INTERNATIONAL NARCOTICS CONTROL BOARD

Precursors

chemicals and equipment frequently used in the illicit manufacture of narcotic drugs and psychotropic substances

2024

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The *Report of the International Narcotics Control Board for 2024* (E/INCB/2024/1) is supplemented by the following reports:

Narcotic Drugs: Estimated World Requirements for 2025—Statistics for 2023 (E/INCB/2024/2)

Psychotropic Substances: Statistics for 2023—Assessments of Annual Medical and Scientific Requirements for Substances in Schedules II, III and IV of the Convention on Psychotropic Substances of 1971 for 2025 (E/INCB/2024/3)

Precursors, Chemicals and Equipment Frequently Used in the Illicit Manufacture of Narcotic Drugs and Psychotropic Substances: Report of the International Narcotics Control Board for 2024 on the Implementation of Articles 12 and 13 of the United Nations Convention against Illicit Traffic in Narcotic Drugs and Psychotropic Substances of 1988 (E/INCB/2024/4)

The updated lists of substances under international control, comprising narcotic drugs, psychotropic substances and substances frequently used in the illicit manufacture of narcotic drugs and psychotropic substances, are contained in the latest editions of the annexes to the statistical forms ("Yellow List", "Green List" and "Red List"), which are also issued by the Board.

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The text of the present report is also available on the website of the Board (www.incb.org).

INTERNATIONAL NARCOTICS CONTROL BOARD

Precursors

chemicals and equipment frequently used in the illicit manufacture of narcotic drugs and psychotropic substances

Report of the International Narcotics Control Board for 2024
on the implementation of articles 12 and 13 of the United Nations
Convention against Illicit Traffic in Narcotic Drugs
and Psychotropic Substances of 1988

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Foreword

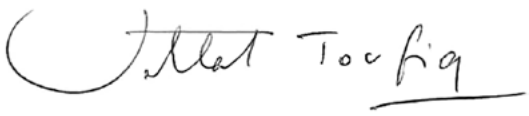
Illicit drug markets are experiencing a dramatic period of change. Synthetic drugs, including amphetamines, cathinones, opioids, synthetic cannabinoids and other new psychoactive substances, are spreading worldwide, altering illicit drug markets. Technological advances are extending to plant-based drugs, with the illicit manufacture of cocaine, both in the original production sites in South America and in clandestine laboratories in western Europe, resulting in improved outputs. The illicit laboratories manufacturing or producing these drugs have been found to be increasingly sophisticated and frequently of an industrial scale, requiring both chemicals and specialized equipment, including pressurized reaction vessels and made-to-order glassware. Furthermore, with illicit drugs increasingly being marketed in the form of tablets and pills, there is a growing need for cutting agents and excipients, as well as punches, dies and tableting or encapsulation machines. As many of the chemicals, equipment and materials required for illicit manufacture have both legal and illegal uses, these items are offered and traded worldwide through the surface web with only a small portion being diverted for the illicit manufacture of drugs, making controls difficult to develop and implement.

Information in PICS, the Board's information- and intelligence-sharing platform, illustrates the current dynamics: of the 147 different chemicals reported in the more than 500 incidents communicated through PICS during the reporting period, less than 15 per cent were chemicals under international control. The challenges posed by the evolution of illicit drug manufacture and production therefore require innovative, proactive responses to support and strengthen the aims of the international control system established by the United Nations Convention against Illicit Traffic in Narcotic Drugs and Psychotropic Substances of 1988.

During 2024, the Board endeavoured to introduce steps to address these challenges. This included developing and disseminating a number of tools to support Governments in addressing the diversion of non-scheduled chemicals, including designer precursors, such as a list of possible substitutes for chemicals in the tables of the 1988 Convention, lists of frequently seen precursors of new psychoactive substances and cutting agents, adulterants and excipients, and information on control measures applied by Governments to chemicals that are not in Tables I and II of the 1988 Convention but that may be used in illicit drug manufacture. It also included the further promotion of the use of the PEN Online Light system for the voluntary exchange of information on shipments involving chemicals not under international control but known to be used in illicit drug manufacture. Presently, 66 importing Governments are regularly notified of shipments of such chemicals to their territories. Steps were also taken to develop an integrated approach to address all facets of illicit drug manufacture, ranging from precursor chemicals to specialized equipment and materials, including excipients, and by expanding engagement with relevant external partners, including the International Association of Judges, to create an environment conducive to addressing the dynamics of today's illicit drug markets.

Engagement with the chemical and related industries and the monitoring of virtual markets where chemicals and specialized equipment are traded are indispensable components of this approach. In 2024, INCB continued its initiative aimed at strengthening public-private partnerships through the mapping of national industry landscapes in several countries to help identify those industries that manufacture, consume or in any way deal with chemicals which could also be used for illicit drug manufacture. Lastly, efforts also commenced to monitor virtual markets for suspicious postings of precursor chemicals. These activities complement the portfolio of well-established services provided by INCB to Member States, which include the PEN Online and PEN Online Light and the PICS electronic platforms, as well as the continuously updated limited international special surveillance list of non-scheduled substances.

I would like to thank Governments for supporting the Board's activities throughout 2024 and look forward to even stronger cooperation in the future.



Jallal Toufiq
President of the International
Narcotics Control Board

Preface

The United Nations Convention against Illicit Traffic in Narcotic Drugs and Psychotropic Substances of 1988 requires the International Narcotics Control Board to report annually to the Commission on Narcotic Drugs on the implementation of article 12 of the Convention and requires the Commission to periodically review the adequacy and propriety of Tables I and II of the Convention.

In addition to its annual report and other technical publications on narcotic drugs and psychotropic substances, the Board has prepared its report on the implementation of articles 12 and 13 of the 1988 Convention in accordance with the following provisions, contained in article 23 of the Convention:

1. The Board shall prepare an annual report on its work containing an analysis of the information at its disposal and, in appropriate cases, an account of the explanations, if any, given by or required of parties, together with any observations and recommendations which the Board desires to make. The Board may make such additional reports as it considers necessary. The reports shall be submitted to the Economic and Social Council through the Commission, which may make such comments as it sees fit.

2. The reports of the Board shall be communicated to the parties and subsequently published by the Secretary-General. The parties shall permit their unrestricted distribution.

Contents

*The annexes are not included in the printed and electronic versions of the present report but are available on the website of the International Narcotics Control Board (www.incb.org).

Explanatory notes

Data sources

Multiple government sources of data were used to generate the present report, including form D ("Annual information on substances frequently used in the illicit manufacture of narcotic drugs and psychotropic substances"); the Pre-Export Notification Online (PEN Online) system and the PEN Online Light system; the Precursors Incident Communication System (PICS); results achieved under Project Prism and Project Cohesion, which are the international operational initiatives regarding chemicals used in the illicit manufacture of, respectively, synthetic drugs, and cocaine and heroin; and official communications with competent national authorities and official national reports on the drug and precursor control situation.

Unless otherwise specified, data provided on form D are referred to by the calendar year to which they apply. The reporting period for data from the PEN Online and PEN Online Light systems and PICS is from 1 November 2023 to 1 November 2024, unless otherwise specified. Additional information might have been provided through regional and international partner organizations, as indicated in the report.

With regard to data on seizures, readers should bear in mind that reported seizures generally reflect the corresponding level of regulatory and law enforcement activity at that specific time. In addition, as seizures are often the result of law enforcement cooperation among several countries (e.g. through controlled deliveries), the occurrence of seizures and the volumes seized in a given country should not be misinterpreted or used as an overestimation in assessing that country's role in the overall situation of trafficking in precursors.

Boundaries

The boundaries and names shown and the designations used on the maps in the present publication do not imply official endorsement or acceptance by the United Nations.

The designations employed and the presentation of the material in the present publication do not imply the expression of any opinion whatsoever on the part of the Secretariat of the United Nations concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries.

Countries and areas are referred to by the names that were in official use at the time the relevant data were collected.

Metric units

Reference to "tons" is to metric tons, unless otherwise stated.

Abbreviations

The following abbreviations are frequently used in INCB reports on precursors:

AIBN	azobisisobutyronitrile
ANPP	4-anilino-*N*-phenethylpiperidine
4-AP	4-anilinopiperidine | *N*-phenyl-4-piperidinamine
APAA	*alpha*-phenylacetoacetamide | 2-phenylacetoacetamide
APAAN	*alpha*-phenylacetoacetonitrile
1-boc-4-AP	1-boc-4-anilinopiperidine *tert*-butyl 4-(phenylamino)piperidine-1-carboxylate
1-boc-4-piperidone	*tert*-butyl 4-oxopiperidine-1-carboxylate
CBD	cannabidiol
1-CBz-4-piperidone	benzyl 4-oxopiperidine-1-carboxylate
DEPAPD	diethyl (phenylacetyl)propanedioate
EAPA	ethyl *alpha*-phenylacetoacetate | ethyl 3-oxo-2-phenylbutanoate
FTZ	free trade zone (also known as a free zone or free port)
GBL	*gamma*-butyrolactone
GHB	*gamma*-hydroxybutyric acid
HHC	hexahydrocannabinol
IMDPAM	isopropylidene (2-(3,4-methylenedioxyphenyl)acetyl)malonate
INCB	International Narcotics Control Board
IONICS	Project Ion Incident Communication System
LSD	lysergic acid diethylamide
MAMDPA	methyl 3-oxo-2-(3,4-methylenedioxyphenyl)butanoate
MAPA	methyl *alpha*-phenylacetoacetate | methyl 3-oxo-2-phenylbutanoate
MDMA	3,4-methylenedioxymethamphetamine (commonly known as "ecstasy")
3,4-MDP-2-P	3,4-methylenedioxyphenyl-2-propanone (also known as piperonyl methyl ketone or PMK)
3,4-MDP-2-P ethyl glycidate	ethyl ester of 3,4-MDP-2-P methyl glycidic acid | PMK ethyl glycidate
3,4-MDP-2-P methyl glycidate	methyl ester of 3,4-MDP-2-P methyl glycidic acid | PMK methyl glycidate
MMDPPA	*alpha*-methyl-1,3-benzodioxole-5-propanamide
NPP	*N*-phenethyl-4-piperidone
P-2-P	1-phenyl-2-propanone (also known as benzyl methyl ketone or BMK)
PEN Online system	Pre-Export Notification Online system
PEN Online Light system	Pre-Export Notification Online Light system
PICS	Precursors Incident Communication System
THC	tetrahydrocannabinol
UNODC	United Nations Office on Drugs and Crime
WCO	World Customs Organization

Glossary

The following terms and definitions are frequently used in INCB reports on precursors:

chemical intermediate A chemical generated during a multi-step synthesis process that is normally not isolated but immediately consumed in the next synthesis step. Stable chemical intermediates can be isolated and have been encountered as purpose-made substitute chemicals for controlled precursors

designer precursor A close chemical relative of a controlled precursor that is purpose-made to circumvent controls and usually does not have any recognized legitimate use

diversion The transfer of substances from licit to illicit channels

forensic profiling analysis In-depth laboratory analysis to trace any by-products generated during illicit manufacture, with a view to, inter alia, identifying the precursors used in such manufacture

immediate precursor A precursor that is generally only one reaction step away from the end product

industrial-scale laboratory A laboratory for the manufacture of synthetic drugs in which oversized equipment and/or glassware that is either custom-made or purchased from industrial processing sources and/or that uses serial reactions is used and in which significant amounts of drugs are produced in very short periods of time, the amount being limited only by the need for access to precursors and other essential chemicals in adequate quantities and for the logistics and workers to handle large amounts of drugs and chemicals

international monitoring list of equipment used in the illicit manufacture of drugs A list prepared and regularly updated by INCB that includes items of equipment of international relevance and for which substantial evidence exists of their use in the illicit manufacture of narcotic drugs, psychotropic substances, new psychoactive substances and/or precursors

limited international special surveillance list of non-scheduled substances A list prepared, pursuant to Economic and Social Council resolution 1996/29, and regularly updated by INCB that includes substitute and alternative chemicals, as well as groups of common derivatives and other related substances that can be converted into one of the scheduled precursors by readily applicable means, and for which substantial information exists on their use in illicit drug manufacture

mapping exercise An initiative of the Board aimed at aiding Governments in identifying industries that manufacture, consume or in any way deal with chemicals (whether or not under national or international control) that could also be used as precursors in illicit drug manufacture

“masked” precursor A chemical that is designed to disguise a controlled precursor and that can be easily converted into the controlled precursor. The concept of a “masked” precursor is based on what is known in organic synthesis as “protection group chemistry”

pharmaceutical preparation A preparation for therapeutic (human or veterinary) use in its finished dosage form that contains precursors present in such a way that they can be used or recovered by readily applicable means; such preparations may be presented in their retail packaging or in bulk

precursor In general, a starting material used to manufacture a narcotic drug, a psychotropic substance or another precursor; sometimes used to refer exclusively to the substances in Table I and Table II of the 1988 Convention

pre-precursor A precursor of a precursor that can then be used to manufacture the desired end product

seizure The act of prohibiting the transfer, conversion, disposition or movement of property or assuming custody of or control over property on the basis of an order issued by a court or competent authority; it may be temporary or permanent (i.e. confiscation); different national legal systems may use different terms

stopped shipment A shipment permanently withheld, either because reasonable grounds exist to believe that it may constitute an attempted diversion, or as a result of administrative problems or because of other grounds for concern or suspicion

suspicious order (or suspicious transaction) An order (or transaction) of questionable, dishonest or unusual character or condition, for which there is reason to believe that a chemical that is being ordered, imported or exported or is transiting a country or territory is destined for use in the illicit manufacture of narcotic drugs or psychotropic substances

Summary

New precursor chemicals under international control

On 3 December 2024, two fentanyl precursors (4-piperidone and 1-boc-4-piperidone) and two series of closely related designer precursors of amphetamine-type stimulants (16 substances in total) were added to Table I of the 1988 Convention. The 16 precursors of amphetamine-type stimulants are all designer precursors with no known legitimate uses and no regular trade.

Normative developments

On 18 January 2024, the 1988 Convention entered into force for South Sudan, bringing the number of States that have ratified, acceded to or approved the 1988 Convention to 191. Changes in legislation and control measures in 10 countries and the European Union are also covered in the section on legislation and control measures.

Reporting to the Board

The quality and quantity of data reported by Governments remain a cause for concern, with only 81 of the 191 States parties to the 1988 Convention having submitted data through form D by the deadline of 30 June 2024. The number had risen to 115 Governments by 1 November 2024, the cut-off date for the present report. The Board notes that only 84 of the forms for 2023 received contained information on estimates of annual legitimate requirements for ephedrine, pseudoephedrine and their preparations. Furthermore, some estimates provided to INCB date back more than 10 years and have not been updated.

Major trends in licit trade and trafficking

- The global quantity of ephedrines (i.e. ephedrine and pseudoephedrine in all forms) seized, at over 15 tons, surpasses the quantities seized in the previous two years combined.
- Quantities of pharmaceutical preparations containing pseudoephedrine seized continue to increase.
- The largest quantities of ephedrine in the form of raw material seized were reported by Pakistan (over 5 tons in 21 cases), indicating the possible emergence of a new trafficking route from West Asia to countries in Europe.
- The suspected diversion of 500 kg of ephedrine and 500 kg of pseudoephedrine in the form of raw material pre-notified through the PEN Online system for export from Europe to Africa highlights the need for heightened vigilance by Governments.
- No seizures of amphetamine precursors were reported in or adjacent to West Asia, where large quantities of amphetamine-based “captagon” are seized.
- Seizures of increasing amounts of P-2-P methyl glycidic acid and its esters (almost 56 tons) and of 3,4-MDP-2-P methyl glycidic acid and its esters (almost 45 tons) have been reported. About 15 tons of amphetamine or methamphetamine and 17 tons of MDMA, respectively, could have been manufactured illicitly from the amounts seized.
- The seizure of precursors of a P-2-P methyl glycidic acid derivative in an illicit industrial-scale laboratory in South Africa is the first instance reported to INCB of these chemicals being used in the illicit manufacture of methamphetamine.
- The highly efficient, industrial-scale illicit manufacture of methamphetamine continues in North America and South-East Asia.
- Methods used in the illicit manufacture of methamphetamine in Mexico are now being observed in South Asia and Southern Africa, with the alleged involvement of Mexican drug trafficking organizations.

- Seized potassium permanganate has predominantly been sourced from within the country in which the seizure has been made.
- The illicit manufacture of cocaine chemicals, including potassium permanganate, continues, albeit on a limited scale.
- Trafficking in acetic anhydride destined for Afghanistan continues, although on a smaller scale.
- No notable developments related to precursors of phencyclidine, LSD and other narcotic drugs and psychotropic substances have been reported to INCB.
- Canada, Mexico and the United States of America are the only countries that have reported notable seizures of fentanyl precursors. In October 2024, the Kingdom of the Netherlands reported the first seizure of a fentanyl precursor in Europe.
- Worldwide, actionable information about the illicit manufacture of ketamine and the sources of the precursors required remains limited.
- More reports are being received of seizures of precursors and the illicit manufacture of synthetic cathinones.
- Seizures of precursors of synthetic cannabinoids have been reported for the first time.
- CBD is being examined as a precursor of THC and HHC.

Equipment used in illicit drug manufacture

INCB is promoting the development and implementation of a coordinated strategic approach to addressing the use of the equipment and excipients used in illicit drug manufacture. A survey was conducted among Governments worldwide to better understand national action and international cooperation. This led to the convening by INCB of the fourth expert group meeting on illicit drug manufacturing equipment and article 13 of the 1988 Convention. Work also continued with WCO to establish unique Harmonized System codes for selected equipment on the international monitoring list of equipment used in the illicit manufacture of drugs.

Cooperation with industry

The Board has continued to reiterate the crucial role of voluntary cooperation with industry as an effective strategy to prevent the diversion of and trafficking in chemicals used for illicit drug manufacture. Furthermore, it has continued to encourage Governments to map their national industry landscapes with the aim of raising awareness among those industries that are likely to be susceptible to diversion. In the reporting period, the Board conducted several national mapping exercises in cooperation with a number of pilot countries. Findings from the mapping exercises and experiences with various existing national cooperation models were discussed at an INCB international conference at the end of 2024.

Virtual markets

Chemical precursors, including designer precursors, are increasingly sourced through virtual markets, mainly on the surface web. Initiated in 2024, the INCB Automated Monitoring of Virtual Chemical and Equipment Markets software solution is aimed at monitoring developments and trends in these markets by leveraging advanced technologies to assist in identifying suspicious postings related to precursor chemicals and illicit drug manufacturing equipment and systematically analyse the data collected in order to develop actionable information and intelligence packages.

Recommendations

Recommendations to Governments appear in bold throughout the present report.

Key recommendations relate to:

- The reporting by Governments to INCB pursuant to article 12, paragraph 12, of the 1988 Convention (paras. 9, 29 (c), 31, 66 and 153)
- The monitoring of legitimate international trade and the utilization of related platforms (i.e. the PEN Online and PEN Online Light systems) and tools and resources (paras. 29 (d), 41, 42, 44, 45, 49, 113 and 157 and boxes 1 and 2)
- The sharing of information on precursor-related incidents through PICS (paras. 29 (c), 63, 66, 153 and 159)
- Cross-cutting issues related to illicit drug manufacturing equipment (para. 170) and cooperation with industry (para. 172)

Additional recommendations related to diversion prevention and investigation include:

- The control of pharmaceutical preparations containing substances in Tables I and II of the 1988 Convention in the same way as the substances themselves (para. 72), and the monitoring of domestic manufacturers of pharmaceutical preparations of ephedrine and pseudoephedrine to prevent the manufacture of fake medicines (para. 78)
- The conduct of investigations into suspicious transactions and precursor seizures and forensic profiling analysis of seized substances to determine the nature of starting materials (paras. 45, 74, 102 and 159)
- The exercise of vigilance about quantities indicated as being required by companies when determining annual legitimate requirements (paras. 37 and 81)

Tools

Monitoring of licit trade

The Board's PEN Online system continued to provide an effective mechanism for monitoring trade in internationally controlled precursors, with the tool now regularly being used by 145 countries. In addition, the analogous PEN Online Light system, another of the Board's initiatives to prevent chemicals not listed in Tables I and II of the 1988 Convention from reaching illicit laboratories, is currently being used by 42 exporting and importing Governments. During the reporting period, INCB, together with UNODC, conducted training for 20 officials from eight countries in East and South-East Asia and Oceania on the use of these systems.

Law enforcement operations

PICS continued to provide a platform for the global communication of actionable information about precursor- and equipment-related incidents in real time. As at 1 November 2024, PICS had more than 700 active users from 130 countries and territories, representing 325 agencies in all regions. Over 4,800 incidents relating to precursors and equipment had been communicated through the system since its inception. Between 1 November 2023 and 1 November 2024, over 500 new incidents were communicated. These incidents involved 147 distinct substances, of which only 18 are internationally controlled (12 are listed in Table I and 6 in Table II of the 1988 Convention). Among these incidents were 130 incidents involving equipment. During the reporting period, INCB trained over 120 officials from 40 countries and three international or regional organizations on the use of PICS.

Other tools and resources

To assist Governments in addressing the diversion of non-scheduled chemicals frequently used in the illicit manufacture of drugs and the proliferation of designer precursors, the Board developed and disseminated to all competent national authorities a list of substances that fall within the extended definitions described in the limited international special surveillance list of non-scheduled substances. The Board also amended the list to include two new sections on the following: (a) frequently seen precursors of substances recently scheduled under the 1961 Convention and the 1971 Convention and of new psychoactive substances; and (b) frequently seen cutting agents, adulterants and excipients. Moreover, INCB disseminated the most recent information on control measures applied by Governments to chemicals that are not in Tables I or II of the 1988 Convention but that may be used in the illicit manufacture of narcotic drugs, psychotropic substances, controlled precursors or new psychoactive substances.

I. Action taken by Governments and the International Narcotics Control Board

HIGHLIGHTS

- In addition to an update on the latest changes to the list of precursors in Table I of the United Nations Convention against Illicit Traffic in Narcotic Drugs and Psychotropic Substances of 1988, the present chapter contains statistics about the reporting by Governments to INCB pursuant to article 12, paragraph 12, of the 1988 Convention (paras. 9, 10, 29 (c) and 31) and information on the exchange of pre-export notifications, both in compliance with the 1988 Convention (through the PEN Online system) for internationally controlled precursors and on a voluntary basis (through the PEN Online Light system) for internationally non-scheduled chemicals (paras. 41–45 and 46–49, respectively).

- INCB is aware of some 50 countries that have placed one or more chemicals that are not in Tables I or II of the 1988 Convention under national control. At the same time, a total of 66 Governments have reported seizures of such chemicals (para. 26).

