent). In 2019, only Slovakia had manufactured alfentanil.

86. Despite the steep increase in manufacturing, consumption did not increase as much in 2020. In 2020, global consumption of alfentanil (28.6 kg) showed a slight increase compared with 2019 (24 kg). However, consumption in the United Kingdom almost tripled, from 7 kg (29 per cent of the global total) in 2019, to 18.8 kg (65.7 per cent). The United Kingdom was followed by Italy (2.9 kg, or 10.1 per cent), Germany (1.2 kg, or 4.5 per cent) and France (1 kg, or 3.6 per cent). Detailed information on the consumption of fentanyl analogues is provided in table XIII.1. While in the period 2016–2019, global stocks of alfentanil decreased by more than 69 per cent, from 183.2 kg in 2015 to 56.4 kg in 2019, those stocks increased considerably, to 87.4 kg in

2020, in another sign of the increasing demand related to the COVID-19 pandemic. With stocks of 23.9 kg, or 27.4 per cent, Belgium replaced Germany as the main holder of global stocks of alfentanil, followed by Slovakia (20.3 kg, or 23.3 per cent), the United Kingdom (13.2 kg, or 15.2 per cent), Germany (11.8 kg, or 13.6 per cent), Italy (5.8 kg, or 6.7 per cent) and the United States (2.7 kg, or 3.1 per cent).

Remifentanil

87. 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 more potent than morphine. Like alfentanil, there were increases in the manufacture, consumption and stocks of remifentanil, probably related to increasing demand created by COVID-19-related health needs. In 2002, global manufacture of remifentanil stood at 27.4 kg. The highest level was recorded in 2018, at 141.1 kg. In 2019, 116.5 kg of remifentanil were reported to have been manufactured, but in 2020 manufacture increased to 139 kg. In 2020, China continued to be the main manufacturing country, with 51.6 kg (37.1 per cent of total manufacture), compared with 39.9 kg (34.2 per cent) in 2019. It was followed by Spain with 26.3 kg (18.9 per cent). In 2019, Spain had manufactured 19.3 kg (16.5 per cent). In 2020, Argentina manufactured 18.5 kg (13.3 per cent), Germany, 14.1 kg (10.2 per cent) and Belgium, 12.6 kg (8.8 per cent). Italy, Spain, Belgium, Germany and Serbia, in descending order, were the main exporting countries, with a total amount of 63 kg and accounting for more than 62.1 per cent of global exports. Serbia was the main importing country, with 17.1 kg, or 18.1 per cent of global imports, followed by Germany (12 kg, or 12.6 per cent), Japan (8.1 kg, or 8.6 per cent), Turkey (7.5 kg, or 7.9 per cent) and the Republic of Korea (5.2 kg, or 5.5 per cent).

88. After increasing in 2019 to 87.1 kg, consumption increased further in 2020, to 104 kg, the highest level since 2001. The main consumer countries were China (27.4 kg, or 26.3 per cent of global consumption), Argentina (14.1 kg, or 13.6 per cent), Japan (7.6 kg, or 7.3 per cent), Turkey (6.9 kg, or 6.6 per cent) and Italy (6.8 kg, or 6.5 per cent). Again, because of the demand for remifentanil related to the COVID-19 pandemic, stocks almost tripled in 2020, reaching 446.7 kg, up from 161 kg in 2019. Most global stocks were held by the United Kingdom (249.2 kg, or 55.7 per cent – up from 12 kg in 2019), followed by China (84.1 kg, or 18.8 per cent – up from 64.3 kg in 2019), Italy (45.2 kg, or 10.1 per cent – up from 1.6 kg in 2019), Spain (13.2 kg, or 2.97 per cent – up from 0.9 kg in 2019) and Germany (11.3 kg, or 2.5 per cent – up from 8 kg in 2019).

Sufentanil

89. Sufentanil manufacture increased but not as much as for the other fentanyl analogues. In 2020, global manufacture of sufentanil increased slightly, to 10.1 kg, up from 9.9 kg in 2019. The main manufacturing countries were Slovakia (5 kg, or 49.7 per cent of global manufacture), China (3.5 kg, or 34.4 per cent), the United Kingdom (0.9 kg, or 9.8 per cent) and the United States (0.6 kg, or 5.9 per cent). The main exporting countries were the United Kingdom (0.9 kg, or 18.3 per cent), Belgium (0.9 kg, or 17 per cent), the United States and Slovakia (0.6 kg, or 12.6 per cent), and Germany and Switzerland (0.3 kg, or 5.6 per cent). Other countries exported less than 0.1 kg. In 2020, global consumption of sufentanil increased slightly, to 5.8 kg. The largest consumers of sufentanil were, in descending order of amount consumed, China, Germany, France, the United States and Italy, which together accounted for 4.9 kg, or 85.3 per cent of the global total. In 2020, global stocks of sufentanil increased to 20.8 kg, most of which were held by China (6.4 kg, or 31 per cent), Slovakia (5.2 kg, or 25.1 per cent), the United States (2.9 kg, or 14.1 per cent), Germany (1.8 kg, or 8.8 per cent) and France (1 kg, or 5.1 per cent).

Ketobemidone

90. Ketobemidone is a powerful opioid analgesic with an effectiveness against pain similar to morphine. The drug is mostly manufactured and used in a small number of countries, mostly in Northern Europe. It appears to be manufactured only every third year, with manufacture reported in 2015 (365.9 kg) and in 2018 (279.8 kg). No manufacture was reported for 2016, 2017, 2019 or 2020. Stocks in 2020 amounted to 170.2 kg, down from 218.3 kg in 2019. In 2020, 28.5 kg was exported, one of the lowest levels registered in the past 20 years. The drug was exported mainly by Germany (23.2 kg, or 81.3 per cent) and France (4.4 kg, or 15.6 per cent), with smaller amounts being exported by Denmark and Norway. Germany held 92.7 per cent (157.9 kg) of global stocks of ketobemidone.

