

III. Extent of licit trade in precursors and the latest trends in precursor trafficking

48. The present chapter provides an overview of major trends and developments in both licit trade and trafficking in precursor chemicals for the period 1 November 2014 to 1 November 2015. It contains a summary of information on seizures and cases of diversion, attempted diversion and suspended or stopped shipments in international trade and, where known, domestic distribution channels, as well as activities associated with illicit drug manufacture. The analysis draws on information submitted to INCB through various mechanisms, such as PEN Online, form D (for 2014), Project Prism and Project Cohesion, as well as through PICS and direct notifications from Governments.

49. INCB wishes to thank all Governments for the information received. Readers are reminded that the data must be seen in the context of significant year-on-year variations in reported seizure data that occur as a result of inconsistent reporting by Governments and in the light of the fact that seizures of precursors, more than seizures of drugs, generally reflect the results of large individual seizures and targeted regulatory and law enforcement initiatives. In addition, seizures of precursors are often the result of cooperation among several countries, and therefore the occurrence and magnitude of seizures made in a given country should not be misinterpreted or overestimated in assessing that country's role in the overall precursor trafficking situation.

A. Substances used in the illicit manufacture of amphetamine-type stimulants

1. Substances used in the illicit manufacture of amphetamines

50. Many of the precursors that could be used in the illicit manufacture of amphetamines (i.e. amphetamine and methamphetamine) are widely traded internationally. During the reporting period, the authorities of 38 exporting countries used the PEN Online system for almost 5,800 transactions involving shipments of precursors of amphetamine and methamphetamine.

(a) Ephedrine and pseudoephedrine

Licit trade

51. During the reporting period, 5,260 transactions involving ephedrine and pseudoephedrine were recorded

through the PEN Online system. The notifications were for shipments totalling more than 2,300 tons of pseudoephedrine and 114 tons of ephedrine. The shipments of ephedrine and pseudoephedrine originated in 35 exporting countries and territories and were destined for 154 importing countries and territories.

52. As noted in the Board's 2014 report on precursors,¹⁶ traffickers are still trying to use licit channels of international trade as sources of ephedrine and pseudoephedrine, albeit significantly less than they did before 2010. On form D for 2014, Luxembourg reported having stopped a shipment of 500 kg of ephedrine to Ghana, and Latvia reported having stopped a shipment of 300 kg of pseudoephedrine preparations to Belarus. In both cases, additional information was not provided, such as information on whether or not the shipments were stopped in transit or at their initial point of export or information on the *modi operandi* of the traffickers. The suspension of shipments by exporting countries also occurred, on a more regular basis, as a result of the authorities of importing countries objecting through the PEN Online system to planned shipments.

53. Malaysia reported on form D a case involving the theft of 5 kg of pseudoephedrine preparations from the warehouse of the manufacturer. In 2015, INCB was informed of three additional cases involving the theft of pseudoephedrine:

(a) In the first case, 150 kg of pseudoephedrine — the contents of 6 drums in a group of 48 drums — disappeared from a shipment of the substance totalling 1.2 tons en route from India to Switzerland while transiting the port of Antwerp, Belgium. Indian authorities provided the relevant documentation. An investigation is under way;

(b) The second case involved the loss of 400 kg from a total of 5 tons of pseudoephedrine hydrochloride en route from India to the United Kingdom of Great Britain and Northern Ireland via Sri Lanka. The authorities concerned are cooperating in the investigation of the case;

(c) In the third instance, the authorities of the United Kingdom reported the loss or theft of about 5 kg of pseudoephedrine from a shipment to Uganda. The substance had disappeared during shipping from a 25-kilogram drum; someone had tampered with the seal of the drum. An investigation is taking place.

54. INCB has previously expressed concern about the diversion and attempted diversion of ephedrine and pseudoephedrine in and from Pakistan that had begun to emerge in 2010. Attempts to divert the substances from

¹⁶ E/INCB/2014/4, para. 86.

legitimate international trade have, since mid-2012, led to several individuals being prosecuted in an ongoing case that involves the allocation of ephedrine to pharmaceutical companies for the manufacture of pharmaceutical preparations in amounts exceeding the quotas established in national regulations.¹⁷

55. Similar major court cases are taking place elsewhere. In 2015, there were ongoing investigations in Argentina of major diversion cases dating back to 2008, when that country was identified as one of the main sources of raw ephedrine and pseudoephedrine diverted to supply illicit methamphetamine manufacture in Mexico,¹⁸ where the import of those substances was banned in 2008. Argentine authorities have since introduced stricter controls on the importation and end use of ephedrines, including in the form of pharmaceutical preparations.

Trafficking

56. A total of 27 countries reported on form D for 2014 seizures of ephedrine (either as raw material or in the form of pharmaceutical preparations) totalling nearly 33 tons. The bulk of the seizures of ephedrine as raw material were reported by China (31.5 tons), followed by the Philippines (510 kg) and Australia (460 kg). China also accounted for nearly the entire amount of reported seizures of ephedrine in the form of pharmaceutical preparations (3.2 tons); all the other countries together accounted for just over 40 kg of the seizures of ephedrine in the form of pharmaceutical preparations. A total of 16 countries reported on form D for 2014 seizures of pseudoephedrine, including 350 kg of pseudoephedrine as raw material and 1.3 tons of pseudoephedrine in the form of pharmaceutical preparations. Seizures of pseudoephedrine preparations amounting to more than 100 kg were reported by Bulgaria (840 kg), the Czech Republic (350 kg) and Malaysia (112 kg).

57. The seizures of pseudoephedrine in Bulgaria and the Czech Republic in 2015 were largely related to a development observed since 2012 involving the smuggling of pseudoephedrine tablets across Europe. The tablets usually originated in Turkey and were destined for Poland; they had a relatively high pseudoephedrine content, up to 120 mg per tablet, and typically also contained an antihistamine. Increasingly aware of the phenomenon, Turkish authorities intensified their inspections of pharmacies, fined those that had sold the preparation without a prescription and in wholesale quantities and tried them in court for engaging in organized criminal activity.

While the investigations are ongoing, Turkish regulatory authorities have classified the product concerned as a controlled preparation requiring import and export authorization (see para. 18 above).

58. Malaysia also reported significant seizures of ephedrine and pseudoephedrine, including the seizure of 287 kg of pseudoephedrine raw material originating in India and the seizure in an illicit methamphetamine laboratory of 112 kg of pseudoephedrine in the form of pharmaceutical preparations of unknown origin; 33 kg of ephedrine preparations were also seized in an illicit laboratory.

59. The Philippines reported the seizure of 510 kg of ephedrine raw material of unknown origin and the dismantling of two large-scale illicit methamphetamine laboratories, estimated to be capable of producing between 15 and 100 kg of methamphetamine hydrochloride each day. In September 2014, Philippine authorities also seized in two warehouses more than 650 kg of 1,2-dimethyl-3-phenylaziridine, a non-scheduled intermediate in the manufacture of methamphetamine using ephedrine. As that represented the first notification of 1,2-dimethyl-3-phenylaziridine to INCB, and as the substance is also known as an artefact from laboratory analysis of “chloro(pseudo)ephedrine”, the Board enquired with the relevant authorities. The reply is still pending. In connection with the evidence uncovered in the two warehouses, the authorities noted the possibility of a shift in the ephedrine-based manufacturing method used, from the traditional Nagai method (using red phosphorus) to the so-called Birch method (using lithium metal and ammonia), and the related reduction in manufacturing costs.

60. Australia reported on form D for 2014 a total of 215 seizures of ephedrine raw material, amounting to nearly 460 kg and originating in China (266 kg), China, Hong Kong Special Administrative Region (116 kg), Malaysia (30 kg), the United States of America (7 kg) and Viet Nam (38 kg). Other significant seizures of ephedrine originated in Lebanon (66 kg, concealed in jars of tomato paste) and India (37 kg, concealed in henna powder).¹⁹ A small amount (10 kg) of pseudoephedrine raw material was seized in Australia in 2014. For the second consecutive year, there have not been any reports in Australia about seizures of pseudoephedrine preparations in the form of ContacNT, a product that used to originate in China; since 2012, authorities in China have gradually tightened controls over ContacNT.

¹⁷ E/INCB/2012/4, para. 22.

¹⁸ E/INCB/2009/4, para. 57.

¹⁹ Australian Crime Commission, *Illicit Drug Data Report 2013-2014*.

61. Through PICS, Australia also communicated the seizure of a number of shipments in international freight and the mailing system involving amounts of up to 20 kg of pseudoephedrine hidden in loose tea leaves from the Islamic Republic of Iran. A shipment from Iraq of 1.3 tons of tea leaves containing up to 90 kg of pseudoephedrine was also intercepted in Australia. Pakistan reported on form D for 2014 seizures of ephedrine with a gross weight of some 35 kg; the ephedrine had been concealed in tea leaves.

62. The trend observed in Australia involving a shift from seizures of pseudoephedrine in the form of pharmaceutical preparations to ephedrine also appears to be emerging in New Zealand. Authorities in New Zealand have reported a significant increase in seizures of ephedrine on the border, whereas previously such seizures had mostly been seizures of pseudoephedrine in the form of pharmaceutical preparations, principally ContacNT. At the same time, ephedrine has so far been seized from only a few of the usually small-scale illicit laboratories feeding the methamphetamine market in New Zealand. Authorities suspect that the change in preference of precursor is linked with changes in the size and sophistication of illicit laboratories dismantled in the country. Nevertheless, the costs of obtaining the required precursors and then manufacturing methamphetamine in New Zealand continued to be significantly higher than those for obtaining the same amount of end product abroad.