- A time-bound international operation targeting the diversion of ephedrine and pseudoephedrine, including their preparations, from licit international trade was launched in view of recent incidents involving trafficking in the substances in Africa, Asia and Europe. Operation Pseudonym involved 60 countries and territories and four international or regional organizations (paras. 53–56).

A. Scope of control

1. On 19 March 2024, at its sixty-seventh session, the Commission on Narcotic Drugs decided, in accordance with the Board's recommendation, to add to Table I of the 1988 Convention two fentanyl precursors (4-piperidone and 1-boc-4-piperidone) and two series of closely related designer precursors of amphetamine-type stimulants (16 substances in total), namely, P-2-P methyl glycidic acid and eight of its esters (i.e. the methyl, ethyl, propyl, isopropyl, butyl, isobutyl, *sec*-butyl and *tert*-butyl esters), as well as seven esters of 3,4-MDP-2-P methyl glycidic acid (i.e. the ethyl, propyl, isopropyl, butyl, isobutyl, *sec*-butyl and *tert*-butyl esters). Those decisions became effective on 3 December 2024, 180 days after they were communicated by the Secretary-General to Governments.

2. Given the close chemical relationships between the substances in each above-mentioned series of designer precursors of amphetamine-type stimulants, the Board had proposed that the named derivatives, that is, the esters, be included in Table I as a footnote to the respective parent substances. The Commission on Narcotic Drugs had supported that proposal. The updated list of 51 chemicals now under international control is available in annex VII to the present report.

3. In September 2024, INCB proposed a further change to Table I of the 1988 Convention, namely, to remove 3,4-MDP-2-P methyl glycidate from the body of Table I and include it in the footnote together with the other seven esters of the acid. The proposal, which was made with a view to increasing consistency in how esters are presented in Table I, will be voted on by the Commission in March 2025.

4. In line with common practice, and pursuant to Economic and Social Council resolution 1992/29, INCB has requested WCO to assign unique Harmonized System codes[1] to the newly scheduled chemicals, for inclusion in the current cycle of the WCO Harmonized System Nomenclature (to be released officially in 2028). Until then, **INCB encourages Governments to adopt, on a voluntary basis, interim, discrete codes based on the applicable Harmonized System group codes.**[2]

B. Adherence to the 1988 Convention

5. With the entry into force of the 1988 Convention for South Sudan on 18 January 2024, as at 1 November 2024, the Convention had been ratified, acceded to or approved by 191 States and formally confirmed by the European Union (extent of competence: art. 12). Details on the status of accession are provided in annex I. Of the six States that have yet to become parties to the Convention, four are in Oceania and two in Africa.[3] The Government of Somalia has, however, requested the Board's assistance in relation to the modalities for the country's accession to the Convention. The low rate of accession in Africa and Oceania makes the regions vulnerable to trafficking in precursor chemicals. **INCB urges the Governments of Equatorial Guinea, Kiribati, Papua New Guinea, Solomon Islands, Somalia and Tuvalu to implement the provisions of article 12 and accede to the Convention without further delay.**

6. While the six above-mentioned countries are yet to take measures to accede to the 1988 Convention, there are also a few countries, including some parties to the Convention, that have not yet established competent national authorities responsible for regulating or enforcing national controls over precursors. To date, 13 countries have not yet provided information regarding a competent national authority responsible for ensuring the implementation of article 12 of the 1988 Convention.[4] This is particularly the case in Africa and Oceania, where seven countries (or 13 per cent) and four countries (or 25 per cent), respectively, have not established an authority responsible for precursor control at the national level. Similarly, there are a number of countries that have three or more

[1] See WCO, *Harmonized Commodity Description and Coding System*, 7th ed. (Brussels, 2022).

[2] The applicable Harmonized System group codes for the 18 newly scheduled chemicals are available on the Red List, a complement to form D available on the Board's public website.

[3] Kiribati, Papua New Guinea, Solomon Islands and Tuvalu in Oceania, and Equatorial Guinea and Somalia in Africa.

[4] They include Angola, the Marshall Islands, Mauritania, Mozambique, Niue, Palau, San Marino, South Sudan and the State of Palestine. The Comoros, Liberia, Nauru and Somalia have competent authorities but have not specified their scope of responsibility (see *Competent National Authorities under the International Drug Control Treaties*, United Nations publication, 2023).

competent authorities, often with unclear or overlapping responsibilities. Both scenarios make the countries concerned vulnerable to attempts by traffickers to obtain chemicals for illicit purposes.

C. Reporting to the Board pursuant to article 12 of the 1988 Convention

7. Pursuant to article 12, paragraph 12, of the 1988 Convention, Governments are required to submit annually to INCB information on substances frequently used in the illicit manufacture of narcotic drugs and psychotropic substances. The information is provided on a form, known as form D,[5] which is made available by INCB on its website. The information to be submitted includes: (a) the amounts seized of substances included in Tables I and II of the 1988 Convention and, when known, their origin; (b) any substance not included in Table I or Table II that is identified as having been used in the illicit manufacture of narcotic drugs or psychotropic substances; and (c) methods of diversion and illicit manufacture. That information is critical as it allows INCB to identify and analyse emerging trends in trafficking in precursors and the illicit manufacture of drugs (see chap. III). The deadline for submission of the data for 2023 was 30 June 2024.

8. By the deadline of 30 June 2024, only 81 Governments had submitted form D for 2023. The number had increased to 115 Governments by the cut-off date of 1 November 2024. Cuba also submitted form D for 2022. Several States parties failed to submit data for 2023 altogether. Of those, 14 have not done so for the past five years, and 26 have not done so for the past 10 years or more (see table 1). Comprehensive information about the status of the submission of form D by individual Governments is included in annex II.

Table 1. States parties failing to report as required under article 12, paragraph 12, of the 1988 Convention, 2023

Africa		
Angola	Eswatini[b]	Namibia
Burkina Faso[b]	Ethiopia[a]	Niger
Burundi	Gabon	Nigeria
Cabo Verde[a]	Gambia[a]	Sao Tome and Principe[b]
Cameroon	Guinea[b]	Senegal[a]
Central African Republic[b]	Guinea-Bissau[b]	Seychelles[a]
Chad	Kenya	Somalia
Comoros[b]	Lesotho[b]	South Sudan
Congo[b]	Liberia[b]	Togo
Côte d'Ivoire[a]	Libya[b]	Tunisia
Djibouti[b]	Madagascar	Uganda
Equatorial Guinea	Malawi[b]	Zambia[a]
Eritrea[b]	Mali[a]	
Americas		
Antigua and Barbuda[b]	Grenada[b]	Saint Lucia
Bahamas[b]	Guyana	Saint Vincent and the Grenadines
Barbados[b]	Jamaica	Suriname
Belize[a]	Peru	
Dominica	Saint Kitts and Nevis[b]	

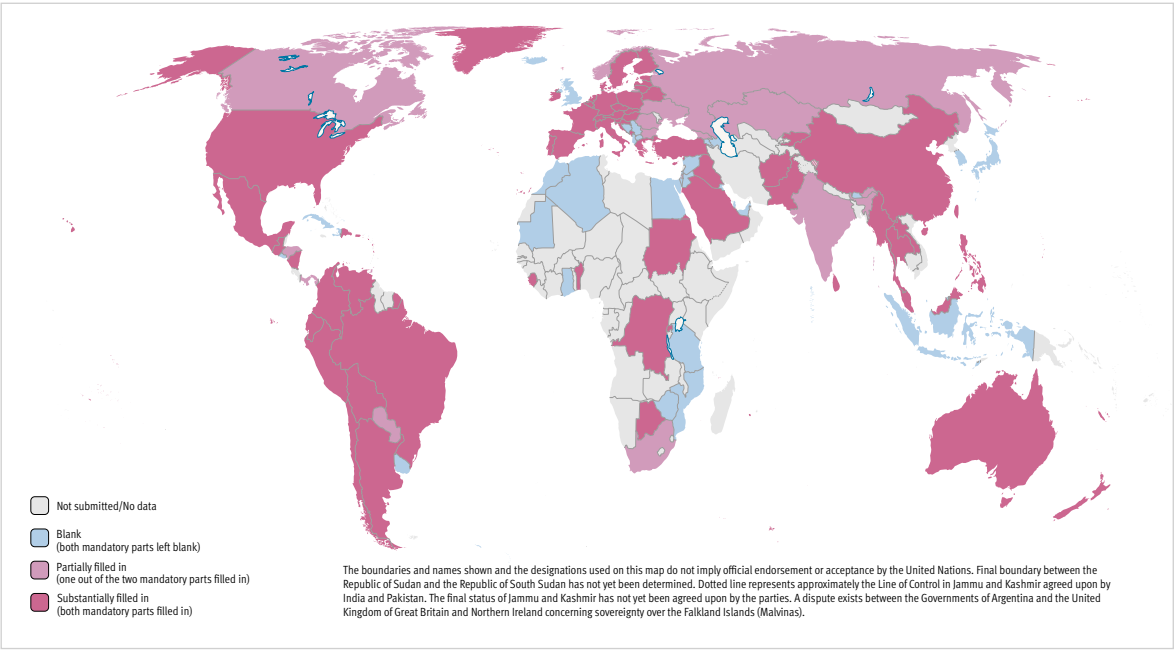
[5] The latest version of form D is available on the INCB website in the six official languages of the United Nations. In an effort to streamline and expedite the reporting process and to minimize the potential for data entry errors, INCB requests the utilization of a spreadsheet form. Fifty States have used the spreadsheet version of form D for 2023.

Asia		
Bangladesh[a]	Mongolia	Turkmenistan
Cambodia[a]	Nepal	Uzbekistan
Democratic People's Republic of Korea	Oman[a]	Viet Nam
Iran (Islamic Republic of)	Tajikistan	Yemen
Lebanon	Timor-Leste	
Europe		
Republic of Moldova	San Marino	
Oceania		
Cook Islands[b]	Nauru[b]	Solomon Islands
Fiji[a]	Niue[b]	Tonga[b]
Kiribati	Palau[a]	Tuvalu
Marshall Islands[b]	Papua New Guinea	Vanuatu[b]
Micronesia (Federated States of)	Samoa[b]	

Note: See also annex II.
[a]Government that failed to submit form D for any year during the past five years (2019–2023).
[b]Government that failed to submit form D for any year during the past 10 years (2014–2023) or more.

9. As at 1 November 2024, 63 Governments had reported seizures of substances listed in Table I or Table II of the 1988 Convention on form D for 2023. Fifty-two Governments had reported seizures of substances not included in Table I or Table II, and only 33 had supplied information concerning methods of diversion and illicit manufacture. Several Governments had submitted incomplete forms lacking details necessary for the Board to identify emerging trends in trafficking in precursors and the illicit manufacture of drugs or to analyse weaknesses in precursor control mechanisms (see map 1). **The Board therefore urges Governments to make every effort to collect, consolidate and report complete information to the Board on time, as mandated in article 12, paragraph 12, of the 1988 Convention.**

Map 1. Status of submissions by Governments of form D for 2023 containing information concerning seizures of substances listed in Table I or Table II of the 1988 Convention and seizures of substances not listed in Table I or Table II, as at 1 November 2024



D. Legislation and control measures

10. In accordance with Economic and Social Council resolution 1992/29, INCB collects information on the specific controls applied to the substances in Tables I and II of the 1988 Convention. The Board also collects information about national control measures applied to chemicals not under international control. To assist Governments in monitoring trade in substances in Tables I and II of the 1988 Convention and to facilitate cooperation and joint investigations related to both chemicals that are under international control and those that are not, INCB disseminates and updates this information regularly as part of its information package on the control of precursors, which can be accessed by competent national authorities on the Board's secure website. To ensure that the information is up to date at all times, **INCB encourages all Governments to inform it regularly of relevant changes to their national precursor legislation and to controls applied, including domestic controls.**

11. The following changes in control measures have been brought to the attention of INCB since the publication of its report on precursors for 2023.

12. The Government of Argentina, through Decree 606/2023, placed three fentanyl precursors (4-AP, 1-boc-4-AP and norfentanyl) under national control by adding them to annex II, list I, of Decree 593/19 on 24 November 2023. All three substances have been under international control since November 2022. In addition, MMDPPA, a precursor of tenamfetamine (MDA), was added to the same list of controlled precursors on the same date. The inclusion of MMDPPA was the result of findings of the Chemical Laboratory Division of the Argentine Federal Police in February 2023.

13. The Ministry of Security of Argentina signed agreements with the Provinces of Entre Ríos and Mendoza on 22 April and 2 June 2024, respectively. The agreements created mechanisms for assistance, coordination and cooperation on issues related to precursor chemicals and to the implementation of the Federal Inspections Plan, as well as for capacity-building. In June 2024, an inter-agency working group was established to prevent the misuse of and trafficking in fentanyl and its analogues, as well as the precursor chemicals used in their manufacture.

14. In Australia, in March 2024, 1,4-butanediol was classified as a border-controlled drug (Crimes and Other Legislation Amendment (Omnibus No. 2) Act 2023). This change, which was made in response to reports of increasing harm resulting from ingestion of the substance when used as a substitute for GHB (see paras. 154–157 below), means that those convicted of illicitly importing 1,4-butanediol will face a maximum penalty of life imprisonment.

15. In Canada, the existing listings of 4-piperidone and its salts under the Controlled Drugs and Substances Act and the Precursor Control Regulations were expanded to include the substance's derivatives and analogues, as well as the salts of derivatives and analogues. This includes 1-boc-4-piperidone, which was added to Table I of the 1988 Convention together with 4-piperidone on 3 December 2024.

16. In China, on 1 May 2024, the list of chemicals for which a non-objection letter is required prior to their export to specific countries and regions was extended to include an additional 24 chemicals that are not under international control but could be used in illicit drug manufacture. At the request of the Government of China, these substances were added to the PEN Online Light system so that importing Governments can be notified of planned exports from China.

17. The Government of China also placed a number of precursors of amphetamine-type stimulants and fentanyls, as well as CBD, a precursor of *delta*-8-THC and *delta*-9-THC and other psychoactive cannabinoids, under national control. This included the three fentanyl precursors that have been under international control since November 2022 (4-AP, 1-boc-4-AP and norfentanyl). It also included P-2-P methyl glycidic acid and all its esters, all the esters of 3,4-MDP-2-P methyl glycidic acid, and 3-oxo-2-phenylbutanoic acid and all its esters (including MAPA, an ester that had been placed under control at an earlier stage). The scope of control of these substances in China thus goes beyond international controls, which apply only to a subset of esters of the three acids (see para. 1). All the substances were placed in category II of the list of controlled precursor chemicals, which means that their production, administration, purchase, transportation, import and export must comply

with the relevant provisions for non-pharmaceutical precursor chemicals. In addition, preclinical research on cannabidiol for medical purposes must also comply with article 10 of the Regulation on the Administration of Narcotic Drugs and Psychotropic Drugs.

18. In Ecuador, the National Assembly ratified a law in July 2024 to increase prison sentences for crimes of terrorism, financing of terrorism and drug trafficking and production. Among others, penalties for the illegal production of precursors and controlled chemicals increased from a term of imprisonment of 3 to 5 years to a term of 7 to 10 years.

19. In Egypt, in order to address traffickers' continued attempts to source pharmaceutical preparations containing pseudoephedrine from community pharmacies, the Egyptian Drug Authority published on its website in April 2023 an organizational guide containing instructions to be followed by community pharmacies dispensing such preparations and providing information on sanctions in the event of their violation, including the temporary closure of pharmacies.

20. In Guatemala, in March 2024, the competent national authorities signed the Protocol of Action of the country's Inter-Institutional Group for the Control and Inspection of Precursors and Chemical Substances to strengthen inter-institutional cooperation in the area of precursor control.

21. In Kazakhstan, through Resolution No. 22 of 23 January 2024, the Government placed 4-methylpropiophenone, a mephedrone precursor, under national control.

22. In New Zealand, in April 2024, pursuant to the Misuse of Drugs (Pseudoephedrine) Amendment Act 2024, cold and flu preparations containing pseudoephedrine were reclassified from prescription to restricted medicines (pharmacist-only), which will allow them to be purchased without a prescription following a consultation with a pharmacist, who must record the person's name and address. Border restrictions for pseudoephedrine remained unchanged.

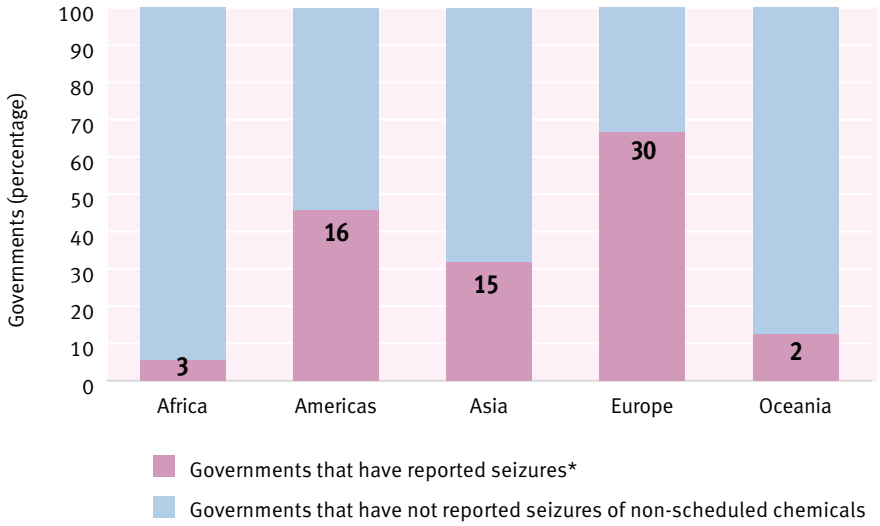
23. The Government of the Russian Federation, through Decision No. 1909 of 14 November 2023, amended the lists of controlled precursors of narcotic drugs and psychotropic substances, trade in which is prohibited or restricted in the country. Specifically, precursors used in the illicit manufacture of amphetamine-, cathinone- and fentanyl-type drugs and in the synthesis of methadone were added, and definitions of "significant", "large" and "especially large" quantities of substances were established for the purposes of determining criminal liability. In particular, control measures (prohibitions or restrictions) were introduced for the following substances: 2-iodo-1-(2,5-dimethylphenyl)propan-1-one; 1-(1,3-benzodioxol-5-yl)-2-iodohexan-1-one; benzoic anhydride; 1-boc-4-AP; 1-phenylhexan-1-one; and EAPA.

24. Through European Commission Delegated Regulation (EU) 2024/1331, IMDPAM, seven esters of P-2-P methyl glycidic acid and six esters of 3,4-MDP-2-P methyl glycidic acid were added as category 1 substances to the annexes of Regulation (EC) No. 273/2004 of the European Parliament and of the Council and Council Regulation (EC) No. 111/2005, effective as at 3 June 2024. Substances in category 1 are subject to the strictest controls under European Union precursor legislation. The inclusion of the two series of esters reflects the implementation of the scheduling decisions of the Commission on Narcotic Drugs of March 2024, which became effective on 3 December 2024.

Measures to address the proliferation of non-scheduled chemicals, including designer precursors

25. Non-scheduled chemicals, that is, chemicals not listed in Table I or Table II of the 1988 Convention, have become a major source of supply for illicit drug manufacture. Although they are not under international control, these chemicals may be controlled nationally in one or more countries, and the control measures applied may vary. As trade and trafficking in many chemicals are global, traffickers are attempting to exploit the varying control landscapes in order to divert these chemicals to clandestine laboratories.

Figure 1. Governments that have seized chemicals not listed in Tables I and II of the 1988 Convention, as reported on form D and through PICS, by region, 2019–2024



*The number of Governments that have reported seizures is indicated in the label.

26. INCB is aware of some 50 countries that that have placed one or more chemicals that are not in Tables I or II of the 1988 Convention under national control. At the same time, INCB is aware of a total of 66 Governments that have reported seizures of such chemicals (see figure 1). The authorities of 15 countries are using the PEN Online Light system to voluntarily notify importing countries and territories of planned exports of chemicals not under international control.

27. To assist Governments in addressing the diversion of non-scheduled chemicals frequently used in the illicit manufacture of drugs and the proliferation of designer precursors, in 2024 the Board carried out the following activities:

(a) The development and dissemination to all competent national authorities of a list of the substances that fall within the extended definitions described in the limited international special surveillance list of non-scheduled substances, that is, the specific derivatives and chemical relatives of the substances in the tables of the 1988 Convention and the limited international special surveillance list. The list, which is available for official use, is aimed at assisting national authorities and relevant industries in implementing Commission on Narcotic Drugs resolution 65/3 of March 2022;

(b) The amendment of the limited international special surveillance list of non-scheduled substances to include two new sections on the following: (a) frequently seen precursors of substances recently scheduled under the Single Convention on Narcotic Drugs of 1961 and the Convention on Psychotropic Substances of 1971 and of new psychoactive substances; and (b) frequently seen cutting agents, adulterants and excipients. Substances in both groups were included on the basis of information shared by Governments on form D and through PICS. The amendments were disseminated as part of the 2024 update of the information package and are available on the Board's secure portal;

(c) The compilation or update and dissemination of information on control measures applied by Governments to chemicals that are not in Tables I or II of the 1988 Convention but that may be used in the illicit manufacture of narcotic drugs, psychotropic substances, controlled precursors or new psychoactive substances. The information is intended for use by competent authorities in their interactions with relevant industries and to support the establishment of a voluntary prior notification mechanism by making enhanced use of the PEN Online Light system for the exchange of information on planned exports involving chemicals not in Tables I or II of the 1988 Convention.

28. At the national level, INCB notes that more Governments are applying the concept of group scheduling to precursors. Notable moves in this direction were made during the reporting period by the Governments of Canada (see para. 15) and China (see para. 17). The Board will reflect such changes in the compendium referred to in paragraph 27 (c), which is available to Governments on the INCB secure website as part of the updated information package on the control of precursors.