Methadone

91. Methadone, together with buprenorphine (which is controlled under the 1971 Convention), is sometimes used for pain management, but it is primarily used in the treatment of opioid dependence. As shown in figure 28, the trends related to its consumption, manufacture and stocks show a steady increase over the 20-year period 2001–2020, albeit with some fluctuations. The manufacture of methadone increased again in 2020, reaching 44.1 tons, compared with 36.6 tons in 2019. The main manufacturing countries were the United States (17.4 tons, or 39.5 per cent) and Switzerland (12.1 tons, or 27.5 per cent), followed by India (6.6 tons, or 15 per cent), Slovakia (3.4 tons, or 7.7 per cent), China

(1.6 tons, or 3.7 per cent) and Spain (1.3 tons, or 2.9 per cent). Smaller quantities were manufactured by North Macedonia, the United Kingdom and Norway. In 2020, Switzerland continued to be the main exporter of methadone (12.4 tons, or 46.2 per cent), followed by India (6.1 tons, or 22.9 per cent), Slovakia (1.6 tons, or 6.3 per cent), the United States (1.6 tons, or 6 per cent) and North Macedonia, the Netherlands, Italy, Poland and Germany (in descending order) and other exporting countries with less than 1 ton each. The main importing countries were the Islamic Republic of Iran (4.9 tons, or 19 per cent), Italy (2.7 tons, or 10.7 per cent), the United Kingdom (2.3 tons, or 9.2 per cent), Canada (1.7 tons, or 6.6 per cent), Myanmar (1.2 tons, or 4.9 per cent) and Ukraine (1.1 tons, or 4.6 per cent). A number of other countries imported less than 1 ton.

92. Consumption of methadone was concentrated in a few countries, and there were large differences in global consumption patterns. Global consumption stood at 59 tons in 2020, up from 45.5 tons in 2019 and a further increase from the level of 36.7 tons in 2018. The countries of greatest consumption were the United States (25.8 tons, or 43.7 per cent of global consumption), followed by Spain (13.6 tons, or 23.1 per cent), the Islamic Republic of Iran (4.9 tons, or 8.3 per cent), France and Canada (each with 1.4 tons, or 2.5 per cent), Italy (1.1 tons, or 1.9 per cent), Germany (1.2 tons, or 2 per cent) and the United Kingdom (1.5 tons, or 3.3 per cent). A number of countries had consumption of less than 1 ton of methadone. In most cases, the different levels of consumption were related to the number of people who inject drugs. In other cases, even though there was a significant number of such people,

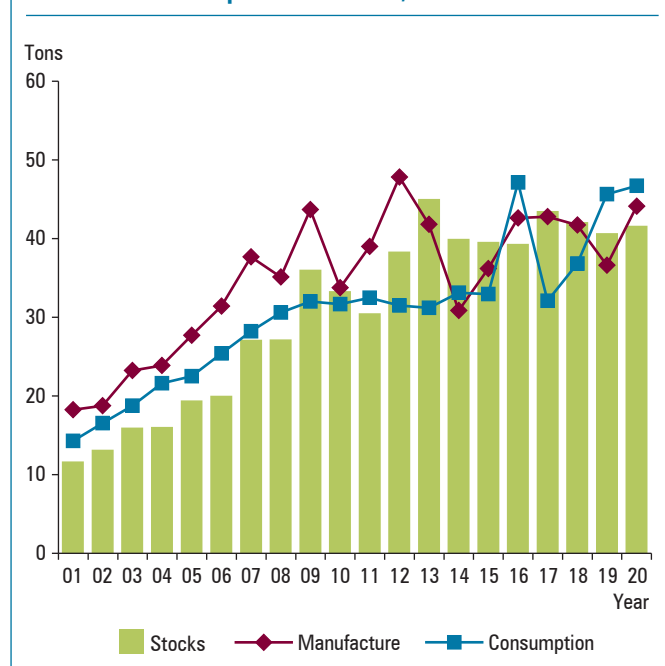
little or no methadone (and buprenorphine) seemed to be consumed, and few, if any, opiate substitution treatment services seemed to be available.

93. Stocks of methadone amounted to 41.6 tons, which were mainly held by the United States (13.8 tons, or 33.3 per cent), Switzerland (5.2 tons, or 12.6 per cent), Spain and Germany (each with 2.7 tons, or 6.7 per cent) and Slovakia (2.3 tons, or 5.7 per cent). Other countries holding stocks of more less than 2 tons were, in descending order, Canada, Italy, China, the United Kingdom, France, India, Myanmar, Austria, the Netherlands, the United Republic of Tanzania, Malaysia, North Macedonia, Denmark, Belgium and Ireland.

Pethidine

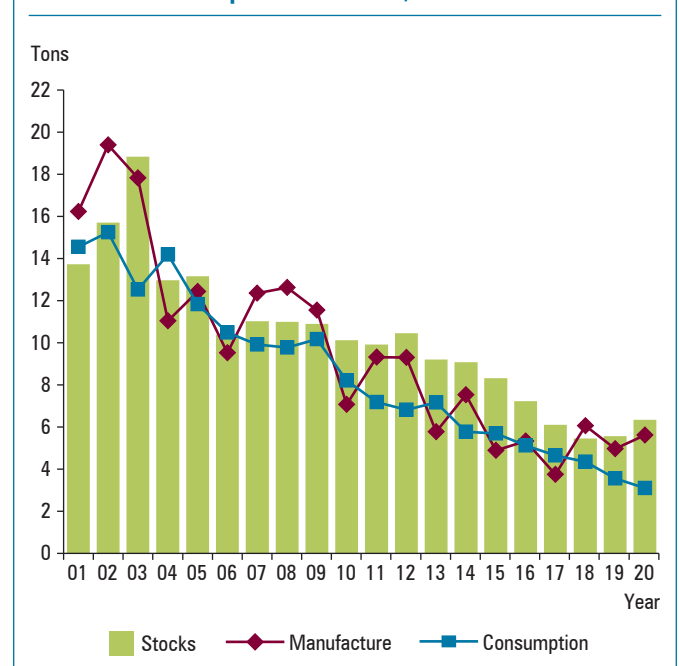
94. The manufacture of pethidine has trended downward over the past 20 years, falling to 5.6 tons in 2020 (see figure 29). Consumption of pethidine, which stood at its highest level in 2002, 15.3 tons, has been decreasing steadily since then and reached its lowest level in 2020, 3.1 tons. Pethidine is used mostly for pain relief in childbirth. The decrease in consumption is attributable to several factors, such as its low potency, short duration of action and unique toxicity (i.e., seizures, delirium and other neuropsychological effects) 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 placed strict limits on its use, but some physicians continue to use it as a strong first-line opioid.

