SUPPLY OF OPIATE RAW MATERIALS AND DEMAND FOR OPIATES FOR MEDICAL AND SCIENTIFIC PURPOSES

1. The International Narcotics Control Board (INCB), in fulfilment of the functions assigned to it under the Single Convention on Narcotic Drugs of 1961¹ and the relevant resolutions of the Economic and Social Council and the Commission on Narcotic Drugs, regularly examines issues affecting the supply of and the demand for opiates for licit requirements, and endeavours to ensure a standing balance between that supply and demand. The present section contains an analysis of the current situation based on the data provided by Governments.²

Introduction

2. The analysis presented below has been prepared by examining the data on opiate raw materials and on opiates manufactured from those raw materials. In the analysis, raw materials rich in morphine and the opiates derived from such materials are, in accordance with the methodology adopted by INCB, considered separately from raw materials rich in thebaine and the opiates derived from them. Global supply of opiate raw materials is measured by the levels of stocks and production. Global demand for opiate raw materials is assessed on the basis of data on total utilization of opiate raw materials for the manufacture of all opiates. Data concerning total consumption and stocks of opiates are also included, as appropriate.

3. The present analysis complements the comments on the reported statistics shown above for individual opiate raw materials obtained from opium poppy (opium, poppy straw and concentrate of poppy straw) and for the opiates obtained from them; readers are invited to turn to those comments for more in-depth information on long-term developments concerning the individual substances (see pages 73-93 above). The main focus of the analysis is on the present situation, including the last four years for which statistical data are available. For the years 2011 and 2012, the data on production are based on advance statistical information and estimates received from the main producing countries,³ while the data on the demand for opiate raw materials and the opiates derived from them are INCB projections based on past trends and taking into account relevant estimates furnished by Governments.

4. Finally, in this section INCB examines the trends in global consumption of all opiates and synthetic opioids over the 20-year period from 1991 to 2010. The findings derived from the analysis complement the comments on reported statistics on individual substances and reflect the changes over time in the relative importance of opiates, which are derived from opium poppy, in the global consumption of opioids.

Supply of opiate raw materials

Cultivation of opium poppy for the extraction of alkaloids

5. Table 1 below provides information on the area cultivated with opium poppy (*Papaver somniferum*) for the extraction of alkaloids in the main producer countries; data on varieties rich in morphine and those rich in thebaine are listed separately, where applicable. For both types of raw materials, the estimated area of cultivation is given for each year. Data on the area sown and the actual area harvested are given for the years for which such data are available.

6. In 2010, the area sown with opium poppy rich in morphine increased over the previous year in all major producing countries except Turkey (see table I). The actual area harvested increased in all major producing countries except Spain; the increase was most significant, in terms of percentage, in Hungary (increase of 556 per cent), Australia (98 per cent) and France (39 per cent). India is the only opium-producing country included in the present analysis. The total area sown in major producing countries was 87 per cent of the total estimated area. In 2010, cultivation of opium poppy rich in thebaine increased in Australia (a 23-per-cent increase in the area actually harvested) and decreased in France and Spain (decreases of 77 per cent and 28 per cent respectively in the area actually harvested). Hungary submitted an estimate for the cultivation of opium poppy rich in thebaine for 2010, but no actual cultivation was reported for that year. The total area sown was only 64 per cent of the total estimated area, in contrast to 2009, when total area sown in major producing countries was 98 per cent of the estimated area.

¹United Nations, *Treaty Series*, vol. 520, No. 7515.

²The analysis excludes data on China and the Democratic Republic of Korea, which produce opiate raw materials solely for domestic use. It also excludes data on the utilization of seized opium that was released in the Islamic Republic of Iran and the demand for opiates derived from such opium.

³Those data have been adjusted, as necessary, to reflect industrially recoverable alkaloid content in the raw materials in question.