29. **To address the proliferation of non-scheduled chemicals, the Board wishes to reiterate its call to Governments to consider:**

(a) **Applying the concept of group scheduling to precursors, that is, the scheduling of chemicals that are closely related to controlled precursors and that may readily be converted to or substituted for those precursors, pursuant to Commission on Narcotic Drugs resolution 65/3;**

(b) **Taking specific measures with regard to chemicals that do not currently have any recognized legitimate uses, which are identified with a symbol in the limited international special surveillance list of non-scheduled substances, and to cooperate with each other to prevent them from reaching clandestine laboratories;**

(c) **Sharing incidents involving non-scheduled substances that are identified as having been used in illicit drug manufacture through PICS or, as a minimum and pursuant to article 12, paragraph 12 (b), of the 1988 Convention, on form D, so as to help establish trends early and alert all Governments accordingly;**

(d) **Using the PEN Online Light system to share information, on a voluntary basis, about planned shipments of common chemicals not under international control with a view to enabling importing countries to take action prior to the arrival of an unwanted or unauthorized shipment, thus preventing its possible diversion.**

E. Submission of data on licit trade in, uses of and requirements for precursors

30. The Economic and Social Council, in its resolution 1995/20, requested Governments to provide, on a voluntary and confidential basis, data on their licit trade in, uses of and requirements for substances listed in Tables I and II of the 1988 Convention. Over the years, those data have proved to be valuable in helping Governments and INCB to understand patterns of regular trade, identify suspicious activity and thus prevent diversion. As at 1 November 2024, 109 Governments had provided information on licit trade in substances in Table I or Table II of the 1988 Convention, and 95 Governments had furnished data on the licit uses of and/or requirements for one or more of those substances (see annex IV).

31. On form D for 2023, nine Governments also provided information on stopped shipments (imports and exports). However, the majority of stopped shipments reported on form D appear to have been stopped for administrative reasons. INCB is also aware of unreported shipments that were stopped because of evidence that the substance might have been diverted into illicit channels. **INCB calls on Governments to share information about stopped shipments more systematically if there is reason to believe that a substance in Table I or Table II is being imported or exported or transiting its territory for use in the illicit manufacture of narcotic drugs or psychotropic substances, in accordance with article 12, paragraph 9, of the 1988 Convention.**

F. Annual legitimate requirements for imports of precursors of amphetamine-type stimulants

32. With a view to providing exporting countries with an additional tool to monitor the amounts of selected amphetamine-type stimulant precursors involved in proposed shipments to importing countries, the Commission on Narcotic Drugs, in its resolution 49/3, requested Member States to provide to INCB estimates

of their annual legitimate requirements for 3,4-MDP-2-P, pseudoephedrine, ephedrine and P-2-P and, to the extent possible, estimated requirements for preparations containing those substances that could be easily used or recovered by readily applicable means. Annual legitimate requirements as reported by Governments are presented in annex V to the present report. By 1 November 2024, the majority of countries and territories had provided at least one estimate of a cumulative total of 910 individual estimates submitted to the Board during the reporting period.

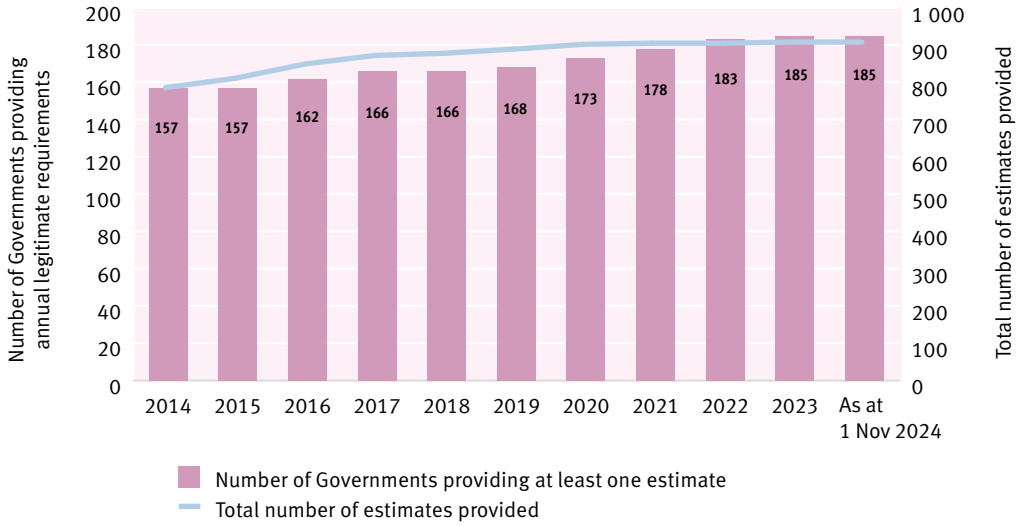
33. Governments have continued to report their annual legitimate requirements for imports of precursors of amphetamine-type stimulants and their preparations to INCB, mostly on form D and, to a lesser extent, by means of individual communications during the year. As at 1 November 2024, 185 Governments had provided at least one estimate (see figure 2). This figure includes a number of territories and States that are not yet parties to the 1988 Convention.

34. The main objective of estimating such requirements is to provide the competent authorities of exporting countries with an indication of the amounts legitimately required by importing countries with a view to facilitating the monitoring of individual shipments and building a clearer picture of trade patterns to enable better monitoring and control. Since the publication of the Board's report on precursors for 2023, 84 countries and territories have reconfirmed or updated their estimates for at least one of the substances.

35. The Board notes the low number of forms submitted for 2023 that contained information on estimates of annual legitimate requirements. Furthermore, some estimates provided to INCB date back more than 10 years and have not been updated. More than 45 countries and territories are in this category, some having missed the opportunity to update their submission for one year and others repeatedly, for several years.

36. In several countries, planned shipments of precursors of amphetamine-type stimulants pre-notified through the PEN Online system exceeded or were close to reaching the estimated annual requirements for the period concerned at the time of the pre-notification, prompting requests from INCB for clarification by the respective competent authorities. It was also noted that several countries had indicated annual legitimate requirements that by far exceeded the amounts imported or pre-notified to them for import, suggesting that unrealistically high estimated requirements had been provided in the first place. In other instances, Governments had indicated on form D the use of a substance or a number of substances for specific purposes; however, they had not provided an indication of the estimated amounts required.

Figure 2. Number of Governments providing estimates of annual legitimate requirements and total number of estimates provided, 2014–2024



37. **INCB invites Governments to review and inform the Board of the methodology used to estimate their annual legitimate requirements for individual precursors to reflect changing market conditions. Furthermore, INCB reminds Governments to report updated or reconfirmed figures through form D on a yearly basis or communicate them by formal means at any time throughout the year as changes to their annual legitimate requirements become necessary**.

38. In order to establish their estimates more accurately, Governments may refer to the *Guide on Estimating Requirements for Substances under International Control*, developed by INCB and the World Health Organization, as well as the recently updated document entitled "Issues that Governments may consider when determining annual legitimate requirements for ephedrine and pseudoephedrine". Both documents are available on the Board's website.

G. Pre-export notifications and utilization of the Pre-Export Notification Online and Pre-Export Notification Online Light systems

39. By invoking article 12, paragraph 10 (a), of the 1988 Convention, Governments of importing countries may formally request exporting countries to inform them of exports prior to shipping. This submission of pre-export notifications has been proved to be one of the most effective means of making the competent authorities of an importing country aware of a planned shipment of precursors destined for their territory, thus enabling them to provide feedback on the legitimacy of a transaction and suspend or stop it in a timely manner, where necessary.

40. Since the launch in March 2006 of the PEN Online system, the Board's automated online system for the exchange of pre-export notifications, the system has become the most effective tool used by Governments to monitor and communicate on, in real time, matters related to international trade in precursor chemicals worldwide. Since October 2022, the twin system, the PEN Online Light system, has provided Governments with the ability to also monitor international trade in precursor chemicals not under international control. In order to increase usage of both systems, during the reporting period INCB trained 20 officials from eight countries on their use.

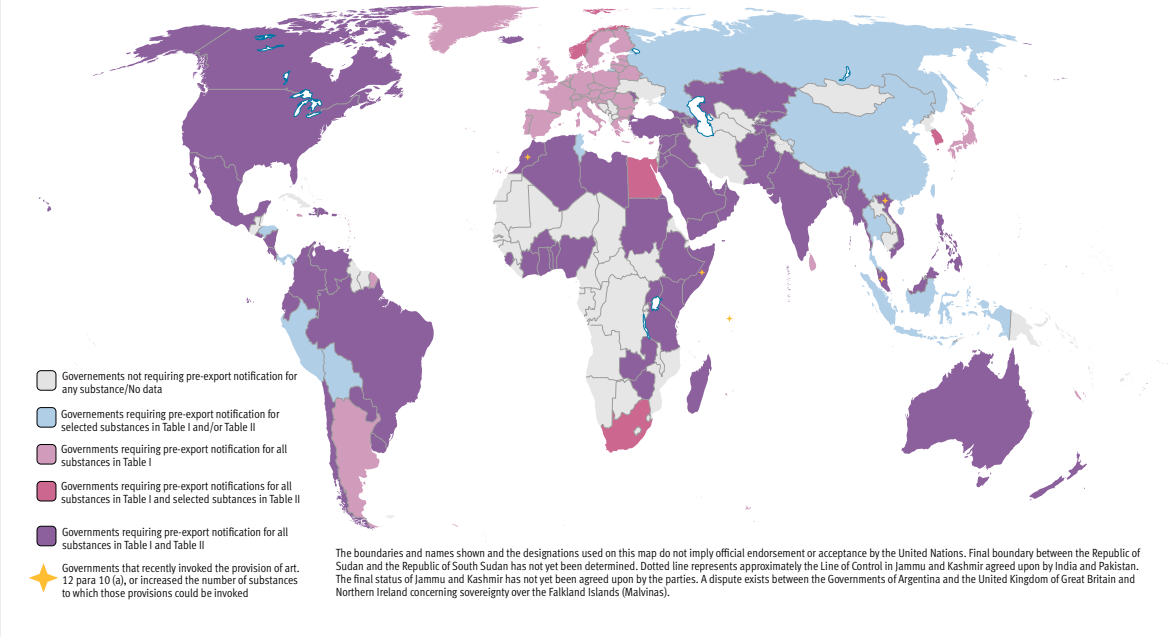
1. Pre-export notifications

41. In 2024, the Governments of Morocco, Somalia and Viet Nam invoked article 12, paragraph 10 (a), of the 1988 Convention for all substances in Tables I and II, thus bringing to 122 the number of Governments that have formally requested to receive pre-export notifications (see map 2 and annex VI). **The Board reiterates its recommendation to Governments to regularly review their national import and export systems applicable to substances controlled under the 1988 Convention and to communicate any updates to INCB**. **Furthermore, the Board calls upon all remaining Governments, in particular those of countries in Africa and Oceania,**[6] **to further strengthen the pre-export notification system by invoking the provisions of article 12, paragraph 10 (a).** The forms to be used for formally requesting to be pre-notified of all shipments of substances included in Tables I and II of the 1988 Convention are available from INCB, including on its secure website.

42. **The Board also wishes to remind the Governments of all exporting countries that it is an obligation to provide pre-export notifications to the authorities of importing countries and territories that have officially requested them. Similarly, the Board reiterates its recommendation to importing Governments to regularly view pre-export notifications involving precursors, in particular if they have requested to receive them, and to respond to exporting authorities in a timely manner, where necessary.**

[6] Angola, Botswana, Burundi, Cabo Verde, Cameroon, Central African Republic, Chad, Comoros, Congo, Cook Islands, Democratic Republic of the Congo, Djibouti, Equatorial Guinea, Eritrea, Eswatini, Fiji, Gabon, Gambia, Guinea, Guinea-Bissau, Kiribati, Lesotho, Liberia, Malawi, Mali, Mauritania, Mauritius, Mozambique, Namibia, Nauru, Niger, Palau, Papua New Guinea, Rwanda, Saint Kitts and Nevis, Samoa, Sao Tome and Principe, Senegal, Seychelles, Solomon Islands, South Sudan, Tuvalu and Vanuatu.

Map 2. Governments that have invoked article 12, paragraph 10 (a), of the 1988 Convention requiring pre-export notification for all or selected substances, as at 1 November 2024



2. Pre-Export Notification Online system

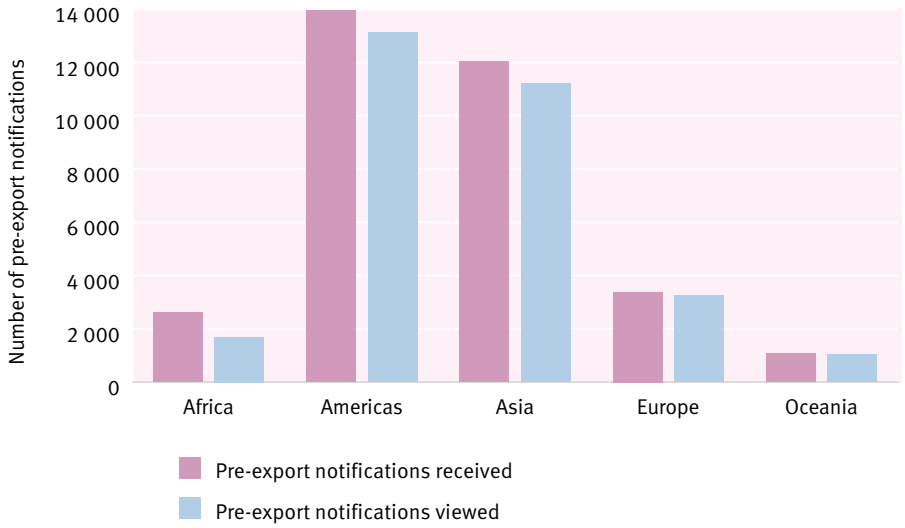
43. Since the publication of the Board's report on precursors for 2023, the number of countries and territories with authorized access to the PEN Online system has remained the same, at 169. Of those, 145 are using the system nearly daily to send notifications about planned exports and/or acknowledge proposed imports. Although the authorities of most countries and territories that are major traders of precursors are actively using the PEN Online system, a number of countries have still not registered to use the system.

44. As at 1 November 2024, about 34,400 pre-export notifications had been communicated by 65 exporting countries and territories through the PEN Online system, which is a slight increase compared with the previous reporting year. While the Board commends the level of active utilization of the system by registered Governments in the Americas, Asia, Europe and Oceania, it is still concerned that not all importing authorities in Africa registered with the PEN Online system view or regularly view pre-export notifications sent to them (see figure 3). **Therefore, the Board strongly encourages all Governments that import or trade in internationally controlled precursor chemicals, particularly those of countries in Africa and Oceania,[7] to register for and make active use of the PEN Online system.**

45. As at 1 November 2024, 8 per cent of the pre-export notifications sent during the reporting year had been objected to, compared with 5 per cent in the previous reporting year. Most of those objections were raised for administrative reasons and, when no evidence of illegal activities could be obtained, the majority of the shipments were subsequently released. **The Board wishes to highlight the importance of launching follow-up investigations should a pre-notified shipment arouse any suspicion and of closely cooperating with relevant authorities and industries to determine whether the order was a diversion attempt.** The Board stands ready to continue to provide all necessary support to Governments in this regard.

[7] Central African Republic, Comoros, Cook Islands, Djibouti, Equatorial Guinea, Eswatini, Guinea, Guinea-Bissau, Kiribati, Lesotho, Liberia, Mauritania, Mozambique, Niger, Palau, Papua New Guinea, Samoa, Sao Tome and Principe, Tonga, Tuvalu and Vanuatu.

Figure 3. Pre-export notifications received and viewed, by region, 1 November 2023–1 November 2024

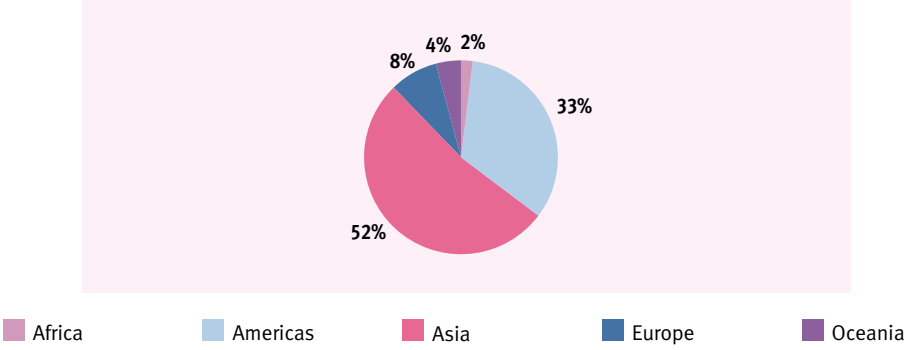


3. Pre-Export Notification Online Light system: sending pre-export notifications for non-scheduled chemicals on a voluntary basis

46. In view of the ongoing use worldwide of chemicals not listed in Table I or Table II of the 1988 Convention in the illicit manufacture of drugs, the Board launched the PEN Online Light system in October 2022. Similar to the PEN Online system, the PEN Online Light system provides a simple, easy-to-use, global platform for the exchange of information about planned transactions of such chemicals in a systematic manner, thus preventing their possible diversion.

47. Since the launch of the PEN Online Light system, almost 1,700 pre-export notifications have been submitted by 15 exporting Governments to 66 importing countries and territories. Most of the pre-export notifications have been sent to countries and territories in Asia and the Americas (see figure 4).

Figure 4. Destination of pre-export notifications submitted through the PEN Online Light system, by region, as at 1 November 2024



48. Approximately 13 per cent of the pre-export notifications received since the launch of the PEN Online Light system have been objected to by importing Governments, indicating their concern over certain non-scheduled substances entering their territory. Most of the objections relate to the substances GBL, sodium hydroxide (caustic soda) and acetic acid, which are also the substances for which notifications are most frequently sent through the PEN Online Light system.

49. The Board remains convinced of the need to improve Governments' knowledge of trade involving their territories in chemicals that are not under international control but that can be used in illicit drug manufacture, in order to prevent their diversion into illicit channels. The monitoring of trade in these chemicals and cooperation globally in this regard are important to address illicit drug manufacture and trafficking (see box 1). **Therefore, the Board strongly advises Governments to establish and strengthen mechanisms for tracking the domestic and international movement of chemicals not listed in Tables I and II and commends those Governments that already actively use the PEN Online Light system to this end. Other authorities of exporting and importing countries and territories that are not necessarily listed under article 12 of the 1988 Convention but that are engaged in trade in internationally non-scheduled chemicals are encouraged to register for and fully utilize the system.**

BOX 1. ADVANTAGES OF SENDING AND RECEIVING PRE-EXPORT NOTIFICATIONS FOR CHEMICALS NOT LISTED IN TABLE I OR TABLE II OF THE 1988 CONVENTION

- **Awareness-raising and prevention of diversion for illicit use:** precursors that are not under international control can still be used in the illicit manufacture of drugs. The illicit manufacture of synthetic drugs, in particular, increasingly often relies on new or alternative precursor chemicals. By receiving pre-export notifications related to such chemicals, importing Governments will be aware of which non-scheduled chemicals are being brought into, or are passing through, their territory and can take the necessary actions to monitor and prevent their diversion into illicit channels.
- **"Know your client principle":** pre-export notifications provide details about exporting and importing companies, some of which may trade only in non-scheduled chemicals and are not, therefore, among the licensed or registered precursor operators under article 12 of the 1988 Convention. Use of the PEN Online Light system allows Governments to analyse the import and export patterns of those companies and verify their legitimacy.
- **Effective threat analysis:** by being aware of and engaging with national industries that trade in substances not under international control, Governments will be able to identify suspicious transactions, keep abreast of emerging trends and determine whether their country is being targeted by traffickers.
- **Enhanced regulatory and law enforcement capabilities – closure of regulatory gaps:** unlike the PEN Online system, access to the PEN Online Light system is not limited to competent authorities under article 12 of the 1988 Convention but is also open to other agencies that regulate or enforce national legislation related to chemicals not listed in Tables I or II of the 1988 Convention. The ability to monitor a broader range of chemicals than those listed in Tables I and II helps to close the loopholes that drug traffickers often exploit to source alternative chemicals or chemical variants that are not under international control.
- **Improved international cooperation:** effective precursor control requires coordinated action across borders. The PEN Online Light system is the only global platform for international cooperation and information-sharing on licit trade transactions involving drug precursors not controlled internationally. Governments that control chemicals not in Tables I or II of the 1988 Convention and that use the PEN Online Light system to submit notifications regarding exports of such chemicals voluntarily can set a good example for other exporting countries and territories, thereby contributing to the creation of a non-invasive preventive monitoring environment based exclusively on a voluntary global compact. Similarly, the benefits of providing advance information about incoming shipments to the authorities of importing countries may gradually convince more Governments to use the PEN Online Light system or to do so more systematically.

H. Other activities and achievements in international precursor control

1. Project Prism and Project Cohesion

50. The operational initiatives of the Board related to precursors are conducted within the framework of Project Prism (in relation to precursors of amphetamine-type stimulants and other synthetic drugs) and Project Cohesion (in relation to precursors of cocaine and heroin). The two projects, steered by the INCB Precursors Task Force,[8] serve as the framework for international cooperation in matters related to trafficking in chemicals used in the illicit manufacture of drugs. Accordingly, they provide platforms for the conduct of time-bound intelligence-gathering operations with a view to collecting information on, among other things, potential gaps or weak links in international precursor control and on new trafficking trends. The projects are thus aimed at assisting Governments in ensuring the necessary level of alertness and developing specific risk indicators to prevent future diversion and ultimately identify the trafficking organizations involved.

51. Project Prism and Project Cohesion focal points are alerted to suspicious shipments and the actual and attempted diversion of precursors, as well as newly emerging precursors. Alerts take the form of special alerts issued to all the focal points and automated push notifications sent via PICS for those focal points registered with the system. Since having up-to-date contact details of the national focal points is critical for ensuring rapid and direct communication between the authorities concerned worldwide, during the reporting period the Board reviewed and updated the focal point lists, with updates being provided by several countries, territories and international organizations. **INCB would like to thank the relevant countries and international organizations for providing updates to the names and contact details of focal points, thereby advancing precursor control efforts worldwide, and encourages them to report changes to those contact details as soon as they occur.**

52. During the reporting period, INCB issued three alerts under the projects. The first provided information on new controls on precursors in China (see para. 17). The second alert related to the theft of a tank container transporting acetic anhydride in the Kingdom of the Netherlands (see para. 143) and the third to procaine seizures and crystallization laboratories in the Kingdom of the Netherlands.

Operation Pseudonym

53. In view of recent incidents related to the diversion of and trafficking in ephedrine and pseudoephedrine, including their preparations, involving countries in Africa, Asia and Europe, a time-bound operation was launched focusing on international and, where possible, domestic trade in ephedrine and pseudoephedrine, including their pharmaceutical preparations. Operation Pseudonym ran for a three-month period commencing on 1 October 2024.

54. The Operation was focused on verifying the legitimacy of licit shipments of the substances and their preparations and on identifying diversion points and areas of illicit manufacture of methamphetamine through backtracking investigations conducted into suspicious shipments and seizures.

55. A total of 60 countries and territories[9] and four international or regional organizations[10] participated in the Operation. Its outcomes will be reported in the Board's report on precursors for 2025.

