



INTERNATIONAL NARCOTICS CONTROL BOARD



# Precursors

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

2025



**United  
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## **Reports published by the International Narcotics Control Board for 2025**

The *Report of the International Narcotics Control Board for 2025* (E/INCB/2025/1) is supplemented by the following reports:

*Narcotic Drugs: Estimated World Requirements for 2026 — Statistics for 2024* (E/INCB/2025/2)

*Psychotropic Substances: Statistics for 2024 — Assessments of Annual Medical and Scientific Requirements for Substances in Schedules II, III and IV of the Convention on Psychotropic Substances of 1971 for 2026* (E/INCB/2025/3)

*Precursors, Chemicals and Equipment Frequently Used in the Illicit Manufacture of Narcotic Drugs and Psychotropic Substances: Report of the International Narcotics Control Board for 2025 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/2025/4)

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](http://www.incb.org)).



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and Psychotropic Substances of 1988



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## Foreword

The United Nations Convention against Illicit Traffic in Narcotic Drugs and Psychotropic Substances of 1988 has been ratified by 191 States and the European Union. Its article 12, which establishes the international precursor control system and entrusts the monitoring of Governments' control over chemicals used in the illicit manufacture of drugs to the International Narcotics Control Board, has provided the international community with certain benefits. It has efficiently ensured smooth international trade in internationally scheduled precursors, reducing diversions from such trade to a minimum. It has also allowed the Board to keep pace with the virtually unstoppable evolution in illicit drug manufacture by ensuring the necessary revision of the lists of internationally scheduled precursors in Tables I and II of the 1988 Convention. From just 12 precursors listed in 1990, these tables now include 51 precursor chemicals.

In assisting countries in the implementation of the precursor-related mandates conferred by the 1988 Convention, the Board also provides assistance in relation to article 13, concerned with materials and equipment used in illicit drug manufacture. The Board has developed an array of services in this area. Launched in 2006, the Pre-Export Notification Online (PEN Online) system oversees some 35,000 international movements of scheduled precursors every year, preventing their diversion to illicit drug manufacture. In March 2025, the use of the PEN Online system by the Government of India prevented the diversion of 3 tons of 1-boc-4-piperidone, a precursor to fentanyl that was officially added to Table I of the 1988 Convention in December 2024. If not stopped, that shipment could have resulted in the manufacture of 700 to 1,600 million doses of deadly fentanyl tablets. The authorities of India, Mexico and the United Republic of Tanzania are now investigating the case with the external support of INCB.

In 2022, INCB put at the disposal of Member States the PEN Online Light system, a platform allowing countries to exchange notifications about planned exports of non-scheduled chemicals known for their possible use in illicit drug manufacture. Use of the PEN Online Light system is voluntary. Over 60 countries have already been using the system, which has processed some 3,000 voluntary notifications of planned exports in about three years.

In recent years and inspired by article 13 of the 1988 Convention, the Board has paid increased attention to the development of tools, services and specialized knowledge relating to the markets for essential equipment and materials used in illicit drug manufacture. Indeed, essential equipment and materials such as cutting agents and excipients are indispensable for the process of making pills containing any kind of synthetic drug. In order to support Governments in monitoring international trade in certain equipment, INCB is exploring a voluntary multilateral notification mechanism for planned exports of relevant equipment based on the PEN Online Light system for non-scheduled chemicals.

When the 1988 Convention entered into force in 1990, the international community provided INCB with only limited human and financial resources for implementing the mandates derived from article 12 of the Convention. To address this problem, a specialized programme, supported by extrabudgetary resources, was established in order to provide INCB with the capacity to keep pace with the evolution of illicit drug manufacture. It is thanks to this extrabudgetary funding that the PEN Online and PEN Online Light systems are running. These extrabudgetary resources also allow INCB to facilitate investigations into diversions and develop new tools and services to monitor equipment and material markets. The current financial situation is, however, putting at risk the permanence of these essential services for Member States.

As clearly indicated in the report on precursors for 2025, the future of illicit drug markets seems indivisibly linked to the growing numbers of synthetic drugs and to the related precursors, specialized equipment and materials. The Board trusts that as a client and beneficiary of the INCB services and initiatives in this very specialized area of the fight against the scourge of illicit drugs, the international community will continue to support the Board and its new and innovative approaches to addressing illicit drug manufacture.



Sevil Atasoy  
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.

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\*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](http://www.incb.org)).

- IV. Submission of information by Governments on licit trade in, legitimate uses of and requirements for substances in Tables I and II of the United Nations Convention against Illicit Traffic in Narcotic Drugs and Psychotropic Substances of 1988 for the years 2020–2024
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# 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 2024 to 1 November 2025, 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 any 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:

ADB-INACA	<i>N</i> -[(1 <i>S</i> )-1-(aminocarbonyl)-2,2-dimethylpropyl]-1 <i>H</i> -indazole-3-carboxamide
AIBN	azobisisobutyronitrile
ANPP	4-anilino- <i>N</i> -phenethylpiperidine
4-AP	4-anilinopiperidine   <i>N</i> -phenyl-4-piperidinamine
APAA	<i>alpha</i> -phenylacetoacetamide   2-phenylacetoacetamide
APAAN	<i>alpha</i> -phenylacetoacetonitrile
1-boc-4-AP	1-boc-4-anilinopiperidine   <i>tert</i> -butyl 4-(phenylamino)piperidine-1-carboxylate
1-boc-4-piperidone	<i>tert</i> -butyl 4-oxopiperidine-1-carboxylate
CBD	cannabidiol
1-CBz-4-piperidone	benzyl 4-oxopiperidine-1-carboxylate
DEPADP	diethyl (phenylacetyl)propanedioate
3,4-DMA	3,4-dimethoxyamphetamine
3,4-DMMA	3,4-dimethoxymethamphetamine
EAPA	ethyl <i>alpha</i> -phenylacetoacetate   ethyl 3-oxo-2-phenylbutanoate
FTZ	free trade zone (also known as a free zone or free port)
GBL	<i>gamma</i> -butyrolactone
GHB	<i>gamma</i> -hydroxybutyric acid
HHC	hexahydrocannabinol
HHC-O	hexahydrocannabinol acetate
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 <i>alpha</i> -phenylacetoacetate   methyl 3-oxo-2-phenylbutanoate
MDMA	3,4-methylenedioxymethamphetamine (commonly known as “ecstasy”)

MDMB-INACA	methyl 2-(1 <i>H</i> -indazole-3-carbonylamino)-3,3-dimethyl-butanoate
MDMB-4-en-PINACA	methyl 3,3-dimethyl-2-(1-(pent-4-en-1-yl)-1 <i>H</i> -indazole-3-carboxamido) butanoate
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	<i>alpha</i> -methyl-1,3-benzodioxole-5-propanamide
NPP	<i>N</i> -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:

**auxiliary chemical** A common chemical, such as a reagent, catalyst, solvent, acid or base, that typically has a number of legitimate uses. It may be used in the illicit manufacture of various drugs and can be replaced by similar chemicals

**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

**cutting agent** An inert substance that has no pharmacological effects and is used as a diluent (such as lactose), or a pharmacologically active, often psychoactive, substance (such as caffeine) that is used as an adulterant, to bulk (“cut”) illicitly manufactured drugs in order to increase volume and profits

**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

**excipient** An inert substance such as a diluent, binder or lubricant that is required to press mixed drug powders into tablets

**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

**form D** The official reporting instrument through which Governments submit annually to INCB information on substances frequently used in the illicit manufacture of narcotic drugs and psychotropic substances

**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

**upstream chemical** A chemical used in the initial stages of a synthesis or manufacturing process

# Summary



## Normative developments

As at 1 November 2025, the 1988 Convention had been ratified, acceded to or approved by 191 States and formally confirmed by the European Union (within the extent of its competence under article 12). It remains the most widely ratified of the three international drug control conventions.



## Reporting to the Board

The quality and quantity of data reported by Governments remain a cause for concern, with only 82 of the 191 States Parties to the 1988 Convention having submitted data through form D by the deadline of 30 June 2025. The number had risen to 115 Governments by 1 November 2025, the cut-off date for the present report. The Board notes that only 73 of the forms for 2024 received contained information on estimates of annual legitimate requirements for ephedrine, pseudoephedrine and their preparations. Furthermore, there are Governments that have never provided estimates of their annual legitimate requirements or have not updated those estimates for several years.



## Major trends in licit trade and trafficking

- The global quantity of ephedrines (i.e. ephedrine and pseudoephedrine in all forms) seized, at 15 tons, remained at the relatively high level seen in the previous year. Of those 15 tons, the proportion of pharmaceutical preparations containing pseudoephedrine also remained high (1.5 tons).
- Quantities seized of P-2-P methyl glycidic acid and its esters, which were added to Table I of the 1988 Convention with an effective date of 3 December 2024, were less than half of the amount reported seized in 2023.
- Criminal networks in Europe engaged in the manufacture of amphetamine-type stimulants appear to have turned to a group of new pre-precursors, namely esters of 4-phenylacetoacetic acid.
- Highly sophisticated methods of methamphetamine manufacture are spreading further geographically, driven by the involvement and know-how of Mexican criminals operating in a greater number of countries.
- Over 230 tons of potassium permanganate were seized globally in 2024, mostly in South American countries, reflecting surging levels of cocaine manufacture and prompting renewed calls for stronger domestic controls.
- Significant seizures of chemicals that enhance the efficiency of cocaine manufacturing processes, such as calcium chloride and sodium metabisulfite, continued to underline the growing sophistication of illicit manufacturers, including in Europe.
- Global quantities of acetic anhydride seized in 2024 amounted to approximately 52,000 litres. China and Netherlands (Kingdom of the) together accounted for about 94% of that amount.
- Fentanyl precursors continued to be seized most frequently in, or en route to, North America, with countries in Africa emerging in 2025 as the targets of traffickers, in addition to the use by traffickers of established routes through Central America.
- The Russian Federation and several countries in Western and Central Europe reported notable levels of illicit methadone manufacture and/or seizures of methadone precursors.
- While ketamine misuse and seizures of the substance, which is not under international control, are increasing worldwide, information about seizures of ketamine precursors and their sources remains limited.
- The increasing number of synthetic cathinones under international control is mirrored by more reports of seizures of their precursors (none of which are under international control), predominantly by countries in Europe and Central Asia.
- Custom-made “semi-finished synthetic cannabinoids” are increasingly being seized as designer precursors that can be converted into the desired end products by readily applicable means and with very limited technical knowledge.

- The placing of CBD under national control as a precursor by China in 2024 and the voluntary notification by China of planned exports to importing countries via the PEN Online Light system makes it possible to gain more insight into the licit market for CBD.



### Equipment used in illicit drug manufacture

- Globally, in the absence of national regulatory frameworks for the operationalization of article 13 of the 1988 Convention, equipment seizures are predominantly reported in the context of the dismantling of clandestine laboratories, while seizures at borders remain infrequent. This represents a missed opportunity for early intervention aimed at disrupting the diversion of equipment before it reaches illicit laboratories.
- To promote the implementation of article 13 of the 1988 Convention, the Board conducted several initiatives during the reporting period, such as the launch of the second edition of its technical report on equipment used in illicit drug manufacture and article 13 of the United Nations Convention against Illicit Traffic in Narcotic Drugs and Psychotropic Substances of 1988 and the update of the international monitoring list of equipment used in the illicit manufacture of drugs to incorporate newly established unique Harmonized System codes, as approved by WCO.