Table 1. Area cultivated with opium poppy rich in morphine and opium poppy rich in thebaine, 2007-2012

(Estimated area, area sown and area harvested, in hectares)

	2007	2008	2009	2010	2011ª	2012 ^b
Australia						
Opium poppy rich in morphine						
Estimated area	4 982	5 250	10 506	12 770°	14 050°	15 960°
Area sown	5 033	4 885	5 447	10 463 ^c		
Actual area harvested	4 661	4 108	4 598	9 127 ^c	12 157°	
Opium poppy rich in thebaine						
Estimated area	3 872	9 700	11 857	11 650	13 580	12 390
Area sown	4 168	8 024	10 439	11 441		
Actual area harvested	3 837	7 807	8 894	10 922	11 343	
Opium poppy rich in morphine ^c and thebaine						
Total estimated area	8 854	14 950	22 363	24 420 ^c	27 630°	28 350°
Total area sown	9 201	12 909	15 886	21 904°		
Total actual area harvested	8 498	11 915	13 492	20 049°	23 500	_
France						
Opium poppy rich in morphine						
Estimated area	5 150	3 650	7 500	8 000	8 978	11 000
Area sown	3 211	3 744	6 837	9 800	9 370	
Actual area harvested	3 198	3 683	6 750	9 400	8 600	
Opium poppy rich in thebaine						
Estimated area	1 000	2 650	2 500	5 000	3 922	2 000
Area sown	2 874	2 551	3 002	700	930	
Actual area harvested	2 707	2 534	2 990	700	130	
Opium poppy rich in morphine and thebaine						
Total estimated area	6 150	6 300	10 000	13 000	12 900	13 000
Total area sown	6 085	6 295	9 839	10 500	10 300	
Total actual area harvested	5 905	6 217	9 740	10 100	8 730	
Hungary						
Opium poppy rich in morphine						
Estimated area	13 000	12 500	15 500	8 000	7 000	9 500
Area sown	6 724	3 983	8 204	11 289		
Actual area harvested	3 269	2 262	1 114	7 308	6 200	
Opium poppy rich in thebaine						
Estimated area	_	_	_	3 000	3 720	3 000
Area sown	_	_	_	_		
Actual area harvested	_	_	_	_	2 000	
Opium poppy rich in morphine and thebaine						
Total estimated area	13 000	12 500	15 500	11 000	10 720	12 500
Total area sown	6 724	3 983	8 204	11 289		
Total actual area harvested	3 269	2 262	1 114	7 308	8 200	
India						
Opium poppy rich in morphine						
Total estimated area	6 220	4 680	11 262	22 000	22 000	
Total area sown	6 158	4 680	11 020	15 851		
Total actual area harvested	5 913	2 653	8 853	12 237		

Table 1. (continued)

	2007	2008	2009	2010	2011ª	2012 ^b
Spain						
Opium poppy rich in morphine						
Estimated area	7 600	6 000	6 590	7 000	8 500	10 000
Area sown	5 865	8 000	7 000	8 383	10 716	
Actual area harvested	5 606	5 507	6 865	6 439	9 488	
Opium poppy rich in thebaine						
Estimated area	_	2 500	4 410	5 000	5 500	2 000
Area sown	1 482	2 000	5 000	3 529	30	
Actual area harvested	1 482	2 537	4 925	3 528	186 ^d	
Opium poppy rich in morphine and thebaine						
Total estimated area	7 600	8 500	11 000	12 000	14 000	12 000
Total area sown	7 347	10 000	12 000	11 912	10 746	
Total actual area harvested	7 088	8 044	11 790	9 967	9 674	
Turkey						
Opium poppy rich in morphine						
Total estimated area ^e	70 000	70 000	70 000	70 000 ^e	70 000 ^e	70 000 ^f
Total area sown	38 850	35 104	60 328	55 296	61 368	
Total actual area harvested	24 603	20 042	48 893	51 987	54 911	

Note: A field in red signifies that the corresponding estimate has been exceeded. Two dots (. .) indicate that data are not available. Figures that are not based on official reports (Form B and Form C) are in italics. Areas of land smaller than 20 hectares are not included in the table.

^aFigures for area sown and actual area harvested in 2011 are based on advance data submitted by Governments to the International Narcotics Control Board. ^bFigures for 2012 are based on estimates submitted by Governments to the International Narcotics Control Board.

^cFigures for the area cultivated with morphine-rich opium poppy in Australia from 2010 to 2012 include cultivation of an opium poppy variety rich in codeine. In 2010, it was estimated that 800 hectares would be cultivated, 613 hectares were sown and 580 hectares were harvested, The estimate for cultivation in 2011 is 360 hectares and according to advance data submitted by Australia, 313 hectares will actually be harvested in 2011. The estimate for cultivation in 2012 is 490 hectares.