63. Chinese authorities uncovered one of the biggest manufacturing cases in 2014, which resulted in the seizure of 1.6 tons of ephedrine and 1 ton of methcathinone, a substance in Schedule I of the Convention on Psychotropic Substances of 1971²⁰ that is an intermediate in the manufacture of ephedrine from 2-bromopropiophenone. In August 2014, a case involving the smuggling of a precursor chemical to New Zealand was uncovered by Chinese authorities in Fujian Province, resulting in five arrests and the seizure of 46 kg of ephedrine in China and subsequently a number of arrests and seizures of ephedrine totalling about 200 kg in New Zealand.²¹

64. Forensic profiling of samples of methamphetamine seized by Japanese customs authorities supports earlier findings suggesting regional differences in the starting materials and synthesis methods used for illicit methamphetamine manufacture. The samples of methamphetamine originating in Asia and Africa appeared to have been manufactured using as starting material ephedrine or pseudoephedrine and as reagents either thionyl chloride (i.e. employing the Emde method) or

hydriodic acid and red phosphorus (i.e. employing the Nagai method). It was found that methamphetamine routed into Japan from Mexico was typically made using P-2-P-based methods. More than 95 per cent of the samples were found to contain the more potent *d*-methamphetamine.

65. Clandestine laboratories manufacturing methamphetamine from ephedrine or pseudoephedrine were reported by the Governments of a few countries. Indonesian authorities seized a small-scale clandestine laboratory in which methamphetamine was being manufactured from ephedrine; other seized precursor chemicals included acetone, hydrochloric acid and toluene, all of which had been obtained from sources within Indonesia.

66. In Nigeria, three laboratories illicitly manufacturing methamphetamine were dismantled in May 2015, bringing to 10 the total number of such laboratories dismantled in that country since 2011. In addition, Nigerian authorities have discovered what appear to be the sites of a number of recently evacuated methamphetamine laboratories, suggesting that traffickers have been operating a chain of laboratories that are moved in order to avoid detection. The trend noted in 2013 whereby the sites of laboratories shifted to more remote areas continued: all the laboratories identified up to May 2015 were located in Anambra State, in south-eastern Nigeria. Available information suggests that the same method of methamphetamine synthesis was employed in all the laboratories, using ephedrine, hypophosphorous acid and iodine; crystallization of methamphetamine hydrochloride was performed using acetone or toluene.

67. In most of the methamphetamine laboratories seized in Nigeria, only traces of the key precursor, ephedrine, were found and the sources of the chemicals were generally not known. However, there is now increasing evidence that precursors are being obtained locally, from domestic distribution channels, after they have been legally imported. Several incidents involving domestic diversions of ephedrine are being investigated. Chief officials of the companies concerned were often involved in the diversions, and it is suspected that the diverted substances were used to illicitly manufacture methamphetamine in laboratories not only in Nigeria but also outside the country.

68. Nigerian authorities have stepped up their efforts to monitor imports of precursor chemicals and the use of the imported chemicals by companies that are the end users. The incidents in Nigeria serve as a reminder that diversion can and does happen at all stages of the distribution chain. **INCB wishes to encourage all competent national authorities to remain vigilant not only regarding the**

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

²¹ National Narcotics Control Commission of China, *Annual Report on Drug Control in China 2015* (Beijing, 2015).

diversion of precursor chemicals from international trade but also regarding their diversion from domestic distribution channels and to pay particular attention to the legitimate final use of key precursor chemicals and the quantity required for that purpose.

69. South Africa remains a key destination for smuggled ephedrine and pseudoephedrine. One of the largest shipments of smuggled ephedrine or pseudoephedrine destined for South Africa — 83 kg of ephedrine — was seized in Nigeria in February 2015. In addition, a number of incidents involving passengers smuggling ephedrine or pseudoephedrine occurred at the international airport at New Delhi; the passengers' intended destination was South Africa. Authorities in Zimbabwe reported seizures of 70 kg of ephedrine in four incidents at Harare International Airport; in all four incidents, South African nationals acted as couriers and Zimbabwe was the intended destination.

70. African countries have occasionally reported on form D seizures of ephedrine or pseudoephedrine that were linked to the abuse of those substances for their stimulant properties and not linked to the use of those substances as precursors in illicit methamphetamine manufacture. Unsubstantiated high estimates of annual legitimate requirements and imports, as well as smuggling, feed that illicit market. Monitoring is further complicated by the fact that in many cases ephedrine and pseudoephedrine are abused in the form of pharmaceutical preparations containing those substances, and pre-export notifications of shipments of such preparations are often not systematically issued through the PEN Online system.

71. The situation with regard to trafficking in ephedrine and pseudoephedrine in some parts of West Asia remains unclear. Several countries in the region report significant seizures of amphetamine-type stimulants, mainly amphetamine (in the form of Captagon) and methamphetamine; however, the sites used for illicitly manufacturing the drugs and the sources of the precursors used remain largely unknown, as few countries in the region provide seizure information on form D. Political instability in a number of countries in West Asia adds to the difficulties encountered in national and international precursor control efforts. Nevertheless, this situation, which INCB drew attention to in its 2014 report on precursors,²² remains a matter of serious concern. **In the light of the prevailing situation in several countries in West Asia, such as the Syrian Arab Republic, INCB encourages all countries to exercise a heightened level of vigilance regarding large-scale orders for pseudoephedrine placed by companies in conflict areas and to consider suspending the authorization of such**

shipments unless there is explicit confirmation regarding the legitimacy of the shipment and the end use of the substance, and secure transportation and handling can be assured.

72. In the Islamic Republic of Iran, methamphetamine supply indicators declined in 2014, as Iranian authorities dismantled 340 small-scale laboratories (a decrease of 24 per cent compared with the 2013 figure) and seized 2.6 tons of crystalline methamphetamine (a decrease of 28 per cent compared with the 2013 figure). Iranian authorities cited the special situation in northern Iraq as a reason for ephedrine being smuggled into Iranian territory, as well as the significant profits resulting from smuggling illicitly manufactured methamphetamine into South-East Asia.²³

73. Increasing concerns about methamphetamine trafficking, abuse and manufacture in Afghanistan have also led authorities there to assess the adequacy of domestic procedures related to the import and distribution of pharmaceutical preparations containing ephedrine and pseudoephedrine. Preliminary results indicate that most shipments of such preparations were not properly declared at customs offices and were not registered by the competent authority for distribution in the country.

74. With the tightening of precursor control legislation in South America and in Central America and the Caribbean, the number and size of reported seizures of precursor chemicals have decreased. In 2014, of all the countries in those regions, only Argentina reported seizures of ephedrine (24 kg) on form D. **While these successes are commendable, INCB wishes to remind all Governments of the importance of implementing existing regulations systematically and consistently and encourages Governments to remain vigilant regarding changes in the modi operandi of traffickers of precursors and the possibility of a country being targeted once again by traffickers.**

75. The almost complete absence of reports of seizures of ephedrine and pseudoephedrine is also evident in North America: United States authorities reported on form D for 2014 the seizure of a total of only 20 kg of ephedrine and pseudoephedrine in all their forms. This contrasts sharply with the situation just a few years earlier, when the United States reported having seized a number of tons of ephedrine and pseudoephedrine. Nevertheless, in the United States small-scale laboratories illicitly manufacturing methamphetamine have continued to use as starting material ephedrine in the form of pharmaceutical preparations obtained through an activity known as

²² E/INCB/2014/4, para. 61.

²³ Islamic Republic of Iran, Drug Control Headquarters, *Drug Control in 2014* (Niktasvir Publishing, March 2015), pp. 53 and 60.

“smurfing”, which involves making a series of purchases from multiple retail distributors to circumvent established purchase limits. United States authorities estimate that domestic methamphetamine manufacture has decreased, most likely as a result of the increased availability of methamphetamine illicitly manufactured in Mexico. Another new trend is the smuggling of liquid methamphetamine into the United States for subsequent recrystallization or recovery in that country; the process is not complicated but it requires a significant amount of solvents such as acetone.

76. Mexico did not report any seizures of ephedrine or pseudoephedrine, confirming the predominant use of P-2-P-based methods in illicit methamphetamine manufacture in that country.

77. Information from India, communicated through PICS, confirmed that in that country seizures continued to be made of ephedrine and pseudoephedrine in the form of raw material and pharmaceutical preparations. The individual seizures were in amounts of up to 25 kg, with few exceptions, such as two cases of domestic diversion of 250 kg and 100 kg of pseudoephedrine in August 2015. During the first eight months of 2015, India did not detect any facilities illicitly manufacturing amphetamine-type stimulants. Information about the dismantling of an alleged illicit ephedrine manufacturing unit is being verified.

(b) Norephedrine and ephedra

Licit trade

78. Analysis of international trade data reported through the PEN Online system revealed that between 1 November 2014 and 1 November 2015 12 countries exported norephedrine to 30 countries and that the shipments involved a total of almost 20.5 tons of the substance. Although it is increasing, international trade in norephedrine, a substance that can be used in the illicit manufacture of amphetamine, remains at a low level compared with trade in other precursors.