[8] The current members of the INCB Precursors Task Force are Australia, China, Colombia, Germany, India, Mexico, Netherlands (Kingdom of the), Nigeria, the Russian Federation, South Africa, Switzerland, Türkiye, the United States, the International Criminal Police Organization (INTERPOL), UNODC, WCO, the European Commission and the Inter-American Drug Abuse Control Commission.

[9] Argentina, Armenia, Australia, Austria, Azerbaijan, Bangladesh, Belgium, Bolivia (Plurinational State of), Brazil, British Virgin Islands, Cambodia, Canada, Chile, China, Costa Rica, Cyprus, Czechia, Dominican Republic, Ecuador, Ethiopia, Falkland Islands, Germany, Ghana, Guatemala, Honduras, Hong Kong, China, Hungary, Iceland, India, Italy, Kenya, Lithuania, Luxembourg, Malaysia, Mali, Malta, Montenegro, Morocco, Netherlands (Kingdom of the), New Zealand, Nigeria, Peru, Philippines, Portugal, Qatar, Romania, Saint Vincent and the Grenadines, Slovakia, South Africa, Spain, Suriname, Trinidad and Tobago, Tunisia, Türkiye, Ukraine, United Arab Emirates, United States, Uruguay, Yemen and Zimbabwe.

[10] WCO, the Directorate-General for Taxation and Customs Union and the European Anti-Fraud Office of the European Commission and the Inter-American Drug Abuse Control Commission of the Organization of American States.

56. **The Board wishes to thank all Governments and international and regional organizations that participated actively in Operation Pseudonym, which is expected to provide valuable insight into the possible diversion of ephedrine and pseudoephedrine, including their preparations, from licit international trade.**

Support for investigations into the suspected and actual diversion of precursors of amphetamine-type stimulants

57. During the reporting period, the Board identified a suspicious shipment of 500 kg of ephedrine hydrochloride and 500 kg of pseudoephedrine hydrochloride in the form of raw materials destined for Libya, which had been pre-notified by France through the PEN Online system. Following virtual meetings involving all countries concerned, the Board believes that the shipment was diverted within the European Union (see box 2).

58. The Board continued to cooperate with the competent authorities of Egypt on investigations into the diversion of and trafficking in pharmaceutical preparations containing pseudoephedrine from the country, as new cases were communicated during the reporting period. Furthermore, the secretariat assisted with the exchange of information between Czechia and the United Arab Emirates regarding seizures of pharmaceutical preparations containing pseudoephedrine purportedly manufactured in the United Arab Emirates and seized in Czechia in 2023 and 2024 (see paras. 80 and 82). Consultations on trafficking in pseudoephedrine preparations were also held with several European countries, including Germany, Lithuania, Poland, the Republic of Moldova, Slovakia and Ukraine.

2. Precursors Incident Communication System

59. PICS is the only global secure online platform for sharing actionable information on incidents, including both seizures and suspicious shipments of precursors and equipment used in illicit drug manufacture. The platform enables users – mainly regulatory and law enforcement authorities dealing with precursor matters – to conduct a wide range of analyses and provides the basis for backtracking investigations. PICS has frequently been used to help establish linkages between cases through the identification of similar modi operandi and common entities involved, thereby preventing similar trafficking attempts. PICS has also been effective in serving as an early warning system for the emergence of new chemicals that have later been brought under international control by the Commission on Narcotic Drugs.

60. Launched in 2012, PICS has regularly been upgraded and adapted to ensure seamless information exchange and analysis. During the reporting period, with a view to enhancing user experience, a new data visualization feature was introduced. This feature enables users to interact with PICS data in a more intuitive way and perform more comprehensive analysis in order to support investigations and obtain critical insight into trends in precursors and equipment used in illicit drug manufacture for operational use. Furthermore, in order to familiarize users of PICS with updates to the system, six training sessions, both virtual and in-person, were organized during the reporting period with over 120 participants from 40 countries and three international or regional organizations.

61. During the reporting period, PICS was further enhanced to allow the communication of incidents involving dump sites where traffickers dispose of the chemical waste from illicit drug laboratories. The sharing of information on such incidents, especially if accompanied by pictures related to the dump sites, provides valuable investigative clues to help identify similarities and links between the criminal organizations involved. It also helps to build a picture of the scale of the problem and the environmental hazards caused by illicit drug manufacture.

62. As at 1 November 2024, PICS had over 700 active users from 130 countries and territories, representing 325 agencies in all regions.[11] Information on over 4,800 incidents relating to precursors and equipment had been communicated through the system. Between 1 November 2023 and 1 November 2024, over 500 new precursor- and/or equipment-related incidents were communicated. These incidents involved 147 distinct substances, of which only 18 were internationally controlled, 12 listed in Table I and 6 in Table II of the 1988 Convention.

[11] Governments that have not yet registered PICS focal points for their national authorities involved in precursor control may request an account by writing to incb.pics@un.org.

As in previous years, most of the incidents communicated through PICS involved substances that are not internationally controlled. They included 38 substances in the limited international special surveillance list of non-scheduled substances and 76 other non-scheduled substances. In addition, 14 cutting agents, adulterants, diluents or excipients were reported.

63. During the reporting period, 130 incidents that involved equipment were also reported. This represents a significant increase compared with the number of such incidents communicated in the previous reporting period (14) (see para. 169). The increase is essentially attributable to 109 incidents involving tableting machines or pill presses communicated by Customs and Border Protection of the United States of America. All such interceptions were made at borders. **The Board appreciates the use by Governments of PICS to communicate incidents related to equipment used in illicit drug manufacture, as investigations into the diversion of and trafficking in equipment complement investigations into precursors. Therefore, the Board encourages all Governments to increase the use of PICS to exchange information on incidents involving precursors and equipment in real time and to utilize the dedicated fields for equipment available in PICS to communicate such incidents.**

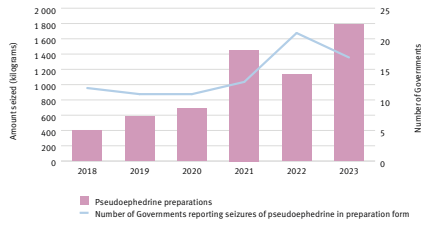
64. As in the previous reporting period, airport (including air cargo), mail and parcel facilities were the locations where most (over 230) of the incidents communicated occurred. More than 85 other incidents occurred in illicit laboratories, indicating the direct use of the substances involved in illicit drug manufacture.

II. Extent of licit trade and latest trends in trafficking in precursors

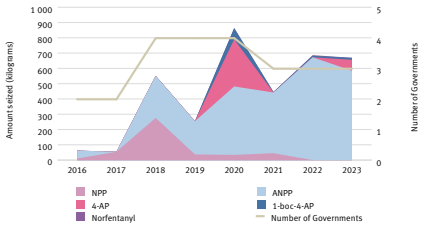
SEIZURE DATA IN FOCUS

- Some of the trends discussed in the present chapter are illustrated below.

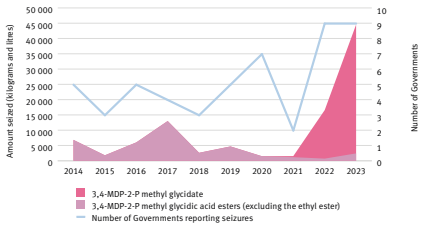
PSEUDOEPHEDRINE PREPARATIONS (paras. 71 and 72)



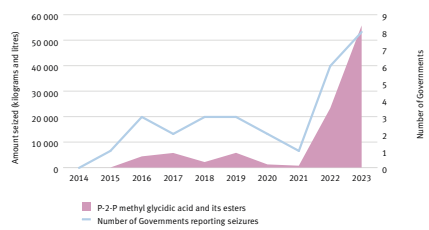
FENTANYL PRECURSORS (paras. 150–153)



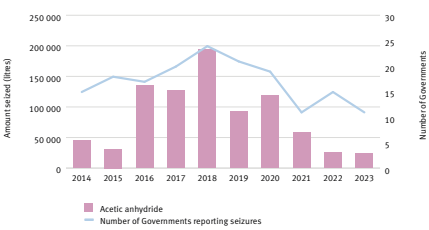
"ECSTASY" PRECURSORS (paras. 103–111)



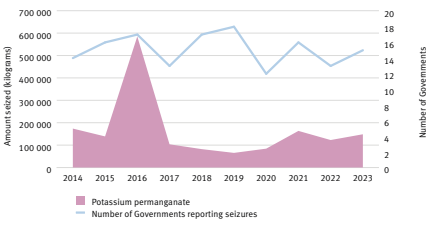
AMPHETAMINE AND METHAMPHETAMINE PRECURSORS: P-2-P METHYL GLYCIDIC ACID (paras. 91–95)



HEROIN PRECURSORS: ACETIC ANHYDRIDE (paras. 137–143)



COCAINE PRECURSORS: POTASSIUM PERMANGANATE (paras. 125–127)



65. The present chapter provides an overview of the major trends and developments in both licit trade and trafficking in precursor chemicals, by substance group, with a view to addressing gaps and weaknesses in precursor control mechanisms. The chapter is based on information provided to the Board through various mechanisms, such as form D, the PEN Online and PEN Online Light systems, PICS, Project Prism and Project Cohesion, and through national reports and other official information provided by Governments. The analysis covers the period up to 1 November 2024.

66. Data on non-scheduled chemicals are generally presented in dedicated subsections but may also be found in the sections providing details on trends relating to substances in Table I and Table II of the 1988 Convention, especially in cases where the non-scheduled chemicals being discussed are part of a more complex development. **INCB would like to thank Governments for the information received and to remind other Governments of their obligation under the 1988 Convention to submit form D annually in a timely manner. Likewise, Governments are encouraged to share information about precursor-related incidents in the most comprehensive and action-oriented way possible through PICS. Without the sharing of such information, new trends in precursor trafficking and illicit drug manufacture cannot be identified and addressed at an early stage, limiting operational cooperation with other countries concerned.**

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

1. Substances used in the illicit manufacture of amphetamines

(a) Ephedrine and pseudoephedrine

67. Ephedrine and pseudoephedrine, including their pharmaceutical preparations, have legitimate medical uses but continue to be exploited by traffickers for illicit drug manufacture. Instances of possible diversion of these substances from international trade have regularly been noted by the Board in recent years and, in 2024, suspected shipments of the substances were objected to through the PEN Online system and subsequently investigated (see box 2). In addition, planned shipments of pharmaceutical preparations containing ephedrine and pseudoephedrine in amounts exceeding the estimated annual legitimate requirements of the countries of destination were also observed through the PEN Online system. Since such preparations are not under international control,[12] notifications of their planned export are not systematically sent through the system. Accordingly, licit trade patterns involving such preparations are not fully clear. The issue is further complicated by the fact that these preparations are advertised and marketed online. Furthermore, common markets, created with a view to facilitating trade among member States, make it difficult to monitor trade in precursors as transactions between member States are not considered to be international trade.

Licit trade

68. Between 1 November 2023 and 1 November 2024, exporting countries sent 5,506 pre-export notifications through the PEN Online system for planned shipments of ephedrine and pseudoephedrine in bulk and in the form of pharmaceutical preparations. The notifications were for a total of almost 1,700 tons of pseudoephedrine, which represents an increase in trade compared with the previous reporting year, and 102 tons of ephedrine, also a slight increase. The shipments originated in 44 exporting countries and territories and were destined for 179 importing countries and territories.

69. India, which is a major exporter of ephedrine and pseudoephedrine in the form of both raw material and pharmaceutical preparations, reported eight stopped shipments of raw ephedrine or pseudoephedrine on form D for 2023. The total quantities involved were in excess of 2 tons. Two of the shipments, amounting to nearly 1 ton of pseudoephedrine in the form of raw material, were destined for Yemen and were objected to on the ground

[12] Pharmaceutical preparations containing ephedrine and pseudoephedrine are not internationally controlled. However, the Board has encouraged the parties to the Convention to control ephedrine and pseudoephedrine in the form of pharmaceutical preparations in the same way as the substances themselves. See INCB, "Compilation of precursor-related recommendations of the International Narcotics Control Board relevant to implementation by Governments". Available at www.incb.org/incb/en/precursors/precursors/recommendations/introduction.html.

that the import permits were not issued by the appropriate office.[13] Furthermore, in May 2024, Kenya objected to a proposed export of 500 kg of pseudoephedrine in the form of raw material, which India had pre-notified through the PEN Online system, as no import permit had been issued to the importer. The matter is under investigation by the Indian authorities.

70. Table 2 below presents the 10 countries with the largest volume of proposed imports of ephedrine and pseudoephedrine, in all forms, ranked in terms of the volume notified through the PEN Online system, in the reporting period.

Table 2. The 10 countries with the largest planned imports of ephedrine and pseudoephedrine, as notified by Governments through the PEN Online system, in all forms, by volume, 1 November 2023–1 November 2024

Ranking	*Ephedrine*	*Pseudoephedrine*
1	Brazil	United States
2	Republic of Korea	Egypt
3	France	Switzerland
4	Nigeria	Pakistan
5	Egypt	Republic of Korea
6	Ghana	Indonesia
7	Denmark	Türkiye[a]
8	United States	Canada
9	South Africa	Japan
10	China, Hong Kong SAR	Saudi Arabia

[a]Since 31 May 2022, "Türkiye" has replaced "Turkey" as the short name used in the United Nations.

Trafficking

71. Global seizures of ephedrines (i.e. ephedrine and pseudoephedrine in all forms) had declined over the period 2012–2022. However, there was a sharp upsurge in quantities seized in 2023, which at over 15 tons, exceeded the quantities seized in the previous two years combined (see figure 5). However, although 37 countries reported such seizures, nearly 95 per cent of the quantity seized globally was attributable to only six – Pakistan (5 tons), Romania (4.3 tons), the Kingdom of the Netherlands (2 tons), China (1.3 tons), India (nearly 1 ton) and Australia (0.6 tons). Of these, the top three countries, Pakistan, Romania and the Kingdom of the Netherlands, do not have a history of significant seizures of ephedrines. Therefore, whether the increase in seizures in 2023 is indeed a reversal of the overall declining trend seen over the previous decade cannot yet be stated with certainty. Notwithstanding that increase in 2023, the overall declining trend in seizures of ephedrines over the past decade continues to be in contrast with the high level of seizures of methamphetamine worldwide in the past four years and is only partly explained by the increase in seizures of designer precursors of P-2-P (see paras. 91–96).

[13]See also the INCB report on precursors for 2023 (E/INCB/2023/4), para. 191.

Figure 5. Seizures of ephedrine and pseudoephedrine, as reported by Governments on form D, and of methamphetamine, as reported on the UNODC annual report questionnaire, 2014–2023

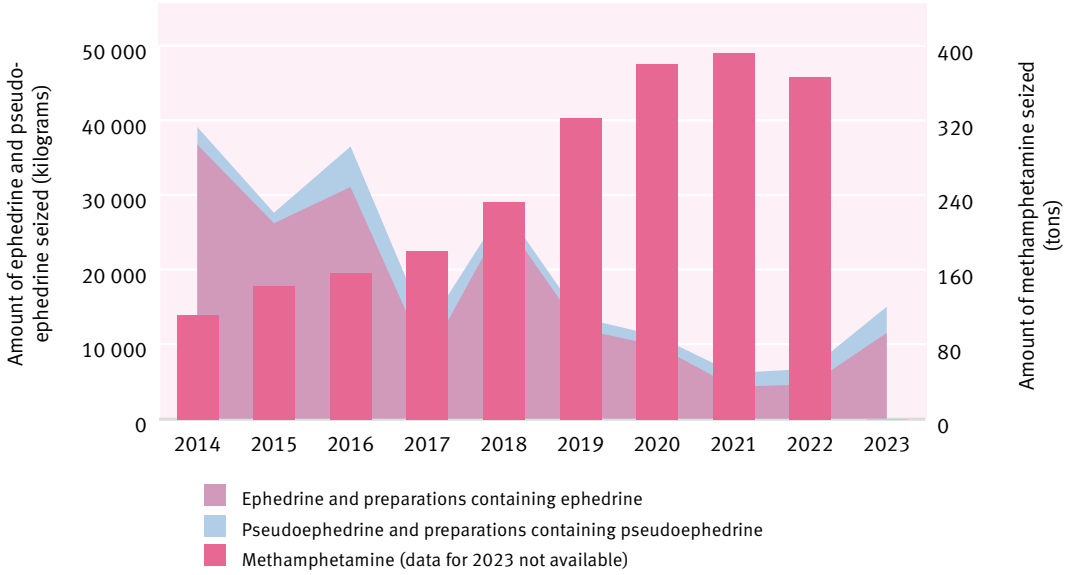
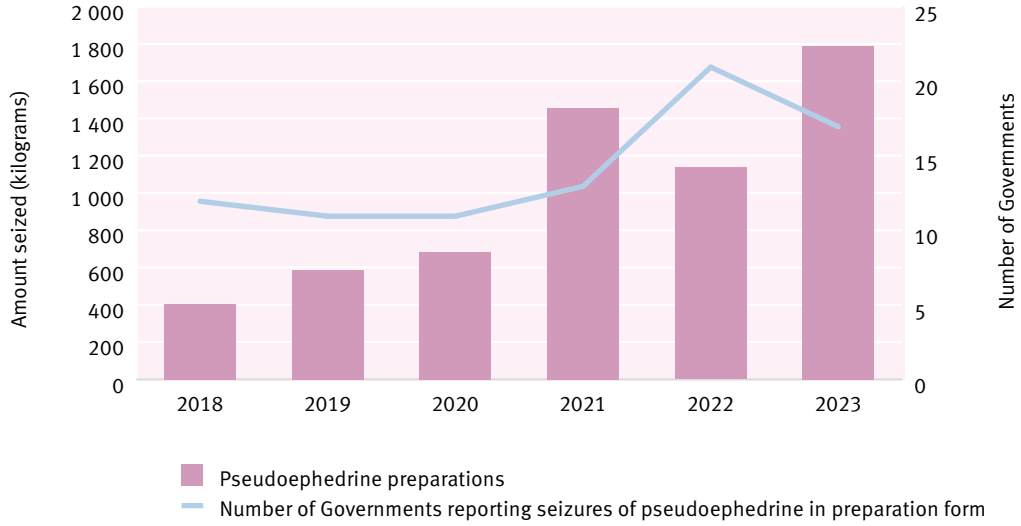


Figure 6. Seizures of pseudoephedrine preparations, as reported by Governments on form D, 2018–2023



72. The increase in seizures of preparations containing pseudoephedrine previously reported by the Board continued in 2023, with the nearly 1.8 tons of pharmaceutical preparations containing pseudoephedrine seized being the largest reported in the past six years and over four times the quantity seized in 2018 (see figure 6). However, the number of countries reporting such seizures, at 17, was less than the number that did so in 2022 (21). India alone accounted for 677 kg of the quantity seized, with Romania (419 kg), Australia (400 kg) and Czechia (113 kg) also reporting seizures in excess of 100 kg. The continued high level of reported seizures of preparations of pseudoephedrine **emphasizes the need for Governments to put in place adequate mechanisms to prevent the diversion of preparations containing chemicals listed in Tables I and II of the 1988 Convention, in particular those containing ephedrine and pseudoephedrine, and to control them in the same way as the substances themselves.**

73. A notable development regarding trafficking in ephedrines was the 21 seizures of a total of over 5 tons of ephedrine in the form of raw material in Pakistan in 2023. This contrasts with seizures amounting to a total of 723 kg reported by the country from 2010 to 2022. All seizures occurred in the border regions between Afghanistan and Pakistan and, in all cases, the origin of the seized substance was reported to be Afghanistan, with the shipments purportedly destined for other countries, possibly for the illicit manufacture of methamphetamine in those countries. The Board is also aware that in October 2023, 324 kg of ephedrine in the form of raw material was seized in Karachi Port, Pakistan, with a suspected final destination in the Kingdom of the Netherlands. The substance had been concealed in bags labelled as talcum powder. Incidentally, earlier in that year, 2 tons of ephedrine in the form of raw material, which had also been mislabelled as talcum powder, had been seized in the Port of Rotterdam in the Kingdom of the Netherlands. The shipment had originated in Afghanistan and had transited Pakistan before reaching the Kingdom of the Netherlands, where it had been intercepted.[14]

74. Although forensic analysis results are not available for the seizures in Pakistan, the Board is aware that the 2 tons of ephedrine seized in the Kingdom of the Netherlands was of natural origin, from the *Ephedra* plant.[15] This provides evidence of the illicit manufacture of ephedrine from the *Ephedra* plant in Afghanistan. It may also suggest the emergence of a new trafficking route from Afghanistan to countries in Europe, including through Pakistan. However, it remains to be seen whether this development marks the emergence of a new trend or is a temporary phenomenon. **Therefore, the Board invites all Governments to fully investigate and report seizures of ephedrine and to cooperate to this end, as the outcome of such investigations will provide insight into trends in the global manufacture of methamphetamine. Governments are also encouraged to cooperate at the international level to determine through forensic profiling analysis the starting material for the ephedrine seized by them.**

75. Afghanistan itself reported seizures of only 60 kg of ephedrine in the form of raw material in 2023. The origin of the substance was not known. Prior to 2023, the country had never reported any seizures of ephedrine in the form of raw material.

76. Among other countries in Asia known for notable ephedrine seizures, China, which on average accounted for over two thirds of global seizures of ephedrine in the decade from 2013 to 2022, reported seizures of only about 1.2 tons, or one tenth of global quantities of the substance seized, in 2023. This represents a significant decline compared with 2018, when China reported seizures of over 25 tons. Most of the ephedrine seized in China was believed to be illicitly manufactured rather than diverted from licit channels, on the basis of seizures of non-scheduled precursors of ephedrine also reported by the country in the past. However, the reasons behind the significant decline in seizures of ephedrine in China remain largely unclear.

77. India reported seizures totalling nearly 1 ton of ephedrines in 2023, about the same as the quantity seized in 2022. However, unlike in 2022, when most of the ephedrines seized were in the form of raw material, the seizures in 2023 were largely of pharmaceutical preparations of pseudoephedrine (a total of 676 kg in three separate cases), with about 260 kg of pseudoephedrine in the form of raw material also having been seized. The origin of the seized substances was India in all cases and, as in the past, Australia was the intended destination in the majority of cases, where the destination was known. The Board is also aware of continued seizures in India in 2024 of ephedrine and pseudoephedrine destined for Australia and New Zealand. In one case, as part of follow-up investigations into a case involving 50 kg of pseudoephedrine that were to be trafficked to Australia and New Zealand, three persons were arrested and trafficking in about 3,500 kg of pseudoephedrine in 45 shipments over the previous three years was revealed. In another case, involving the dismantling of a clandestine methamphetamine laboratory and the seizure of 9 kg of pseudoephedrine, three Mexican nationals with alleged links to a Mexican drug trafficking organization were arrested.