### Cooperation with industry

- In December 2024, the Board convened an international conference in Vienna on the theme “Engaging the private sector to address illicit drug manufacture – know your industries”. The conference served as a strategic platform for the exchange of experiences and best practices regarding the active participation of industrial operators in efforts to prevent illicit drug manufacturing, including national cooperation models. The event brought together over 70 government representatives from 30 countries across all continents.
- The outcomes of the conference were subsequently incorporated into a guidance document entitled “Guiding industry partnerships: a policy framework for preventing chemical diversion”, which was released in March 2025.
- The INCB industry mapping exercise, aimed at improving understanding of the potential exposure of national industrial landscapes to infiltration by illicit drug manufacturers, progressed with the active support of a few pioneer countries. As a result of the initiative, some Governments have begun follow-up actions based on the findings of the mapping exercise.



### Virtual markets

- INCB used specialized tools such as the Automated Monitoring of Virtual Chemical and Equipment Markets (AMVICHEM) software solution and the Scanning of Novel Opioids on Online Platforms (SNOOP) tool to identify suspicious postings related to precursor chemicals.
- That monitoring work revealed continued postings regarding 3,4-MDP-2-P ethyl glycidate – a designer precursor of MDMA or its analogues, and P-2-P methyl glycidic acid – a designer precursor of amphetamine or methamphetamine, both of which were placed in Table I of the 1988 Convention in December 2024, contrary to the declining seizures of those substances.
- The monitoring work also identified a substantial number of postings related to precursors of the fentanyl analogue *para*-fluorofentanyl and non-scheduled pre-precursors of fentanyl, namely 4-hydroxypiperidine and its “masked” analogue.
- The Board’s monitoring confirmed the continued relevance of online markets for the supply of precursors (and equipment) for illicit drug manufacture and provided useful intelligence input.

# Recommendations

Recommendations to Governments and major observations appear in bold throughout the present report.

## Key recommendations relate to:

- The need to improve reporting by Governments to INCB pursuant to article 12, paragraph 12, of the 1988 Convention (para. 8 and box 1), both in terms of quality and timeliness
- The monitoring of legitimate international trade and the utilization of related platforms (i.e. the PEN Online and PEN Online Light systems) with a view to preventing diversion, investigating suspicious transactions and diversion attempts and enhancing knowledge of legitimate markets, operators and supply chains (paras. 36, 42, 107, 134, 146 and 161)
- The sharing of actionable information on precursor-related incidents through PICS (paras. 61, 88, 146 and 168), in order to facilitate joint investigations and as a means of identifying emerging trends and providing early warning
- The utilization of tools and resources available on the Board's secure web page, in particular the compendium of national controls (para. 28) and the limited international special surveillance list of non-scheduled substances and its complement (paras. 88, 95 and 176 (third bullet point)) to enable preventive regulatory and enforcement action and voluntary cooperation with industry
- Cross-cutting issues related to equipment used in illicit drug manufacture (paras. 165–171), cooperation with industry (paras. 172–177) and virtual markets (paras. 178–185)

## Additional recommendations related to diversion prevention and investigation include:

- The control of pharmaceutical preparations containing ephedrine and pseudoephedrine in the same manner as the substances themselves, the monitoring of domestic trade, including trade in common markets, and the use of the PEN Online system to send pre-export notifications regarding planned shipments of such preparations (paras. 51 and 69)
- The recognition and utilization of the PEN Online Light system as a tool for enhancing knowledge of legitimate markets and supply chains for non-scheduled chemicals while also facilitating voluntary, proactive cross-border cooperation to prevent diversion with a minimal burden on industry (paras. 107, 134, 146 and 161)
- The complementing of information available from the PEN Online and PEN Online Light systems and estimates of annual legitimate requirements with actual trade data in order to identify possible cases of oversupply and therefore prevent diversion (para. 51)
- The need for Governments not to disregard what may appear to be small seizures but to instead conduct back-tracking investigations, respond to requests to share information, including requests made by INCB, undertake joint investigations and/or communicate information about such seizures through PICS in a timely manner, or, at a minimum, on form D for the year in question (para. 142)
- The exercise of vigilance when precursors and non-scheduled alternative precursor chemicals are shipped to or through non-traditional countries and regions, such as countries in Africa, as patterns observed with ephedrines in the early 2000s appear to be re-emerging, including in relation to other precursors (paras. 69 and 137 and table 4)
- The need to enhance capabilities to detect and forensically identify small quantities of precursors of potent end products, such as fentanyl, and to cooperate internationally to that end (paras. 106 and 147)

# Tools

## Monitoring of licit trade

Between 1 November 2024 and 1 November 2025, over 34,000 pre-export notifications were communicated by 63 exporting Governments to 192 importing countries and territories through the PEN Online system, which represents a slight increase compared with the previous reporting year. 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, was used to send notifications regarding planned exports to 74 importing Governments. **Efficient use of the PEN Online system and cooperation between importing and exporting countries prevented the diversion of 3 tons of a fentanyl precursor in 2025.**



## Law enforcement operations

PICS continued to serve as a unique global platform for sharing real-time, actionable information about precursor- and equipment-related incidents. As at 1 November 2025, PICS had active users from over 100 countries and territories, and more than 5,700 incidents relating to precursors and equipment had been communicated through the system since its inception. Between 1 November 2024 and 1 November 2025, over 950 new incidents, including 27 incidents related to equipment, were communicated, an increase of nearly 100% on the previous year. During the reporting period, INCB trained more than 200 officials from 46 countries and seven international or regional organizations on the use of PICS. **PICS also acted as an effective early warning tool, capturing the first incidents involving methyl 4-phenylacetate – a new pre-precursor of amphetamine and methamphetamine not under international control.**



## Other tools and resources

To assist Governments in addressing the diversion of chemicals frequently used in the illicit manufacture of drugs, including both controlled and non-scheduled chemicals and designer precursors, the Board makes various tools and reference publications available to all competent national authorities on the secure area of its website related to precursors. That secure area contains the information package on the control of precursors, the details of focal points for precursors (Project Prism and Project Cohesion) and for equipment, as well as other resources related to precursor control, equipment used in illicit drug manufacture, industry cooperation and the investigation of suspicious postings regarding precursors and equipment on the Internet.





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

## HIGHLIGHTS

- ▶ The present chapter contains statistics about the reporting by Governments to INCB pursuant to article 12, paragraph 12, of the United Nations Convention against Illicit Traffic in Narcotic Drugs and Psychotropic Substances (paras. 6, 7 and 9–13) 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. 30–36 and paras. 37–42, respectively).
- ▶ An international operation, code-named Operation Pseudonym, was conducted under Project Prism from October to December 2024. The operation focused on the international and, where possible, domestic trade in ephedrine and pseudoephedrine in all forms. It saw widespread participation, with 60 countries and territories and four international or regional organizations taking part. The operation resulted in 168 seizures of the target substances, helped establish links between incidents occurring in different regions and identified gaps in controls and possible remedial measures.

## A. Scope of control

1. On 12 March 2025, at its sixty-eighth session and following the Board's proposal, the Commission on Narcotic Drugs decided by consensus to remove 3,4-MDP-2-P methyl glycidate from the body of Table I of the 1988 Convention and include it in the footnote that was introduced in accordance with Commission decision 67/25 of March 2024. The updated list of the 51 chemicals under international control is available in annex VII to the present report.

2. In June 2025, pursuant to Economic and Social Council resolution 1992/29, WCO adopted new tariff codes<sup>1</sup> for a number of precursor chemicals that have been under international control since 2019. The new codes will be included in the next edition of the Harmonized System Nomenclature, expected to be released in January 2028. Until then, **INCB encourages Governments to adopt, on a voluntary basis, interim, discrete codes based on the applicable Harmonized System codes.**<sup>2</sup>

## B. Adherence to the 1988 Convention

3. As at 1 November 2025, the 1988 Convention had been ratified, acceded to or approved by 191 States and formally confirmed by the European Union (within the extent of its competence under article 12). It remains the most widely ratified of the three international drug control conventions. Equatorial Guinea, Kiribati, Papua New Guinea, Solomon Islands, Somalia and Tuvalu have not yet acceded to the Convention. **INCB urges the Governments of those States to accede without further delay. In line with its mandate, INCB stands ready to assist as necessary.** Further details on accession status are provided in annex I.

4. 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, 14 countries have not yet provided information regarding a competent national authority responsible for ensuring the implementation of article 12 of the 1988 Convention.<sup>3</sup> This is particularly the case in Africa and Oceania, where six countries (or 11%) and four countries (or 25%), 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 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

5. Pursuant to article 12, paragraph 12, of the 1988 Convention, States Parties are required to submit annually to INCB information concerning substances that are frequently used in the illicit manufacture of narcotic drugs and psychotropic substances. Such information is provided on a standardized reporting instrument known as form D, the principal features of which are outlined in box 1.

<sup>1</sup>See WCO, *Harmonized Commodity Description and Coding System*, 7th ed. (Brussels, 2022).

<sup>2</sup>The applicable Harmonized System codes for all chemicals under international control are available on the Red List, a complement to form D available on the Board's public website.

<sup>3</sup>They comprise Angola, the Marshall Islands, Mauritania, Mozambique, Niue, Palau, Qatar, 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 online directory, available at [www.unodc.org/unodc/en/commissions/Secretariat/cna.html](http://www.unodc.org/unodc/en/commissions/Secretariat/cna.html)).

**BOX 1. FORM D: ANNUAL REPORTING UNDER THE 1988 CONVENTION*****WHAT IS FORM D?***

Form D is the official reporting instrument through which Governments submit annually to INCB information on substances frequently used in the illicit manufacture of narcotic drugs and psychotropic substances.

The latest version of form D is available on the INCB website in the six official languages of the United Nations. The preferred format to be used is the spreadsheet form, which helps streamline and expedite the reporting process and minimize the potential for data entry errors.

***BY WHEN SHOULD THE FORM BE SUBMITTED TO INCB?***

Submission deadline: 30 June each year (preferably 30 April each year)

- Timely submission is crucial to allow INCB sufficient time to process the data and analyse emerging trends
- Form D should be completed by the competent authority responsible for ensuring the implementation of article 12 of the 1988 Convention and should be returned as a single, consolidated copy incorporating all information from all relevant agencies for the country or territory in question

***WHAT INFORMATION NEEDS TO BE SUBMITTED?***

- Part one of form D (mandatory, pursuant to article 12, paragraph 12):
  - ▶ The amounts seized of substances included in Tables I and II of the 1988 Convention and, where known, their origin
  - ▶ 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
  - ▶ Methods of diversion and illicit manufacture
- Part two of form D (voluntary, pursuant to Economic and Social Council resolution 1995/20):
  - ▶ Data on licit trade in, uses of and requirements for substances listed in Tables I and II of the 1988 Convention
- Part three of form D (voluntary):
  - ▶ Details of the competent national authorities empowered to regulate or enforce national controls over precursors and essential chemicals in accordance with the provisions of article 12 of the 1988 Convention

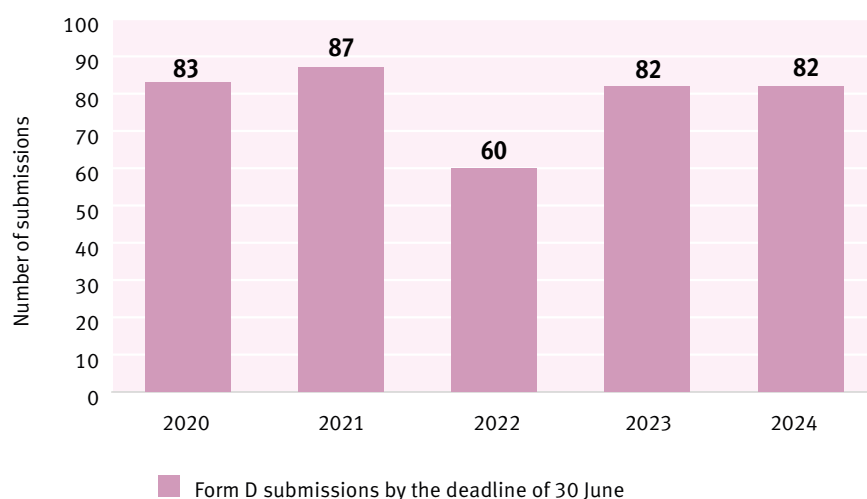
***WHAT IS FORM D DATA USED FOR?***

- Information submitted in part one supports INCB in:
  - ▶ Monitoring and identifying trends in precursor trafficking
  - ▶ Assessing patterns in the illicit manufacture of drugs
  - ▶ Providing recommendations to Governments on remedial action and policy measures, including in the annual report on precursors
- Information submitted in part two supports INCB in verifying information about planned trade communicated through the PEN Online system and in understanding patterns of regular trade, thus assisting in the identification of suspicious activity and the prevention of diversion
- Information submitted in part three is used to complement information on competent national authorities made available by the Commission on Narcotic Drugs<sup>a</sup>

<sup>a</sup>[www.unodc.org/unodc/en/commissions/Secretariat/cna.html](http://www.unodc.org/unodc/en/commissions/Secretariat/cna.html).