^dThe area sown is less than the area harvested in this case; this could be because some land was sown with the intention of producing opium poppy rich in morphine but producers later decided to harvest it as opium poppy rich in thebaine.

^eEstimate refers to the maximum area available for cultivation.

^fThe Government expects an area of cultivation of 35,000 hectares in 2012.

7. The advance data for 2011 show an overall rise of 8 per cent in the actual area of opium poppy rich in morphine harvested in major producing countries for which advance data were available. This increase was smaller than the 25-per-cent increase from 2009 to 2010. The actual area harvested increased in Australia, Spain and Turkey and decreased in France and Hungary. The largest single increase was 47 per cent in Spain. Cultivation of opium poppy rich in thebaine rose again in Australia; Hungary also started to harvest opium poppy rich in thebaine. In both France and Spain, the actual area harvested fell below 200 hectares; this represented more than an 80-per-cent decline in the actual area harvested in France and a decline of 95 per cent in cultivation in Spain. Overall, the actual area harvested in major producing countries fell 10 per cent.

8. For 2012, estimates for cultivation of opium poppy rich in morphine will increase relative to 2011 in all major producing countries for which there are data, except for Turkey, where the estimated amount will remain constant. With regard to the cultivation of opium poppy rich in thebaine, all major producing countries estimate decreases in production. However, production of opiate raw materials rich in thebaine is nonetheless expected to increase in 2012, as France and Spain produce large quantities of thebaine through extraction from poppy straw rich in morphine; cultivation of opium poppy rich in morphine is expected to increase in those countries.

Production of opiate raw materials

9. Tables 2 and 3 below provide an overview of global production of and demand for morphine-rich and thebaine-rich opiate raw materials for the period 2007-2012. The total production of morphine-rich opiate raw materials in the main producing countries increased to 510 tons⁴ in morphine equivalent in 2010. Production declined each year from 2004 to 2008, but rose in each of the two subsequent years. This increase was primarily due to an increase in production in Australia, in particular an increase in the

⁴The analysis is based predominantly on raw materials obtained from opium poppy rich in morphine but includes the morphine alkaloid contained in opium poppy rich in thebaine whenever appropriate.

	2007	2008	2009	2010	2011 ^b	2012 ^c
Australia						
Production	58	35	60	128	144	287
France						
Production	20	36	84	89	63	146
Hungary						
Production	14	10	5	18	37	20
India						
Production	30	15	45	63	89 ^d	80 ^d
Spain						
Production	75	68	70	47	110	112
Turkey						
Production	30	48	134	140	148	108
Other countries						
Production	25	21	30	25 ^{<i>d</i>}	34 ^d	35 ^d
(1) Total production	252	233	428	510	625	788
Demand						
Opium	70	61	54	49	60	70
of poppy straw	334	311	332	349	360	360
(2) Total demand for oniate raw materials	404	372	386	398	420	430
	101	072	000	000	42.0	400
(3) Total demand for opiates for medical and scientific purposes ^e	330	322	379	378	380	390
Balance (1) minus (2)	-152	-139	42	112	205	358
Balance (1) minus (3)	-78	-89	49	132	245	398
Stocks						
Opium	124	77	74	78		
Poppy straw	297	233	257	266		
concentrate of poppy straw	112	09	/9	/4		
Total stocks of opiate raw materials	533	379	410	418	623	981
Total stocks of all opiates	337	360	370	378		

Table 2. Opiate raw materials rich in morphine: production, demand, balance between the two^a and stocks, in tons of morphine equivalent, 2007-2012

Note: Two dots (. .) indicate that data are not available.

^aFor the balance between supply (stocks and production) of and demand for opiate raw materials rich in morphine, see paragraph 24 below.

^bFigures for 2011 are based on advance data submitted by Governments to the International Narcotics Control Board.

^cFigures for 2012 are based on estimates submitted by Governments to the International Narcotics Control Board.

^dEstimated by the secretariat of the International Narcotics Control Board.