Figure 28. Methadone: global manufacture, consumption and stocks,^a 2001–2020



^aStocks as at 31 December of each year.

Figure 29. Pethidine: global manufacture, consumption and stocks,^a 2001–2020



^aStocks as at 31 December of each year.

95. In 2020, pethidine was mostly manufactured in Slovakia (2.4 tons, or 44 per cent of total manufacture), Spain (2 tons, or 35.6 per cent), China (0.6 tons, or 11.6 per cent), the United States (0.3 tons, or 6.3 per cent) and India (0.1 tons, or 2.2 per cent): those were the five large manufacturers. The main exporting countries were Slovakia (2 tons, or 54.6 per cent), the United Kingdom (0.5 tons, or 13.7 per cent), Spain (0.4 tons, or 11.9 per cent) and Austria, Germany and India (0.1 tons, or 3.7 per cent, each). Other countries exported less than 0.1 tons. The main countries importing pethidine were the United Kingdom and South Africa (0.4 tons, or 10 per cent), Germany (0.3 tons, or 7.5 per cent) and other countries importing less than 0.3 tons. Further details on exports and imports of pethidine are contained in annex IV, tables 3 and 4.

96. Pethidine consumption totalled 3.1 tons in 2020. The main consumer country was the United States (0.3 tons, or 11.7 per cent). Smaller quantities of consumption were reported by the Islamic Republic of Iran, Turkey, Kenya, Bangladesh and South Africa, in descending order. Global stocks of pethidine increased to 6.3 tons. The largest stocks were held by Spain (1.4 tons, or 23 per cent of global stocks), China (0.8 tons, or 13 per cent), the United States (0.7 tons, or 11.5 per cent), Slovakia (0.6 tons, or 9.4 per cent) and Germany (0.5 tons, or 8.5 per cent). A number of other countries held quantities of less than 0.3 tons.

Tilidine

97. Global manufacture of tilidine declined to 27.4 tons in 2020, compared with 40.5 tons in 2019, continuing the volatile pattern of the past 20 years. In 2020, Germany accounted for the vast majority of the global manufacture of tilidine (20.2 tons, or 82.1 per cent), with Serbia reporting 2.9 tons, or 12 per cent of the global total. Exports of tilidine increased to 67.4 tons in 2020, up from 48.8 tons in 2019. The largest exporting countries were Serbia (34.3 tons, or 51 per cent) and Germany (32.5 tons, or 48.2 per cent), which together accounted for almost 99 per cent of global exports.

98. Consumption of tilidine fluctuates. It was highest in 2012, at 59.1 tons, dropped to 20 tons in 2013, then rose gradually to 46.4 tons in 2018, dropped again to 28.5 in 2019 and rose to 45.7 tons in 2020. Most tilidine is consumed in Germany (44 tons, or 96.3 per cent), followed by Belgium (1.2 tons, or 2.6 per cent). In 2020, most global stocks of tilidine (20.3 tons, or 82 per cent of the global total) were held by Germany, followed by Serbia (2.9 tons, or 12 per cent).

Trimeperidine

99. Since 2012, the quantity of trimeperidine manufactured has been more or less stable at about 200 kg. In 2020, manufacture increased to 326.3 kg. The only manufacturers of trimeperidine were India (252.6 kg, or 77.4 per cent of the global total) and the Russian Federation (73.7 kg, or 22.6 per cent). Trimeperidine was developed around 1945 in the former Union of Soviet Socialist Republics, and historically manufacture and consumption was concentrated there. India has been reporting manufacture of trimeperidine since 2002.

100. In 2020, global consumption of trimeperidine amounted to 144.3 kg, with the Russian Federation reporting 105.8 kg, or 73.3 per cent, followed by Kazakhstan (12 kg, or 8.3 per cent), Belarus (5.9 kg, or 4 per cent), Turkmenistan (4.3 kg, or 3 per cent) and Uzbekistan (4.2 kg, or 2.9 per cent). Imports and exports of trimeperidine increased tenfold in 2020. Exports reached 509.7 kg in 2020 compared with 56 kg in 2019. Imports grew to 510.5 kg in 2020, from 54.4 kg in 2019. In 2020, the main exporting countries of trimeperidine were India (380.7 kg, or 74.7 per cent of global exports), followed by the Russian Federation (95.5 kg, or 18.7 per cent), Ukraine (13.3 kg, or 2.6 per cent) and Slovakia (5.6 kg, or 1.1 per cent). The main importing countries in 2020 were the Russian Federation (347.6 kg, or 68.1 per cent of global imports), India (76.5 kg, or 15 per cent) and Ukraine (22 kg, or 4.3 per cent). In 2020, global stocks stood at 521.8 kg; they were mainly held by the Russian Federation (407.6 kg, or 78.1 per cent), Slovakia (29.7 kg, or 5.6 per cent), Kazakhstan (22.8 kg, or 4.3 per cent), Belarus (13.9 kg, or 2.6 per cent) and Latvia (10.6 kg, or 2 per cent). A number of other countries had less than 10 kg in stock.