6. Over the years, the Board has continued to emphasize the importance of the timely submission by Governments of form D in supporting data analysis and the identification of emerging trends. In this regard, there are still opportunities to further enhance the timeliness of submissions and the completeness and quality of the information submitted. Figure 1 presents an overview of submissions of form D by the deadline for the reporting years 2020 to 2024. A detailed breakdown of the submission of form D by individual Governments over the period 2020–2024 is provided in annex II, and an overview of data submitted in form D for 2024 is presented in table 1.

**Figure 1. Submissions of form D by Governments by the deadline (30 June of each year), 2020–2024**



**Table 1. Overview of data submitted by Governments on form D for 2024**

	Number of Governments	
Form D submissions – total <sup>a</sup> (by the cut-off date of 1 November 2025)	115	
Form D submissions – by the deadline (30 June 2025)	82	
<i>Submission of mandatory information (Part 1 of form D)</i>	Seizures of substances in Tables I and II of the 1988 Convention	70
	Seizures of substances not included in Tables I or II of the 1988 Convention	60

<sup>a</sup>Forty-two States used the spreadsheet version of form D for 2024.

7. As in previous years, a number of States Parties failed to submit information through form D altogether; some did not do so only for 2024, while others have not submitted information through the form for the past five years and a number of them have not done so for a decade or longer (see table 2).

**Table 2. States Parties failing to report as required under article 12, paragraph 12, of the 1988 Convention, 2024**

<i>Africa</i>		
Algeria	Eritrea <sup>a</sup>	Malawi <sup>a</sup>
Benin	Eswatini <sup>a</sup>	Mali <sup>b</sup>
Burkina Faso <sup>a</sup>	Ethiopia <sup>b</sup>	Mauritania
Burundi	Gabon	Namibia
Cabo Verde <sup>b</sup>	Gambia <sup>b</sup>	Sao Tome and Principe <sup>a</sup>
Cameroon	Guinea <sup>a</sup>	Senegal <sup>b</sup>
Central African Republic <sup>a</sup>	Guinea-Bissau <sup>a</sup>	Seychelles <sup>b</sup>
Chad	Kenya	South Sudan
Comoros <sup>a</sup>	Lesotho <sup>a</sup>	Sudan
Congo <sup>a</sup>	Liberia <sup>a</sup>	Togo
Côte d'Ivoire <sup>b</sup>	Libya <sup>a</sup>	Tunisia
Djibouti <sup>a</sup>	Madagascar	Zambia <sup>a</sup>
<i>Americas</i>		
Antigua and Barbuda <sup>a</sup>	Dominican Republic	Saint Lucia
Bahamas (The) <sup>a</sup>	Grenada <sup>a</sup>	Saint Vincent and the Grenadines
Belize <sup>b</sup>	Jamaica	Suriname
Cuba	Panama	
Dominica	Saint Kitts and Nevis <sup>a</sup>	
<i>Asia</i>		
Afghanistan	Kuwait	Timor-Leste
Bangladesh <sup>b</sup>	Mongolia	Turkmenistan
Cambodia <sup>a</sup>	Nepal	Yemen
Kazakhstan	Oman <sup>b</sup>	
<i>Europe</i>		
Bosnia and Herzegovina	San Marino	Ukraine
<i>Oceania</i>		
Cook Islands <sup>a</sup>	Nauru <sup>a</sup>	Tonga <sup>a</sup>
Fiji <sup>b</sup>	Niue <sup>a</sup>	Vanuatu <sup>a</sup>
Marshall Islands <sup>a</sup>	Palau <sup>b</sup>	
Micronesia (Federated States of)	Samoa <sup>a</sup>	

*Note:* See also annex II. The cut-off date for the submission of information through form D was 1 November 2025.

<sup>a</sup>Government that failed to submit information through form D for any year during the past 10 years (2015–2024) or more.

<sup>b</sup>Government that failed to submit information through form D for any year during the past five years (2020–2024).

**8. The Board 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, in order to allow INCB to identify emerging trends in trafficking in precursors and the illicit manufacture of drugs or to analyse weaknesses in precursor control mechanisms. In an effort to streamline and expedite the reporting process and to minimize the potential for data entry errors, INCB encourages the utilization of the spreadsheet version of form D, accompanied by a duly signed and stamped cover page issued by the respective competent national authority.**

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

9. Pursuant to Economic and Social Council resolution 1995/20, Governments are requested 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. Those data help Governments and INCB understand patterns of regular trade, identify suspicious activity and thus prevent diversion. Table 3 below presents an overview of the number of Governments that provided data on licit trade in, uses of and requirements for precursors on form D for 2024. Further details can be found in annex IV.

**Table 3. Submission of data on licit trade in, uses of and requirements for precursors**

		Number of Governments
Submission of voluntary information (Part two of form D)	Licit trade	107
	Licit uses of and/or requirements for one or more of the substances in Tables I and II of the 1988 Convention	92

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

10. With a view to providing exporting countries with an additional tool for monitoring 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 imports of 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 2025, the majority of countries and territories had provided at least one estimate of a cumulative total of 915 individual estimates submitted to the Board during the reporting period.

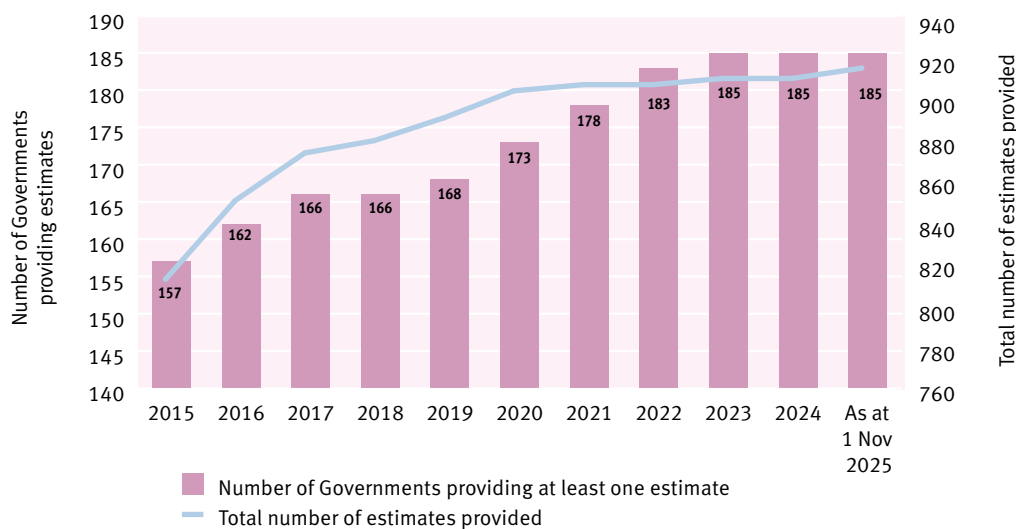
11. Governments have continued to report their annual legitimate requirements for imports of precursors of amphetamine-type stimulants and their preparations to INCB, mostly on form D and, to a lesser extent, by means of individual communications during the year. As at 1 November 2025, 185 Governments had provided at least one estimate (see figure 2). That figure includes a number of territories and States that are not yet Parties to the 1988 Convention.

12. 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.

13. Since the publication of the Board's report on precursors for 2024, only 73 countries and territories have reconfirmed or updated their estimates for at least one of the substances. Furthermore, there are still Governments worldwide that have never provided estimates of their annual legitimate requirements, that have never updated them or that have not updated them for several years.

14. INCB reminds Governments to regularly review their annual legitimate requirements and inform the Board of the methodology used to estimate those requirements for individual precursors taking into account changing local market conditions. Furthermore, INCB invites 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.

Figure 2. Number of Governments providing estimates of annual legitimate requirements and total number of estimates provided, 2015–2025



15. In order to establish more accurate estimates, 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 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.

## F. Legislation and control measures

16. 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 that 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.**

17. The following changes in control measures have been brought to the attention of INCB since the publication of its report on precursors for 2024.

18. In Australia, in February 2025, the Criminal Code Amendment (Controlled and Border Controlled Drugs and Precursors) Regulations 2025 were published. The Regulations, which entered in effect on 1 March 2025, *inter alia*, added methylamine to the list of restricted border-controlled precursors.

19. In Canada, on 27 February 2025, a ministerial order was issued to temporarily include phenethyl bromide in Schedule V to the Controlled Drugs and Substances Act for a period of one year, starting in April 2025. Under the same order, benzyl chloride and propionic anhydride were added to Schedule V for a period of one year, starting in May 2025.

20. Furthermore, on 28 June 2025, proposed regulations amending the precursor control regulations (increased regulatory oversight) were published in the Canada Gazette. The proposed amendments are aimed at strengthening existing regulatory controls over precursors by expanding restrictions on the sale of certain medical products containing ephedrine and/or pseudoephedrine, precursors that could be used in the illicit manufacture of methamphetamine.

21. In China, the State Council approved the decision of the Ministry of Public Security, the Ministry of Commerce, the National Health Commission, the Ministry of Emergency Management, the General Administration of Customs and the National Medical Products Administration to include two fentanyl precursors, 4-piperidone and 1-boc-4-piperidone, in the Catalogue of Classification and Varieties of Precursor Chemicals, a schedule of the Regulation on the Administration of Precursor Chemicals, effective 20 July 2025. Specifically, the two chemicals were regulated as category II precursor chemicals, requiring their production, distribution, purchase, transportation, import and export to comply with the relevant provisions for non-pharmaceutical precursor chemicals. In November 2025, China also introduced controls over exports of selected internationally non-controlled precursors of fentanyl and of fentanyl analogues to countries in North America.

22. In India, on 23 January 2025, the Narcotic Drugs and Psychotropic Substances (Regulation of Controlled Substances) Order, 2013, was amended through the inclusion of the 18 substances added to Table I of the 1988 Convention pursuant to a decision that became effective on 3 December 2024 in schedules B and C of that Order. In addition, on 2 September 2024, the Government of India issued a public notice on the establishment of a special surveillance list of substitute and “new” chemicals for which there was substantial evidence of their use in illicit drug manufacture. The list, prepared on the basis of input provided as part of the INCB mapping exercise, has since been used by India to submit notifications regarding planned exports of listed chemicals on a voluntary basis through the PEN Online Light system (see para. 134).

23. In Egypt, in August 2025, the Egyptian Drug Authority issued an update to the regulatory framework governing preparations containing pseudoephedrine. The revised guideline substantially expands the Authority’s jurisdiction beyond community pharmacies to all licensed national entities involved in the supply chain, and covers all processes, from manufacturing, import and export to distribution, storage and sale. Key enforcement measures now mandate complete traceability for all manufactured batches and the consumption of active ingredients, alongside a requirement for pre-approval for any sales to distributors and warehouses. Furthermore, supply caps have been instituted with regard to quantities dispensed to community pharmacies, and any supply requests may be subject to inspection, including a thorough review of sales records.