^eExcluding demand for substances not controlled under the 1961 Convention as amended by the 1972 Protocol.

amount of poppy straw produced in that country and an increase in the efficiency with which concentrate of poppy straw rich in morphine is extracted from poppy straw in Australia, although several other countries also increased their production. Turkey remained the largest producer in 2010, accounting for 27 per cent of global production in terms of morphine equivalent; Turkey also remained the largest producer in terms of absolute quantity of poppy straw rich in morphine produced. Turkey was followed by Australia (25 per cent), France (17 per cent), India (12 per cent), Spain (9 per cent) and Hungary (4 per cent). 10. Global production of opiate raw materials rich in morphine is expected to be about 625 tons in morphine equivalent in 2011 (see table 2). Of that quantity, poppy straw will account for 536 tons (86 per cent), and opium will account for 89 tons (14 per cent). The main producers in 2011 will be Turkey (24 per cent of total production), Australia (23 per cent), Spain (18 per cent), India (14 per cent) and France (10 per cent). Those five countries, together, are expected to account for about 89 per cent of global production of opiate raw materials rich in morphine in 2011.

11. According to the information submitted by the Governments of the main producing countries, global production of opiate raw materials rich in morphine is estimated to increase further to 788 tons in morphine equivalent in 2012, mainly as a result of the expanded production planned in Australia and France.

12. Global production of opiate raw materials rich in thebaine declined slightly from 2009 to 2010, to 238 tons

in thebaine equivalent⁵ (see table 3). Australia accounted for 76 per cent of the global total, Spain for 20 per cent and India for 3 per cent. Production in Australia increased significantly, but this was offset by reductions in production in France and Spain.

⁵The analysis is based predominantly on raw materials obtained from opium poppy rich in thebaine but includes the thebaine alkaloid contained in opium poppy rich in morphine whenever appropriate.

Table 3.	Opiate raw materials rich in thebaine: production, demand, balance between the two ^a and stocks,							
in tons of thebaine equivalent, 2007-2012								

	2007	2008	2009	2010	2011 ^b	2012°
Australia						
Production	70	113	142	181	196	185
France ^d						
Production	13	17	30	2	4	25
Hungary						
Production	1	1	1	1	6	4
Spain ^d						
Production	22	45	63	47	14	37
India						
Thebaine extracted from opium	3	1	4	6	9 ^e	8 ^e
Other countries						
Thebaine extracted from						
poppy straw (M)	1	1	1	1 ^{<i>e</i>}	2 ^e	2 ^e
(1) Total production	110	178	241	238	231	261
Demand for						
Opium	7	6	6	5	7	7
Poppy straw and concentrate						
of poppy straw	106	120	172	195	203	213
(2) Total demand for opiate raw materials	113	126	178	200	210	220
(2) Total demand for existing for medical						
(5) Total demand for oplates for medical and scientific purposes ^f	67	69	100	96	110	120
Balance (1) minus (2) Balance (1) minus (2)	-3	52	63	38	21	41
Balance (1) minus (3)	43	109	141	142	121	141
Stocks						
Opium	13	8	8	8		
Poppy straw	38	81	118	88		
Concentrate of poppy straw	44	41	44	82		• •
Total stocks of opiate raw materials	95	130	170	178	199	240
Total stocks of all opiates	126	133	157	172		

Note: Two dots (. .) indicate that data are not available.

^aFor the balance between supply (stocks and production) of and demand for opiate raw materials rich in thebaine, see paragraph 25, below.

^bFigures for 2011 are based on advance data submitted by Governments to the International Narcotics Control Board.

^cFigures for 2012 are based on estimates submitted by Governments to the International Narcotics Control Board.

^dIn France and Spain, large quantities of thebaine alkaloid are extracted from poppy straw rich in morphine in addition to those derived from poppy straw rich in thebaine. ^eEstimated by the secretariat of the International Narcotics Control Board.

^fExcluding demand for substances not controlled under the 1961 Convention as amended by the 1972 Protocol.

13. Global production of opiate raw materials rich in thebaine is expected to decline further to about 231 tons in thebaine equivalent in 2011, following an overall decrease in cultivation in 2011. Australia, Spain and India, together, are expected to account for about 95 per cent of the global production of opiate raw materials rich in thebaine in 2011.

14. Production of thebaine-rich materials in 2012 is expected to increase, reaching about 261 tons. As in previous years, the actual production of opiate raw materials in 2012 may differ considerably from the estimates, depending on weather and other conditions.