Trafficking

79. Seizures of norephedrine were reported on form D for 2014 by only three countries (Australia, China and Philippines), in amounts of less than 100 grams.

80. For the third consecutive year, no seizures of ephedra were reported on form D. China continued to seize ephedra in 2014, according to information in the annual report on drug control in that country. However, seizures of ephedra amounted to only 423 tons, a significant decrease compared with the 2013 figure; Chinese authorities attribute that decrease to the implementation of strengthened controls in

ephedra-producing areas of the Inner Mongolia Autonomous Region, the Xinjiang Uighur Autonomous Region, Gansu Province and the Ningxia Autonomous Region of China.²⁴ **INCB wishes to remind Governments to remain vigilant regarding the possibility of ephedra, a natural source of ephedrine, or ephedra-based products being illicitly used on their territory.**

(c) 1-Phenyl-2-propanone, phenylacetic acid and *alpha*-phenylacetoacetonitrile

81. P-2-P is an immediate precursor in the illicit manufacture of amphetamine and methamphetamine with very few legitimate uses other than the manufacture of those substances for pharmaceutical purposes. P-2-P can be synthesized from phenylacetic acid and APAAN. Non-scheduled esters of phenylacetic acid and other pre-precursors may be used as substitutes for P-2-P in the illicit manufacture of amphetamine and methamphetamine (see paras. 104, 105 and 115 below and annex IV).

Licit trade

82. International trade in P-2-P is limited, in terms of both the volume and the number of countries involved: during the reporting period, six exporting countries sent, via the PEN Online system, to 10 importing countries pre-export notifications for the planned exportation of 25 shipments of P-2-P, amounting to almost 33,000 litres. By contrast, licit trade in phenylacetic acid, an immediate precursor of P-2-P, is far more significant in terms of both the number of countries involved and the total amount traded: during the reporting period, 13 exporting countries sent pre-export notifications to 50 importing countries about 458 planned shipments of phenylacetic acid, amounting to 254 tons. There was only one transaction involving APAAN.

83. Investigations into an attempted import of more than 9,000 litres of P-2-P into the Syrian Arab Republic by a previously unknown company continued. The shipment was stopped by the Indian authorities in response to a request made by the competent national authorities of the Syrian Arab Republic through PEN Online. Despite subsequent claims by other Syrian authorities that the shipment was legitimate, no delivery has been made from India. The Syrian Arab Republic has not submitted any annual legitimate requirements for P-2-P and the final end use could not be sufficiently substantiated. **INCB therefore recommends all exporting countries not to authorize any shipment of P-2-P to the Syrian Arab Republic unless its legitimate final use has been duly confirmed**

²⁴ National Narcotics Control Commission of China, *Annual Report on Drug Control in China 2015* (Beijing, 2015).

by the relevant competent national authorities. INCB requests all exporting countries to communicate to it any significant order placed for P-2-P to be exported to the Syrian Arab Republic or any other country in order to allow for follow-up with the competent national authorities.

Trafficking

84. Seizures of P-2-P were reported by 13 countries on form D for 2014; seizures of P-2-P in amounts in excess of 1,000 litres were reported by Mexico (5,900 litres), Myanmar (4,800 litres), China (3,200 litres) and Poland (1,400 litres). Lithuania and the Netherlands reported seizures of P-2-P in amounts of 400 to 700 litres, while other countries reported seizures of the substance in amounts not exceeding 50 litres. With the exception of the seizures of P-2-P reported by Myanmar and seizures of that substance in Australia and Ireland, which were reported to have originated in China, the seized P-2-P was typically of illicit origin; that is, the substance was seized in illicit laboratories and had been illicitly manufactured from pre-precursors such as APAAN or phenylacetic acid esters. Such incidents also continued in 2015 and were typically communicated by the Netherlands through PICS. This distinction is important because a case involving a precursor chemical diverted from legitimate sources requires an intervention that is very different from what is required in a case involving a precursor chemical illicitly manufactured from a scheduled or non-scheduled pre-precursor. INCB commends those Governments that have provided information about the origin of seized chemicals (i.e. whether they are of licit or illicit origin) and the country of origin, where applicable, and encourages all others to do the same in order to support the design of appropriate interventions worldwide.

85. INCB was informed about a seizure of almost 7,000 litres of P-2-P in Poland in March 2015. The substance was seized in a warehouse in the seaport of Gdansk, Poland, and was part of a shipment from China in 2012 containing a total of 32 tons of unspecified chemicals. The authorities concerned are cooperating in the investigation of the case.

86. Four countries reported on form D for 2014 seizures of phenylacetic acid, and seven countries reported seizures of APAAN.²⁵ The seizures of phenylacetic acid included large amounts seized in China (nearly 50 tons) and Mexico (more than 1.3 tons). The seizures in Mexico were associated with the illicit manufacture of P-2-P, most often from phenylacetic acid esters that are under national

control in Mexico but not under international control (see paras. 105 and 106 below). Estonia reported the seizure of 100 kg of phenylacetic acid in one instance but did not provide any information on the origin of the precursor chemical. In 2015, seizures of phenylacetic acid were also communicated through PICS; they typically occurred in illicit laboratories, often in the Netherlands.

87. APAAN seizures in 2014 amounted to more than 11 tons and were all reported by countries in Europe. This represents a significant decline compared with 2013, when a record amount of more than 43.5 tons of APAAN was seized. The largest amounts of APAAN were seized in 2014 in Germany; those seizures totalled more than 5.1 tons and included a shipment of 5 tons of the substance, en route to Poland, that was reported to have originated in China in February 2014, three months before the ban on the substance in China went into effect. The Netherlands reported seizing more than 3 tons of APAAN in eight instances, and Bulgaria reported seizing two shipments totalling nearly 2 tons that had entered the country by land from Turkey; Belgium, Poland and Romania reported seizures of APAAN in amounts of 100 to 600 kg. In the majority of those instances, information about the origin of the substance was not provided. In the first 10 months of 2015, seven incidents involving over 700 kg of APAAN were communicated through PICS; all but one incident occurred in the Netherlands.

88. Information about the substances used in the illicit manufacture of drugs can also be obtained from the forensic analysis of the drug end product. Relevant programmes have existed for many years for methamphetamine and have helped to confirm a shift from the use of ephedrines to P-2-P-based manufacturing methods for the illicit manufacture of that drug in North America. This trend peaked in mid-2014, when it was shown that more than 95 per cent of the analysed methamphetamine samples had been manufactured using P-2-P-based methods. More recently, the figure has dropped to 78 per cent and forensic profiling data suggest a shift to the use of benzaldehyde and nitroethane as alternative chemicals for the manufacture of P-2-P and subsequently methamphetamine. Mexico added these two chemicals to the list of controlled substances on 1 October 2015 (see para. 16 above).

89. By contrast, P-2-P has traditionally been the chemical of choice for illicit amphetamine manufacture in Europe. In this situation, forensic analysis can provide valuable information about the synthetic route and about whether a seized sample of P-2-P was diverted from legitimate sources or illicitly manufactured from APAAN, phenylacetic acid or its esters.

²⁵ APAAN was included in Table I of the 1988 Convention effective 6 October 2014.

90. In Australia, a forensic drug-profiling programme analysing samples of methamphetamine seized at the border found that methamphetamine continued to be manufactured primarily from ephedrine and pseudoephedrine. However, starting in 2013 there was a slight increase in the proportion of the samples of seized methamphetamine that had been synthesized from P-2-P. This trend was also seen in relation to clandestine methamphetamine laboratories operating in Australia. **INCB encourages Governments that have the technical capabilities to conduct such detailed forensic analyses and offer such support, to the extent possible, to other Governments on request, with a view to improving knowledge of the chemicals actually being used in illicit drug manufacture and the sources of those chemicals, thus supporting precursor control measures worldwide.**

2. Substances used in the illicit manufacture of 3,4-methylenedioxyamphetamine and its analogues

91. Four substances included in Table I of the 1988 Convention are precursors of “ecstasy”-type substances. 3,4-MDP-2-P is an immediate precursor of MDMA and other “ecstasy”-type substances, and it can be manufactured from piperonal, safrole or isosafrole (see annex IV). Licit trade in all those precursor chemicals except piperonal involves only a few countries, there have not been any significant diversions from international trade recently, and seizures of those chemicals vary from one year to another. However, several non-scheduled derivatives of 3,4-MDP-2-P are increasingly becoming available (see paras. 116-119 below) and may to some extent be contributing to the apparent increase in the availability of MDMA.

(a) 3,4-Methylenedioxyphenyl-2-propanone and piperonal

Licit trade

92. There is almost no legitimate industrial use for 3,4-MDP-2-P, and international trade in the substance is nearly non-existent; the opposite is true for piperonal. For 3,4-MDP-2-P, there was one pre-export notification for 3 litres sent through the PEN Online system, and only four Governments have a legitimate annual requirement for the import of more than 1 litre of the substance per year (see annex II). For piperonal, during the reporting period, 17 exporting countries used the PEN Online system to send pre-export notifications for 590 shipments of that substance, totalling almost 2,000 tons, to 51 importing countries.