24. In Guatemala, on 8 July 2025, Government Decision No. 102-2025 entered into force. The Decision contains the Regulation for the Authorization and Control of Precursors and Chemical Substances, an updated legal framework for the control of chemical precursors and substances in response to the changing and complex nature of drug trafficking, the increase in the scale of synthetic drug markets and the diversion of chemical precursors and substances for the illicit manufacture of drugs.

25. In Singapore, on 1 July 2025, amendments to the First Schedule of the Misuse of Drugs Act came into effect, listing additional substances to be included as class A controlled drugs. The list of additional substances explicitly includes intermediates in the manufacture of synthetic cannabinoids, that is, substances that can be used as precursors (see para. 154).

26. In the United States of America, on 4 June 2025, an update to the Special Surveillance List of Chemicals, Products, Materials and Equipment Used in the Manufacture of Controlled Substances and Listed Chemicals was published in the Federal Register. The List identifies laboratory supplies that are used in the manufacture of controlled substances. With a view to deterring the illicit production of pills, tablets and capsules, including counterfeit and fake tablets, the update includes the addition of selected excipients, alone or in combination. The publication of the List also reminds individuals and firms that civil penalties may be imposed on them if they distribute a laboratory supply to a person who uses, or attempts to use, a laboratory supply to manufacture a controlled substance or a listed chemical, in violation of the provisions of the Controlled Substances Act, with reckless disregard for the illegal uses to which that laboratory supply will be put.

27. Through European Commission Delegated Regulation (EU) 2025/1475 of 21 May 2025, Regulation (EC) No. 273/2004 of the European Parliament and of the Council and Council Regulation (EC) No. 111/2005 were amended to include the fentanyl precursors 4-piperidone and 1-boc-4-piperidone in the list of scheduled substances. The Regulation came into effect on 14 August 2025.

28. **The Board wishes to remind competent national authorities that details of import and export requirements and other control measures applied to chemicals under national control are available on the Board's secure web page as part of the INCB information package on the control of precursors, specifically, the compendium of controls pursuant to article 12 of the 1988 Convention.**

29. On 18 December 2024, INCB distributed a circular letter to all Governments encouraging them to submit information regarding the import and export systems applicable to the 18 substances added to Table I of the 1988 Convention pursuant to a decision of the Commission on Narcotic Drugs that became effective on 3 December 2024. Information received throughout 2025 is currently being compiled and consolidated so that it can be made available to the competent national authorities of all Governments in a revised version of the information package on the control of precursors.

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

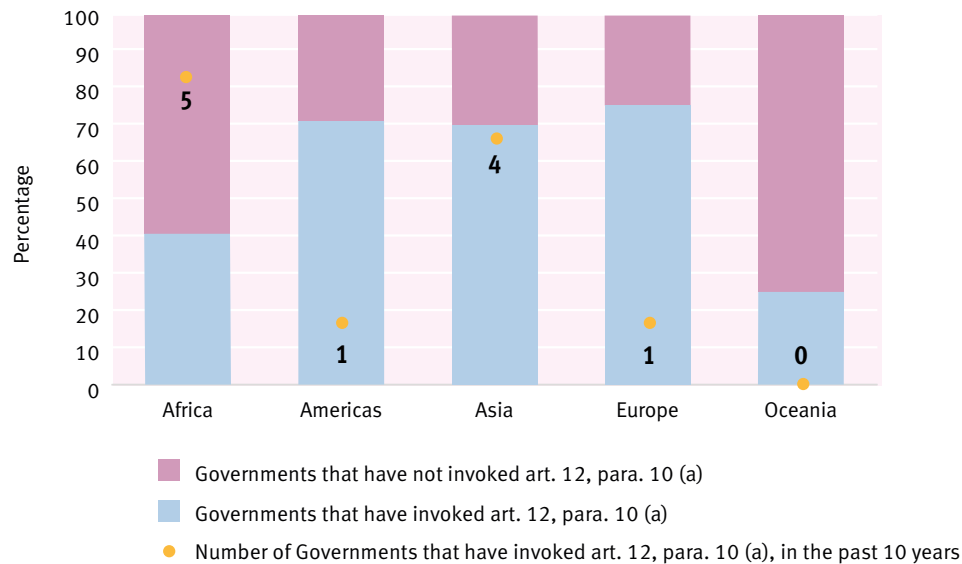
30. Pre-export notifications are central to the monitoring of international trade in substances listed in Tables I and II of the 1988 Convention. In order for the international precursor control system to function effectively, Governments must formally invoke article 12, paragraph 10 (a), of the Convention, thereby requiring authorities of exporting countries to issue pre-export notifications. In addition, although it is not mandated by the Convention, Governments are encouraged to register with the Board's PEN Online system to ensure that they have real-time access to information on planned shipments. Together, these two complementary measures, namely the invocation of article 12, paragraph 10 (a), of the Convention and registration in the PEN Online system, have proved essential for the rapid identification of suspicious transactions and the prevention of their diversion. Additionally, the PEN Online Light system offers Governments a voluntary mechanism for exchanging pre-export notifications relating to substitute and alternative chemicals that are not listed in Tables I and II of the 1988 Convention but are known to be used in the illicit manufacture of drugs.

### 1. Pre-export notifications

31. As at 1 November 2025, 122 States and territories had formally requested to receive pre-export notifications pursuant to article 12, paragraph 10 (a), of the Convention. During the reporting period, the Governments of Singapore and Sri Lanka amended their initial request to now include all substances in Tables I and II (see annex VI). As noted in past reports, the **Board is concerned that in several regions, particularly Africa and Oceania, many Governments continue to rely on the discretion of the authorities of exporting countries and territories to provide information on planned shipments of controlled precursors.** While some improvement has been observed in Africa with regard to the number of countries that have invoked article 12, paragraph 10 (a), significant gaps persist (see figure 3).

32. **The Board welcomes the efforts of Governments to adjust pre-export notification requirements in line with changes to national control measures and urges all remaining Governments to strengthen the pre-export notification system by making use of the provisions of article 12, paragraph 10 (a), of the 1988 Convention.**

**Figure 3. Governments that have invoked article 12, paragraph 10 (a), of the 1988 Convention (as at 1 November 2025)**



## 2. Pre-Export Notification Online system

33. Since the publication by the Board of its report on precursors for 2024, the Government of Djibouti has registered as a user of the PEN Online system, thus increasing the number of countries and territories with authorized access to the electronic tool to 170.

34. Between 1 November 2024 and 1 November 2025, over 34,000 pre-export notifications were communicated by 63 exporting Governments to 192 importing countries and territories through the PEN Online system, which represents a slight increase compared with the previous reporting year.

35. The level of active utilization of the system by the authorities of importing countries remained unchanged from the previous reporting year, with 90% of pre-export notifications viewed and 6% objected to. As the Board has repeatedly emphasized, a timely response to pre-export notifications remains a key factor in the effectiveness of the international precursor control system. Relevant achievements and diversion attempts that have been thwarted through effective use of the PEN Online system are discussed in chapter II of the present report (see, for example, para. 137).

36. **The Board commends importing Governments for utilizing the PEN Online system to view and respond to pre-export notifications and encourages those that have not yet made active use of the system to do so. Additionally, the Board reiterates its recommendation to treat shipments that have been objected to as the starting point for investigations to identify traffickers and modi operandi.**

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

37. Similar to the PEN Online system, the PEN Online Light system enables Governments to process information on planned international transactions involving non-scheduled chemicals, thereby minimizing delays in legitimate trade while helping to prevent diversion.

38. The PEN Online Light system contains a list of more than 170 non-scheduled chemicals known to be used in the illicit manufacture of drugs. This includes substances, and their synonyms, featured on the limited international special surveillance list of non-scheduled substances, as well as frequently seized precursor chemicals reported through PICS. The list is continuously updated at the request of the authorities using the system.

39. The number of pre-export notifications submitted via the PEN Online Light system is steadily increasing. As at 1 November 2025, 3,250 pre-export notifications had been submitted by 18 exporting Governments to 74 importing countries and territories, including more than 1,480 notifications between 1 November 2024 and 1 November 2025. As in the previous reporting year, most notifications were sent to countries and territories in Asia and the Americas; however, Europe received more than triple the number of notifications compared with the preceding year (see figures 4 and 5).

Figure 4. Destination of pre-export notifications submitted through the PEN Online Light system, by region, as at 1 November 2025

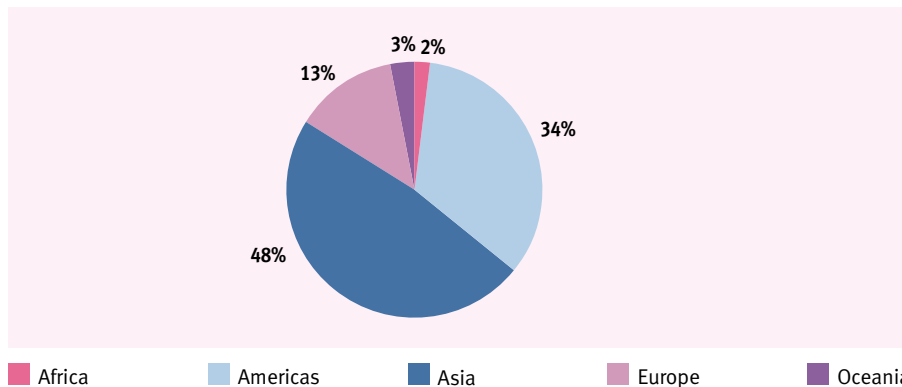
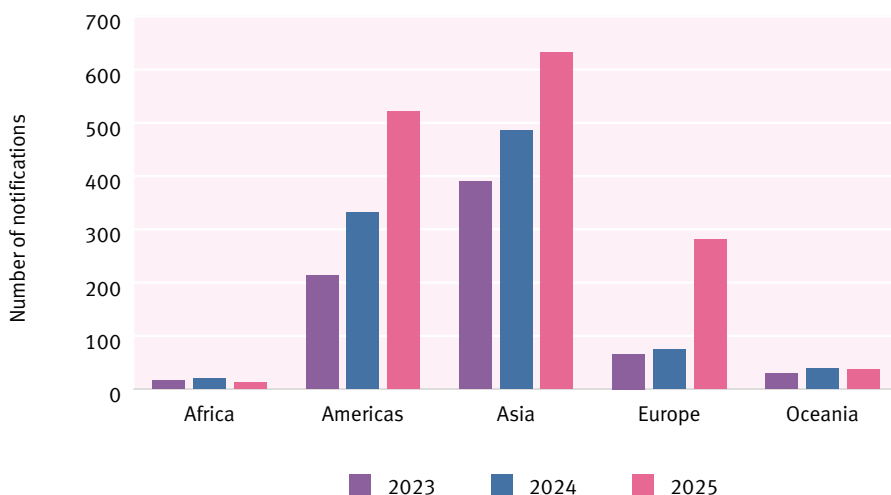
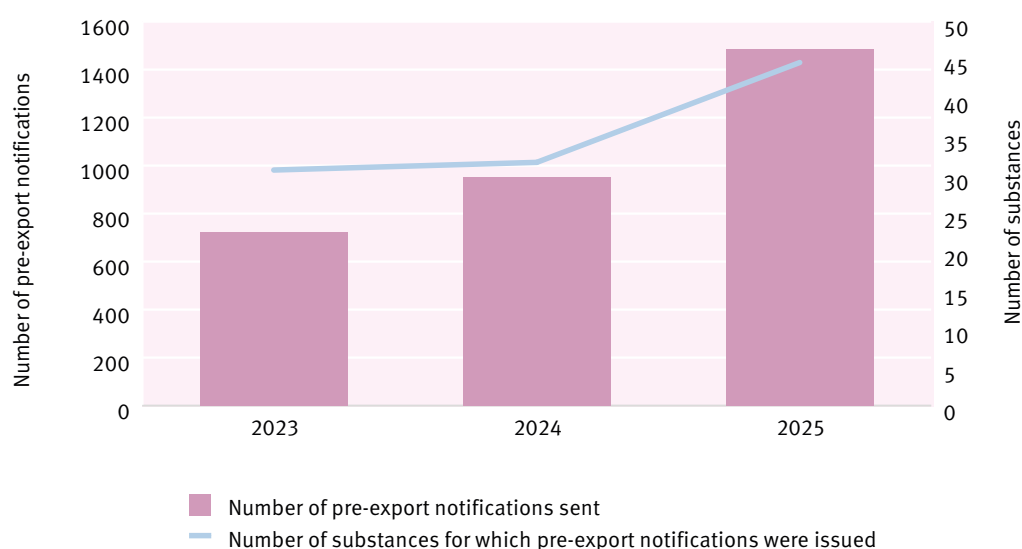


Figure 5. Number of pre-export notifications submitted through the PEN Online Light system, by region and reporting year, as at 1 November 2025



40. CBD, a substance that was added to the PEN Online Light system in October 2024 following its placing by China under national control as a precursor, has become one of the substances for which notifications are most frequently issued. Other substances for which notifications are most frequently sent through the PEN Online Light system are GBL, glacial acetic acid, ethanol, sodium hydroxide (caustic soda), chloroform and red phosphorous. To date, exporting authorities have submitted pre-export notifications relating to a total of 54 non-scheduled chemicals (see figure 6).