78. In 2023, other destination countries included Myanmar (one case involving 3.9 million tablets of pharmaceutical preparations containing pseudoephedrine) and South Sudan (3.96 million capsules, each of which were supposed to contain 120 mg of pseudoephedrine). In the latter case, chemical analysis found pseudoephedrine

[14] INCB report on precursors for 2023 (E/INCB/2023/4), para. 95.

[15] Ibid.

to be missing from the samples of the capsules tested, and the director of the pharmaceutical company in the northern part of India that had manufactured the "fake" medicine that allegedly contained pseudoephedrine was later arrested on charges of diverting 475 kg of pseudoephedrine by not mixing it with the medicine. The Board is aware of other instances of pharmaceutical companies diverting the active ingredient – ephedrine or pseudoephedrine – into illicit channels and producing fake medicines without the claimed quantity of active ingredients. **The Board therefore encourages Governments to put in place effective controls and monitoring mechanisms over domestic manufacturers of pharmaceutical preparations containing ephedrine and pseudoephedrine in order to achieve the twin goals of preventing the diversion of precursors into illicit channels and preventing the manufacture of fake medicines, which has serious health implications.**

79. In Oceania, every year since 2020 Australia has reported annual seizures of nearly half a ton of pseudoephedrine in the form of pharmaceutical preparations. This continued in 2023, with seizures of 440 kg of such preparations in 298 cases. Of the quantity seized, 243 kg (in 11 cases) had been sourced in Malaysia and 176 kg (in 43 cases) in India. New Zealand continued to report notable seizures in 2023, with over 250 kg of pseudoephedrine in the form of raw material being seized and Hong Kong, China (163 kg), Singapore (43 kg) and India (17 kg) being the major sources.

80. In Europe, the largest seizures of ephedrines in 2023 were reported by Romania, at levels that were unprecedented for the country. In total, seizures of 1.9 tons of ephedrine in the form of raw material (one case), 960 kg of ephedrine in the form of preparations (two cases), 1 ton of pseudoephedrine in the form of raw material (two cases) and 419 kg of pseudoephedrine in the form of preparations (two cases) were reported by the country. Although no further details were provided, the seizures may be related to the dismantling in 2023 of a criminal group responsible for the manufacture and distribution of at least 4.7 tons of methamphetamine by the authorities of Czechia, Poland, Romania and Slovakia with the support of the European Union Agency for Criminal Justice Cooperation (Eurojust) and the European Union Agency for Law Enforcement Cooperation (Europol). In this case, a Romanian company had been used to supply pharmaceutical preparations containing ephedrine and pseudoephedrine that had been manufactured in such a manner as to facilitate quick extraction of the precursors from the preparations for methamphetamine manufacture.[16]

81. The case serves to emphasize the need for Governments to verify and submit accurate estimates of their annual legitimate requirements to the Board, as after the dismantling of the criminal network, the annual legitimate requirements reported by Romania for ephedrine in the form of raw material were reduced to nil following an increase from 1 ton in 2021 to over 8 tons in 2022. The spike in the reported requirements for ephedrine in the form of raw material in the period 2022–2023 may have been attributable to the requirements related to the Romanian company, with at least some of the pharmaceutical preparations manufactured being for illicit purposes. **Governments need to remain vigilant about increases in the quantities requested by companies and to examine consequent imports of such substances.**

82. Authorities believe that following the case in Romania, criminals began to acquire pseudoephedrine for the manufacture of methamphetamine by smuggling pharmaceutical preparations from various countries in Africa, Asia and Europe. In 2023 and 2024, Egypt was reported as a suspected country of origin of ephedrine and pseudoephedrine, including in the form of pharmaceutical preparations, seized in Germany (six incidents) and the Republic of Moldova (two incidents), which had been destined for Czechia and Slovakia, among other countries. The seized tablets had been concealed in coffee bags.

83. As a result of the large seizures in Romania (see para. 80) and the Kingdom of the Netherlands (see para. 73) in 2023, the quantities reported seized in Europe as a region were the highest in over two decades. In addition, in 2024, a case involving the possible diversion from international trade of 500 kg each of ephedrine and pseudoephedrine in the form of raw material, which had originated in France, also came to light (see box 2).

[16] Ibid., box on p. 19.

BOX 2. LICIT INTERNATIONAL TRADE IN PRECURSORS – THE NEED FOR CONTINUED VIGILANCE BY GOVERNMENTS FOLLOWING DIVERSION ATTEMPTS

The monitoring of licit international trade in precursors is a critical component of international precursor control. Article 12, paragraph 9 (a), of the 1988 Convention requires each party to establish and maintain a system to monitor international trade in substances in Tables I and II in order to facilitate the identification of suspicious transactions. Such monitoring systems must be applied in close cooperation with manufacturers, importers, exporters, wholesalers and retailers, who must inform the competent authorities of suspicious orders and transactions. Furthermore, article 12, paragraph 10 (a), requires exporting countries to provide importing countries with advance notification of shipments of substances in Table I. The PEN Online system has been facilitating the sending of such notifications for several years and has proved to be very effective in reducing the diversion of precursors from licit international trade.

Instances continue to come to light that emphasize the need for Governments to strengthen their monitoring mechanisms for international trade, including scrutiny of the legitimate needs of importing countries, vigilance against possible red flags related to shipments that may indicate illicit activity and the need for the companies concerned to report suspicious orders and transactions to authorities.

In early January 2024, a pre-export notification was submitted by France through the PEN Online system for a shipment of 500 kg of ephedrine hydrochloride and 500 kg of pseudoephedrine hydrochloride in the form of raw materials destined for Libya. The information available in the PEN Online system indicated that the companies involved in France and Libya appeared to be first-time exporters and importers, respectively. Furthermore, the large amounts of the substances ordered, as well as the identification of previous suspicious shipments of pseudoephedrine to Libya from other countries, led to inquiries with the countries concerned. Subsequently, the Libyan authorities determined that the import permit had been forged and had not been issued by the competent authority in the country and objected to the shipment in the PEN Online system within the time frame provided by the French authorities. However, the French authorities had received an earlier email, allegedly from an official at the Ministry of Health of Libya, confirming the legitimacy of the shipment, and the shipment had already been released by the time the PEN Online system response was received. It later transpired that the shipment never reached Libya, a country which had no legitimate needs for ephedrine or pseudoephedrine in the form of raw material, and there was no record of the shipment leaving the territory of the European Union.

Investigations to locate the shipment are ongoing. The case serves as a timely reminder that licit international trade in precursors remains vulnerable to diversion. Effective use of the PEN Online system, including due diligence in the case of first-time exporters or importers, can help prevent such trafficking attempts.

(b) Norephedrine and ephedra

Licit trade

84. Between 1 November 2023 and 1 November 2024, pre-notifications were processed through the PEN Online system by 12 exporting countries for 184 shipments of norephedrine to 36 importing countries, involving more than 22 tons of raw material and approximately 917 kg in the form of pharmaceutical preparations, which represents a 20 per cent increase in the amount of preparations pre-notified compared with the previous year. Shipments amounting to 1 ton or more were pre-notified to the following importing countries, in descending order of the amounts shipped: United States, Denmark, Philippines and Myanmar. No shipments of ephedra were pre-notified.

Trafficking

85. Seizures of norephedrine reported on form D for 2023 or communicated through PICS in the first 10 months of 2024 were negligible. This contrasts with the situation some 20 years ago, when several countries in nearly all regions of the world reported seizures of up to 250 kg.

86. Seizures of ephedra have primarily been reported by China in recent years, although INCB is also aware of seizures of locally grown ephedra in Afghanistan in 2018, a new development then, which was identified as requiring closer monitoring.[17] The amounts seized in China have shown a continued downward trend, from the over 100 tons seized in 2019 and 2020, to the nearly 30 tons seized in 2021 and 2022 and just 5 tons seized in 2023.

[17] INCB report on precursors for 2018, para. 82.

No further details of the seizures were provided. Kyrgyzstan also reported seizures of 63 kg of ephedra in 2023 and communicated a seizure of 284 kg in April 2024 through PICS.

(c) P-2-P, phenylacetic acid, APAAN, APAA and MAPA

87. Of the five substances P-2-P, phenylacetic acid, APAAN, APAA and MAPA, only P-2-P and phenylacetic acid have legitimate uses (see annex IX) and are traded internationally on a notable scale. However, instances of diversion of the two substances from legitimate trade have been rare in recent years, and seizure data for 2023 confirm the continued declining importance to traffickers of the two precursors. Where seizures are reported, they often involve material that has been illicitly manufactured from one of their precursors, including internationally non-scheduled precursors. Seizure data also confirm the continued declining importance to traffickers of APAAN, APAA and MAPA, which have largely been replaced by as yet non-scheduled alternative precursors, namely, esters of P-2-P methyl glycidic acid (see paras. 91–102 below).

Licit trade

88. Between 1 November 2023 and 1 November 2024, proposed international trade in P-2-P and phenylacetic acid remained at a level similar to that of previous years. Thirty-four proposed shipments of P-2-P, from four exporting countries to 11 importing countries, and 753 proposed shipments of phenylacetic acid, from 16 exporting countries to 48 importing countries and territories, were pre-notified through the PEN Online system. As APAAN, APAA and MAPA are designer precursors without legitimate uses beyond limited use for reference and laboratory analytical purposes, international trade in them is limited or non-existent.

Trafficking

89. Seizure data submitted by Governments for the year 2023 confirm the decrease in importance of P-2-P and phenylacetic acid, as well as their alternatives (APAAN, APAA and MAPA), which have gradually been placed under international control since 2014, as starting materials for illicit drug manufacture. Seizures of P-2-P and phenylacetic acid, in particular in Europe and North America, have typically not been as a result of diversion from legitimate trade but rather of illicit manufacture of P-2-P or phenylacetic acid from alternative precursors.

90. Eleven countries submitted data on **P-2-P** seizures on form D for 2023, amounting to about 15,500 litres, and two countries reported seizures of **phenylacetic acid**, amounting to 790 kg. The largest seizures of both substances were reported by Mexico (9,900 litres of P-2-P and 785 kg of phenylacetic acid). The Kingdom of the Netherlands reported seizures of over 5,400 litres of P-2-P, mainly in clandestine laboratories, where it was encountered as an intermediate and had itself been manufactured from alternative precursors. Australia reported seizures of more than 170 litres of the substance, which had originated in China, including Hong Kong. Australia also reported seizures of 2 litres of phenylacetic acid, which had originated in Singapore, and almost 170 kg of **MAPA**, the largest quantity reported seized globally in 2023, which had originated in China. **The Board notes that no seizures of any of the five internationally controlled amphetamine precursors were reported in or adjacent to West Asia, where interceptions of large amounts of amphetamine-based "captagon" tablets are reported.**

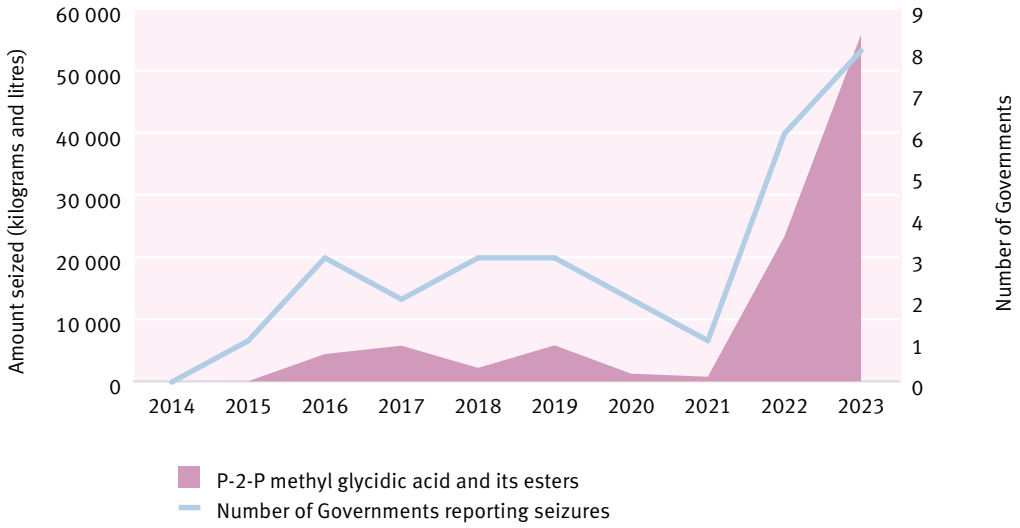
(d) Use of non-scheduled chemicals and other trends in the illicit manufacture of amphetamine and methamphetamine

91. The unprecedented increase in the number of seizures and amounts seized of **P-2-P methyl glycidic acid and its esters** resulted in the international scheduling of these substances in 2024 (see paras. 1 and 2). Seizures in the past have mostly involved P-2-P methyl glycidic acid, its sodium salt and methyl ester; however, in 2023, the **ethyl ester**, also known as BMK ethyl glycidate, was encountered in the Kingdom of the Netherlands for the first time.

92. Seizures of P-2-P methyl glycidic acid and its esters are still predominantly reported by countries in Europe, with more countries in that region reporting such seizures in 2023 than in the past. In some cases, the seizures were the result of investigations and risk analysis within the European Union customs territory. A phenomenon observed in the region was the shift in the point of submission of documents for clearance by customs authorities of shipments involving P-2-P methyl glycidic acid and its esters away from initial points of entry, which has also been seen with shipments involving 3,4-MDP-2-P methyl glycidic acid esters (see para. 110).

93. In addition, seizures of P-2-P methyl glycidic acid and its esters have now been reported by countries in North America and Oceania, albeit on a significantly smaller scale. On form D, eight countries reported seizures of a total of nearly 56 tons of P-2-P methyl glycidic acid esters (see figure 7), which could have been converted into about 15 tons of amphetamine or methamphetamine. First-time seizures were reported by Austria (0.2 kg), Hungary (16 tons), New Zealand (2.1 kg) and Sweden (100 kg).

Figure 7. Seizures of P-2-P methyl glycidic acid and its esters, as reported by Governments on form D, 2014–2023



94. Seizures communicated through PICS in 2024 amounted to more than 12 tons and 1,300 litres. About 30 per cent of incidents occurred at airports, about the same ratio as in 2023, and involved the smuggling of mislabelled or misdeclared contraband; about 55 per cent of seizures were made in clandestine laboratories or warehouses, typically in the Kingdom of the Netherlands. Where such information was available, the consignments originated in China, including Hong Kong. In this connection, it is noteworthy that China placed P-2-P methyl glycidic acid and all its esters under control on 1 September 2024 (see para. 17).

95. A notable incident communicated through PICS involved the seizure of significant amounts of **precursors of a P-2-P methyl glycidic acid derivative** in a clandestine laboratory in South Africa. Although evidence collected from the laboratory is still being forensically verified, the seizure provides the first instance known to INCB of the illicit manufacture of methamphetamine from scratch using this synthesis method.

96. While the long-term effects of the controls applied in China and the international scheduling of P-2-P methyl glycidic acid and a number of its esters in 2024 remain to be seen, during the reporting period, and unlike similar situations in the past when controls were tightened, no new alternative chemicals have as yet come to the Board's attention. Specifically, in 2023, only a few seizures of other designer precursors of amphetamine and methamphetamine, such as **DEPAPD**, were reported on form D.

97. In most regions, established traditional manufacturing methods continued to be seen. For example, forensic profiling analysis of methamphetamine seized in the United States and allegedly originating in Mexico continues to suggest that the substance was manufactured using a synthetic pathway through phenylacetic acid and P-2-P. Consistent with this, Mexico reported on form D seizures of significant amounts of both substances, which were likely manufactured from their precursors, predominantly using **benzyl cyanide**-based methods (see para. 99). Significant seizures of benzyl chloride (13.7 tons), sodium cyanide (6.5 tons) and lead acetate (655 kg) provide supporting evidence for this. Furthermore, seizures of considerable quantities of **tartaric acid**, **AIBN** and **methyl thioglycolate** in Mexico confirm the continued high efficiency and industrial scale of the illicit manufacture of methamphetamine in that country.

98. A similar level of efficiency and industrialization also continues to characterize the illicit manufacture of methamphetamine in Western Europe, namely, in Belgium and Netherlands (Kingdom of the). This includes the use of tartaric acid to enhance potency (chemically, enantiomeric enrichment) and AIBN and methyl thioglycolate to maximize output of the more potent form of methamphetamine (see paras. 119 and 120, and box 3). Although no details of the chemicals involved were provided, France reported its first case of large-scale methamphetamine manufacture, with the involvement of Mexican nationals, suggesting the emergence of France as another country in Western Europe with notable illicit manufacture of synthetic drugs.

99. As in past years, several Governments reported seizures of common chemicals associated with various methods of illicitly manufacturing amphetamine and methamphetamine (see figure 8).[18] Some chemicals are precursors of controlled precursors, while others are reagents that are characteristic of the methods in question, namely:

(a) The nitrostyrene method of P-2-P manufacture, which uses benzaldehyde and nitroethane;

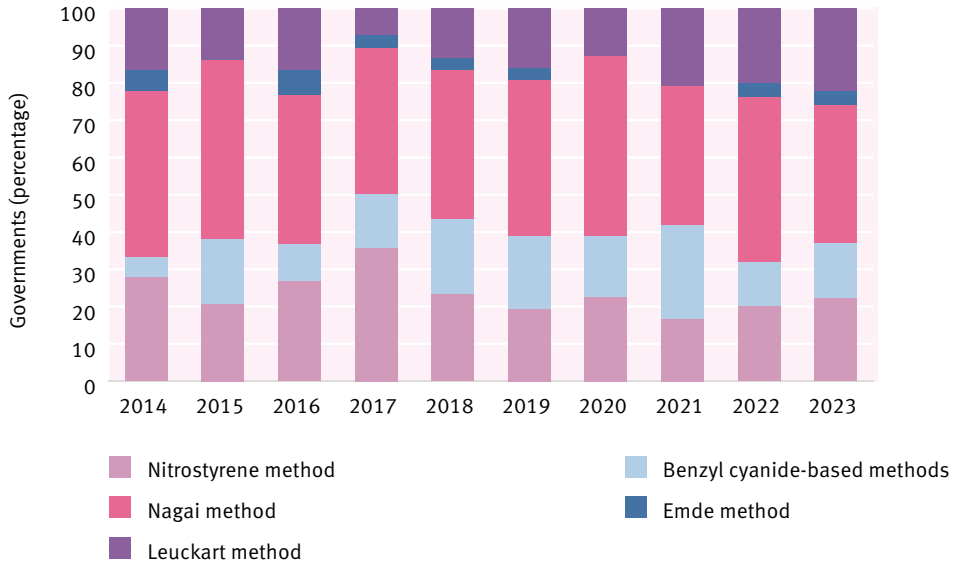
(b) Benzyl cyanide-based methods of P-2-P manufacture via APAAN or phenylacetic acid. These methods use benzyl chloride and sodium cyanide, or begin directly with benzyl cyanide;

(c) The P-2-P-based Leuckart method, which uses formamide or ammonium formate and formic acid (for amphetamine), or *N*-methylformamide or methylamine and formic acid (for methamphetamine);

(d) The ephedrine-based Nagai method of methamphetamine manufacture and its modifications, which use combinations of one or more of the following chemicals: iodine, hydriodic acid, red phosphorous, hypophosphorous acid and phosphorous acid, in addition to ephedrine or pseudoephedrine;

(e) The ephedrine-based Emde method of methamphetamine manufacture and its modifications, which are characterized by the use of **thionyl chloride** or **phosphorous pentachloride**.

Figure 8. Governments that have reported seizures of chemicals associated with different methods of illicitly manufacturing amphetamine or methamphetamine on form D, 2014–2023



Note: The figure depicts the number of Governments reporting one or more of the chemicals referred to in paragraph 99.

[18] The reductive amination method, a P-2-P-based method that uses hydrogen gas and ammonia (for amphetamine) or methylamine (for methamphetamine) is not included because it is also a common method for manufacturing MDMA, and seizures of the related chemicals may not be indicative of the illicit manufacture of amphetamine or methamphetamine. The Birch method, an ephedrine-based method that uses anhydrous ammonia and sodium or lithium metal, is not included as it is typically used only in small-scale settings to supply a limited number of customers.

100. Most of the chemicals associated with these manufacturing methods have several legitimate uses. INCB welcomes that fact that the authorities of some exporting countries use the PEN Online Light system to inform their counterparts in importing countries or territories about planned shipments in legitimate trade of these chemicals.

101. Similarly, INCB welcomes the use of forensic profiling analyses to generate information about manufacturing methods and the chemicals used. While the use of benzyl cyanide-based methods for the illicit manufacture of methamphetamine has been established in North America, it has not yet been confirmed for countries in East and South-East Asia.

102. In 2023, both Myanmar and Thailand reported first-time seizures of **benzyl cyanide**, amounting to 67,000 litres and 25 tons, respectively. This constitutes a change from the past, when equally significant amounts of sodium cyanide were reported by the two countries. In addition to reflecting the successes of law enforcement authorities, the seizures of benzyl cyanide may also indicate a shift by traffickers away from the primary, more closely controlled chemical, sodium cyanide, to the intermediate chemical, benzyl cyanide. However, given the quantities involved, which would be enough to manufacture nearly 50,000 litres of P-2-P,[19] and the fact that none of the seizures were made in clandestine laboratories, **INCB once again encourages the Governments concerned to continue gathering evidence of the actual use of benzyl cyanide-based methods and the associated chemicals in the illicit manufacture of methamphetamine.**

2. Substances used in the illicit manufacture of MDMA and its analogues

103. Of the six precursors[20] of MDMA (commonly known as "ecstasy") and its analogues, which were under international control as at 1 November 2024, only piperonal has notable legitimate uses and is traded internationally. However, instances of diversion of piperonal from legitimate trade have been rare to non-existent in recent years. The same applies to seizures of most of the other precursors, with the exception of 3,4-MDP-2-P methyl glycidic acid and its methyl ester. To address the use of other esters of 3,4-MDP-2-P methyl glycidic acid in illicit manufacture, seven of them were placed in Table I of the 1988 Convention on 3 December 2024 (see para. 1).

(a) 3,4-MDP-2-P, 3,4-MDP-2-P methyl glycidate, 3,4-MDP-2-P methyl glycidic acid and piperonal

Licit trade

104. Between 1 November 2023 and 1 November 2024, 16 exporting countries and territories notified the authorities of 60 importing countries and territories of 820 proposed exports of piperonal. The number of both exporting countries and importing countries in that period was about the same as in previous years. As in the past, international trade in 3,4-MDP-2-P and its designer precursors, 3,4-MDP-2-P methyl glycidic acid and 3,4-MDP-2-P methyl glycidate, was very limited or non-existent.