Opioid analgesics controlled under the 1971 Convention

101. 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.¹⁸

Buprenorphine

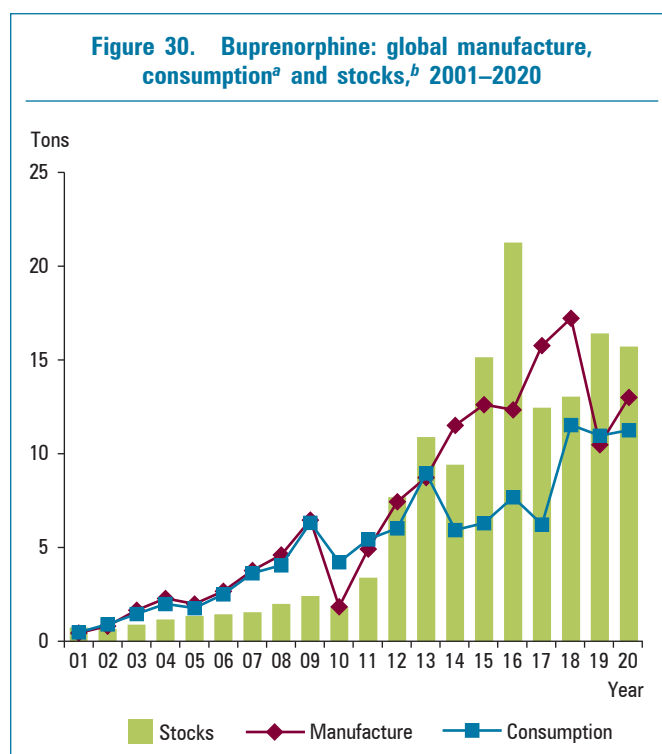
102. Buprenorphine is an opioid agonist used as an analgesic and in detoxification and substitution treatment for opioid dependence. Buprenorphine produces effects similar to other opioids but not as strong as those of heroin.

¹⁸E/INCB/2021/3.

For that reason, buprenorphine is used to produce a sufficient agonist effect to enable opioid-dependent individuals to discontinue the misuse of opioids without experiencing withdrawal symptoms. Since the late 1990s, global manufacture of buprenorphine has increased (with the exception of 2010, when there was a sharp decrease), reaching a peak of 17.2 tons in 2018. By 2020, manufacture of buprenorphine stood at 13 tons (see figure 30). The main manufacturing countries in 2020 were the United Kingdom (6.9 tons), the United States (2 tons), Czechia (1.5 tons), Germany (0.8 tons), India (0.8 tons), Switzerland (0.3 tons), Denmark (0.2 tons), with Belgium and China manufacturing smaller amounts. In 2020, the main exporters were, in descending order of the amounts exported, the United Kingdom, Germany, Czechia, France, Switzerland, India, Belgium and the United States. The main countries importing buprenorphine in 2020 were, in descending order of the amount imported, the United States, France, Germany, Canada, the United Kingdom, Australia, Austria, Sweden, Spain and Italy.

Pentazocine

103. Pentazocine is an opioid analgesic with properties and uses similar to those of morphine. In 2020, global manufacture of pentazocine was at 2.6 tons, up from 1.1 tons of 2019, manufactured almost completely in India (2.4 tons). Italy reported manufacturing 0.2 tons in 2020. Italy declared 0.3 tons of export followed by India, with



^aUntil 2013, the approximate calculated global consumption was determined on the basis of statistical data submitted by Governments. As of 2014, the reported consumption data provided by Governments on a voluntary basis were considered, and may therefore be incomplete.

^bStocks as at 31 December of each year.

0.1 tons. The main importers were Nigeria (1.3 tons), Pakistan and Japan (0.1 tons). Some countries imported smaller quantities.

Cannabis

104. Until 2010, the United States was the only country reporting the licit use of cannabis for medical and scientific purposes. Since 2011, however, an increasing number of countries have started to use cannabis and cannabis extracts¹⁹ for medical purposes, as well as for scientific research. In the past 20 years, the global production of cannabis has therefore seen an increase, amounting to 650.8 tons in 2020, a further increase compared with the 468.3 tons recorded for 2019 (see table 2). The data need to be taken with caution since manufacturing processes for cannabis are not standardized, and some data are being clarified in order to ensure consistency.

105. Production was reported by the United Kingdom (238.7 tons, or 36.7 per cent) followed closely by Canada

(227.8 tons, or 35 per cent), Spain (84.4 tons, or 13 per cent), Israel (24.6 tons, or 3.8 per cent), Australia (18.4 tons, or 2.8 per cent), Colombia (18.1 tons, or 2.8 per cent), North Macedonia (12.2 tons, or 1.9 per cent), Uruguay (6.9 tons, or 1.1 per cent), Denmark (6.5 tons, or 1 per cent), the Netherlands (5.9 tons, or 0.9 per cent), Uganda (4.4 tons, or 0.7 per cent) and Thailand (1.4 tons, or 0.2 per cent). Other countries that reported less than 1 ton of production were, in descending order of the amounts produced, Republic of Korea, Austria, New Zealand, Switzerland and Czechia. The production figures presented in the table are reported as received, and it should be noted that, in the extraction of cannabinoids from the cannabis plant, there may be large variations in the quantities used, owing to the different processes employed.

¹⁹In 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”).