**Figure 6. Number of pre-export notifications sent through the PEN Online Light system and number of substances for which they were issued, by reporting year, as at 1 November 2025**



41. The Board notes with appreciation that some exporting authorities submit pre-export notifications not only for substances under their national control but also for those not controlled domestically (see para. 134 for details). Since the launch of the system, importing Governments have objected to 11% of the pre-export notifications they have received. Most of those objections continue to be related to GBL, followed by sodium hydroxide, glacial acetic acid and chloroform. Common reasons included unauthorized use, the absence of import licences, the exceedance of import quotas, unregistered trading companies, the misuse of company names and insufficient evidence of legitimate end use. Significant incidents are described in chapter II of the present report.

42. The Board commends all exporting and importing Governments for making use of the PEN Online Light system and for the constructive feedback received on the use of the tool. An inherent issue is the fact that because many of the substances for which pre-export notifications are sent are not controlled as drug precursors in most importing countries, they are not under the purview of the competent national authorities registered as users of the PEN Online system. **INCB would therefore like to remind Governments that the PEN Online Light system provides for the registration of other relevant national authorities that may be better placed to make informed decisions about proposed shipments involving chemicals not under international control as drug precursors. The Board underscores the importance of monitoring domestic and international trade in chemicals not listed in Tables I and II of the 1988 Convention and encourages all such authorities to register with and make full use of the system.**

## H. Other activities and achievements in international precursor control

### 1. Project Prism and Project Cohesion

43. Project Prism and Project Cohesion are the operational initiatives of the Board related to precursors of synthetic drugs and to precursors of cocaine and heroin, respectively. They provide a framework for international cooperation to prevent the diversion of and trafficking in chemicals for illicit drug manufacture. Under the projects, Governments appoint precursor focal points, who are the Board's prime contacts for operational initiatives and the recipients of regular alerts issued by INCB relating to new chemicals, *modi operandi*, suspicious shipments and diversion attempts. Moreover, in order to identify potential gaps and weaknesses in the international precursor control system, international operations are carried out under the two projects.

44. During the reporting period, 10 alerts were issued under the projects. They included three alerts regarding the emergence of new substances, namely 3,4-dimethoxy-P-2-P ethyl glycidate – a precursor of amphetamine-type stimulants not under international control (see para. 95), methyl 4-phenylacetoacetate – a new pre-precursor of amphetamine and methamphetamine (see para. 94), and *ortho*-methyl 4-AP – a new precursor of fentanyl analogues that is not under international control (see para. 139). Four alerts provided information about trafficking trends and *modi operandi*, including first-time seizures of fentanyl precursors in Europe, the seizure of red and white pseudoephedrine tablets of unknown origin and brand in Czechia, the successful prevention of the diversion of 3 tons of a fentanyl precursor through the effective use of the PEN Online system (see para. 137), and the use of excipients and premixed tableting powders in the illicit manufacture of tablets. Lastly, two alerts related to precursors of nitazenes (see paras. 162 and 163). INCB alerts reached relevant national and international officers, including precursor focal points and users of PICS and the PEN Online system.

#### Operation Pseudonym

45. During the reporting period, an international operation, code-named Operation Pseudonym, was conducted under Project Prism from October to December 2024. The operation focused on the international and, where possible, domestic trade in ephedrine and pseudoephedrine in all forms. It saw widespread participation, with 60 countries and territories and four international or regional organizations taking part.

46. While the primary focus of the operation was international trade in ephedrine and pseudoephedrine in all forms, some participating countries also reported on seizures that were not related to licit trade but that involved outright smuggling. Four of the participating countries reported 168 seizures, with the majority reported by Australia and New Zealand. In both countries, the origin of the substances, which took the form of raw material and preparations, was reported as being China and India. Trafficking in ephedrines from South Asia to Oceania has also been noted several times in the past. Notably, some seizures in Australia originating in India included pseudoephedrine tablets that were similar to tablets of unknown origin and brand previously encountered in Czechia, about which an alert had previously been issued under Project Prism, thereby pointing to a possible connection between the cases in Australia and the earlier case in Europe (see para. 72). The Board is awaiting confirmation of whether the tablets are of legitimate origin or were illicitly manufactured in India.

47. Türkiye identified a large shipment of a pseudoephedrine preparation transiting through its territory, which it communicated through PICS. The shipment, for which no pre-export notification had been sent through the PEN Online system, involved over 15 tons in gross weight of a pharmaceutical preparation containing pseudoephedrine, which had originated in Morocco and was destined for the Islamic Republic of Iran. The quantity involved by far exceeded the annual legitimate requirement of the Islamic Republic of Iran for pseudoephedrine preparations on record with INCB. The incident therefore highlighted the need to make better use of the annual legitimate requirements system, as well as to send pre-export notifications regarding planned exports of pharmaceutical preparations containing ephedrine and pseudoephedrine through the PEN Online system and monitor international trade in such preparations in the same manner as the substances themselves,

as the Board has repeatedly recommended.<sup>4</sup> The matter has been taken up with the Government of the Islamic Republic of Iran, and the Board is awaiting its response.

48. The United Arab Emirates prevented the delivery of two pre-notified shipments of pseudoephedrine preparations totalling 380 kg proposed to be exported to Libya. The shipments were not allowed to proceed due to doubts regarding the authenticity of the Libyan import permits.

49. Operation Pseudonym also revealed the possible exploitation of trade within the European Union for the purposes of trafficking, particularly in pharmaceutical preparations containing ephedrine or pseudoephedrine. The large-scale procurement of pharmaceutical preparations containing the substances sourced from within the European Union was noted by some member States; such cases of procurement were suspicious in nature and required further investigation. The absence of pre-export notifications related to trading in controlled precursors and pharmaceutical preparations containing ephedrine and pseudoephedrine within the European Union makes analysis of the trade to, from and within markets such as this difficult.

50. Lastly, Operation Pseudonym was successful in bringing together a large number of countries and territories to focus on preventing the diversion of and trafficking in ephedrine and pseudoephedrine for the illicit manufacture of drugs. INCB commends all countries that actively participated in the operation by providing relevant information about the target substances, which helped to identify – and address – one of the contemporary gaps in control measures. Unfortunately, several countries that have previously been linked with the large-scale diversion of and trafficking in the substances<sup>5</sup> either did not take part in the operation or did not participate actively.

51. On the basis of the results of Operation Pseudonym, **the Board reiterates the need to control pharmaceutical preparations containing ephedrine and pseudoephedrine in the same manner as the substances themselves, and to use the PEN Online system to systematically pre-notify the authorities of importing countries and territories of shipments of the substances in all forms, including preparations, including for trade within common markets. Furthermore, the Board encourages countries to make a realistic assessment of their annual legitimate requirements for such substances and to closely monitor trade in the substances in relation to those requirements. The Board also encourages Governments to complement the information available in the PEN Online system and the estimates of annual legitimate requirements with actual trade data that Governments (including those in common markets) are privy to, in order to identify possible oversupply and therefore prevent diversion.**

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

52. During the reporting period, there were several developments, incidents and seizures related to the fentanyl precursor 1-boc-4-piperidone, which was placed under Table I of the 1988 Convention with effect from 3 December 2024. The first ever seizures of the substance in Europe were communicated through PICS. In those cases, the substance mostly originated in India.<sup>6</sup> That was followed by seizures of 1-boc-4-piperidone in Guatemala (see para. 136), which in all cases originated in India. The Board followed up on the seizures with the countries concerned to assist with backtracking investigations. Furthermore, taking note of those developments, the Board analysed international trade in the substance prior to its international scheduling through the export and import information obtained from a commercially available online platform. Since the nature and extent of the legitimate uses of 1-boc-4-piperidone and other recently scheduled fentanyl precursors are only coming to light after the placing of those substances under national control in an increasing number of countries, the Board

<sup>4</sup>See, for example, “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](http://www.incb.org/incb/en/precursors/precursors/recommendations/introduction.html). Annex IV.H. to the limited international special international surveillance list of non-scheduled substances also provides a summary of action recommended in Economic and Social Council and Commission on Narcotic Drugs resolutions related to preparations containing chemicals in Tables I and II of the 1988 Convention.

<sup>5</sup>See the INCB report on precursors for 2024 (E/INCB/2024/4), paras. 80 and 82 and box 2; the INCB report on precursors for 2023 (E/INCB/2023/4), paras. 93 and 96 and the box on page 19; and the INCB report on precursors for 2022 (E/INCB/2022/4), paras. 77, 78 and 88.

<sup>6</sup>See the INCB report on precursors for 2024 (E/INCB/2024/4), para. 153.

is working with the authorities of major importing and exporting countries to better understand the extent and nature of those legitimate uses.

53. In October 2025, an information-sharing meeting was held by the Board on the incidents related to 1-boc-4-piperidone originating in India (see para. 137).

54. In the reporting period, the Board supported the Government of South Africa with enquiries related to lead acetate. The substance, which is not under international control, has wide industrial applications, including as a reagent and as a fixative for some dyes. However, it can also be used to convert phenylacetic acid to P-2-P in the illicit manufacture of methamphetamine. From April 2023 to November 2024, South Africa had communicated four seizures, involving more than 11 tons of lead acetate, through PICS. The Board's analysis of information available on the aforementioned open-source, commercially available online platform revealed that in the period 2023–2024, a total of 44 tons of the substance had apparently been imported by a particular importer into South Africa from India. The information has been shared with the competent authorities of South Africa, which have initiated steps to verify the legitimacy and end use of the substance in the country.

55. The Board also enquired with the competent authorities of Togo about the legitimacy of a shipment of 4 tons of lead acetate purportedly imported in the country in 2024. That shipment appeared to be inconsistent with known licit trade patterns and was apparently shipped by a company involved in a previous precursor-related incident.

56. In January 2025, the competent authorities of Spain sought the assistance of the Board in verifying the legitimacy of an order for 9,000 tons of sulfuric acid per month received by a Spanish company from a company in the Democratic Republic of the Congo. The matter was taken up with the authorities of the Democratic Republic of the Congo, which have initiated investigations. It is worth mentioning that in 2023 and 2024, the Ministry of Health of the Democratic Republic of the Congo objected, through the PEN Online system, to four shipments (amounting to almost 6,173 tons) of sulphuric acid destined for the country. The reasons for past objections included the involvement of importers not authorized to operate in the country and the use of false import permits to justify proposed imports of the substance.