Trafficking

93. Three countries (Australia, Belgium and China) reported seizures of 3,4-MDP-2-P on form D for 2014, and four countries (Australia, Estonia, Netherlands and Philippines) reported seizures of piperonal. The reported total amounts of less than 60 litres of 3,4-MDP-2-P and 5 litres of piperonal are negligible in comparison with the figures for the previous year; thus, the situation is similar to the situation in the period 2010-2011.

94. Through PICS, INCB was made aware of a seizure of 60 kg of 3,4-MDP-2-P in Australia in May 2015; the origin of the substance was China. Acting on information provided by Belgian customs authorities, authorities in China, Hong Kong Special Administrative Region, seized 1.5 tons of a substance identified as 3,4-MDP-2-P that had been stored at a warehouse pending exportation to Poland via Belgium. The source of the substance was allegedly in China but no additional documentation was available on site to confirm the alleged source. Investigations are still taking place.

95. During the reporting period, the authorities of the Netherlands communicated three seizures of piperonal through PICS. The seizures occurred in warehouses where precursors of various drugs were stored. Spanish authorities reported on form D that shipments containing more than 2.8 tons of piperonal had been stopped; however, no additional details were provided.

(b) Safrole, safrole-rich oils and isosafrole

Licit trade

96. During the reporting period, eight exporting countries sent via PEN Online to 15 importing countries 37 pre-export notifications for shipments of safrole and safrole-rich oils, with a total volume of 4,000 litres. Though that is about the same trade volume as in the previous three years, it represents a significant decline from the peak reached in 2011. Unlike the situation years earlier, only a small portion of the traded safrole was in the form of safrole-rich oils. During the reporting period, there was no pre-export notification for isosafrole, an intermediate in the synthesis of MDMA from safrole.

Trafficking

97. As in previous years, very few Governments provided on form D for 2014 information about suspicious and stopped shipments of safrole, safrole-rich oils and isosafrole. In 2014, German authorities reported having prevented two shipments totalling 1,050 litres from entering the country; further details were not provided.

98. Reported seizures of safrole, safrole-rich oils and isosafrole have fluctuated significantly over the years. For 2014, only Australia and Namibia reported on form D seizures of safrole and/or isosafrole. Namibia reported the seizure of 2,100 litres of isosafrole, but information about the circumstances and the origin of the substance had not been provided at the time of writing the present report.

99. According to other sources, however, significant seizures of safrole-rich oils were made in Cambodia in August 2014. The seizures, which took place in different locations, resulted in the recovery of a total of nearly 5,000 litres of safrole-rich oils that had been buried in 140 underground tanks. It is believed that the tanks were buried in 2012, when police had intensified their efforts against the production and sale of safrole-rich oils in Pursat Province of Cambodia. Verification of the information is ongoing.

100. Seizures of safrole and safrole-rich oils continued to be communicated through PICS in 2015. In June 2015, a sophisticated industrial-scale laboratory operation for the illicit manufacture of MDMA was discovered in Ontario, Canada. Acting on information about a suspicious transaction, authorities conducted a search of the company's premises that resulted in the seizure of 1,500 litres of safrole-rich oils; 1,000 kg of helional, a precursor of 3,4-methylenedioxymphetamine that is not under international control, were also seized. Investigations are under way. These incidents show that closely monitoring legitimate trade transactions at the national and international levels can lead to valuable information indicating illicit activity.

101. In July 2015, 5 tons of unspecified precursors of amphetamine-type stimulants were seized in a warehouse in Bolikhamxay Province of the Lao People's Democratic Republic, near that country's border with Viet Nam.

3. Use of non-scheduled substances and other trends in the illicit manufacture of amphetamine-type stimulants

102. Illicit manufacture of amphetamine-type stimulants has diversified significantly in recent years. The precursors of amphetamine-type stimulants now include chemicals available off the shelf (such as benzaldehyde, nitroethane, methylamine and a range of reagents), as well as a number of unusual chemicals that may be made on demand with a view to circumventing existing controls ("designer" precursors). In the light of the constantly and rapidly changing array of chemicals being used in illicit drug manufacture, **INCB wishes to remind Governments of the importance of sharing information about non-scheduled chemicals, their sources, the modi operandi**

of traffickers and the actual or suspected use of non-scheduled chemicals in illicit drug manufacture. Such information-sharing should start at the national level, when a company receives a suspicious order and reports it to the competent national authorities; and such information should also be shared at the international level, to prevent traffickers from exploiting weak links elsewhere. PICS provides an opportunity for the early sharing of such information worldwide.

(a) Pre-precursors of amphetamine and methamphetamine

103. The countries that reported on form D for 2014 substances not included in Table I or II of the 1988 Convention but identified as having been used in the illicit manufacture of amphetamine or methamphetamine included Mexico and several European countries (Czech Republic, Denmark, Estonia, Germany, Hungary and Russian Federation).

104. Of those substances, the one most frequently reported in 2014 was benzaldehyde, a pre-precursor of amphetamine and methamphetamine, although the amounts remained small, totalling just 12 kg, in Denmark, Germany, Hungary and the Russian Federation. Benzaldehyde was typically seized together with nitroethane in clandestine amphetamine laboratories. Estonia reported a single seizure of nearly 16 kg of 1-phenyl-2-nitropropene, the reaction product of benzaldehyde and nitroethane, in an illicit amphetamine laboratory. A record single seizure of 10 tons of benzaldehyde was made in Australia in the financial year 2013/14;^{26, 27} however, no further details have been made available. In 2015, Austria reported through PICS the seizure of 270 litres of benzaldehyde and 250 litres of nitroethane in a clandestine laboratory. **INCB commends those Governments that provided details of seizures of non-scheduled substances on form D, and it wishes to remind all other Governments that the provision of such information is an obligation under article 12, paragraph 12 (b), of the 1988 Convention and critical to establishing new trends.**

105. Mexico reported seizures amounting to nearly 63 tons of ethyl phenylacetate, an ester of phenylacetic acid: 58.5 tons of the substance were found on a truck and about 4 tons were found abandoned on a beach. In continuation of a trend observed during the previous year, none of the seizures were made at international borders, suggesting

²⁶ In Australia, the financial year begins on 1 July and ends the following year on 30 June.

²⁷ Australian Crime Commission, *Illicit Drug Data Report 2013-14*.

that the control measures introduced in Mexico and in the countries in which, in the past, consignments of that substance had originated, are having the desired effect. In addition, Mexican authorities reported having seized in clandestine laboratories varying amounts of other pre-precursors of P-2-P, including benzyl cyanide, 2-phenylacetamide and phenylethyl alcohol. Most of those chemicals, namely the derivatives of phenylacetic acid, have been under national control in Mexico since November 2009.

106. As in the previous five years, Mexico also reported seizures of tartaric acid. In 2014, more than 2.8 tons of the substance were seized in clandestine methamphetamine laboratories in Mexico, which represents a continuation of the decline from the peak level of 2011. Tartaric acid is used to enrich the more potent form of methamphetamine manufactured using P-2-P-based methods, thus achieving potency levels comparable to or higher than the potency levels of methamphetamine manufactured from ephedrine or pseudoephedrine, depending on the level of sophistication of the laboratory.

107. In response to the tightening of controls on precursors, including controls on pharmaceutical preparations containing ephedrine and pseudoephedrine (in 2012) and on *Ephedra* plant material (in 2013), China has continued to identify the use of non-scheduled chemicals in illicit drug manufacture.²⁸ In particular, it is now evident that 2-bromopropiophenone is used to illicitly synthesize ephedrine, as it has been found that more than 50 per cent of the crystalline methamphetamine on illicit markets in that country have been synthesized from that substance. After 2-bromopropiophenone came under national control in May 2014, a number of manufacturers and operators in China were closed down and more than 20 tons of the substance was seized. In 2014, for the first time, a person was arrested in China for illicitly manufacturing synthetic ephedrine.

108. A record seizure of a non-scheduled “designer” precursor of methamphetamine was reported by German authorities: 2.9 tons of “chloro(pseudo)ephedrine”¹⁴ hydrochloride, seized in a warehouse in Leipzig, Germany, in November 2014. Investigations are still ongoing but it has been confirmed that the seized substance was produced specifically at the request of the main suspect in Switzerland and delivered to Germany. A total of 600 grams of the substance, originating in Germany, was reported seized in the Czech Republic, and nearly 400 grams of the substance was reported through PICS in New Zealand. **INCB wishes to remind Governments of**

the possibility of traffickers approaching legitimate industry for customized synthesis of non-scheduled intermediates and the need to alert industry to that possibility. A list of key substitute chemicals, including the relevant extended definitions covering a range of derivatives and chemically related substances, is available to competent national authorities in the limited international special surveillance list of non-scheduled substances, as part of the information package on the control of precursors, on the secure website of INCB.

109. Methylamine (monomethylamine) is a chemical required for the illicit manufacture of not only methamphetamine but also MDMA and several new psychoactive substances. Incidents involving methylamine were reported on form D for 2014 by the authorities of five countries (Germany, Malaysia, Mexico, Netherlands and United States). Seizures of the substance in Malaysia (22.5 litres) and Mexico (more than 3,700 litres) were made in clandestine methamphetamine laboratories; the seizure location in the United States was not provided. Seizures of the substance in the Netherlands amounted to more than 9,500 litres and were made in three unspecified clandestine laboratories; the seizures reported on form D were largely a confirmation of information communicated in real time through PICS in 2014.