Table 2. Cultivation of cannabis plant and production of cannabis, 2016–2020

Country ^a	Year	Area harvested (hectares)	Quantity produced (kilograms)	Country ^a	Year	Area harvested (hectares)	Quantity produced (kilograms)
Argentina	2016	n/a	n/a	Netherlands	2016	0.50	1 460
	2017	n/a	n/a		2017	0.00	2 385
	2018	n/a	n/a		2018	1.00	5 105
	2019	n/a	n/a		2019	1.00	5 426
	2020	0.13	..		2020	1.00	5 910
Australia	2016	n/a	n/a	New Zealand	2016	n/a	n/a
	2017	.. ^b	224		2017	n/a	n/a
	2018	.. ^b	958		2018	0.01	5
	2019	.. ^b	3 169		2019	0.02	21
	2020	..	18 391		2020	0.90	242
Austria	2016	0.09	116	North Macedonia	2016	n/a	n/a
	2017	1.00	259		2017	n/a	n/a
	2018	1.00	362		2018	2.51	4 041
	2019	1.00	362		2019	–	–
	2020	0.16	366		2020	8.19	12 244
Canada	2016	10.74	80 816	Portugal	2016	7.00	21 000
	2017	20.20	131 437		2017	..	..
	2018	515.01	64 466		2018	..	..
	2019	332.01	38 353		2019	..	..
	2020	806.00	227 750		2020	..	..
Chile	2016	1.00	1 416	Republic of Korea	2016	n/a	n/a
	2017	1.00	444		2017	n/a	n/a
	2018	1.00	621		2018	n/a	n/a
	2019	0.40	20		2019	n/a	n/a
	2020	..	..		2020	0.40	586
Colombia	2016	n/a	n/a	Spain	2016	n/a	n/a
	2017	0.36 ^c	..		2017	0.66	2 079
	2018	0.63	887		2018	2.95	3 920
	2019	1.34	4 018		2019	16.58	37 389
	2020	8.50	18 063		2020	57.43	84 448
Czechia	2016	..	46	Switzerland	2016	..	453
	2017	..	95		2017	..	230
	2018	..	5		2018	..	106
	2019	1.00	26		2019	..	187
	2020	..	28		2020	..	232
Denmark	2016	n/a	n/a	Thailand	2016	n/a	n/a
	2017	n/a	n/a		2017	n/a	n/a
	2018	n/a	n/a		2018	n/a	n/a
	2019	1.83	2 112		2019	0.09	315
	2020	4.77	6 587		2020	3.57	1 371
Israel	2016	8.45	9 263	Uganda	2016	n/a	n/a
	2017	9.03	10 424		2017	n/a	n/a
	2018	18.00	20 786		2018	n/a	n/a
	2019	23.60	26 662		2019	n/a	n/a
	2020	21.80	24 600		2020	2.86	4 446
Italy	2016	0.00	315	United Kingdom	2016	117.00	95 000
	2017	..	60		2017	37.90	258 378
	2018	..	..		2018	21.00	217 197
	2019	0.06	775		2019	40.00 ^d	320 000 ^d
	2020	..	..		2020	33.79	238 671
Jamaica	2016	n/a	n/a	United States	2016	0.00	0
	2017	n/a	n/a		2017	0.00	74 ^e
	2018	n/a	n/a		2018	1.00	246 ^e
	2019	21.45	23 315		2019	..	642 ^e
	2020	..	..		2020	..	..
Japan	2016	0.58	..	Uruguay	2016	n/a	n/a
	2017	0.05	..		2017	n/a	n/a
	2018	0.02	..		2018	2.50	..
	2019	1.30	..		2019	2.10	5 552
	2020	0.03	..		2020	4.25	6 888
Lesotho	2016	?	?	Total	2016	145.35	209 884
	2017	?	?		2017	68.84	408 473
	2018	18.50	30 738		2018	585.13	354 548
	2019	..	..		2019	443.77	468 343
	2020	..	..		2020	953.77	650 823

Note: Two dots (..) signify that statistical information was furnished but data were not submitted for this specific item; a dash (–) indicates that the amount is nil; and n/a indicates that there was no reported licit cultivation of cannabis in the year in question. A question mark “?” signifies that the statistical data were not provided.

^aIn addition to the 25 countries listed in this table, the following seven countries (Bolivia (Plurinational State of), Germany, Malawi, Malta, Peru, Saint Vincent and the Grenadines and Zimbabwe) furnished estimates for 2021 and/or 2022 on the cultivation of cannabis plant and the production of cannabis.

^bOnly the number of cannabis plants harvested was reported; data on the area sown and harvested were not provided.

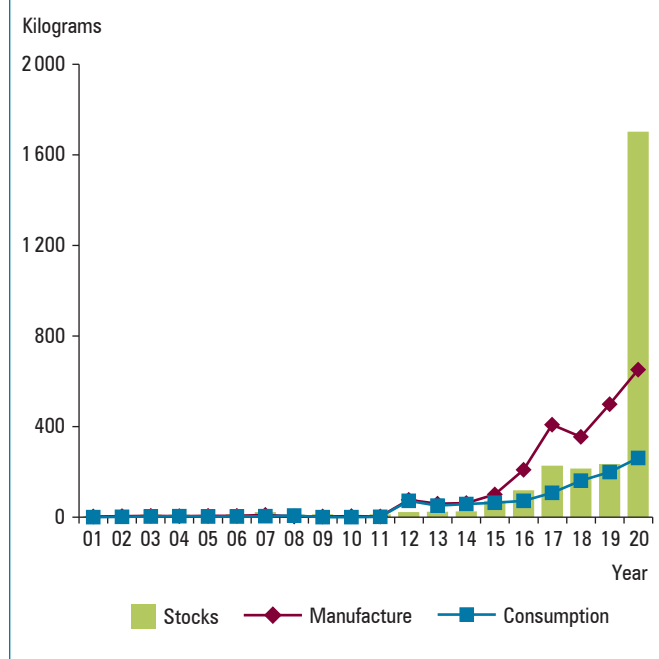
^cThe manufactured quantity is being used exclusively for research purposes.

^dThis figure was calculated by INCB and is based on estimates submitted by the Government. It is being followed up with the authorities.

^eThese figures refer only to the cultivation of cannabis plant authorized at the federal level. The figures were reported by the Government on the annual statistical return.

106. In 2020, Canada continued to be the main exporter of cannabis (88.4 tons, or 74.5 per cent of the global total), followed by Portugal (7.3 tons, or 6.2 per cent), Lesotho (6.1 tons, or 5.1 per cent), the United States (5.2 tons, or 4.4 per cent), the Netherlands (3.6 tons, or 3 per cent), Uruguay (2.8 tons, or 2.4 per cent) and Germany (1 ton, or 0.8 per cent). Smaller exports were also reported, in descending order, from Uganda, Spain, Finland, Colombia, Denmark, Austria, Australia, Poland, North Macedonia, Israel, Belgium, Czechia and Slovenia. In 2020, Germany imported 16.2 tons, or 17.2 per cent of the global total, followed by Denmark (15.8 tons, or 16.8 per cent), Finland (15.5 tons, or 16.5 per cent), Israel (14.6 tons, or 15.5 per cent), Portugal (5.3 tons, or 5.6 per cent), the United States (5 tons, or 5.3 per cent), Australia (4.5 tons, or 4.8 per cent), New Zealand (3.6 tons, or 3.9 per cent), Uruguay (2.8 tons, or 3 per cent), Spain (2.1 tons, or 2.3 per cent), Belgium (2 tons, or 2.2 per cent), Peru (1.6 tons, or 1.8 per cent) and Italy (1.5 tons, or 1.7 per cent). Countries importing amounts of below 1 ton were, in descending order, France, Malta, Poland, North Macedonia, Luxembourg,

Figure 31. Cannabis: global manufacture, consumption and stocks,^a 2001–2020



^aStocks as at 31 December of each year.