Trafficking

105. On form D for 2023, 10 Governments submitted data on seizures of 3,4-MDP-2-P, 3,4-MDP-2-P methyl glycidate, 3,4-MDP-2-P methyl glycidic acid and piperonal. As in the past, there were no notable incidents involving the diversion of **3,4-MDP-2-P** from legitimate sources; seizures were typically made in clandestine laboratories, where the substance had been synthesized from one of its precursors. An alleged seizure of 3,4-MDP-2-P reported by Italy in 2022 was in fact later confirmed to have been the ethyl ester of 3,4-MDP-2-P methyl glycidic acid, which was not controlled internationally at the time. Australia reported seizures of **piperonal** that had originated in Singapore (100 kg) and the United Arab Emirates (2 kg). The seizures were the third largest seizures of the substance reported in the past 10 years.

[19] 1,000 litres of benzyl cyanide could be converted into about 540 litres of P-2-P, via APAAN.

[20] Isosafrole, 3,4-MDP-2-P methyl glycidate, 3,4-MDP-2-P methyl glycidic acid, 3,4-MDP-2-P, piperonal and safrole.

106. Seizures of **3,4-MDP-2-P methyl glycidic acid** and its **methyl ester** (both under international control since November 2019) were reported by five countries in 2023, the same number as in 2022, thus confirming yet again the decreasing attractiveness to traffickers of designer precursors once they are placed under international control (see figure 9). No seizures of the two substances were communicated through PICS in the first 10 months of 2024.

(b) Safrole, safrole-rich oils and isosafrole

Licit trade

107. Between 1 November 2023 and 1 November 2024, five exporting countries sent 33 pre-export notifications regarding safrole to the authorities of 14 importing countries and territories through the PEN Online system, involving a total of almost 30,000 litres. Given that this amount was more than 100 times the total amount pre-notified through the PEN Online system in previous years and that almost the entire amount was imported in a single shipment to a country that had not been known as a major importer in the past, the Board verified the legitimacy with the authorities concerned. There were no imports of safrole-rich oils or isosafrole during the reporting period.

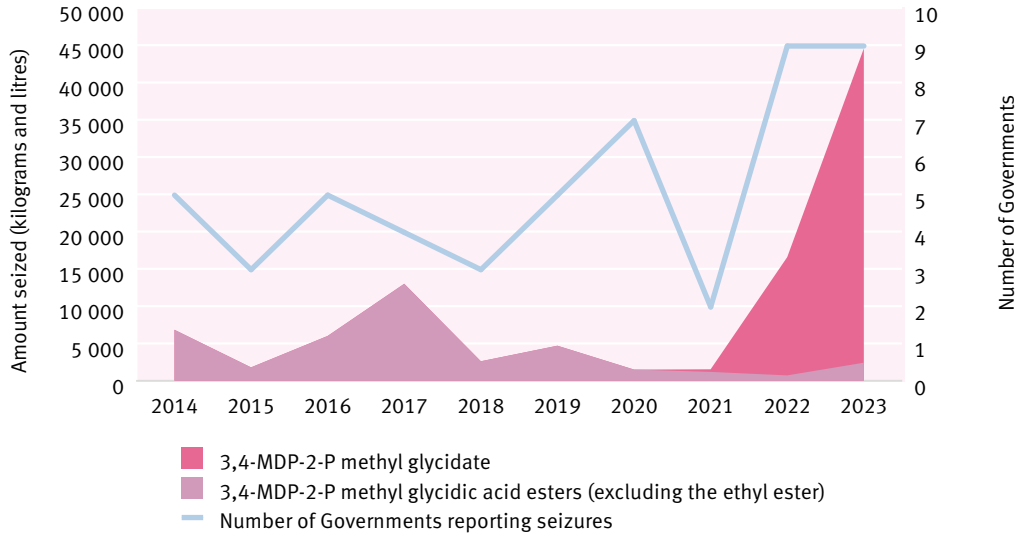
Trafficking

108. Seizures of safrole, safrole-rich oils and isosafrole reported on form D for 2023 or communicated through PICS up to 1 November 2024 were negligible. Instead, the large majority of precursors of MDMA seized globally are now sourced from chemical synthesis. Natural raw materials, such as safrole-containing plants, appear to play a marginal role. In addition to the easier accessibility of precursors from chemical synthesis, tighter controls and/or better enforcement of controls over these plant raw materials in source countries, such as Cambodia, may also be a reason for the marginal role that natural raw materials now play as a source of safrole.

(c) Use of non-scheduled chemicals and other trends in the illicit manufacture of MDMA and its analogues

109. In 2023, the amounts of **3,4-MDP-2-P ethyl glycidate** seized continued to increase, a development that resulted in the international scheduling of the substance in 2024, together with seven additional esters of the relevant acid (and similar to the situation with P-2-P methyl glycidic acid and its esters) (see paras. 1 and 2). On form D, five countries reported seizures of a total of more than 42 tons of 3,4-MDP-2-P ethyl glycidate in 2023, while seizures of the internationally controlled methyl ester and acid amounted to less than 2.5 tons (see figure 9). These amounts combined could have been converted into more than 20 tons of MDMA.

Figure 9. Seizures of 3,4-MDP-2-P methyl glycidic acid esters, as reported by Governments on form D, 2014–2023



110. As in the past, the largest amounts of 3,4-MDP-2-P ethyl glycidate continued to be seized in Europe. A new development of note is the size of individual seizures. For example, Germany and Hungary reported single seizures of 11.5 tons and 13 tons, respectively. Both shipments were misdeclared transit shipments being sent from China, via Germany and Hungary, to the Kingdom of the Netherlands. Shifts in the location of seizures within the European Union customs territory away from initial points of entry appear to be the result of greater attention by customs authorities at those points of entry. German authorities also observed patterns of smuggling via air freight and sea cargo, with shipments mislabelled as "non-dairy creamer" or "electronics" and the involvement of small logistics companies in Germany, from where the shipments were sent to further destinations in Europe, mainly to Belgium and Netherlands (Kingdom of the).

111. In the first 10 months of 2024, 20 incidents involving 3,4-MDP-2-P ethyl glycidate were communicated through PICS, amounting to more than 7 tons. Only one incident occurred outside Europe, in Australia. 60 per cent of seizures were the result of law enforcement investigations, in particular in the Kingdom of the Netherlands. Information about the origin of the substance was only available for 25 per cent of the incidents and in all cases, it was China, including Hong Kong. In 2024, there was only one incident involving an alternative precursor of MDMA, namely, the **sodium salt of IMDPAM**, a designer precursor seized for the first time in the Kingdom of the Netherlands in February 2023. The seizure (5 kg) was effected in a clandestine polydrug laboratory.

3. Other trends in the illicit manufacture of amphetamine-type stimulants

112. In addition to alternatives to key precursors, a number of other chemicals not included in the tables of the 1988 Convention, such as acids, bases, catalysts, reagents, separating agents and solvents, are required in the illicit manufacture of different amphetamine-type stimulants. In 2023, as in previous years, notable seizures of methylamine, hydrogen gas and tartaric acid and related separating agents were reported on form D. Unfortunately, in most cases, the context was insufficient to determine the specific substance that was to be manufactured using these chemicals.

113. Most of the chemicals have widespread legitimate applications and are traded in notable amounts. As tight monitoring of international trade and domestic distribution is not feasible for most of these chemicals, the focus must be on the identification of suspicious orders and transactions, an activity that requires close and trustful cooperation between national authorities and industry (see paras. 171–173 below). **The Board encourages Governments to consider using the PEN Online Light system to notify the authorities of importing countries of planned shipments of these substances, thus aiding understanding of patterns of trade and possible vulnerabilities.**

BOX 3. USES OF SELECTED CHEMICALS IN ILLICIT DRUG MANUFACTURE

METHYLAMINE

Methylamine is a methylating agent that is used in the illicit manufacture of several synthetic drugs, including amphetamine-type stimulants (e.g. methamphetamine and MDMA), synthetic cathinones (e.g. mephedrone), ketamine and ephedrine.

HYDROGEN GAS

Hydrogen gas is used as a reducing agent in the illicit manufacture of several synthetic drugs, including amphetamine, methamphetamine and MDMA via the reductive amination method.

TARTARIC ACID

Tartaric acid is a separation agent that is used to increase the potency of methamphetamine manufactured using P-2-P-based methods. It is also used for similar purposes in the illicit manufacture of ephedrine from 2-bromopropiophenone, its precursor propiophenone and other ephedrine pre-precursors. Traditionally, tartaric acid is also associated with the illicit manufacture of heroin, namely, the extraction of morphine from opium.

(continued)

AIBN (OR DIMYRISTYL PEROXYDICARBONATE) AND METHYL THIOGLYCOLATE

AIBN (or dimyristyl peroxydicarbonate) and methyl thioglycolate are typically encountered in connection with P-2-P-based manufacturing methods to convert ("racemize") the unwanted, less potent *l*-methamphetamine into a 50:50 mixture of *d*- and *l*-methamphetamine, which can subsequently be separated ("resolved") by using tartaric acid. As a result, more of the more potent *d*-form of methamphetamine is produced.

CUTTING AGENTS (ADULTERANTS AND DILUENTS) AND EXCIPIENTS

Cutting agents are used to bulk ("cut") drugs to maximize profits. While diluents, such as lactose, are inert substances that have no pharmacological effects, adulterants, such as caffeine, have a pharmacological, often psychoactive, effect. Excipients are substances such as binders and lubricants that aid the manufacturing process for tablets and capsules (see paras. 166–170 below).

Methylamine

114. In 2023, 10 countries reported seizures involving a total of 18,500 litres of methylamine and more than 65 tons[21] of its hydrochloride salt on form D. In the first 10 months of 2024, incidents involving a total of more than 19,500 litres and 3 tons of methylamine were communicated through PICS. The majority of seizures occurred in Europe, in particular in illicit laboratories and warehouses in the Kingdom of the Netherlands, where the substance was likely used for the illicit manufacture of MDMA and methamphetamine. The seizure in India of 3 tons of methylamine was associated with the illicit manufacture of mephedrone.

115. Mexico reported a seizure of nearly 750 litres of **formaldehyde**, one of two chemicals required for the illicit manufacture of methylamine, in 2023.

Hydrogen gas

116. Seizures and thefts of gas cylinders containing hydrogen gas have regularly been reported on form D. Of note are the thefts of large quantities reported by Germany since 2015. Authorities estimate that the amount stolen between 2015 and 2023 (145,000 litres) could have been used, together with other chemicals, in the illicit manufacture of up to 217 tons of MDMA.

117. Stolen gas cylinders are frequently recovered in the Kingdom of the Netherlands and, to a lesser extent, Belgium. In 2023, the Kingdom of the Netherlands reported seizures of more than 8,300 litres of hydrogen gas. Thefts from the premises of gas distribution companies in Germany in 2023 were smaller in both number and amount than in the years 2019 to 2022. This was likely the result of the arrest of two suspects in Germany who, like all suspects identified so far, had been hired specifically to steal the gas cylinders.

118. In the first 10 months of 2024, hydrogen gas thefts in Germany and seizures in the Kingdom of the Netherlands continued to be communicated through PICS. About 3,500 litres of hydrogen gas were reported stolen in Germany, while seizures in the Kingdom of the Netherlands amounted to 8,000 litres.

Tartaric acid

119. Quantities of tartaric acid reported seized on form D for 2023 reflected a significant increase compared with 2022 in all reporting countries. In Mexico, more than 23 tons were seized, about 10 times the amount seized in 2022. Seizures in the Kingdom of the Netherlands amounted to nearly 10 tons and in Belgium to about 1.2 tons; in both countries, the amounts seized in 2023 were nearly five times the amounts seized in 2022. Seizures communicated through PICS in the first 10 months of 2024 totalled 16.5 tons and included first-time seizures of notable amounts of the substance in industrial-scale laboratories in South Africa, the set-up of at least one of which closely resembled methamphetamine laboratories seen in Mexico.

[21] The amount includes 25 tons disposed of in Argentina in 2023. The substance was initially imported in 2017; however, the importing company went bankrupt before the import could be formalized.

AIBN, methyl thioglycolate, thioglycolic acid and dimyristyl peroxydicarbonate

120. Seizures of AIBN, methyl thioglycolate, thioglycolic acid and dimyristyl peroxydicarbonate have only been reported from countries in Europe (namely, Belgium and Netherlands (Kingdom of the)) and Mexico. On form D for 2023, Austria reported for the first time the seizure of a small amount of AIBN. In the first 10 months of 2024, three incidents involving AIBN and one incident involving methyl thioglycolate in the Kingdom of the Netherlands were communicated through PICS.

Cutting agents (adulterants and diluents) and excipients

121. In 2023, eight countries reported seizures of cutting agents and tablet excipients. As in the past, the substance most frequently reported was **caffeine**. It was reported to be used to cut heroin, ketamine and methamphetamine, among others. Although most countries do not currently have laws or regulations that specifically target trade in the substances that may be used as cutting agents in illicit drug manufacture, monitoring them can provide valuable information for efforts to counter drug supply and trafficking. Article 13 of the 1988 Convention provides a framework for action against cutting agents and excipients.

B. Substances used in the illicit manufacture of cocaine

1. Potassium permanganate

122. Potassium permanganate is the principal oxidizing agent used in the illicit manufacture of cocaine, and most cocaine that is seized continues to be highly oxidized.[22]

Licit trade

123. Between 1 November 2023 and 1 November 2024, the authorities of 33 exporting countries and territories sent 1,880 pre-export notifications to 113 importing countries and territories relating to a total of more than 33,000 tons of potassium permanganate, which represents almost the same trade in the substance as in the previous reporting year. The main exporters were China, followed by India, the Kingdom of the Netherlands and the United States.

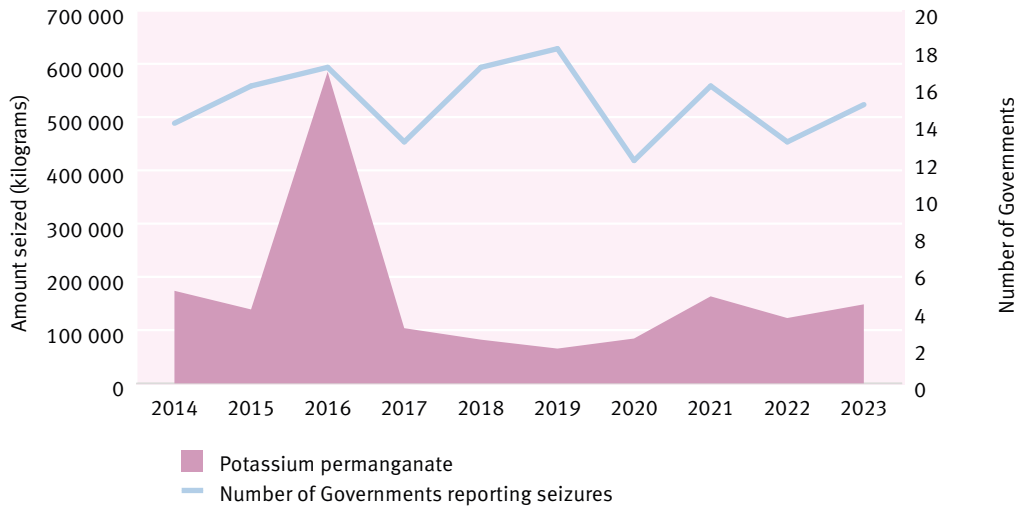
124. Imports of the substance by the three coca-producing countries in South America – Bolivia (Plurinational State of), Colombia and Peru – continued to account for a very limited proportion (less than 1 per cent) of the total global amount imported. Imports of the substance by other countries in South America totalled 1,243 tons, which represents a slight increase compared with the amount reported the previous year. Of those countries, Argentina, Brazil and Chile had pre-notified exports of potassium permanganate, involving a total of 11.2 tons.

Trafficking

125. On form D for 2023, 15 countries and territories reported seizures of potassium permanganate amounting to more than 148 tons (see figure 10). As in previous years, the largest seizures were reported by countries in South America and cumulatively accounted for around 98 per cent of the total amount of potassium permanganate reported seized in 2023. Colombia reported the largest seizures, amounting to more than 139 tons (in 281 incidents), the third largest amount of the substance seized by the country in the past decade. The second largest seizures of the substance, amounting to over 4 tons, were reported by the Plurinational State of Bolivia, and the third largest amount (over 3.7 tons) was reported by Peru. For both Bolivia (Plurinational State of) and Peru, the amounts reported seized in 2023 were significantly higher than in previous years. Chile also reported seizures of the substance; however, the amount was small. Although very little information related to the seizures was provided to the Board, the information available continues to suggest that the substance originated from within the country in which it was seized.

[22] Continuing the trend identified in previous years, results from the Cocaine Signature Program of the United States Drug Enforcement Administration Special Testing and Research Laboratory indicate that less than 1 per cent of the cocaine samples examined, from seizures in 2023 in the United States, were moderately or not oxidized.

Figure 10. Seizures of potassium permanganate, as reported by Governments on form D, 2014–2023



126. Countries in Europe also continued to report seizures of the substance, suggesting that the large-scale extraction of cocaine from smuggled carrier materials and its further processing continue in Europe, in particular in countries of the European Union. In 2023, the largest seizures of potassium permanganate, amounting to 2 tons, were reported by Spain.

127. Seizures of potassium permanganate continued to be communicated through PICS. In the first 10 months of 2024, 150 kg of potassium permanganate was seized in a clandestine laboratory in South Africa, and Chile reported a seizure of 500 kg in a warehouse. In the latter case, the substance had been mixed with various commodities.

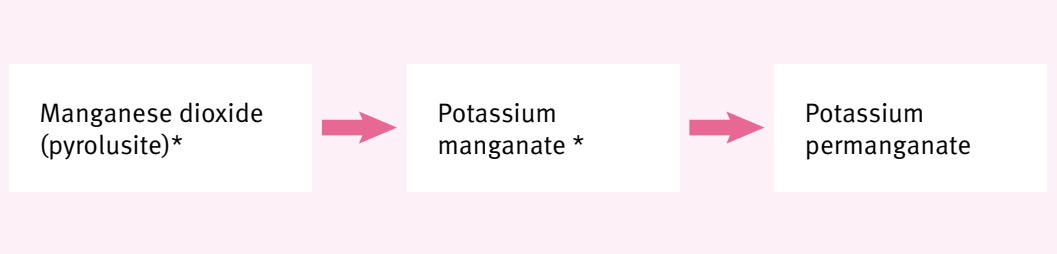
2. Use of non-scheduled chemicals and other trends in the illicit manufacture of cocaine

128. Similar to other drugs, cocaine processing has undergone notable changes over the years, reflecting increased levels of sophistication and efficiency. As a result, a wider range of chemicals are now employed in the process, either as precursors of or alternatives to traditional precursors, or as a complement to them to increase efficiency. Several of these chemicals, which are not under international control, have long been controlled in the countries concerned, especially in countries in South America. As they are often common chemicals with legitimate uses, domestic distribution channels are commonly the source of supply. Individual seizures often involve significant quantities and include amounts seized both for administrative reasons, that is, they are in contravention of applicable regulations, and because of actual illicit intent.

Chemicals used to illicitly manufacture controlled precursors or substitute for controlled precursors used in cocaine processing

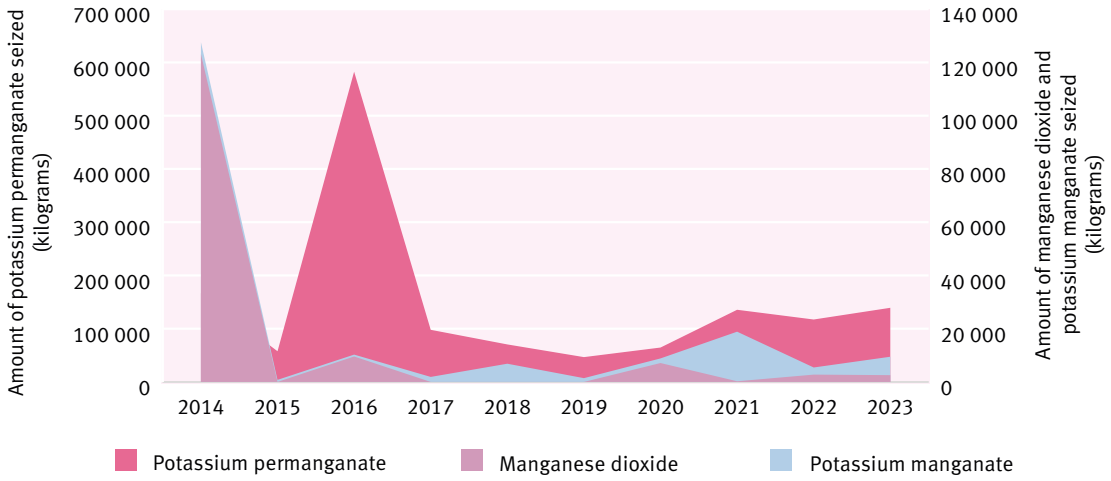
129. **Manganese dioxide** (pyrolusite) and **potassium manganate** are the two most frequently reported chemicals used in the manufacture of potassium permanganate (see figure 11). Colombia remained the only country to report such seizures. Specifically, in 2023, 2.5 tons of manganese dioxide and nearly 7 tons of potassium manganate were seized, which together could have been used to manufacture more than 5 tons of potassium permanganate. However, as in past years, compared with the amounts of potassium permanganate seized (see figure 12), the amounts of precursors of the substance seized remained small.

Figure 11. Alternative chemicals used in the illicit manufacture of cocaine



* Not under international control but included in the limited international special surveillance list of non-scheduled substances.

Figure 12. Seizures of potassium permanganate, manganese dioxide and potassium manganate, as reported by Colombia on form D, 2014–2023



130. Other substances needed in cocaine processing, in addition to potassium permanganate, include ammonia, ethyl ether, hydrochloric acid and sulphuric acid. Notable seizures of one or more of these chemicals were reported by countries in which cocaine processing, including secondary extraction, is known to be carried out. While all of these chemicals may also be illicitly manufactured, the extent of their illicit manufacture remains unknown. Although several countries report seizures of chemicals that may be used as precursors of one or more of the four substances, in most cases they do not provide information about the drug or precursor that was intended to be illicitly manufactured. An exception to this is Peru, which reported the illicit manufacture of ammonia and hydrochloric acid in 2023.