110. Germany reported three attempts by traffickers to obtain a total of 32.1 tons of methylamine. In two instances, companies in Belgium and the Netherlands tried to obtain methylamine in Germany; as the end use was either suspicious or not provided, both shipments were denied and the authorities of the countries of destination were informed. The third incident involved an attempted theft of the substance.

111. Seizures of methylamine also continued in 2015, with 10 incidents in which more than 6,500 litres of the substance was seized, communicated through PICS by the Netherlands alone. In one of the laboratories, more than 60 tons of chemicals were seized. Methylamine was the subject of Operation MMA (see para. 38 above).

112. A number of countries reported on form D for 2014 seizures of other non-scheduled chemicals essential to the illicit manufacture of amphetamine and methamphetamine. Chinese authorities reported seizures of thionyl chloride, a chemical required for manufacturing methamphetamine from ephedrine and pseudoephedrine using a method common in South-East Asia; seizures of thionyl chloride in China amounted to nearly 18.5 tons in 2014, compared with 14 tons in 2013. Thailand reported seizures of sodium cyanide amounting to 5.5 tons at its border with Myanmar, and it is assumed that the substance

²⁸ National Narcotics Control Commission of China, *Annual Report on Drug Control in China 2015* (Beijing, 2015).

had been intended for use in illicit methamphetamine manufacture; further details, including information on the origin of the seized sodium cyanide, were not provided.

113. Significant seizures of non-scheduled chemicals associated with a P-2-P-based method for manufacturing amphetamine and methamphetamine known as the Leuckart method were reported by the Netherlands (17.7 tons of formamide and 4,000 litres of formic acid), Peru (nearly 48 tons of formic acid) and Poland (13 kg of formamide, 60 kg of formic acid and 1 kg of ammonium formate). Seizures of non-scheduled chemicals used in modifications of methamphetamine manufacturing methods based on the use of ephedrine were reported by several countries, the largest amounts being reported by the Czech Republic (4.1 tons of iodine and 740 kg of red phosphorus), followed by the Philippines (200 kg of iodine and nearly 400 kg of red phosphorus); in all the other reporting countries combined, seizures of iodine, as well as red phosphorus, amounted to less than 20 kg.

114. Authorities in New Zealand reviewed the modus operandi of those engaged in illicit methamphetamine manufacture and concluded that they obtained other non-scheduled yet essential precursors, including hypophosphorous acid, iodine, potassium iodide and potassium iodate, through a range of methods such as purchasing from legitimate suppliers within the country, stealing from suppliers' premises or from trucks in transit, and direct (often online) purchasing from international vendors.

115. Seizures of a variety of non-scheduled pre-precursors of amphetamine and methamphetamine continued to be communicated through PICS in 2015. They were typically found in illicit laboratories, often in the Netherlands. One seizure in the Netherlands involved 95 kg of the sodium salt of P-2-P glycidic acid, a pre-precursor first identified in the United Kingdom in 2012 that can be converted into P-2-P at a practical ratio of about 2 to 1.

(b) Pre-precursors of 3,4-methylenedioxyamphetamine (MDMA) and related "ecstasy"-type drugs

116. The methyl ester and sodium salt of 3,4-MDP-2-P methyl glycidate were seized in Europe in 2014, continuing a trend that started in 2010. Seizures of the sodium salt were reported by Belgium (1.74 tons), the Netherlands (2.8 tons) and Spain (1 ton); the type of derivative was not specified in the seizures in Germany (1.25 tons) and Romania (less than 1 kg). In cases where information was provided about the origin or the intended destination of the seized non-scheduled substance, China was cited as the

country of origin and the Netherlands was cited as the intended country of destination.

117. Germany also reported a seizure of a small amount of 3,4-(methylenedioxy)phenylacetonitrile, which can be used to synthesize 3,4-MDP-2-P, a substance used to manufacture MDMA (commonly known as "ecstasy"), just as benzyl cyanide can be used to synthesize P-2-P, a substance used to manufacture amphetamine or methamphetamine. Thus, 3,4-(methylenedioxy)phenylacetonitrile is the "ecstasy" equivalent of benzyl cyanide.

118. Seizures of 3,4-MDP-2-P glycidic acid derivatives continued in 2015. One seizure at the Romanian seaport of Constanta involved the shipment of 1 ton of the sodium salt of 3,4-MDP-2-P methyl glycidic acid, communicated via PICS. The shipment had originated in China and had been destined for the Netherlands.

119. In the light of the variety of non-scheduled "designer" precursors that are being encountered by regulatory and law enforcement authorities, INCB wishes once again to draw attention to the challenges that some of the new chemical derivatives may pose to forensic laboratories regarding the identification of such precursors. For example, the inadvertent generation of analytical artefacts during laboratory analysis may suggest the presence of a controlled primary precursor such as P-2-P or 3,4-MDP-2-P when in fact the analysed sample was the sodium salt of the glycidic acid derivative.

B. Substances used in the illicit manufacture of cocaine

1. Potassium permanganate

120. Potassium permanganate is an oxidizing agent used in the illicit manufacture of cocaine. A minimum of about 145 tons of the substance is required annually for illicit cocaine manufacture in the three coca-producing countries.²⁹ While those countries account for only a very limited proportion of legitimate international trade in potassium permanganate, a relatively large proportion of global seizures of potassium permanganate continues to be

²⁹ This figure is based on average low-end estimates by UNODC of the potential manufacture of 100 per cent pure cocaine in the period 2010-2013, published in the *World Drug Report 2015* (annex I), and the approximate quantities of potassium permanganate required (see annex IV to the present report). Note that potential cocaine hydrochloride production in Colombia increased by about 52 per cent in 2014 compared with 2013 (UNODC and Government of Colombia, *Colombia: Coca Cultivation Survey 2014* (Bogota, July 2015), p. 11).

reported by them. In the absence of any recent significant diversions of potassium permanganate from legitimate international trade and other indicators suggesting that cocaine continues to be highly oxidized, it appears that the potassium permanganate that is used in illicit cocaine manufacture has been mainly diverted from domestic distribution channels into illicit channels or has been illicitly manufactured.

Licit trade

121. During the reporting period, the authorities of 31 exporting countries notified their counterparts in 125 importing countries of plans to export 1,357 shipments of potassium permanganate totalling more than 25,500 tons; the corresponding figures in previous years were about the same. As in previous years, the three coca-producing countries — Bolivia (Plurinational State of), Colombia and Peru — accounted for less than 1 per cent of all the imports of potassium permanganate for which notifications were sent through the PEN Online system.

122. Spain was the only country reporting on form D stopped shipments of potassium permanganate — a total of 18 shipments of the substance, amounting to about 26 tons, intended for various countries of destination. Many of those shipments appear to have been stopped for administrative reasons.

123. The pronounced effect of chemical control on cocaine availability was recently demonstrated in a study on the impact of federal cocaine chemical regulations on the availability of cocaine in the United States during the period 1989-2006. The findings of the study, which were consistent with the findings of similar research on methamphetamine and heroin, showed precursor control to be the first policy with such a demonstrated breadth of impact across major illicit drugs.³⁰

Trafficking

124. In 2014, as in previous years, global seizures of potassium permanganate were dominated by seizures made in Colombia, where more than 166 tons of the substance was seized, the largest amount seized in six years. Eleven other countries reported on form D for 2014 seizures of potassium permanganate totalling 7.5 tons; seizures in excess of 1 ton were reported by Peru (2.7 tons), China (2.1 tons), Bolivia (Plurinational State of) (1.5 tons) and Venezuela (Bolivarian Republic of) (1.12 tons in

two instances involving illicit laboratories). Additional seizures of potassium permanganate were also communicated through PICS in 2015.

125. About 99 per cent of global seizures of potassium permanganate were made in countries in South America, including the three coca-producing countries (Bolivia (Plurinational State of), Colombia and Peru). Seizures reported by Colombia did not include seizures of potassium permanganate in the form of solutions, as the concentrations are usually not known. Authorities of Colombia, Ecuador and Venezuela (Bolivarian Republic of) indicated that the substance had originated in their countries, which represents a continuation of the overall trend of the previous few years whereby potassium permanganate diverted from domestic distribution channels is used to feed illicit cocaine processing in South America. Colombian authorities also continued to dismantle laboratories illicitly manufacturing potassium permanganate from chemicals not under international control (see para. 129 below).