Austria and Norway. Most of the stocks were held by the United Kingdom (1,489.2 tons, or 85.2 per cent), followed by Spain (88.9 tons, or 5.2 per cent), Canada (49.3 tons, or 2.9 per cent), Denmark and Finland (20 tons, or 1.2 per cent, each), North Macedonia (17 tons, or 1 per cent) and Colombia (16.4 tons, or 1 per cent). Countries keeping stocks of less than 1 per cent of the global total each were, in descending order, Australia, Israel, Germany, Uruguay, the Philippines, the Netherlands, Chile, the United States, Malta, France, Switzerland, Austria and Thailand.

Coca leaf and cocaine

Coca leaf

107. Peru has been the only country exporting coca leaf for the global market since 2000. Most of the quantities are exported to the United States, where coca leaf is utilized for the extraction of flavouring agents and the manufacture of cocaine is a by-product. In 2020, exports from Peru amounted to 148.9 tons, all exported to the United States. For 2020, the United States reported the utilization of 111.7 tons of coca leaf, a slight decrease from the 127.8 tons reported in 2019. In 2020, the largest stocks of coca leaf were held in the United States: 664.4 tons, or 99.9 per cent. Stocks of less than 1 ton were reported by Italy (213 kg) and France (4.3 kg).

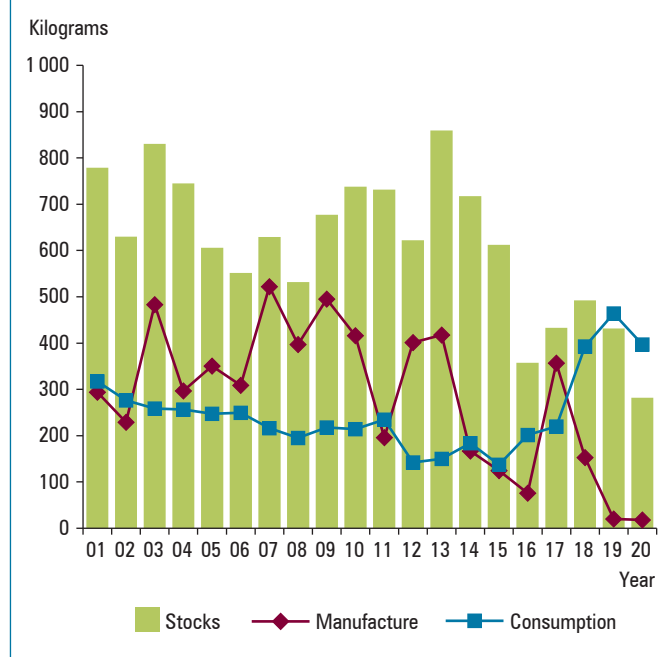
108. The cultivation of coca bush in the Plurinational State of Bolivia for the chewing of coca leaf and the consumption and use of coca leaf in its natural state for cultural and medicinal purposes, such as preparing infusions, is allowed in accordance with the reservation made by the country in 2013, when it reaccessed to the 1961 Convention as amended by the 1972 Protocol. In that connection, the Plurinational State of Bolivia reported the production of 30,954 tons in 2020.

Cocaine

109. The global licit manufacture of cocaine continued to fluctuate, as it has for more than 20 years. For 2020,

manufacture decreased slightly to 18.3 kg, all manufactured in the United States (see figure 32). The main exporting country in 2020 was the United Kingdom (46.7 kg, or 74.4 per cent of global exports), followed by the Netherlands (9.4 kg, or 15 per cent), Switzerland (2.2 kg, or 3.5 per cent), Germany (1.8 kg, or 3 per cent) and Australia (1.6 kg, or 2.5 per cent). The Netherlands was the main importing country (24.9 kg), accounting for 41 per cent of the total global imports of cocaine in 2020, followed by Switzerland (12 kg, or 19.8 per cent), Belgium (4.8 kg, or 8 per cent), Malaysia (3.6 kg, or 6 per cent) and Sweden (2.4 kg, or 4 per cent). A number of countries imported less than 2 kg. The licit consumption of cocaine, which had been stable for the last 20 years, on average between 100 kg and 300 kg, was at 396.4 kg in 2020, down from 465.6 kg in 2019. The main consumer countries were the United States (306.6 kg, or 77 per cent), followed by the United Kingdom (45.7 kg, or 11.5 per cent) and the Netherlands (10.2 kg, or 2.6 per cent). Stocks were held by the United States (125.3 kg, or 44.2 per cent), the Russian Federation (46.3 kg, or 16.4 per cent), the Netherlands (25.2 kg, or 8.9 per cent), the United Kingdom (21.4 kg, or 7.5 per cent) and Switzerland and Finland (12 kg, or 4.4 per cent, each). A number of other countries held less than 10 kg in stocks.

Figure 32. Cocaine: global manufacture, consumption and stocks,^a 2001–2020



^aStocks as at 31 December of each year.

Comparative trends in the consumption of opioid analgesics

110. The previous section highlighted the most salient trends in the manufacturing, export, import and consumption of the individual drugs. To gain an overview of the trends of the various substances and to analyse how and why the consumption of some drugs is increasing or decreasing, it is important to look at them together, particularly in the case of opioid analgesics that are needed for pain management. The following analysis is based on the consumption of the main opioid analgesics (codeine, fentanyl, hydrocodone, hydromorphone, morphine and oxycodone), expressed in defined daily doses for statistical purposes (S-DDD).²⁰

111. A comparison of the consumption of individual substances (see figure 33) shows the predominance of fentanyl over the past two decades. However, after peaking in 2018 at 285,959 S-DDD, global consumption of fentanyl decreased to 235,074 S-DDD in 2019 and remained relatively stable, with a slight decrease in 2020, to 233,636 S-DDD. The consumption of oxycodone has been

increasing, although at a lower level, and, since 2009, has replaced morphine as the second most-consumed opioid (after fentanyl). Like fentanyl, consumption of oxycodone reached an all-time high in 2018 (45,726 S-DDD), decreasing to 44,821 S-DDD in 2019 and fell further, to 42,099 S-DDD in 2020. The trend in the use of morphine, on the other hand, remained relatively stable between 2004 (25,644 S-DDD) and 2019 (27,957 S-DDD), but in 2020 it increased to 31,824 S-DDD, the highest level of consumption since 2002. After decreasing steadily since 2014, hydrocodone consumption increased from 14,161 S-DDD in 2018 to 20,415 S-DDD in 2019 but decreased to 18,366 in 2020. The consumption of codeine for pain management decreased from 5,720 S-DDD in 2018 to 4,591 S-DDD in 2019 but increased to 4,665 S-DDD in 2020. Hydromorphone consumption decreased from 11,834 S-DDD in 2018 to 7,713 S-DDD in 2019, the lowest level since 2008, but increased to 8,528 S-DDD in 2020. The United States accounted for almost all global hydrocodone use (99.2 per cent), whereas the consumption of the other drugs shown in the figure was reported in more than one country.