57. During the reporting period, the Board also partnered with the International Criminal Police Organization (INTERPOL) on Operation Lionfish-Mayag III, which was coordinated by the INTERPOL Drugs Unit and was conducted from 30 June to 4 July 2024. The operation focused on seizures of synthetic drugs, precursors and other illicit goods while disrupting the proceeds of crime. The operation resulted in 54 seizures of precursor chemicals amounting to over 9 tons.

## 2. Precursors Incident Communication System

58. PICS continued to serve as the one global platform of its kind, enabling the real-time exchange of actionable information about incidents involving precursor chemicals and equipment used in illicit drug manufacture. It also acted as an effective early warning system for precursor chemicals (and equipment), as national focal points communicated hitherto unreported substances and *modi operandi* through the platform. One such example during the reporting period was methyl 4-phenylacetoacetate – a new pre-precursor of amphetamine and methamphetamine not under international control – an incident involving which was communicated through PICS by the Kingdom of the Netherlands in April 2025, soon followed by incidents in other countries in Europe (see para. 94). Similarities in the form of mislabelling point to possible connections between the cases, thus enabling the conduct of backtracking investigations. The sharing of incidents in PICS therefore served the dual purpose of alerting other countries about the emergence of a new substance and of enabling the conduct of investigations into possible links between cases.

59. PICS was upgraded during the reporting period and was migrated to a more secure user authentication system. Following the migration, three virtual training sessions, including one in Spanish, were conducted to familiarize users with the features of the platform and its effectiveness as an intelligence-sharing tool. A total of 203 officers from 46 Governments and seven international and regional organizations participated in those sessions.

60. As at 1 November 2025, PICS had over 500 users from about 100 countries and territories in all regions of the world. During the reporting period, the Board undertook outreach efforts to expand the PICS user base.<sup>7</sup> As at 1 November 2025, more than 5,700 incidents had been communicated through PICS, including over 230 incidents related to equipment used in the illicit manufacture of drugs. During the reporting period, 968 incidents involving 1,898 communications regarding substances were shared through the platform, representing an increase of nearly 100% on the previous reporting period. That was largely attributable to the sharing by the Government of Canada of a large number of incidents, including incidents that had occurred in previous years. There were 586 incidents involving substances in Table I of the 1988 Convention, 141 incidents involving those in Table II, 273 incidents involving substances on the limited international special surveillance list of non-scheduled substances, 193 incidents involving other non-scheduled substances and 54 incidents involving cutting agents, adulterants, diluents or excipients. A total of 27 equipment-related incidents were also communicated. The reason that a greater share of incidents related to Table I of the 1988 Convention was mainly because a large number of incidents communicated by the Government of Canada involved ephedrine and pseudoephedrine, both substances in Table I. The results under Operation Pseudonym, which targeted ephedrine and pseudoephedrine, also contributed to the increase.

**61. The Board commends those Governments that have communicated incidents through PICS, thereby enhancing international cooperation on investigations related to precursors and equipment used in the illicit manufacture of drugs. Those communications have also led to increased knowledge of the emergence of new chemicals and modi operandi for trafficking such substances. The Board encourages Governments that are not yet using PICS to nominate suitable regulatory and/or law enforcement officials to register for the system and increase their national capacity to address the diversion of and trafficking in precursors and equipment, in addition to strengthening collective global efforts in this field.**

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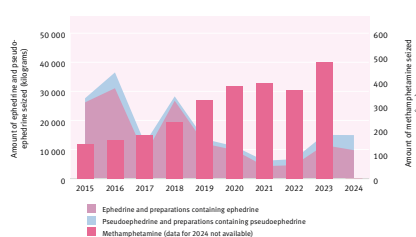
<sup>7</sup>Governments that have not yet registered PICS focal points for their national authorities involved in precursor control may request an account by writing to [incb.pics@un.org](mailto:incb.pics@un.org).

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

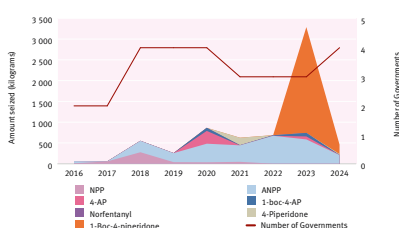
### SEIZURE DATA IN FOCUS

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

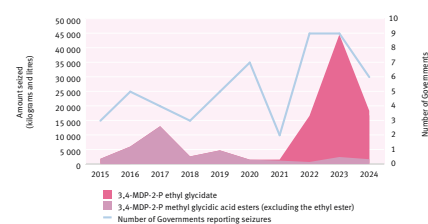
EPHEDRINES (para. 67)



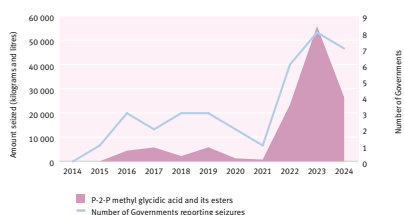
FENTANYL PRECURSORS (paras. 135–137)



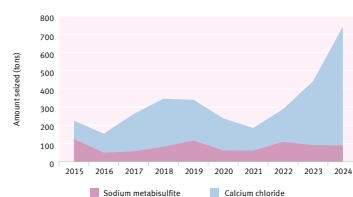
“ECSTASY” PRECURSORS (paras. 89–92)



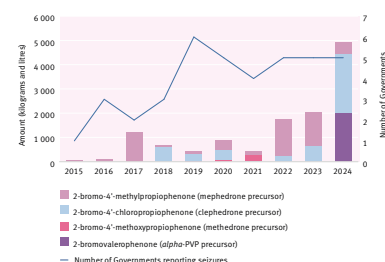
AMPHETAMINE AND METHAMPHETAMINE PRECURSORS: P-2-P METHYL GLYCIDIC ACID AND ITS ESTERS (paras. 85 and 86)



COCAINE PROCESSING CHEMICALS: SODIUM METABISULFITE AND CALCIUM CHLORIDE (paras. 117 and 118)



PRECURSORS OF SYNTHETIC CATHINONES: (paras. 148–151)



62. The present chapter provides an overview of the major trends identified 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 analysis was developed on the basis of information provided by Governments 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. The analysis covers the period up to 1 November 2025. **INCB wishes to thank Governments for the information received.**

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

### 1. Substances used in the illicit manufacture of amphetamines

#### (a) Ephedrine and pseudoephedrine

63. Ephedrine and pseudoephedrine, including their pharmaceutical preparations, (ephedrines, for short) are used in the illicit manufacture of methamphetamine. Since they are also widely used for legitimate medical purposes, they are among the most frequently traded substances in Table I of the 1988 Convention. Methamphetamine can also be manufactured through the P-2-P route (see paras. 81–86 below and annex VIII), and in recent years, the use of designer precursors such as the esters of P-2-P methyl glycidic acid to manufacture methamphetamine has increasingly been noted, leading to the scheduling of such esters in Table I of the 1988 Convention in 2024. That development broadly coincided with a decline in global seizures of ephedrines. Nevertheless, the international legitimate trade in ephedrines continued to be targeted by traffickers in 2024.

#### *Licit trade*

64. Between 1 November 2024 and 1 November 2025, exporting countries sent 5,393 pre-export notifications through the PEN Online system regarding planned shipments of ephedrine and pseudoephedrine in bulk and in the form of pharmaceutical preparations. The notifications related to a total of 1,108 tons of pseudoephedrine, which represents a slight decrease in trade compared with the previous reporting year, and over 52 tons of ephedrine, which represents a similar trade pattern to that seen prior to the reporting year of 2024. The shipments originated in 40 exporting countries and territories and were destined for 178 importing countries and territories.

65. Table 4 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 4. 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 2024–1 November 2025**

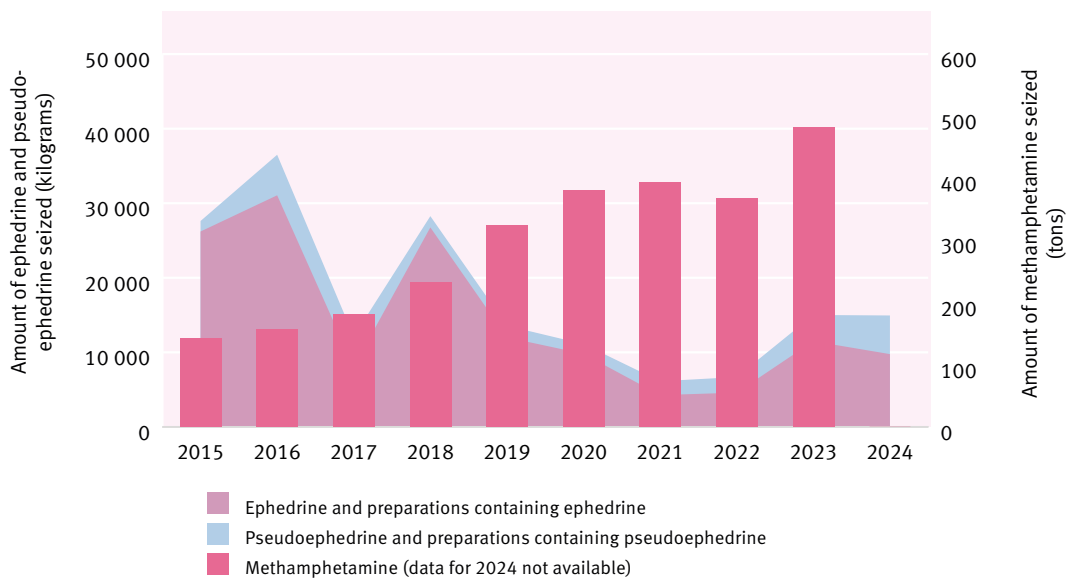
Ranking	Ephedrine	Pseudoephedrine
1	Republic of Korea	United States
2	Nigeria	Egypt
3	Egypt	Switzerland
4	United States	Türkiye
5	Denmark	Pakistan
6	Ghana	Republic of Korea
7	France	Japan
8	China, Hong Kong SAR	Indonesia
9	South Africa	Italy
10	Kenya	Saudi Arabia

66. On form D for 2024, India, a major exporter of ephedrine and pseudoephedrine in the form of both raw material and pharmaceutical preparations, reported 12 stopped shipments of raw ephedrine or pseudoephedrine. The total quantities involved were nearly 6 tons. Furthermore, the United Republic of Tanzania stopped a shipment of 375 kg of pseudoephedrine originating in Denmark on account of the absence of a valid import authorization permit.

**Trafficking**

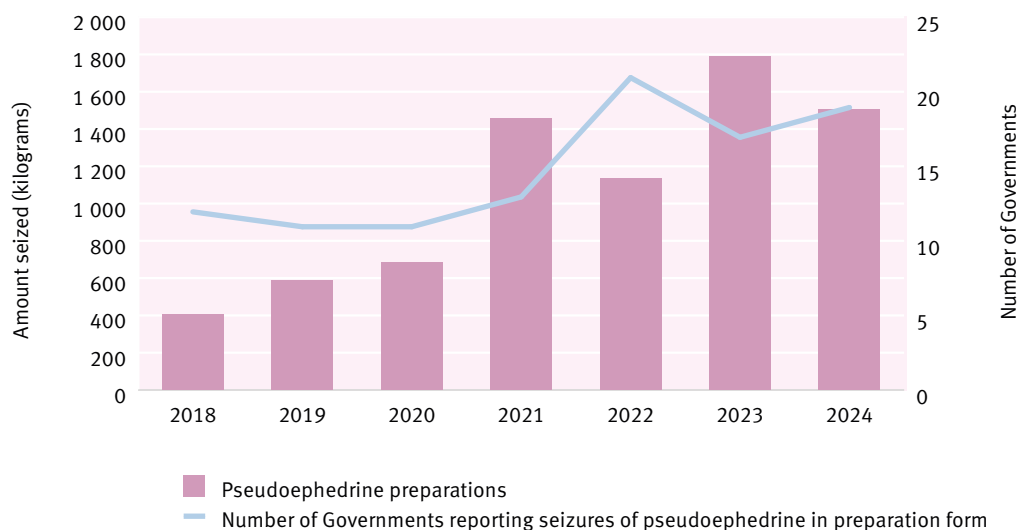
67. At 15 tons, the global quantity of ephedrines seized in 2024 remained at a level similar to that of 2023 (see figure 7). Twenty-eight countries reported seizures for 2024, a decline from the 37 that did so for 2023. Over 85% of the quantity seized globally was accounted for by only four countries – Pakistan (6 tons), China (nearly 5 tons), New Zealand (1.2 tons) and Australia (nearly 1 ton). Despite the increase in the quantities of ephedrines seized in 2023 and 2024, those quantities were relatively low compared with the amounts reported seized a decade ago, and were in stark contrast with the increasing amount of methamphetamine seized worldwide (see figure 7), a trend that the Board has noted previously. This is particularly true of South-East Asia, where the results of forensic profiling analysis of methamphetamine seized in the region continue to suggest that ephedrines are being used as starting materials despite the fact that no seizures of ephedrines or notable seizures of ephedrine precursors have been reported. In contrast, it has long been known that in North America, methamphetamine is manufactured using P-2-P-based methods, which rely on non-scheduled pre-precursor chemicals.