126. There was no information to substantiate a further spread of coca bush cultivation outside the three coca-producing countries, unlike the situation in 2013, when a small illicit coca bush cultivation site was detected in Panama, and in 2014, when illicit coca bush cultivation sites were discovered in Mexico near that country's border with Guatemala. **Nonetheless, INCB wishes to reiterate its warning about the possibility of illicit coca bush cultivation, cocaine manufacture and related precursor trafficking spreading to countries previously not affected by such illicit activity and the need to address such developments collectively at the regional and international levels.**

2. Use of non-scheduled substances and other trends in the illicit manufacture of cocaine

127. Several countries in Latin America and elsewhere reported seizures of a variety of chemicals not under international control but used in the processing, refinement (after trafficking) or adulteration of cocaine. Those chemicals include solvents used for the extraction of cocaine base from coca leaves and for the conversion of cocaine base into cocaine hydrochloride, chemicals used in the illicit manufacture of internationally controlled precursors, and chemicals used for improving the efficiency of cocaine processing by reducing the volume of chemicals needed and/or the processing time. Several of these alternative chemicals that are not under international control (but are often under national control in the countries concerned) are known to have been used in illicit drug manufacture for many years and have partly replaced some chemicals under international control, in particular

³⁰ James K. Cunningham, et al., "US federal cocaine essential ('precursor') chemical regulation impacts on US cocaine availability: an intervention time-series analysis with temporal replication", *Addiction*, vol. 110 (2015), pp. 805-820.

substances in Table II of the 1988 Convention. Furthermore, improved processing techniques, especially related to illicit cocaine manufacture, and recycling and reuse have resulted in reduced requirements for acids and solvents in Table II. **To improve knowledge of the chemicals actually being used and their sources, INCB encourages Governments to use form D to report details of seizures of, and describe links between, the various alternative (scheduled and non-scheduled) substances.**

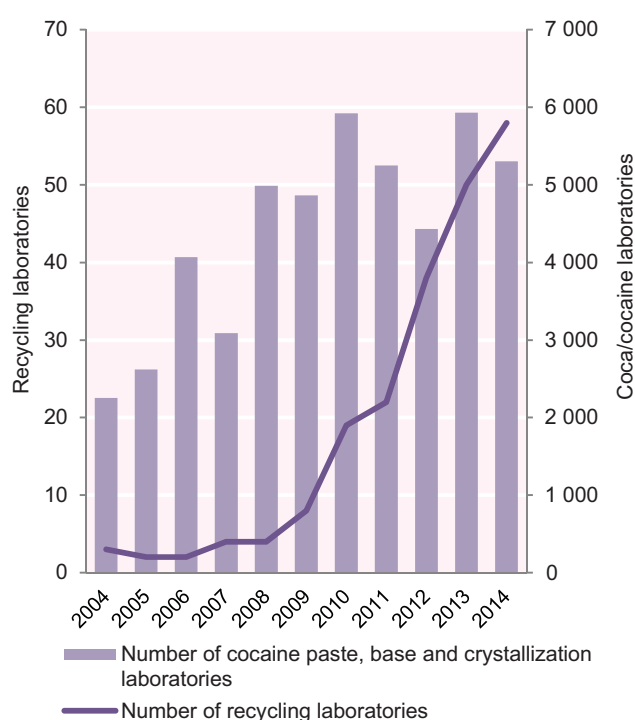
128. Significant amounts of such chemicals were reported on form D for 2014 by the authorities of the three coca-producing countries and other countries in South America, as well as the authorities of Spain. In the majority of cases, those chemicals were reported to have been obtained from domestic sources. For example, Colombia seized in almost 700 incidents more than 3,000 tons of urea, a substance used in the illicit manufacture of ammonia and/or used as fertilizer in coca bush cultivation.³¹ The seizure of more than one ton of urea was also reported in 2014 by the authorities of the Bolivia (Plurinational State of) Bolivia (3.2 tons), Peru (12 tons) and Venezuela (Bolivarian Republic of) (30 tons).

129. In 2014, Colombia also reported having seized a total of 123 tons of manganese dioxide at 10 illicit potassium permanganate manufacturing sites and about 4.5 tons of potassium manganate at 13 illicit potassium permanganate manufacturing sites. In all cases, the seized substances were reported to have originated in Colombia. Neither manganese dioxide or potassium manganate is in Table I or II of the 1988 Convention, but both are in the INCB limited international special surveillance list of non-scheduled substances and are under national control in Colombia. Seizures of precursors of potassium permanganate in Colombia continued in 2015: in July, a seizure of 3 tons of potassium manganate was made in a single illicit laboratory; in the same laboratory, almost 3.5 tons of potassium permanganate was also seized.

130. Seizures of sodium metabisulphite, a reducing agent used to standardize the oxidation level of cocaine base from different sources prior to further processing, were reported in 2014 by the authorities of Colombia (54 tons), Bolivia (Plurinational State of) (16.2 tons) and Venezuela (Bolivarian Republic of) (1,860 kg). Seizures of this substance by Bolivian and Colombian authorities increased steadily during the past few years. Seizures of small amounts of the substance were also reported in Ecuador (20.8 kg) and Spain (4 kg). The seizures typically occurred in illicit laboratories. Incidents involving sodium metabisulphite continued in 2015, with three incidents in Colombia, totalling 1,465 kg, communicated via PICS.

131. Another chemical used to increase the efficiency of cocaine processing is calcium chloride, a drying agent for solvents, used in the conversion of cocaine into cocaine hydrochloride; it is also used in the recycling and reusing of solvents. Varying amounts of calcium chloride have been reported on form D by a number of countries over the years. In 2014, seizures involving several tons of calcium chloride were reported on form D by Bolivian authorities (13 tons) and Colombian authorities (28 tons); and Ecuadorian and Venezuelan authorities reported having seized small amounts. The extent of solvent recycling is evident from data from the Plurinational State of Bolivia (see figure III).

Figure III. Number of illicit laboratories dismantled in the Plurinational State of Bolivia, by type of laboratory, 2004-2014



Source: United Nations Office on Drugs and Crime and Plurinational State of Bolivia, *Estado Plurinacional de Bolivia: Monitoreo de Cultivos de Coca 2014* (2015)

132. Latin American countries also continued to report significant amounts of various acetate solvents, such as ethyl acetate, butyl acetate, isopropyl and *n*-propyl acetate, isopropyl alcohol and methyl isobutyl ketone, all of which are known to have been used for many years in illicit cocaine processing as substitutes for solvents in Table II of the 1988 Convention. The particular solvents and the amounts reported on form D reflect cocaine manufacturing preferences that are often associated with different groups of illegal operators. Forensic analysis can be used to

³¹ Urea can also be used to produce explosives.

determine the differences in the solvents used in the final crystallization, which helps to identify links between samples of seized cocaine hydrochloride and to establish processing trends, and can thus provide valuable information for regulatory authorities.

133. Incidents involving non-scheduled chemicals used for illicit cocaine processing continued to be communicated through PICS in 2015.

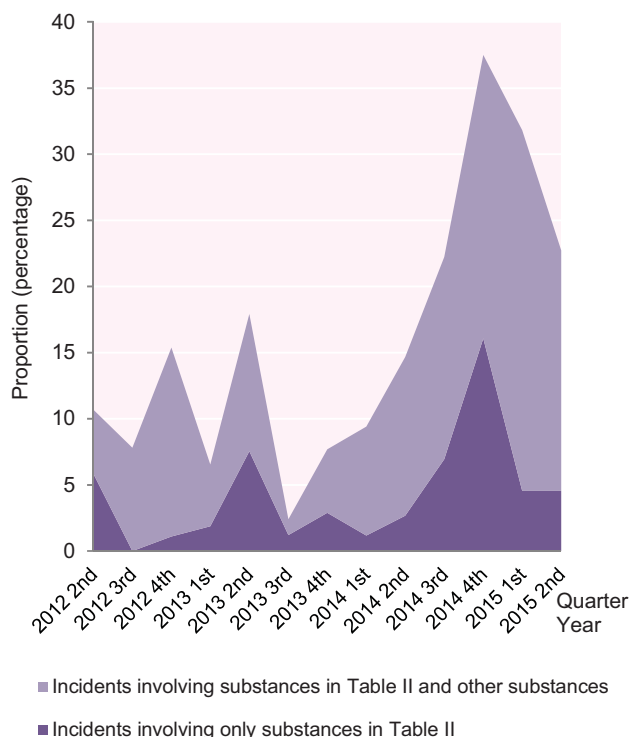
C. Acids and solvents in Table II of the 1988 Convention that are used in the illicit manufacture of narcotic drugs and psychotropic substances

134. Acids and solvents in Table II of the 1988 Convention are required throughout various stages of nearly all illicit drug manufacture. Given the average scale of illicit heroin and cocaine processing operations compared with the average scale of illicit synthetic drug manufacture operations, the largest amounts of those acids and solvents were seized in countries in which plant-based drug manufacture is known to occur.

135. A total of 27 countries and territories reported on form D for 2014 seizures of solvents in Table II of the 1988 Convention (acetone, ethyl ether, methyl ethyl ketone and toluene). The largest seizures of those solvents were reported by Myanmar (almost 2.5 million litres of toluene) and Colombia (460,000 litres of acetone). Myanmar also reported having seized the largest amount of hydrochloric acid (1.6 million litres) and sulphuric acid (6.7 million litres), followed by the amounts of seizures of those two acids in China and in coca-producing countries. Acids in Table II were reported to have been seized in 31 countries and territories in 2014. **INCB commends Governments for having provided detailed data on seizures of substances in Table II of the 1988 Convention. The Board notes that in many cases where information about the origin of a seized chemical was provided, the chemical had been obtained from a domestic source; Governments are therefore encouraged to take measures to address the diversion of chemicals from domestic distribution channels.**

136. Information on acids and solvents in Table II of the 1988 Convention also continued to be communicated through PICS. Over the years, the proportion of PICS incidents involving substances in Table II has increased (see figure IV); it is likely that that development is linked to the increase in the number of illicit laboratories on which information is communicated through PICS.