²⁰The list of defined daily doses for statistical purposes (S-DDD) and an explanation of that concept are contained in the notes to tables XIV.1.a-i., XIV.2 and XIV.3.

112. A regional analysis of the main trends in the consumption of the main opioid analgesics (codeine, dextropropoxyphene, dihydrocodeine, fentanyl, hydrocodone, hydromorphone, ketobemidone, morphine, oxycodone, pethidine, tilidine and trimeperidine), expressed in S-DDD per million inhabitants per day, shows that the highest consumption of these drugs is in developed countries in Europe and North America. Countries reporting the highest average consumption of opioids for pain management in the period 2018–2020 were the United States (26,122 S-DDD), Germany (22,298 S-DDD), Austria (20,323 S-DDD),²¹ Israel (17,947 S-DDD) and Belgium (15,422 S-DDD).

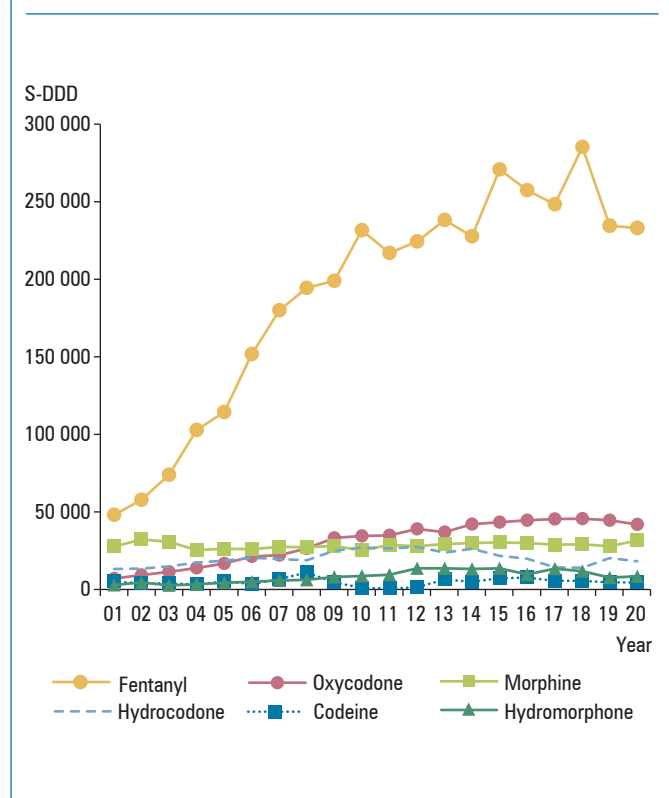
113. The regional analysis confirms the persistence of a global disparity in the consumption of opioid analgesics. Regional S-DDD is calculated on the basis of the total population of the countries reporting consumption and the

²¹The Government of Austria has reported data to the Board containing the breakdown of the country's morphine consumption for opioid substitution treatment in 2019 and 2020, which corresponded to 93 per cent of consumption for both years. Taking this information into consideration, it is estimated that the overall amount of opioids consumed for pain management in Austria during the 2018–2020 period is 14,310 S-DDD. According to the information available to the Board, this is a unique situation and should not impact the S-DDD of other high-consuming countries.

overall amounts of opioid analgesics reported as consumed. In 2020, the reported consumption of some countries in North America, Oceania and Western and Central Europe resulted in regional averages of 19,214 S-DDD for North America, 10,001 S-DDD for Western and Central Europe and 5,984 S-DDD for Oceania, the latter representing a marked decrease, from 9,984 S-DDD, in 2019. Although also reporting a decline, from 26,151 S-DDD in 2019, North America remains the region with the highest consumption of opioids for pain management in the world. Consumption had declined in Western and Central Europe between 2018 (11,021 S-DDD) and 2019 (9,200 S-DDD) but increased again in 2020 (see figure 34).

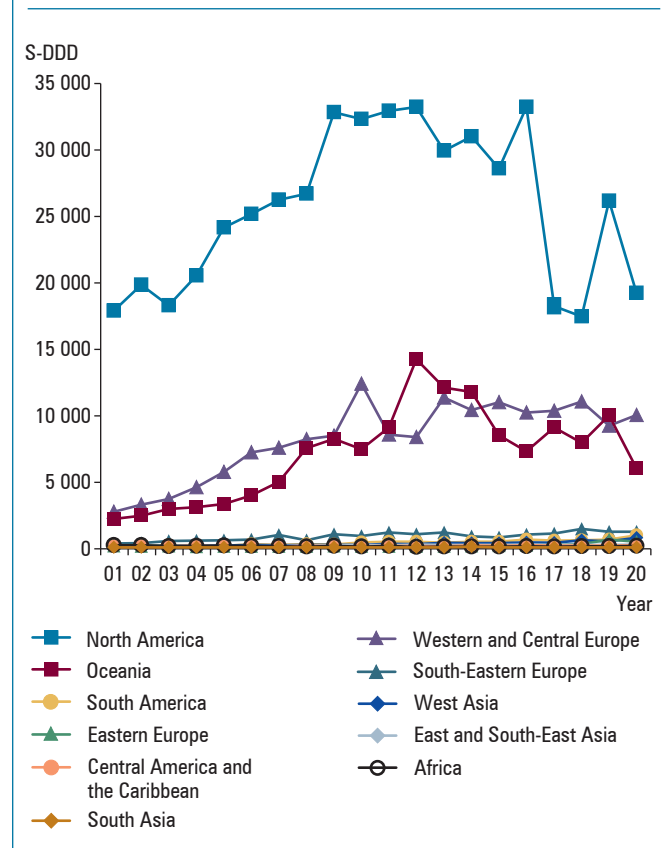
114. The levels of opioid consumption in North America, Oceania and Western and Central Europe are far higher than in all other regions in the world, as seen in figure 34. Figure 35 provides a closer look at consumption in other regions. A general upward trend in consumption was evident in South-Eastern Europe until 2018, when it reached 1,415 S-DDD, but it decreased to 1,192 S-DDD in 2019 and to 1,188 S-DDD in 2020. Consumption in South America has been increasing since 2017, when countries reported 537 S-DDD, and reached an all-time high of 919 S-DDD in 2020. In West Asia, a similar trend was observed, also with an all-time high (743 S-DDD) seen in 2020.