**Figure 7. Seizures of ephedrine and pseudoephedrine, as reported by Governments on form D, and of methamphetamine, as reported on the UNODC annual report questionnaire, 2015–2024**



68. At 1.5 tons, the quantity of preparations containing pseudoephedrine seized declined marginally from the quantity seized in 2023 (1.8 tons) but remained at the relatively high levels seen since 2020 (see figure 8), with 19 countries reporting such seizures. Four of the 19 countries, namely Australia (691 kg), India (256 kg), New Zealand (243 kg) and the Democratic Republic of the Congo (240 kg), accounted for 98% of the quantity seized, with the Democratic Republic of the Congo reporting one seizure of such preparations, originating in India, for the first time since 2007. Some of the seizures in Australia and New Zealand were made under Operation Pseudonym.

Figure 8. Seizures of pseudoephedrine preparations, as reported by Governments on form D, 2018–2024



69. One case involving 180,000 pseudoephedrine tablets communicated by Kenya through PICS in 2025 exemplified how a combination of international trade and domestic diversion is used by traffickers. The seizure of a pharmaceutical preparation manufactured by an Indian company was made at a land border with Uganda, from a bus coming from South Sudan. The Board's subsequent enquiries revealed that the quantity seized was part of a shipment of 2 million such tablets that India had pre-notified South Sudan about through the PEN Online system and subsequently exported in 2024. In that case, a portion of the legitimate imports into South Sudan had been domestically diverted and trafficked to Kenya. **As diversions of pharmaceutical preparations containing ephedrine and pseudoephedrine continue to be noted at the domestic level, the Board encourages Governments to ensure that controls are placed over the domestic manufacture and distribution of such preparations, in addition to monitoring and controlling their international trade.**

70. For the second year in a row, Pakistan reported the highest amounts of ephedrines seized globally, at 6 tons, comprising 2.5 tons of ephedrine in the form of raw material (i.e. half the quantity reported seized in 2023) and 3.5 tons of pseudoephedrine in the form of raw material. The seizures of ephedrine were made at hidden drug dumps. The seizures of pseudoephedrine in the form of raw material were unprecedented for the country. In both cases, efforts were reported to be under way to determine the country of origin.

71. With seizures of over 4.9 tons, almost exclusively of ephedrine in the form of raw material, China recorded nearly a third of the global quantity of ephedrines seized in 2024. New Zealand was the next highest, with seizures in 2024 totalling 1.2 tons, an amount that was more than four times the seizures recorded in 2023. In one case, over 400 kg of ephedrine in the form of raw material was seized, the last known location of which prior to its arrival in New Zealand was Viet Nam. Otherwise, China, including Hong Kong, China, was the last known location of the bulk of the remaining ephedrines seized. New Zealand was also a very active participant in Operation Pseudonym, seizing over 500 kg of ephedrines in 63 incidents in the three months of the operation.

72. Australia, also an active participant in Operation Pseudonym, seized nearly 1 ton of ephedrines in 2024, but unlike its trans-Tasman neighbour, made no seizures of ephedrine in the form of raw material. Most of the seizures made in Australia – nearly 700 kg – were of pseudoephedrine preparations seized in over 430 incidents. Of those, 600 kg related to a single case sourced to Israel, a hitherto unknown route. India was the next highest source for the pseudoephedrine preparations seized, accounting for 80 kg in nearly 130 cases. India was also the source of half the 300 kg of ephedrine preparations reported seized in 2024.

73. Canada was the next highest contributor to global seizures of ephedrine preparations in 2024. That quantity had been lawfully obtained by a licensed dealer but was subsequently seized for administrative rather than law enforcement reasons.

74. The Democratic Republic of the Congo, which submitted seizure data on form D for the very first time, reported the seizure of more than 360 kg of ephedrine preparations. That included over 120 kg of ephedrine preparations, 110 kg of which was reported as having originated in India, and 240 kg of pseudoephedrine preparations, also sourced to India. Since there is no historical record of seizures in the country, the Board is corresponding with the relevant authorities for further details.

75. India reported seizures of 265 kg of the substances in 2024, comprising 256 kg of pseudoephedrine preparations and 9 kg of ephedrine preparations. That was a significant decline compared with the seizures of nearly 1 ton reported in each of the preceding two years. In the first 10 months of 2025, India communicated through PICS, among other seizures, one seizure of more than 60 kg of pseudoephedrine in the form of raw material, part of which was recovered during attempts to smuggle it out of the country from an airport and part of which was seized during domestic follow-up investigations. Nationals from India, Nigeria and Uganda were arrested in the case.

76. Thirteen countries in Europe collectively reported seizures of 140 kg of ephedrine preparations, with nearly 66 kg (in all forms) being accounted for by Czechia. Those 66 kg were seized in over 100 separate incidents, indicating the small quantities per incident typical of the small-scale “kitchen” laboratories known to be used to manufacture methamphetamine in the country. Germany reported seizures of nearly 60 kg of the substances, including six incidents in which 40 kg of pseudoephedrine preparations originating in Egypt had been concealed in coffee bags.<sup>8</sup> Germany also reported the theft of a pending outbound shipment of 800 kg of pseudoephedrine from a warehouse at an airport in 2024. Furthermore, 15 European Union member States actively participated in Operation Pseudonym (see paras. 45–51), which revealed the need for the monitoring of trade within the European Union, especially in respect of pharmaceutical preparations. The Board has highlighted that issue in the past.<sup>9</sup>

77. Other countries that reported seizures of more than 35 kg of ephedrine preparations included Malaysia (two incidents involving ephedrine preparations amounting to 43 kg) and Nigeria (38 kg in four incidents).

### *(b) Norephedrine and ephedra*

#### *Licit trade*

78. Between 1 November 2024 and 1 November 2025, 10 exporting countries sent pre-export notifications through the PEN Online system for 168 shipments of norephedrine to 31 importing countries, comprising 34 tons of raw material and about 760 kg in the form of pharmaceutical preparations, representing a slight decrease in the amount of preparations for which pre-export notifications were sent compared with the previous year. The following importing countries were pre-notified of shipments amounting to 1 ton or more, in descending order of the amounts shipped: Philippines, United States, Indonesia, Japan, Myanmar and Denmark. There were two shipments of ephedra, totalling an amount of 38 kg.

#### *Trafficking*

79. Seizures of norephedrine were reported by only three countries on form D for 2024, namely Australia, Sweden and the United States. With a combined quantity of less than 0.5 kg, global seizures once again confirmed the declining importance of the substance in illicit drug manufacture.

80. Only two countries – China and Kyrgyzstan – reported seizures of ephedra on form D for 2024. The quantities reported by China as having been seized declined further in 2024. At just 1 ton, the amount was less than 1% of the quantities reported in 2019 and 2020. Kyrgyzstan also reported seizures of 284 kg in April 2024.

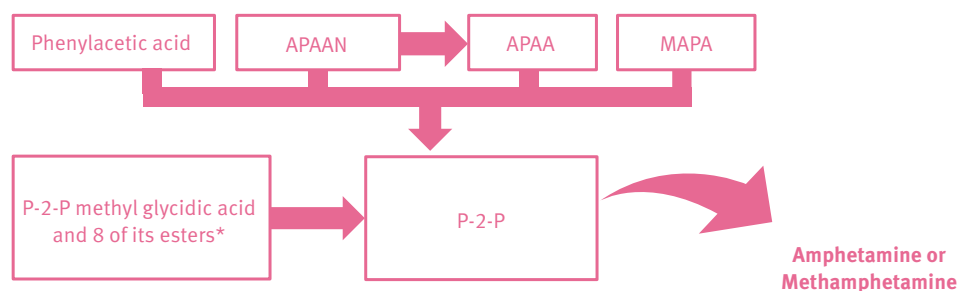
<sup>8</sup>See the INCB report on precursors for 2024 (E/INCB/2024/4), para. 82.

<sup>9</sup>Ibid., box 2.

### (c) P-2-P, phenylacetic acid and related internationally controlled designer precursors of amphetamine and methamphetamine

81. Since 3 December 2024, 14 precursors that can be used in P-2-P-based methods of illicit amphetamine and methamphetamine manufacture have been under international control (see figure 9). Except for P-2-P and phenylacetic acid, the other 12 internationally controlled chemicals are designer precursors with no known legitimate uses or trade.

Figure 9. Internationally controlled precursors used in P-2-P-based methods of illicit amphetamine and methamphetamine manufacture



\* Methyl, ethyl, propyl, isopropyl, butyl, isobutyl, *sec*-butyl and *tert*-butyl esters of P-2-P methyl glycidic acid.

#### Licit trade

82. Between 1 November 2024 and 1 November 2025, proposed international trade in P-2-P and phenylacetic acid remained at a level similar to that of previous years. Thirty proposed shipments of P-2-P, from four exporting countries to seven importing countries, and 789 proposed shipments of phenylacetic acid, from 15 exporting countries to 44 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.

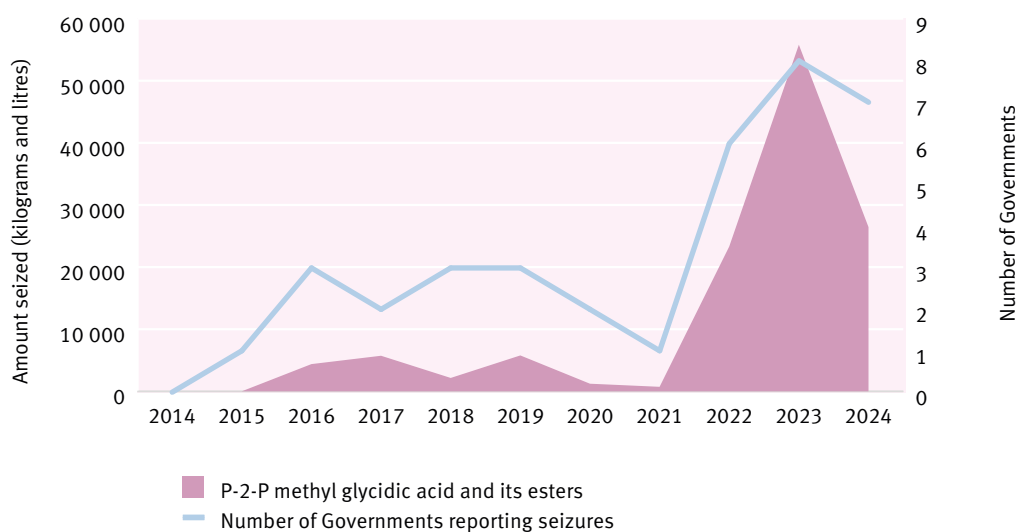
#### Trafficking

83. Twelve countries submitted data on **P-2-P** seizures and four countries submitted data on **phenylacetic acid** seizures on form D. Nearly 90% of the total quantity of P-2-P seized was reported by two countries, namely the Kingdom of the Netherlands and Mexico. As in previous years, where seizures of P-2-P or phenylacetic acid were reported, they often involved material that had been illicitly manufactured from one of their precursors, including recently or as yet non-scheduled alternative precursors, while instances of diversion from international trade have been rare in recent years. In 2024, aggregated seizures of **APAAN, APAA and MAPA**, which were placed under international control between 2014 and 2020, amounted to less than 85 kg, down from a peak of several tens of tons annually in the period 2018–2020.