Global stocks of opiate raw materials and of opiates derived from them

As shown in table 2, stocks of opiate raw materials 15. rich in morphine (poppy straw, concentrate of poppy straw and opium) amounted to about 418 tons in morphine equivalent at the end of 2010. Those stocks were sufficient to cover the expected global demand in 2011 for almost 12 months. In 2010, Turkey continued to be the country with the largest stocks of opiate raw materials (120 tons in morphine equivalent, in the form of poppy straw, concentrate of poppy straw and opium); it was followed by France (73 tons), Spain (59 tons), India (57 tons in morphine equivalent, in the form of opium) and the United States (39 tons). Those five countries together accounted for 83 per cent of global stocks of opiate raw materials rich in morphine. The remaining stocks were held in other producing countries and in countries importing opiate raw materials.

16. Stocks of opiate raw materials rich in thebaine (poppy straw, concentrate of poppy straw and opium) increased to about 178 tons in thebaine equivalent at the end of 2010. Those stocks were sufficient to cover the expected global demand in 2011 for 10 months (see table 3). Australia, France, Spain and the United States together accounted for about 96 per cent of the world total in 2010, while the countries importing those raw materials held the remaining stocks.

17. Global stocks of opiates based on morphine, mainly in the form of codeine and morphine, held at the end of 2010 (378 tons in morphine equivalent) were sufficient to cover global demand for those opiates for almost one year, even in the absence of additional opiates being manufactured from opiate raw materials. Total stocks of both opiates and opiate raw materials are fully sufficient to cover demand for opiates.

18. Global stocks of opiates based on thebaine (oxycodone, thebaine and a small quantity of oxymorphone) have increased significantly in recent years, although with fluctuations. At the end of 2010, those stocks stood at 172 tons in thebaine equivalent and were sufficient to cover global demand for such opiates for about 19 months.

Demand for opiates

19. As described below, INCB measures demand for opiates in two ways: (*a*) in terms of the utilization of opiate raw materials, in order to reflect the demand by manufacturers; and (*b*) in terms of global consumption of all opiates controlled under the 1961 Convention.⁶

Demand for opiate raw materials by manufacturers measured as utilization of raw materials

20. Global demand by manufacturers for opiate raw materials rich in morphine has increased, with fluctuations, by an average of about 2 per cent per year since 2000, reaching 398 tons of morphine equivalent in 2010. In 2011 and 2012, global demand is expected to increase again. Global demand for opiate raw materials rich in morphine is anticipated to be about 420 tons in 2011 and 430 tons in 2012.

21. Global demand by manufacturers for opiate raw materials rich in thebaine has also been increasing in recent years, albeit with fluctuations. In 2010, total demand increased significantly, to 200 tons of thebaine equivalent. Global demand for raw materials rich in thebaine is expected to rise to about 210 tons of thebaine equivalent in 2011 and reach 220 tons in 2012.

Demand for opiates measured as consumption

22. Figure I presents a breakdown of the demand, in terms of consumption for morphine-based opiates, expressed in morphine equivalent, for the main narcotic drugs. Global demand for morphine-based opiates has continued to increase, with some fluctuations. In 2010, global demand for morphine-based opiates used for medical and scientific purposes amounted to 378 tons. That

⁶Prior to 2003, INCB measured the global demand only by global consumption of major opiates controlled under the 1961 Convention, expressed in morphine equivalent. However, by using that approximation the following were excluded: (*a*) demand for less commonly used narcotic drugs; (*b*) demand for substances that are not under control of the 1961 Convention but are manufactured from opiate raw materials and for the consumption of which data are not available to INCB; and (*c*) fluctuations in the utilization of raw materials due to developments in the market anticipated by the manufacturers, such as expectations of sales of opiates, expected changes in prices of raw materials or opiates and so on.

demand is expected to remain roughly stable. As a result, global demand for opiates based on morphine may reach 380 tons in 2011 and 390 tons in 2012.



23. Demand for thebaine-based opiates, which is concentrated mainly in the United States and which has increased sharply since the late 1990s, was slightly less in 2010, equalling 96 tons, than in 2009. It is likely to rise in future years, partly because the consumption of such opiates is expected to spread to other countries. Global demand is anticipated to reach approximately 110 tons of thebaine equivalent in 2011 and 120 tons in 2012.