Chemicals that help to improve the efficiency of the cocaine manufacturing process

131. Seizures of **sodium metabisulfite**, a chemical used to standardize the oxidation level of cocaine base sourced from multiple extraction laboratories prior to further processing, have predominantly been reported by the three coca-producing countries, namely, Bolivia (Plurinational State of), Colombia and Peru, as well as the Bolivarian Republic of Venezuela. In 2023, seizures amounted to more than 90 tons and included notable amounts seized in transit in Ecuador. In most countries that reported seizures of sodium metabisulfite, the substance had been diverted from domestic distribution channels.

132. In 2023, the largest seizures of **calcium chloride**, a chemical used as a drying agent for solvents, thus enabling them to be recycled and reducing the need for fresh solvents, were also reported by Peru, Colombia, the Plurinational State of Bolivia and Ecuador, in that order. Ecuador reported all seizures as a transit country, with the consignments destined for Colombia. Seizures of calcium chloride elsewhere may also indicate the recycling of solvents for other drugs.

133. As in previous years, smaller, yet still notable, seizures of both substances in some European countries, including Belgium, Netherlands (Kingdom of the) and Spain, reflect the existence in Europe of cocaine secondary extraction or "washing" laboratories, where smuggled cocaine is recovered from carrier materials.

C. Substances used in the illicit manufacture of heroin

1. Acetic anhydride

134. Acetic anhydride is a key precursor of heroin and a frequently and widely traded chemical that is included in Table I of the 1988 Convention. The substance is required not only in the illicit manufacture of heroin but also in certain P-2-P-based methods used in the illicit manufacture of amphetamine and methamphetamine (see annex VIII).

Licit trade

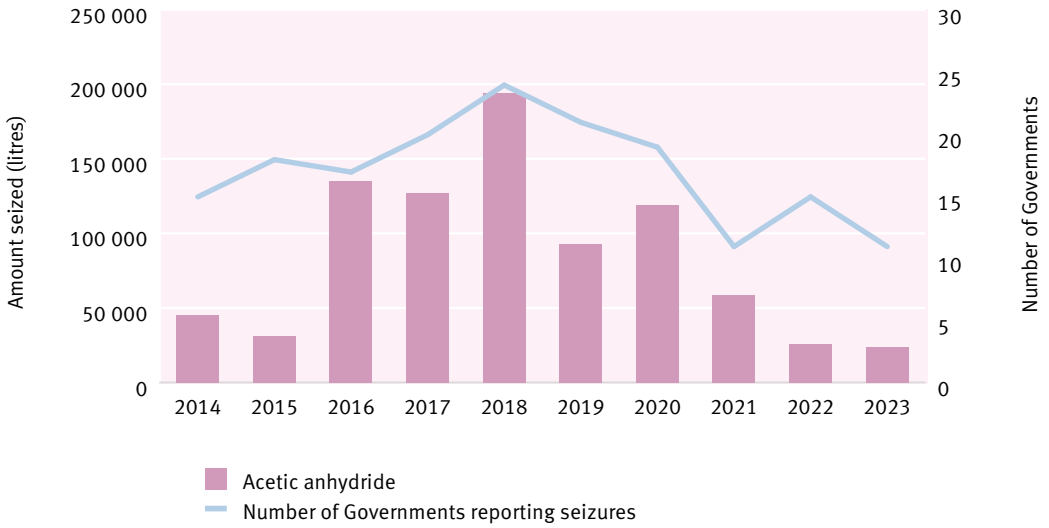
135. From 1 November 2023 to 1 November 2024, the authorities of 28 exporting countries and territories used the PEN Online system to submit 2,239 pre-export notifications for shipments of acetic anhydride. The shipments were destined for 88 importing countries and territories and involved a total of approximately 0.8 billion litres of acetic anhydride, a decrease compared with the previous reporting period.

136. From 1 November 2023 to 1 November 2024, the competent national authorities of importing countries objected to a total of 101 of 2,239 shipments of acetic anhydride (4.5 per cent), mostly for administrative reasons. In the previous reporting period, the importing countries had objected to 3.9 per cent of pre-notified shipments of acetic anhydride.

Trafficking

137. In recent years, the number of attempts to divert acetic anhydride from international trade has remained low, and most of the known instances of diversion were from domestic trade and distribution.

Figure 13. Seizures of acetic anhydride, as reported by Governments on form D, 2014–2023



138. The total amount of acetic anhydride seized worldwide, according to information provided by Governments on form D, has continued to decline since 2018 (see figure 13). In 2023, 11 countries reported on form D seizures of a total of 23,695 litres of the substance. In comparison, 15 countries reported seizures of a total of 25,593 litres in 2022. In 2023, the largest seizures of the substance were reported by China (15,794 litres), Pakistan (4,230 litres), Myanmar (1,710 litres), the Kingdom of the Netherlands (740 litres), Türkiye (620 litres) and Afghanistan (400 litres). The remaining five countries reported seizures of the substance not exceeding 100 litres per country. The seizures in Pakistan consisted of three incidents near the border with Afghanistan. The origin of the acetic anhydride seized in Pakistan was unknown. In China, the seizures of acetic anhydride were the result of domestic law enforcement operations.

139. Owing to a lack of recent information on the capacity and efficiency of heroin laboratories in Afghanistan and the amount of opium stored and available for conversion into heroin in the country following the ban prohibiting the cultivation of opium poppy and all types of narcotics announced by the de facto authorities in April 2022, it is difficult to estimate the amount of acetic anhydride required for the illicit manufacture of heroin in Afghanistan in 2023 and 2024.

140. According to UNODC, in 2023, opium production in Afghanistan declined by 95 per cent, from 6,200 tons in 2022 to 333 tons. Those 333 tons of opium could be converted into 24 to 38 tons of export quality heroin (50–70 per cent purity). In contrast, in 2022, the amount of export quality heroin was estimated by UNODC to be 350–580 tons. The illicit manufacture of 24 to 38 tons of export quality heroin would require between 12,000 and 67,000 litres of acetic anhydride, based on the Board's conversion figures (see annex VIII). The reported seizures of acetic anhydride in Afghanistan (400 litres) and neighbouring Pakistan (4,230 litres) indicate that the substance continues to be trafficked to Afghanistan, albeit on a smaller scale.

141. South-East Asia has continued to be an important region for the production of opium and the manufacture of heroin. While the cultivation of opium poppy and the production of opium are monitored annually in Myanmar, in the Lao People's Democratic Republic, such cultivation and production were last surveyed in 2015. Therefore, it is difficult to assess the impact of the Taliban ban on the cultivation of opium poppy in Afghanistan on global manufacture of heroin, including in South-East Asia.

142. In 2023, the estimated production of dry opium in Myanmar was 1,080 (760–1,720) tons, which represents an increase of 36 per cent compared with the 2022 estimate. In 2023, it was calculated that 5.8 tons of heroin were consumed in Myanmar and between 58 and 154 tons of heroin were exported.

143. Although countries in the European Union used to be a source of acetic anhydride, which was diverted and trafficked from the region to West Asia, the significance of the region has gradually diminished. The recent theft, in August 2024, of 27,000 litres of acetic anhydride in the Kingdom of the Netherlands, 15,000 litres of which were later recovered, could not be conclusively connected to the illicit manufacture of a specific drug. The recovered acetic anhydride was found together with sizeable amounts of solvents, including methyl ethyl ketone and ethyl acetate.

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

144. **Acetyl chloride** is a chemical known to be a possible substitute for acetic anhydride as an acetylating agent in the conversion of morphine to heroin. Acetyl chloride is therefore included in the limited international special surveillance list of non-scheduled substances and is also controlled in several countries, including Afghanistan, Iran (Islamic Republic of) and Pakistan.

145. In the past 10 years, seizures of the substance have been reported on form D by Belgium, France, Iran (Islamic Republic of), Netherlands (Kingdom of the) and the United Arab Emirates. The largest seizures were reported by the Islamic Republic of Iran (26,300 litres) and the United Arab Emirates (2,500 litres). In 2023, only the Kingdom of the Netherlands reported a seizure of the substance (17 litres) on form D. In addition, since 2024, seizures of acetyl chloride have been communicated through PICS by Afghanistan, Hong Kong, China, India and Türkiye.

146. **Glacial acetic acid** is a chemical that is included in the limited international special surveillance list of non-scheduled substances due to its potential use in the illicit manufacture of some drugs and precursors, including P-2-P and 3,4-MDP-2-P. In the past, the substance has repeatedly been reported as being used as a cover load or to otherwise conceal acetic anhydride. On form D for 2023, the amounts of glacial acetic acid reported seized worldwide totalled 1,400 litres. Most of that amount was seized in Ecuador and Peru.

147. **Ammonium chloride** is another non-scheduled chemical frequently associated with the illicit manufacture of heroin, in which it is used in the process of extracting morphine from opium. It is also required for the illicit manufacture of methylamine. Only Peru reported seizures of a small amount of ammonium chloride on form D for 2023.

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

148. With the exception of precursors of fentanyl, fentanyl analogues and other synthetic opioids, similar to previous years there have been no notable developments related to precursors of other narcotic drugs and psychotropic substances. This applies to both licit trade in and seizures of **precursors of phencyclidine and other phencyclidine-type drugs** (i.e. piperidine) and **LSD** (i.e. ergometrine, ergotamine and lysergic acid). With regard to **precursors of methaqualone**, although there have been no reports of seizures of the traditional precursors, anthranilic acid and *N*-acetylanthranilic acid, in 2023, South Africa reported the seizure, in a storage facility, of 3 tons of phthalimide, a precursor of anthranilic acid not under international control.

Precursors of fentanyl, fentanyl analogues and other synthetic opioids, and alternative chemicals

Licit trade

149. During the reporting period, trade in four of the five fentanyl precursors under international control (NPP, ANPP, 4-AP, 1-boc-4-AP and norfentanyl) continued to be limited to small amounts for analytical research and reference purposes (see table 3). As in the past, the most notable trade was in NPP, which is used as a starting material for the legitimate manufacture of fentanyl. The largest exporters were France and India, in that order, and the largest importers were the United States and South Africa, also in that order.

Table 3. Planned transactions in international trade pre-notified through the PEN Online system, 1 November 2023–1 November 2024

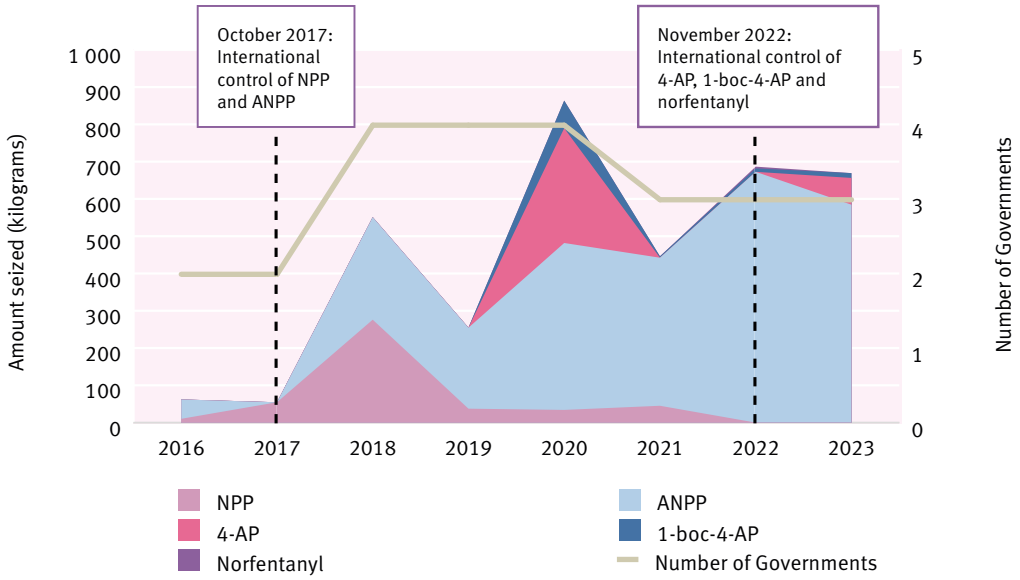
Substance	*Number of exporters*	*Number of importers*	*Number of pre-export notifications*	*Total amount traded (kg)*
NPP	3	3	5	900
ANPP	2	10	17	0.002
4-AP	1	1	1	0.002
1-boc-4-AP	–	–	–	–
Norfentanyl	5	16	49	6.677

Trafficking

150. As in past years, Mexico and the United States were the only countries that reported notable seizures of fentanyl precursors on form D for 2023. **ANPP** was the most frequently seized fentanyl precursor under international control (see figure 14), with a total of more than 580 kg seized. This is compared with an amount of just 2 grams traded annually. By contrast, there were no notable seizures of the more widely traded **NPP**. The Board has observed this apparent contradiction before, which suggests that ANPP may be being supplied through

unregistered operators or through the "grey market".[23] While Mexico and the United States did not provide any information on the origin of the fentanyl precursors seized, Australia, which reported 14 seizures, amounting to a total of 100 grams, identified Belgium, China, India, Singapore and the United Kingdom of Great Britain and Northern Ireland as the countries of origin.

Figure 14. Seizures of fentanyl precursors under international control, as reported by Governments on form D, 2016–2023



*Mexico also reported seizures of 855 litres and 113 litres of ANPP in 2022 and 2023, respectively, as well as 72 litres of 1-boc-4-AP in 2023. As the concentration of the solutions was not indicated, these amounts could not be converted into weights and are not reflected in the figure. However, seizures of solutions may indicate the existence of illicit fentanyl synthesis laboratories.

151. With regard to the two fentanyl precursors that were scheduled internationally in 2024, namely, 1-boc-4-piperidone and 4-piperidone, a total of 2.5 tons of **1-boc-4-piperidone** was seized globally in 2023. The entire amount, which could have been used to manufacture between 1.2 and 2.8 tons of fentanyl, was seized in the United States while being transhipped to Mexico. The origin was not specified. There were no seizures of **4-piperidone** reported on form D. However, Canada communicated a seizure of more than 630 kg of the substance, in the form of its monohydrate hydrochloride salt, through PICS. The incident also involved notable amounts of MDMA designer precursors and GBL. Polyprecursor seizures involving significant amounts of precursors for different drugs are a phenomenon now observed more frequently.

152. The United States was the only country to report notable seizures of other alternative fentanyl precursors in 2023. This included 650 kg of **2-phenethyl bromide**, a chemical that is not under international control and that is required together with other fentanyl precursors in various synthesis methods. It also included the first report to INCB of a seizure of 6 kg of **1-CBz-4-piperidone**, another derivative of 4-piperidone designed to circumvent controls (a "masked" precursor). Although the substance is not under international control, it is included in the limited international special surveillance list of non-scheduled substances as one of several closely related derivatives that INCB recommends that national authorities bring to the attention of industry actors to aid those actors in denying traffickers access to such alternative chemicals. No seizures of **precursors of fentanyl analogues** were reported on form D for 2023.

[23] For the purposes of the present report, a "grey market" refers to a market outside regulatory control and where the boundaries between legitimacy and illegality are not readily apparent.

153. In October 2024, the Kingdom of the Netherlands communicated a seizure of 1-boc-4-piperidone through PICS. This was the first reported seizure of a fentanyl precursor in Europe. It was also the only seizure of any precursor of fentanyl or fentanyl analogue, or of any of the known alternative chemicals, communicated through PICS in the first 10 months of 2024. The lack of reporting of seizures, especially in North America (with the exception of the United States), contrasts with the abundant media coverage of the smuggling of such chemicals, including in official media reports. **INCB therefore reminds Governments to make greater efforts to share information about trafficking incidents involving fentanyl precursors, including on form D and through the more active and timely use of PICS. It is only sufficiently detailed actionable information that enables the authorities of the countries concerned to investigate cases and prevent incidents of trafficking in precursors using similar modi operandi in the future.**

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

1. Precursors of GHB

154. **GBL** is a chemical precursor of GHB and **1,4-butanediol** is a chemical precursor of GBL. Both substances are also prodrugs of GHB, that is, they are converted into GHB when ingested. Governments have reported seizures of both substances on form D for more than 20 years. However, reporting has not been systematic because some countries control GBL as a precursor while others control it as a psychotropic substance.

155. Compared with seizures of GBL, which has frequently been reported in notable amounts (see figure 15), seizures of 1,4-butanediol have been smaller, amounting to about 1,500 litres in the 20-year period from 2004 to 2023. This has included notable seizures in Canada in 2004 (about 1,020 litres) and in Türkiye in 2023 (about 330 litres). The following Governments have reported seizures of 1,4-butanediol on form D since 2004: Argentina, Australia, Austria, Belarus, Canada, Estonia, Finland, Germany, Hungary, Norway, Spain, Sweden, Türkiye and United States.

156. Given their dual nature as precursors and prodrugs, incidents involving both substances are not only communicated through PICS but also through IONICS. Incidents reported through IONICS typically involve retail-level quantities.

Figure 15. Seizures of GBL, as reported by Governments on form D, 2004–2023

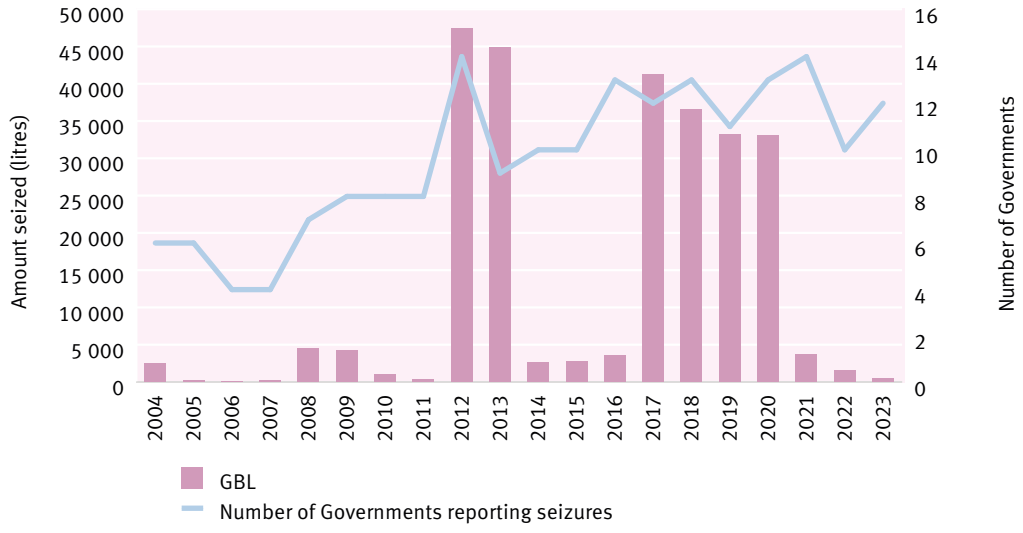
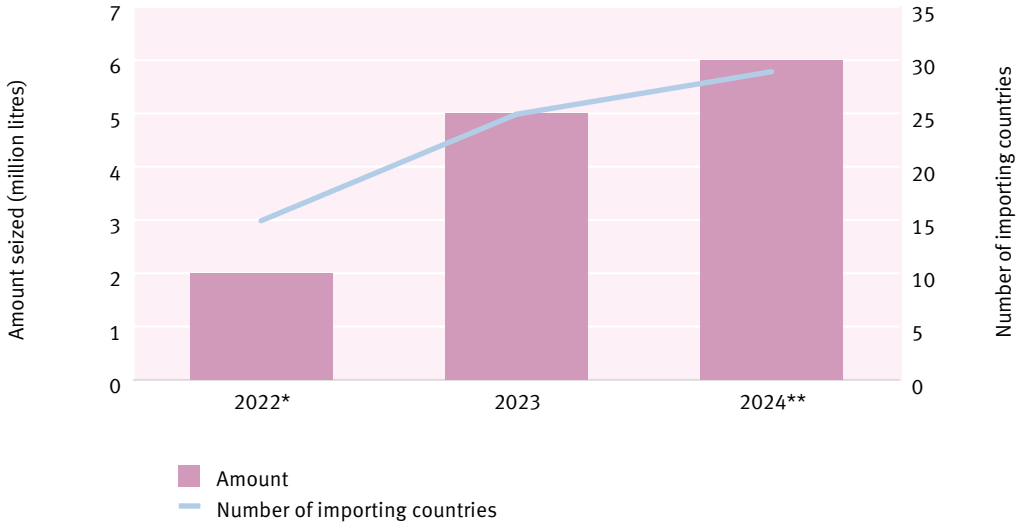


Figure 16. Planned shipments of GBL, as notified by Governments through the PEN Online Light system, 2022–2024



*The data for 2022 cover only mid-October to December.
**The data for 2024 cover only the first 10 months of the year.

157. GBL and 1,4-butanediol also have a number of legitimate industrial uses and are therefore traded widely and in significant amounts. Since the launch of the PEN Online Light system in October 2022, the authorities of some countries, in particular China, have notified importing countries of planned shipments of GBL as part of legitimate trade (see figure 16). China also reported on form D that it had stopped 39 shipments involving a total of almost 510,000 litres of GBL in 2022 and 19 shipments involving more than 100,000 litres in 2023. **The Board commends Governments that use the PEN Online Light system for their important contributions to improving understanding of licit trade patterns, thus aiding efforts to prevent the diversion of GBL from international trade.**

2. Precursors of ketamine

158. Worldwide, actionable information about the illicit manufacture of ketamine and the sources of the precursors required remains limited. In 2023, as in the past, China was the only country to report seizures of ketamine precursors on form D. However, UNODC reported[24] the dismantling in the Lao People's Democratic Republic in 2023 of a large-scale clandestine laboratory where two intermediary designer precursors of ketamine (**2-chlorophenyl cyclopentyl ketone** and "**hydroxylimine**"[25]) were being manufactured. During the joint operation, which involved authorities from China and the Lao People's Democratic Republic, more than 1 ton of 2-chlorophenyl cyclopentyl ketone was seized, in addition to more than 120 tons of other unspecified chemicals.

159. The dismantling of that laboratory followed the dismantling of a number of highly sophisticated, industrial-scale ketamine laboratories, as well as warehouses, in Cambodia between 2020 and 2022. Unfortunately, neither Cambodia nor the Lao People's Democratic Republic reported any seizures of the chemicals required for the illicit manufacture of ketamine, which are mostly not under international control, on form D. **INCB therefore wishes to remind Governments of the tools available for multilateral cooperation with a view to preventing the diversion of ketamine precursors and pre-precursors, primarily voluntary trade monitoring through use of the PEN Online Light system. Backtracking investigations into seizures and other trafficking incidents are supported by PICS, which allows the sharing of seizure details and actionable information.**

[24] UNODC, Regional Office for South-East Asia and the Pacific, *Synthetic Drugs in East and Southeast Asia: Latest Developments and Challenges* (Bangkok, 2024).

[25] "Hydroxylimine" is an informal term used to refer to the substance known chemically as 1-hydroxycyclopentyl (2-chlorophenyl)-ketone-*N*-methylimine.