Figure IV. Proportion of incidents communicated via the Precursors Incident Communication System and involving substances in Table II of the 1988 Convention, by quarter, 2012-2015



D. Substances used in the illicit manufacture of heroin

1. Acetic anhydride

137. Acetic anhydride is the key substance used in the illicit manufacture of heroin. It is also required in the illicit manufacture of methamphetamine or amphetamine in instances where the immediate precursor P-2-P is illicitly derived from phenylacetic acid or phenylacetic acid derivatives (see annex IV). While seizures of acetic anhydride in Afghanistan and neighbouring countries are typically associated with illicit heroin manufacturing attempts, seizures of the substance in Mexico and neighbouring countries used to be largely related to the use of phenylacetic acid derivatives in the illicit manufacture of methamphetamine. However, they may also be attributed to illicit heroin manufacture, as Mexico has continued to be a source of heroin in the Americas and estimates of illicit opium poppy cultivation in Mexico have continued to be high.

138. In spite of the fact that Myanmar is the country with the second largest total area under illicit opium poppy cultivation and the second largest potential opium production, there continues to be a lack of information

reported by that country and other countries in East and South-East Asia on seizures of acetic anhydride and other chemicals required to process opium into morphine and, subsequently, heroin.

Licit trade

139. Acetic anhydride continued to be one of the most frequently traded substances in Table I of the 1988 Convention. During the reporting period, authorities of 25 exporting countries and territories used the PEN Online system to provide over 1,493 pre-export notifications for international trade in acetic anhydride.³² The shipments of acetic anhydride were destined for 86 importing countries and territories and involved a total of 352 million litres of the substance.

140. The situation with regard to the diversion of acetic anhydride is similar to the situation with regard to the diversion of potassium permanganate: there have not been any known diversions of acetic anhydride from international trade in recent years. However, Operation Eagle Eye, which was conducted by the INCB Precursor Task Force from July 2013 to May 2014, confirmed that the control measures applied to domestic trade in and distribution and end use of acetic anhydride lagged behind those applied in international trade.

141. Attempts to divert acetic anhydride from international trade continued during the reporting period, though there were relatively few attempts. There were two unsuccessful attempts by a company located in the Kurdistan region of Iraq to obtain acetic anhydride through intermediaries in Spain. The competent national authorities of Iraq informed the Spanish authorities that the company in question was not authorized to import the substance, and subsequently the Spanish authorities stopped the shipments. In December 2014, authorities in Pakistan objected through PEN Online to a shipment of 3,700 litres of acetic anhydride from China. Investigations revealed that the company did not reside at the address provided; investigations are ongoing.

142. INCB has previously expressed concern over the insufficiency and inconsistency of information about the magnitude and patterns of licit manufacture of and trade in acetic anhydride, and it continues to believe that domestic transactions involving the substance are not sufficiently monitored in many countries. **INCB therefore encourages Governments to consider the registration of all companies that are in any way involved in acetic anhydride manufacture, trade, distribution or end use.**

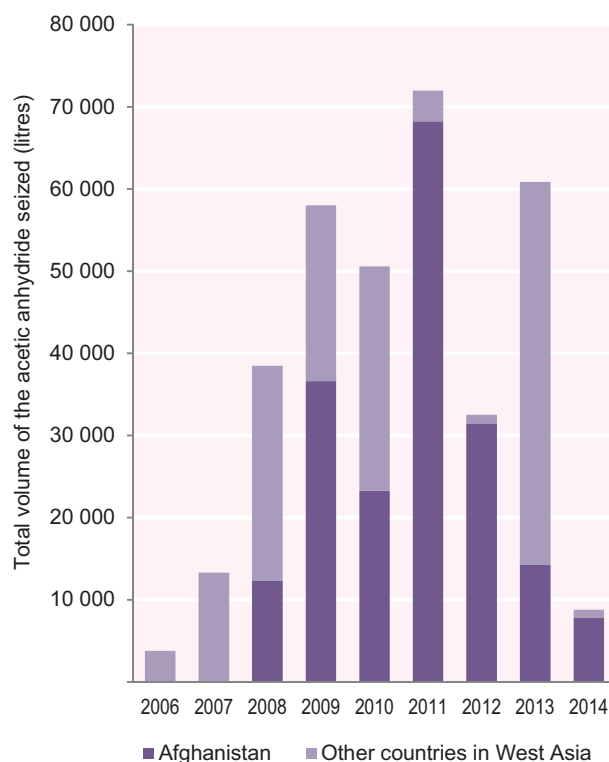
INCB wishes once more to encourage Governments of countries in which acetic anhydride and other scheduled substances are manufactured to report accurate, complete and up-to-date details of such manufacture in accordance with Economic and Social Council resolution 1995/20.

Trafficking

143. Of the 13 countries and territories that reported seizures of acetic anhydride on form D for 2014, only Afghanistan, China and Mexico reported the seizure of more than 1,000 litres of the substance.

144. The total volume of acetic anhydride seized in Afghanistan in 2014, about 7,750 litres, was just about half the amount reported in 2013, thus continuing a declining trend, at a year-on-year rate of 50 per cent, that had started in 2011, when the total amount seized was about 68,000 litres (see figure V). The reporting of seizures of acetic anhydride in countries neighbouring Afghanistan has been traditionally low, with few exceptions. Tajikistan, Turkmenistan and Uzbekistan have not reported on form D any seizures of acetic anhydride since 2000, while cooperation between the Governments of China and Iran (Islamic Republic of) has resulted in significant amounts of the substance being seized in 2013 by the Chinese authorities (95,000 litres) and the Iranian authorities (16,500 litres).

Figure V. Seizures of acetic anhydride reported on form D by Afghanistan and other countries in West Asia, 2006-2014



³² Not including trade between States members of the European Union.

145. According to data provided by Afghanistan on form D for the years 2011-2014, acetic anhydride was smuggled into that country through the Islamic Republic of Iran in over 85 per cent of the cross-border trafficking cases involving the substance and through Pakistan in the remaining 15 per cent of such cases. However, the detection rate of acetic anhydride trafficking across the Afghan border is low. Afghan authorities estimate that less than half of all seizures of acetic anhydride in Afghanistan occur at the border, whereas most of the seizures are made inland, while the substance is being transported from temporary warehouses to illicit heroin manufacturing sites. Intelligence suggests that such temporary warehousing of acetic anhydride is used by traffickers to circumvent any surveillance operations by national law enforcement authorities.

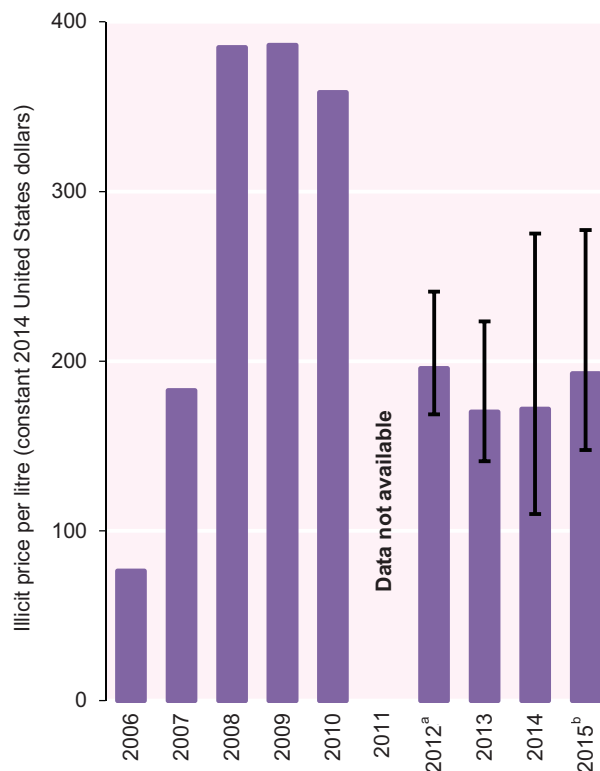
146. To address the problem of decreasing rates for intercepting trafficked precursors, Afghan law enforcement authorities launched two special operations in 2015, focusing on the identification and disruption of domestic transportation of smuggled precursors and on the analysis of data on licit trade from countries identified in the past as being sources of diverted acetic anhydride. Furthermore, in line with the recommendations of Operation Eagle Eye, the Afghan law enforcement authorities reviewed risk indicators used by customs authorities to identify cases of trafficking in acetic anhydride.

147. In 2015, authorities in Afghanistan continued to communicate through PICS seizures of acetic anhydride (total amount seized: over 1,500 litres). The Government also continued to monitor black market prices of acetic anhydride. Depending on the perceived quality, the average price of acetic anhydride on the illicit market in the country varied between \$140 and \$347 during the first 10 months of 2015 — slightly higher than in 2013 and 2014 but still significantly lower than in the peak years 2008-2010 (see figure VI). The reasons for this decline in the black market price are not known, as the statistical data do not indicate any clear correlation between prices in Afghanistan and the amounts of acetic anhydride seized at the regional level (i.e. in West Asia) or the country level (i.e. in Afghanistan); since 2006, seizures of acetic anhydride in Afghanistan have accounted for nearly two thirds of the total volume of acetic anhydride seized in West Asia (see figure V).