Balance between the supply of and demand for opiate raw materials

24. While global production of opiate raw materials rich in morphine had been lower than global demand for those raw materials in the period 2006-2008, production exceeded demand in 2009 and 2010. As a result, stocks increased and at the end of 2010 stood at about 418 tons, sufficient to cover the expected global demand for just over 12 months (see figure II).⁷ In 2011, global production of opiate raw materials rich in morphine is expected to exceed global demand again, with the result that global stocks of those raw materials will further increase in 2011. Stocks were expected to reach 623 tons by the end of 2011, which is equivalent to the expected level of global demand in 2012 for about 17 months. For 2012, producing countries plan to increase production. Stocks are anticipated to reach about 981 tons at the end of 2012, sufficient to cover the expected level of global demand in 2013 for about 25 months.⁸ The global supply of opiate raw materials rich in morphine (stocks and production) will remain fully sufficient to cover global demand.



 $^a\mathrm{Data}$ for production and demand for 2011 are based on advance data (dotted line) submitted by Governments.

^bData for 2012 are based on estimates (*dotted line*) submitted by Governments. ^cStocks as at 1 January of each year.

 $^{d}\mbox{Excluding substances not controlled under the 1961 Convention as amended by the 1972 Protocol.$

25. In 2010, global production of opiate raw materials rich in thebaine was again higher than demand, leading to a slight increase in stocks (to 178 tons) at the end of 2010, equivalent to global demand for 10 months (see figure III). Production is expected to fall slightly in 2011 but to grow again in 2012 and exceed the level of 2010. By the end of 2011, global stocks of opiate raw materials rich in thebaine are likely to reach 199 tons, a level sufficient to cover global demand for about 12 months.⁹ The global supply of opiate raw materials rich

⁷Because of a change in format, figures II and III are not directly comparable with the figures that appeared as figures II and III in this technical publication before 2008.

⁸The preliminary projection of the Board for global demand in 2013 is about 480 tons.

⁹The preliminary projection by the Board of global demand for 2013 is about 250 tons.



^aData for production and demand for 2011 are based on advance data (*dotted line*) submitted by Governments.

^bData for 2012 are based on estimates (*dotted line*) submitted by Governments. ^cStocks as at 1 January of each year.

in thebaine (stocks and production) will be fully sufficient to cover global demand in 2011 and 2012.

Trends in consumption levels of opioids

26. Figure IV presents the global consumption levels of opiates and synthetic opioids over the 20-year period from 1991 to 2010. The figure reflects data including buprenorphine and pentazocine, which are opioids controlled under the Convention on Psychotropic Substances of 1971.¹⁰ To allow the aggregation of consumption data for substances having different potencies, the consumption levels are expressed in billions of defined daily doses for statistical purposes.¹¹



Global consumption of opioids,^a in billions of

Figure IV.

 $^{\rm c}{\rm Including}$ pentazocine, a synthetic opioid controlled under the 1971 Convention.

27. The global consumption of opioids more than tripled during the period 1991-2010. The consumption of opiates, expressed in defined daily doses for statistical purposes, increased steadily during the same period, to more than 2.5 times the amount at the start of the period. Throughout the period, the supply of opiate raw materials from which opiates were obtained was sufficient to cover the increasing demand. The consumption of synthetic opioids, which are used for the same indications as opiates, more than quadrupled. As a result, the share of consumption of opiates in the total consumption of opioids declined from 69 per cent in 1991 to 63 per cent in 2010. In 2010, demand for both opiates and opioids experienced its greatest decline in absolute terms since 1991. Demand for synthetic opioids also fell, although their share in global consumption of all opioids continued to rise. It is expected that the demand for opiates will increase again in the future, while their share in the total consumption of opioids will further decline, owing to the expected faster growth in the consumption of synthetic opioids.

 $^{^{}d}\!$ Excluding substances not controlled under the 1961 Convention as amended by the 1972 Protocol.

¹⁰United Nations, Treaty Series, vol. 1019, No. 14956.

¹¹See the explanatory notes to tables XIV.1-XIV.3 for an explanation of defined daily doses for statistical purposes and for the method used to calculate those consumption levels; see also table XIV.3 for further details on developments in consumption levels.