3. Precursors of new psychoactive substances, including substances recently scheduled under the Single Convention on Narcotic Drugs of 1961 as amended by the 1972 Protocol or the Convention on Psychotropic Substances of 1971

160. An increasing number of new psychoactive substances, especially synthetic cannabinoids, cathinones and fentanyl-related substances, have been placed under international control since 2015. Consequently, there has been a shift to the use of pharmacologically similar, yet uncontrolled, new psychoactive substances. Another consequence has been a diversification in the sourcing of recently scheduled substances, from direct supply through grey markets to their clandestine manufacture from precursor chemicals that are not under international control. Since 2015, several countries, primarily in Europe, have shared information about seizures of internationally non-controlled precursors of new psychoactive substances and of substances recently placed under international control on form D and through PICS. Most of the seizures reported have involved precursors of synthetic cathinones.

161. In 2023, five countries reported seizures of various **precursors of** synthetic cathinones, namely, **mephedrone** and **clephedrone (4-CMC)**. The largest seizures were reported by the Kingdom of the Netherlands, while the largest variety of synthetic cathinone precursors seized was reported by Poland. Small amounts of a **precursor of mephedrone** and an ***alpha*-PVP precursor** were also reported by Belarus and New Zealand, respectively. Belgium reported seizures of solvents and other chemicals for the illicit manufacture of 4-CMC.

162. The Russian Federation, which has reported seizures of precursors of *alpha*-PVP and mephedrone in the past, did not report such seizures on form D for 2023. However, it communicated seizures of notable amounts of the chemicals through PICS in 2023 and 2024 and provided actionable information such as labels and trafficking routes, as well as reporting Kazakhstan as a recurrent transit country. INCB is also aware of the clandestine manufacture of synthetic cathinones in Kazakhstan and other countries in Central Asia, as well as seizures of related precursors, although their type is not usually specified in the reports.

163. In the first 10 months of 2024, two additional countries, Germany and India, communicated incidents involving precursors of new psychoactive substances through PICS. They included predominantly **precursors of 4-CMC** and were found in clandestine laboratories. INCB is also aware of the dismantling in Germany in 2023 and 2024 of laboratories where 3-CMC, 4-CMC and mephedrone were being illicitly manufactured, typically on a small scale, and of the seizure of the chemicals used in their manufacture.

164. In 2023, Germany also dismantled a laboratory used for the illicit manufacture of synthetic cannabinoids, including MDMB-4-en-PINACA, from **designer precursors, or intermediaries, of synthetic cannabinoids**. This was the first report of seizures of such precursors that had been brought to the Board's attention. The limited reporting of the precursors used in the clandestine manufacture of new psychoactive substances globally may be the result of the fact that these chemicals are not controlled in most countries. In addition, it may be because of limited awareness of and/or capacity to identify these substances, in particular designer precursors of synthetic cannabinoids, which are quite diverse, mostly custom-made and only one or two steps away from the end product.

165. During the reporting period, **CBD** has attracted increased attention as a precursor. Although no seizures of the substance as a starting material were reported, some Governments reported that they had taken measures to address its potential use in the illicit manufacture of *delta*-9-THC, *delta*-8-THC and HHC and HHC derivatives, use of which has recently increased. The measures taken ranged from adding CBD to the list of controlled precursors (China) to awareness-raising and cooperation with relevant industries (Czechia).

III. Other matters related to illicit drug manufacture

HIGHLIGHTS

- INCB conducted a survey on the implementation of article 13 (materials and equipment) of the 1988 Convention and convened an expert group meeting on equipment in September 2024 (para. 168).

- In the reporting period, the Board conducted several national mapping exercises in cooperation with a number of pilot countries. Findings from the mapping exercises and experiences with various existing national cooperation models were discussed at an INCB international conference at the end of 2024 (paras. 172 and 173).

- INCB initiated the Automated Monitoring of Virtual Chemical and Equipment Markets tool, which leverages advanced technologies to assist in monitoring the Internet (the surface web) and identifying suspicious postings of precursor chemicals and equipment used in illicit drug manufacture (paras. 174–176).

- During the reporting period, the Board collaborated with the third Study Commission of the International Association of Judges on issues related to emerging challenges to the successful adjudication of precursor-related offences (paras. 177–186).

A. Equipment used in illicit drug manufacture

166. The illicit manufacture of drugs requires not only precursor chemicals, but also materials and equipment. Article 13 of the 1988 Convention requires parties to prevent trade in and the diversion of materials and equipment for illicit production or manufacture of narcotic drugs and psychotropic substances and to cooperate with each other.

167. Although article 13 of the 1988 Conventions does not contain any specific provisions that define how it should be implemented, some countries have established measures aimed at monitoring trade in and/or the distribution of certain types of materials and equipment, such as tableting and encapsulating machines.[26] The specific measures reflect the national circumstances and challenges faced by the Governments. Over the past five years, INCB has conducted several activities to raise awareness and guide international policy efforts and actions with the aim of preventing the diversion of equipment essential for illicit drug manufacture, enhancing the operational use of article 13 and encouraging cooperation in that regard. More recently, INCB has expanded its focus to include excipients, that is, the substances needed for the compression of the mixed powders containing drugs into tablets, such as binders, lubricants and colorants.

168. During the reporting period, the Board carried out the following activities to assist Governments in enhancing their use of article 13 of the 1988 Convention and preventing the diversion of specialized equipment to illicit laboratories:

(a) A survey was conducted among Governments worldwide with a view to further understanding national action and international cooperation. The survey was aimed at gathering information on regulatory and operational aspects of illicit drug manufacturing equipment and excipients, including information about relevant national authorities with competence over different aspects of article 13 and specialized equipment. The information gathered through the survey, in particular a list of global focal points, is expected to be disseminated to all Governments in 2025 to support international cooperation;

(b) Work continued with WCO to establish unique Harmonized System codes for selected equipment on the international monitoring list of equipment used in the illicit manufacture of drugs. Once the unique codes are available, they will allow more effective monitoring of international trade and, consequently, contribute to preventing the diversion of these items for illicit manufacture;

(c) An expert group meeting on illicit drug manufacturing equipment and article 13 of the 1988 Convention was convened. Participants in the meeting, which was the fourth of its kind, discussed the latest equipment-related trends and developments in order to inform strategic action at the international level and identify best practices for dissemination to Governments worldwide.

169. During the reporting period, 130 equipment-related incidents were communicated through PICS. The majority involved tableting machines (115), followed by punches and dies, reaction vessels, distillation apparatus, industrial mixers and glassware. Most of the incidents (109) were communicated by the United States and involved tableting machines, with all the seizures being made at borders and, where such information was available, the source being identified as China. Some Governments informed the Board of incidents that involved the import of tableting machines in separate parts that were then assembled locally, an observation that resulted in the analysis of legislative amendments to address such loopholes.

170. The incidents communicated through PICS involved new or second-hand, custom-made or modified equipment. On the basis of the information available to INCB, second-hand equipment is typically purchased in local markets and on the Internet and then modified locally. The effective monitoring and control of such equipment are therefore important. The information shared by countries in PICS enhances knowledge of trends in equipment used for illicit purposes. The Board continues to promote the use of article 13 of the 1988 Convention

[26] A global repository of national approaches to the equipment used in illicit drug manufacture is available on the INCB website. The repository contains national regulations or approaches implemented by Governments in relation to article 13 of the 1988 Convention. The list is not exhaustive and is updated as additional information is made available.

as a valuable complementary tool for addressing illicit drug manufacture. **The Board encourages Governments that have not yet implemented measures to prevent trade in and the diversion of materials and equipment for the illicit production or manufacture of narcotic drugs and psychotropic substances and that do not yet cooperate to this end to examine ways to do so. Governments are also encouraged to make full use of the tools and resources related to illicit manufacturing equipment available on the INCB website. The Board underlines the need to continue identifying innovative approaches to improve the implementation of article 13.**

B. Cooperation with industry

171. The continuous evolution of illicit drug markets and the capacity of actors to rapidly adjust manufacturing processes and products to circumvent the control measures enacted call for innovative and proactive approaches, including to strengthen cooperation and knowledge-sharing. In this context, the Board has repeatedly emphasized the crucial role of voluntary cooperation with industry as an effective and sustainable strategy to prevent the diversion of and trafficking in chemicals used for illicit drug manufacture.

172. The Board has also reiterated that one of the most important elements of a successful partnership is knowledge and understanding of the range of industries that deal with the chemicals used for illicit drug manufacture and thus might – often unwittingly – be exploited by traffickers. In the past few years, the Board has encouraged Governments to map their national industry landscapes with the aim of raising awareness among those industries that are likely to be susceptible to diversion. The mapping of the industries that manufacture, consume or in any way deal with chemicals that could be used as precursors has been part of the Board's initiative to promote industry cooperation as a key element of the strategy to prevent illicit drug manufacture. In this regard, the Board has developed a resource that establishes the overall framework for conducting the INCB mapping initiative and, in particular, for identifying the existence of these or other related industries in countries, and has conducted several national mapping exercises in cooperation with several pilot countries. **The Board continues to encourage Governments to map their national industry landscape with the aim of aiding understanding of which categories are available in their territories and raising awareness among all industries concerned. The Board also encourages Governments that have conducted the mapping exercise to follow up on the findings included in the respective national mapping reports. Furthermore, the Board recommends that Governments make greater use of the INCB resources and materials that have been developed for this purpose and that are available on the INCB website.**

173. Findings from the mapping exercises and experiences with existing cooperation models in different national contexts were also discussed at an international conference on the topic "Engaging the private sector to address illicit drug manufacture – Know your industries". The event was also focused on examining good practices in addressing diversion from domestic distribution channels and innovative approaches to disrupting supply chains for alternative precursors, which are often not under control.

C. Virtual markets

174. Addressing the misuse of the Internet (the surface web) to traffic precursors has been a priority area of work for the Board for several years.[27] The Board has highlighted the issue in many of its previous annual reports on precursors. It has also undertaken several other initiatives, including an international operation, Operation Acronym, to target precursor trafficking through the Internet and train officials to investigate suspicious Internet postings related to precursors. From time to time, the Board has also supported Governments in the investigation of suspicious Internet postings related to precursors.

175. Online platforms act as virtual marketplaces, enabling buyers to obtain chemicals needed for illicit drug manufacture and vendors to advertise and market their products, including scheduled and non-scheduled precursors and equipment that can be used for such manufacture. The lack of regulatory controls over such platforms

[27] INCB report on precursors for 2022 (E/INCB/2022/4), chap. IV.

in most countries facilitates their operations. Since the footprint of precursors and equipment on the Internet in general, and online trading platforms in particular, has grown in recent years and is likely to expand further, the Board felt the need to establish more systematic monitoring of the Internet in order to provide Governments with information about emerging trends as a basis for operational work to prevent trafficking in and the diversion of precursors and essential equipment.

176. During the reporting period, the Board initiated the development of the Automated Monitoring of Virtual Chemical and Equipment Markets software tool, as a solution that leverages advanced technologies to assist in monitoring the Internet (the surface web) and identifying suspicious postings of precursor chemicals and illicit drug manufacturing equipment. The data collected and analysed will be used to develop actionable information and intelligence packages to be shared with Governments. The analysis also supports the identification of patterns, trends and potential connections between online activities and illicit drug manufacture. Where necessary, operational support is provided to Governments for the investigation of suspicious postings.

D. Addressing de jure challenges related to the evolution of illicit drug manufacture and the diversification of precursor chemicals: raising awareness among judges and prosecutors

177. The Board has observed in the past that law enforcement authorities may face difficulties in investigating cases involving precursors. For example, in its report on precursors for 2019 (para. 208 ff.), the Board noted that the legal requirement stipulated in the 1988 Convention for proving an alleged offender's intent or knowledge, or more specifically, for producing evidence showing that the suspect knew that the substance in question was to be used in illicit drug manufacture, has sometimes been perceived as a possible impediment to the successful investigation, prosecution and adjudication of precursor-related crime. The provision of information on the specificities of drug-related crime involving synthetic drugs and their precursors to criminal justice practitioners, including prosecutors and judges, has been identified as an area requiring attention.

178. During the reporting period, the Board collaborated with the third Study Commission of the International Association of Judges. A jointly developed questionnaire explored the overall knowledge of the national associations of judges that comprise the International Association of Judges of the specific judicial instruments applicable to illicit drug manufacture and the challenges to the successful prosecution of precursors-related crimes. As at 1 November 2024, a total of 30 national associations in all regions of the world had responded to the questionnaire.

179. A preliminary analysis of the replies received showed that all respondents indicated having adopted legislation and regulations relevant to precursor control. In some cases, there had been no amendments to precursor and drug control legislation that was more than 20 years old, while about half of the respondents reported having adopted amendments in the past 10 years, three as recently as in 2023 and 2024.

180. The survey enquired as to whether approval by a judge was a precondition for launching an investigation into the diversion of and trafficking in precursors, and to whether a court order or approval by a judge was required for effecting controlled or monitored deliveries. All respondents indicated that the public prosecutor's office led the investigation and that approval by a judge was not a precondition for launching an investigation. Nevertheless, on the basis of the code of procedure in some jurisdictions, approval by a judge might be required for specific acts, such as if an investigator applied for a search or surveillance warrant as part of an investigation.

181. Respondents also elaborated and provided specific information on the role of the judiciary when a precursor-related crime was being investigated and when information was requested from or provided to a foreign State. The survey requested information on the existence of legislation, including court rulings, related to the monitoring of precursor manufacture and trafficking. All respondents specified that in order to launch a criminal investigation, including close surveillance of the further use and internal distribution of precursors, there must be evidence that the precursors were intended to be used for the illicit manufacture of narcotic drugs or were related to drug trafficking.

182. The survey also enquired about essential equipment and criminal provisions establishing the manufacture, transport and distribution of such equipment as a criminal offence when it was intended to be used for illicit drug manufacture. About half of the respondents indicated having legislation specific to essential equipment, while the other half indicated that a criminal offence could be established solely on the basis of proven intent or evidence of known misuse of such equipment for the illicit manufacture of drugs. A few respondents indicated that such actions with essential equipment could be prosecuted as other criminal offences, such as preparation to commit a drug offence. In such cases, the equipment would be subject to forfeiture if the suspected crime was brought to trial.

183. Valuable replies were provided in respect of the question about whether the misdeclaration of non-scheduled chemicals and equipment in customs declarations would suffice to impute knowledge on the part of the supplier of their intended use for illicit drug manufacture. Almost all respondents indicated that it was essential to prove that the supplier knew, or at least should have known, that those items would indeed be used in the illicit manufacture of drugs. Nevertheless, if such intent was not established, the offender – as in the case of essential equipment described in the previous paragraph – could be prosecuted on other criminal charges, such as false declaration in public documents or failure to declare imported goods at value.

184. With regard to non-scheduled precursors, only three respondents indicated that in their jurisdictions it would be possible to convict people caught importing chemical substances not listed in the list of controlled substances. In the first case, the legislation in effect made it an offence to handle scheduled and non-scheduled chemicals without a licence issued by the Minister of Justice; a misdeclaration of the nature and use of the imported chemical would give rise to the presumption that the supplier had no licence and would be sufficient to impute knowledge on the part of the supplier of their intended use for illicit drug manufacture. In the second case, misdeclaration to the customs authorities would be an indication that the importer knew that the substances or equipment would be used in illicit drug manufacture, which might be also sufficient to initiate a criminal investigation.

185. With regard to the question of whether domestic legislation included measures or civil, criminal and administrative sanctions to address non-scheduled chemicals and emerging precursors used as starting materials or intermediaries in the legitimate manufacture of substances in Table I and Table II of the 1988 Convention, the majority of respondents indicated that no legal sanctions existed in their jurisdictions if the specific substance was not mentioned in the lists of substances annexed to the criminal code of procedure. In such cases, the police could only intervene in the context of averting imminent danger. Furthermore, there were no specific administrative sanctions applicable to non-scheduled chemicals. A few respondents indicated that non-compliance with administrative requirements and rules gave rise to the possibility of administrative sanctions, such as a formal warning, the seizure of the chemical, the suspension or cancellation of an operating licence, the revocation of a special authorization or a fine.

186. The rapid evolution of illicit drug manufacture and the challenges this poses to successful prosecutions were also discussed at the sixty-sixth annual meeting of the International Association of Judges, which was held in Cape Town, South Africa, in October 2024. The Board is pleased to see this topic being brought to the attention of judges worldwide and hopes to see similar outreach to specialized associations of prosecutors and other relevant criminal justice practitioners to ensure adequate awareness-raising aimed at generating specialized knowledge of the de jure challenges in securing convictions resulting from the continued evolution of illicit drug manufacture, in particular synthetic drug manufacture, and the related diversification of precursor chemicals. This outreach should include reviewing efficient normative investigative and penal approaches, promoting dialogue between judges, prosecutors and law enforcement authorities and enhancing understanding of the role of INCB information and intelligence tools and platforms with these audiences.

Annexes

Annexes I to XI of the present report are available on the INCB website, on the page containing the Board's annual reports on precursors:

www.incb.org/incb/en/precursors/technical_reports/precursors-technical-reports.html

About the International Narcotics Control Board

The International Narcotics Control Board (INCB) is an independent and quasi-judicial control organ, established by treaty, for monitoring the implementation of the international drug control treaties. It had predecessors under the former drug control treaties as far back as the time of the League of Nations.

Composition

INCB consists of 13 members who are elected by the Economic and Social Council and who serve in their personal capacity, not as government representatives. Three members with medical, pharmacological or pharmaceutical experience are elected from a list of persons nominated by the World Health Organization (WHO) and 10 members are elected from a list of persons nominated by Governments. Members of the Board are persons who, by their competence, impartiality and disinterestedness, command general confidence. The Council, in consultation with INCB, makes all arrangements necessary to ensure the full technical independence of the Board in carrying out its functions. INCB has a secretariat that assists it in the exercise of its treaty-related functions. The INCB secretariat is an administrative entity of the United Nations Office on Drugs and Crime, but it reports solely to the Board on matters of substance. INCB closely collaborates with the Office in the framework of arrangements approved by the Council in its resolution 1991/48. INCB also cooperates with other international bodies concerned with drug control, including not only the Council and its Commission on Narcotic Drugs, but also the relevant specialized agencies of the United Nations, particularly WHO. It also cooperates with bodies outside the United Nations system, especially the International Criminal Police Organization (INTERPOL) and the World Customs Organization.

Functions

The functions of INCB are laid down in the following treaties: Single Convention on Narcotic Drugs of 1961 as amended by the 1972 Protocol; Convention on Psychotropic Substances of 1971; and United Nations Convention against Illicit Traffic in Narcotic Drugs and Psychotropic Substances of 1988. Broadly speaking, INCB deals with the following:

(a) As regards the licit manufacture of, trade in and use of drugs, INCB endeavours, in cooperation with Governments, to ensure that adequate supplies of drugs are available for medical and scientific uses and that the diversion of drugs from licit sources to illicit channels does not occur. INCB also monitors Governments' control over chemicals used in the illicit manufacture of drugs and assists them in preventing the diversion of those chemicals into the illicit traffic;

(b) As regards the illicit manufacture of, trafficking in and use of drugs, INCB identifies weaknesses in national and international control systems and contributes to correcting such situations. INCB is also responsible for assessing chemicals used in the illicit manufacture of drugs, in order to determine whether they should be placed under international control.

In the discharge of its responsibilities, INCB:

(a) Administers a system of estimates for narcotic drugs and a voluntary assessment system for psychotropic substances and monitors licit activities involving drugs through a statistical returns system, with a view to assisting Governments in achieving, inter alia, a balance between supply and demand;

(b) Monitors and promotes measures taken by Governments to prevent the diversion of substances frequently used in the illicit manufacture of narcotic drugs and psychotropic substances and assesses such substances to determine whether there is a need for changes in the scope of control of Tables I and II of the 1988 Convention;

(c) Analyses information provided by Governments, United Nations bodies, specialized agencies or other competent international organizations, with a view to ensuring that the provisions of the international drug control treaties are adequately carried out by Governments, and recommends remedial measures;

(d) Maintains a permanent dialogue with Governments to assist them in complying with their obligations under the international drug control treaties and, to that end, recommends, where appropriate, technical or financial assistance to be provided.

INCB is called upon to ask for explanations in the event of apparent violations of the treaties, to propose appropriate remedial measures to Governments that are not fully applying the provisions of the treaties or are encountering difficulties in applying them and, where necessary, to assist Governments in overcoming such difficulties. If, however, INCB notes that the measures necessary to remedy a serious situation have not been taken, it may call the matter to the attention of the parties concerned, the Commission on Narcotic Drugs and the Economic and Social Council. As a last resort, the treaties empower INCB to recommend to parties that they stop importing drugs from a defaulting country, exporting drugs to it or both. In all cases, INCB acts in close cooperation with Governments.

INCB assists national administrations in meeting their obligations under the conventions. To that end, it proposes and participates in regional training seminars and programmes for drug control administrators.

Reports

The international drug control treaties require INCB to prepare an annual report on its work. The annual report contains an analysis of the drug control situation worldwide so that Governments are kept aware of existing and potential situations that may endanger the objectives of the international drug control treaties. INCB draws the attention of Governments to gaps and weaknesses in national control and in treaty compliance; it also makes suggestions and recommendations for improvements at both the national and international levels. The annual report is based on information provided by Governments to INCB, United Nations entities and other organizations. It also uses information provided through other international organizations, such as INTERPOL and the World Customs Organization, as well as regional organizations.

The annual report of INCB is supplemented by detailed technical reports. They contain data on the licit movement of narcotic drugs and psychotropic substances required for medical and scientific purposes, together with an analysis of those data by INCB. Those data are required for the proper functioning of the system of control over the licit movement of narcotic drugs and psychotropic substances, including preventing their diversion to illicit channels. Moreover, under the provisions of article 12 of the 1988 Convention, INCB reports annually to the Commission on Narcotic Drugs on the implementation of that article. That report, which gives an account of the results of the monitoring of precursors and of the chemicals frequently used in the illicit manufacture of narcotic drugs and psychotropic substances, is also published as a supplement to the annual report.

INTERNATIONAL NARCOTICS CONTROL BOARD

The International Narcotics Control Board (INCB) is the independent monitoring body for the implementation of United Nations international drug control conventions. It was established in 1968 in accordance with the Single Convention on Narcotic Drugs, 1961. It had predecessors under the former drug control treaties as far back as the time of the League of Nations.

Based on its activities, INCB publishes an annual report that is submitted to the United Nations Economic and Social Council through the Commission on Narcotic Drugs. The report provides a comprehensive survey of the drug control situation in various parts of the world. As an impartial body, INCB tries to identify and predict dangerous trends and suggests necessary measures to be taken.

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