148. Mexico reported on form D for 2014 the seizure of acetic anhydride in amounts larger than those seized in Afghanistan; in Mexico, shipments of acetic anhydride are known to feed the illicit manufacture of methamphetamine, although the illicit manufacture of heroin is also on the rise. The seizure of nearly 13,500 litres of acetic anhydride was reported by Mexico in 2014, twice the amount seized in 2013 but still only about 20 per cent

of what was seized in 2011, when seizures of the substance peaked. Seizures of acetic anhydride in China amounted to more than 22,600 litres; the context of those seizures was not provided.

Figure VI. Price of acetic anhydride on the black market in Afghanistan, 2006-2015



Note: Values represent unweighted average of all samples. Error bars represent the average illicit price range based on the perceived quality of the acetic anhydride in the samples, which were collected and reported beginning in March 2012.

^a Data for 2012 are for the period from March to December.

^b Data for 2015 are for the period from January to October.

149. Seizures of acetic anhydride in amounts totalling more than 100 litres were reported on form D for 2014 by Turkey (850 litres), Pakistan (185 litres) and Spain (110 litres). During the reporting period, 12 incidents involving acetic anhydride were communicated via PICS (though some of those incidents related to seizures of the substance that may already have been included in the aggregate totals reported on form D).

150. Seizures of acetic anhydride continued in 2015. The authorities of the Netherlands informed INCB about the theft of a truck transporting 18,000 litres of acetic anhydride to a company based in that country; although the investigation into the theft resulted in the stolen truck being found, the acetic anhydride has not been recovered. In April 2015, Austrian authorities seized 2.2 tons of acetic anhydride;

the circumstances of the seizure, including the modus operandi and the countries involved, were similar to those of other diversion cases investigated in the European Union several years ago. According to information provided by the authorities of the countries involved, the origin of the seized substance was a legitimate company in the Czech Republic and the shipment was destined for a consignee in Slovenia; investigations are ongoing. In the second half of 2015, Iranian customs made two seizures of acetic anhydride totalling more than 28 tons, concealed in transit containers, according to the Iranian Customs Administration. Through PICS, Pakistan communicated four seizures of acetic anhydride in 2015, amounting to over 5,000 litres.

151. INCB has previously noted a lack of information about the sources of chemicals feeding illicit heroin manufacture in Afghanistan. The same is true for other regions affected by illicit opium poppy cultivation and illicit heroin manufacture. In general, there is little or no information about incidents (seizures, diversions, attempted diversions and stopped shipments) and trafficking trends involving acetic anhydride not only in Afghanistan but also in neighbouring countries and worldwide; in cases in which such information is available, it is often very limited, lacking any details on which action can be taken. **INCB therefore encourages all Governments to make every effort to identify the modi operandi of those involved in trafficking in acetic anhydride and to communicate through established channels any relevant details (including information about the sources of that substance). In doing so, Governments should consider communicating possible changes in trafficking routes, concealment methods, modi operandi and trafficking trends, as well as the possible shifting of illicit heroin laboratories to previously unsuspected locations (such laboratories were identified, for example, in Spain in 2013 and 2014).**

2. Use of non-scheduled substances and other trends in the illicit manufacture of heroin

152. The non-scheduled chemicals most frequently associated with illicit heroin processing are ammonium chloride, commonly used in the extraction of morphine from opium, and glacial acetic acid, which has long been suspected of being used: (a) as a cover load, to conceal acetic anhydride contraband; and (b) in the acetylation of morphine to heroin, probably mixed with acetic anhydride. Neither chemical is under international control but both are in the limited international special surveillance list of non-scheduled substances and, according to information available to INCB, are under national control in a number of countries and territories (21 in the case of glacial acetic acid and 8 in the case of ammonium chloride).

153. Four countries reported seizures of ammonium chloride on form D for 2014. The largest seizures were reported by Afghanistan (19.3 tons), followed by Thailand (600 kg) and Mexico and Peru (less than 100 kg each). Seizures of acetic acid were reported by (in descending order of amount seized) Brazil, Mexico, Peru and Argentina; however, no specific reference to illicit heroin manufacture was made in connection with any of the reported seizures of acetic acid. **INCB wishes to acknowledge the provision of information about substances not in Table I or II of the 1988 Convention and encourages all Governments to provide on form D complete and comprehensive information about such substances (in particular, the intended or suspected use of such substances and their sources), with a view to establishing trends and preventing the diversion of those substances worldwide.**

E. Substances used in the illicit manufacture of other narcotic drugs and psychotropic substances

1. Ergot alkaloids and lysergic acid

Licit trade

154. Ergot alkaloids (ergometrine and ergotamine and their salts) are used in the treatment of migraines and as an oxytocic in obstetrics, but there is comparatively limited international trade in those substances. During the reporting period, 17 countries sent pre-export notifications to 48 importing countries for 335 exports of ergot alkaloids totalling nearly 1,340 kg; there was one shipment of lysergic acid.

155. Authorities in the Netherlands informed INCB of significant amounts of ergot alkaloids being delivered from the Czech Republic to an operator in the Netherlands between December 2013 and August 2014 without the required license. Investigations are ongoing. Since December 2014, authorities in the Netherlands, Suriname and Switzerland have cooperated with each other and the Board, to prevent traffickers from misusing a company in Suriname for the diversion of ergot alkaloids. While it appears that two shipments of 1 kg each might have been delivered, further known orders amounting to more than 8 kg over a two-year period will not be delivered, as a result of the cooperation of the authorities concerned. **INCB is aware that there have also been attempts to obtain the chemicals from other exporting countries and therefore invites all Governments to exercise vigilance with regard to orders and shipments of ergot alkaloids.**

Trafficking

156. Available information suggests that lysergic acid diethylamide (LSD) may be making a return, connected with the increasing role of the Internet in supplying drugs, and increasing amounts of LSD being seized in several regions. However, there is limited information about the precursors and methods actually being used for the manufacture of LSD. Also, given the potency of LSD, for which dosages are measured in millionths of a gram, only very small quantities of precursor chemicals are needed to manufacture a significant amount of the drug. Not surprisingly, aggregated annual seizures of the precursor chemicals of LSD reported on form D very rarely exceed a couple of hundred grams. Only three countries reported on form D for 2014 seizures of ergotamine, ergometrine or lysergic acid; the reported total amount seized was less than 60 grams.

2. *N*-Acetylanthranilic acid and anthranilic acid

Licit trade

157. *N*-Acetylanthranilic acid and anthranilic acid are precursors used for the illicit manufacture of methaqualone, a sedative-hypnotic that is commonly known as “quaalude” or “mandrax” (former brand names of pharmaceutical products that are no longer licitly manufactured). During the reporting period, there were eight pre-export notifications for amounts totalling 280 grams of *N*-acetylanthranilic acid. In addition, 42 importing countries were sent pre-export notifications by 11 exporting countries for 312 shipments of anthranilic acid totalling nearly 1,122 tons.

Trafficking

158. Reports of seizures of precursors of methaqualone have always been sporadic. In 2014, China was the only country to report seizures of anthranilic acid; those seizures totalled over 800 kg, which is less than the total amount seized in 2013. There were no seizures of *N*-acetylanthranilic acid in 2014.

159. INCB has as yet been unable to confirm details regarding an alleged large-scale methaqualone laboratory site in the greater Durban area in South Africa, dismantled in June 2014, including details about the chemicals found at the site and their sources. In the meantime, seizures of “mandrax” tablets, continued to be reported regularly on the official website of the South African Police Service. Likewise the dismantling of “mandrax” laboratories has occasionally been reported on the official police website; however, it appears that those laboratories were processing

“mandrax” powder into tablets and not synthesizing methaqualone from chemical starting materials.

F. Substances not in Table I or II of the 1988 Convention that are used in the illicit manufacture of other narcotic drugs and psychotropic substances, precursors under international control or substances of abuse not under international control

160. In 2014, Governments continued to use form D also to report seizures of a variety of substances not in Table I or II of the 1988 Convention that can be used in the illicit manufacture of other narcotic drugs or psychotropic substances, precursors under international control or substances of abuse not under international control, including new psychoactive substances. Seizures reported in 2014 mostly concerned *gamma*-butyrolactone (GBL) and precursors of ketamine.

1. Precursors of *gamma*-hydroxybutyric acid

161. GBL is a precursor used in the illicit manufacture of *gamma*-hydroxybutyric acid (GHB), and it is also ingested and metabolized in the body into GHB; 1,4-butanediol is a pre-precursor of GHB and a precursor of GBL. In 2014, GBL seizures were reported by nine countries, mostly in Europe. Each of those countries reported multiple seizures of GBL totalling less than 50 litres (i.e. the individual seizures were usually small), the exception being the Netherlands, which reported having seized a total of nearly 1,100 litres of the substance, including 1,000 litres in a single seizure at a warehouse. In addition to the GBL seizures made in countries in Europe, such seizures were also made in Australia (370 kg) and the United States (49 kg). Information about the origin of the seized substance and the shipping mode was usually not provided; one country mentioned the use of international courier services.

162. GBL seizures continued to be communicated via PICS in 2015; however, the amounts were usually small. Authorities in Australia and the Netherlands communicated incidents involving GBL seizures in warehouses and illicit laboratories.

2. Precursors of ketamine

163. China is the only country that has regularly reported seizures of ketamine precursors. In 2014, China reported