Figure 33. Consumption of codeine, fentanyl, hydrocodone, hydromorphone, morphine and oxycodone, expressed in total S-DDD,^a 2001–2020



^aTotal consumption of a drug is the sum of S-DDD of all individual countries reporting consumption.

Figure 34. Consumption of opioids for pain management in all regions, in S-DDD per million inhabitants per day, 2001–2020



Eastern Europe reached an all-time high in 2019, with 601 S-DDD, but consumption in 2020 decreased, to 457 S-DDD.

115. The Board considers levels of consumption of opioid analgesics in quantities between 100 and 200 S-DDD to be inadequate, and in quantities of less than 100 S-DDD to be very inadequate. In this context, the average levels of consumption reported in 2020 in East and South-East Asia (220 S-DDD), Central America and the Caribbean (166 S-DDD), Africa (128 S-DDD) and South Asia (20 S-DDD) are of particular concern.

116. Figures 36 and 37 show consumption of opioid analgesics in total S-DDD by substance and region. This analysis highlights once again the predominance of fentanyl in most regions of the world. Oxycodone consumption is highest in North America, Oceania, Western and Central Europe and West Asia, although it is also consumed in other regions. Hydrocodone consumption is significant in the Americas. The share of morphine is less pronounced in most regions, except for Africa and South America.

117. The Board reiterates that there is an urgent need to increase levels of consumption and to improve the prescription and use of opioid analgesics in all countries reporting inadequate and very inadequate levels of consumption and calls for targeted public policies with

the support of Governments, health systems and health professionals, civil society, the pharmaceutical industry and the international community.

Figure 36. Consumption of codeine, fentanyl, hydrocodone, morphine, oxycodone and pethidine and other opioids, by region, expressed in S-DDD, 2020

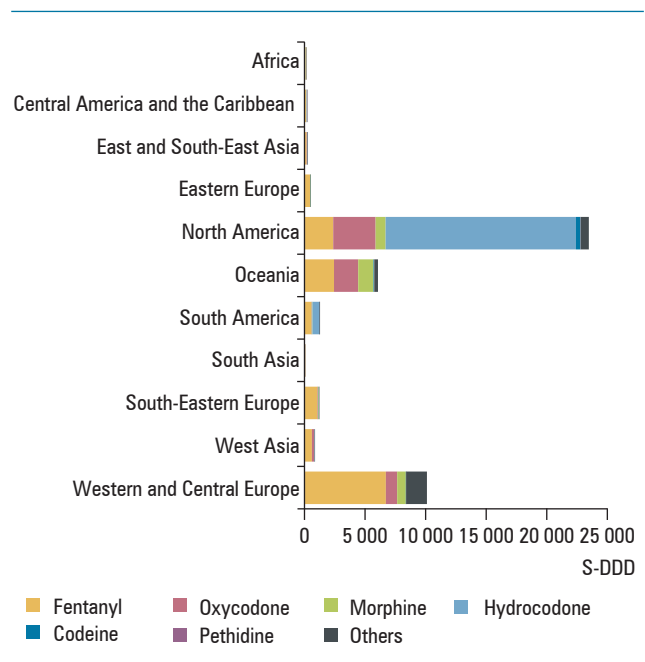


Figure 35. Consumption of opioids for pain management in the regions with the lowest consumption, in S-DDD per million inhabitants per day, 2001–2020

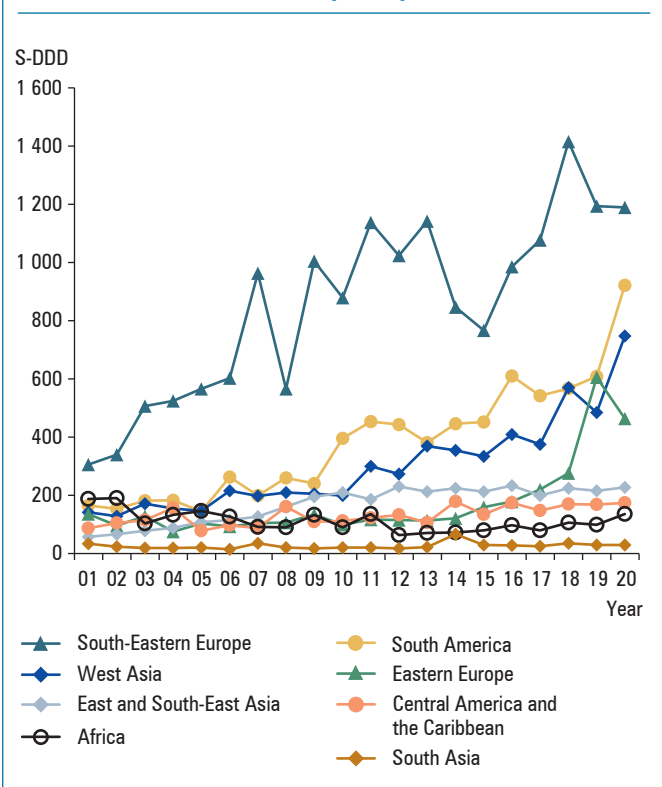


Figure 37. Consumption of codeine, fentanyl, hydrocodone, morphine, oxycodone, pethidine and other opioids, in selected regions, expressed in S-DDD, 2020