84. Through PICS, the Board became aware of a laboratory in Kenya that was using a P-2-P-based method to illicitly manufacture methamphetamine in 2024. In a development also observed elsewhere, the laboratory had a connection with Mexican criminals. Some of the common chemicals not under international control allegedly originated in India.

85. Seizures of **P-2-P methyl glycidic acid and its esters**, substances that were added to Table I of the 1988 Convention effective 3 December 2024, were reported by seven countries. New Zealand and Norway were the only countries to report such seizures outside the European Union, where the esters have been controlled since 3 June 2024. The Kingdom of the Netherlands, followed by Germany and then Belgium, reported the largest amounts seized. However, total seizures in 2024 were less than half of the amount reported seized in 2023 (see figure 10) and involved exclusively P-2-P methyl glycidic acid and its methyl and ethyl esters.

Figure 10. Seizures of P-2-P methyl glycidic acid and its esters, as reported by Governments on form D, 2014–2024



86. In the first 10 months of 2025, in line with the trend observed in relation to other designer precursors of their becoming less important to traffickers after being placed under international control, only eight incidents involving P-2-P methyl glycidic acid and its esters, involving less than 300 kg and litres combined, were communicated through PICS. All those instances were reported by the Kingdom of the Netherlands. **The Board wishes to commend all Governments that have placed P-2-P methyl glycidic acid and its esters under national control, including those that did so ahead of the effective date of the scheduling decisions of the Commission on Narcotic Drugs of 3 December 2024. Those Governments include the Government of China and the Governments of European Union member States.**

87. One of the most notable trends during the reporting period was the continued marked discrepancy between seizures of amphetamine precursors and of amphetamine-based “captagon”,<sup>10</sup> especially in parts of West Asia. While seizures of “captagon” continued to be made at record levels, no notable seizures of relevant precursors were reported to INCB in 2024, despite the apparent emergence of new sources of “captagon” supplies. In fact, only four countries in the subregion of West Asia provided seizure data for any drug precursor in the period 2020–2024, notwithstanding continued reports in open-source media about the dismantling of “captagon” laboratories (both laboratories synthesizing amphetamine and laboratories producing “captagon” tablets). In response to enquiries by the Board, Iraq confirmed the dismantling of laboratories producing “captagon” tablets in the country in July 2023 and April 2024. Lebanon confirmed seizures of illicit drug manufacturing equipment and raw materials, as well as the dismantling of “captagon” manufacturing facilities in Hermel and Yammunah, Baalbek, in 2025.

88. Given the concurrent expansion of methamphetamine trafficking across West Asia and North Africa,<sup>11</sup> **it will become even more important to carry out more systematic forensic analysis of seized “captagon” tablets to determine whether methamphetamine might gradually replace amphetamine as the main active ingredient in fake “captagon” tablets.** As precursors for amphetamine and methamphetamine are different, such knowledge would allow more targeted action to address weaknesses in precursor control systems at the regional and global levels. **The Board therefore urges all Governments to remain alert with regard to inflated estimates of annual legitimate requirements for key amphetamine and methamphetamine precursors and**

<sup>10</sup> Captagon was originally the trade name for a pharmaceutical preparation containing the substance fenethylline, a synthetic stimulant. The “captagon” encountered in seizures today, in particular in the Middle East, and referred to in the present report, is a fake product that takes the form of tablets that are similar in appearance but distinct from the earlier pharmaceutical preparation. The active ingredient in fake “captagon” is often amphetamine, which is typically cut with various adulterants, such as caffeine.

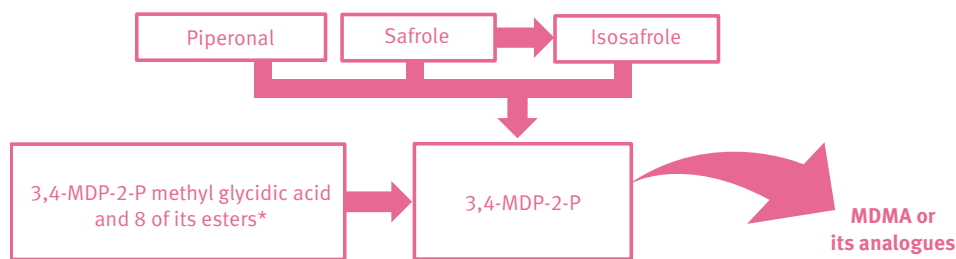
<sup>11</sup> *World Drug Report 2025*, Key findings, p. 28.

to the possible use of non-scheduled chemicals in the illicit manufacture of the two drugs, and to keep themselves up to date with and consult available tools, such as the Board's limited international special surveillance list of non-scheduled chemicals and PICS.

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

89. Of the 13 precursors of MDMA (commonly known as “ecstasy”) and its analogues, which have been under international control since 3 December 2024 (see figure 11), only piperonal has notable legitimate uses and is traded internationally. Instances of diversion from legitimate trade and seizures of piperonal remain negligible, with only 10 countries having reported seizures in the period 2020–2024, in the total amount of less than 300 kg. The opposite is true for 3,4-MDP-2-P and 3,4-MDP-2-P methyl glycidic acid and its esters: there are limited or no known legitimate uses for the substances, and subsequently little to no trade in them. However, several countries, predominantly European Union member States, reported seizures in significant amounts.

Figure 11. Internationally controlled precursors used in the illicit manufacture of MDMA and its analogues



\* Methyl, ethyl, propyl, isopropyl, butyl, isobutyl, *sec*-butyl and *tert*-butyl esters of 3,4-MDP-2-P methyl glycidic acid.

### (a) 3,4-MDP-2-P, 3,4-MDP-2-P methyl glycidic acid and its esters, and piperonal

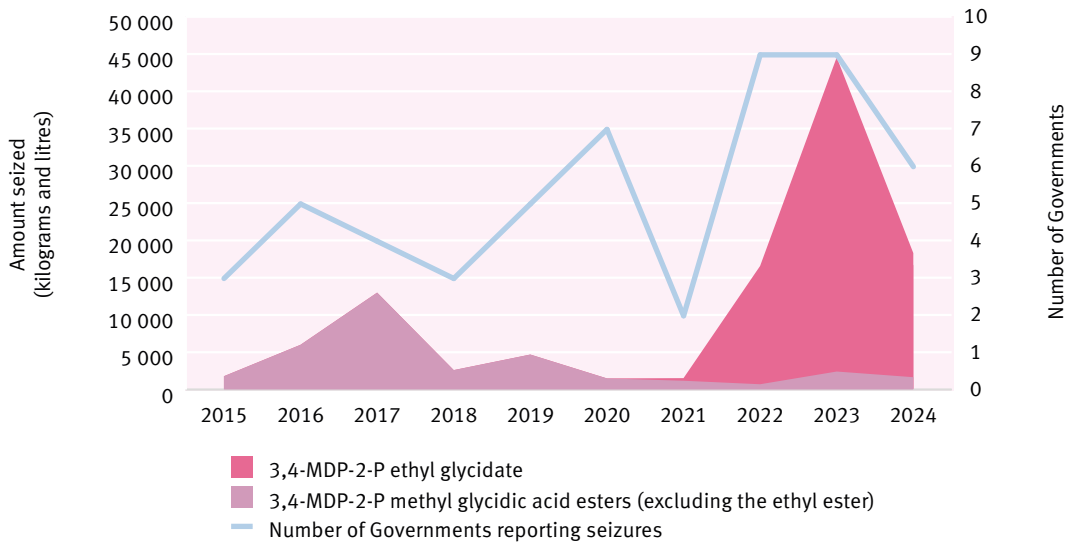
#### Licit trade

90. Between 1 November 2024 and 1 November 2025, 14 exporting countries and territories notified the authorities of 54 importing countries and territories of 797 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

91. On form D for 2024, 12 Governments reported seizures of one or more internationally controlled precursors of MDMA and its analogues. The substances most frequently reported seized were **3,4-MDP-2-P** and **3,4-MDP-2-P ethyl glycidate**, by 10 and 4 Governments, respectively. While 3,4-MDP-2-P was typically seized in clandestine laboratories, about 30% of seizures of 3,4-MDP-2-P ethyl glycidate were made at airports. Following the pattern of other designer precursors, which lost their attractiveness to traffickers once they had been placed under international control, the amount of 3,4-MDP-2-P ethyl glycidate seized in 2024 decreased notably compared with 2023 (see figure 12).

Figure 12. Seizures of 3,4-MDP-2-P methyl glycidic acid esters, as reported by Governments on form D, 2015–2024

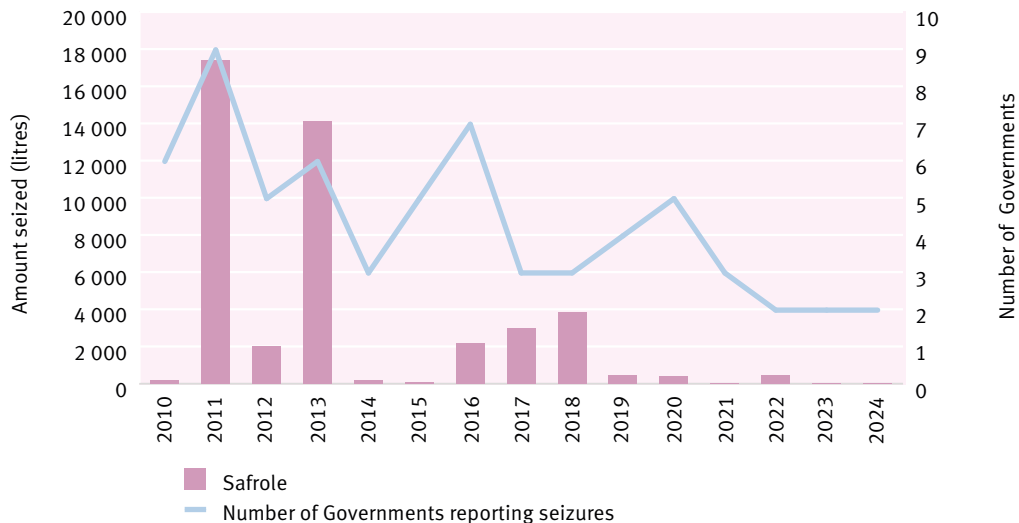


92. In the first 10 months of 2025, six seizures, amounting to a total of less than 1,500 kg of 3,4-MDP-2-P ethyl glycidate, were communicated through PICS. Two thirds of the amount was seized in Thailand, in the first incident involving the substance in that country. Available information suggests that the substance was destined for Myanmar, thus providing a rare indication of the likely use of designer precursors for the illicit manufacture of MDMA in South-East Asia.

(b) Safrole, safrole-rich oils and isosafrole

93. During the reporting period, no notable developments were brought to the Board’s attention with regard to licit trade and trafficking in safrole, safrole-rich oils and isosafrole. That continues a trend observed over a number of years (see figure 13) and is likely a consequence of the emergence of designer precursors for the illicit manufacture of MDMA and related analogues.

Figure 13. Seizures of safrole, as reported by Governments on form D, 2010–2024



### 3. Non-scheduled chemicals and other trends in the illicit manufacture of amphetamine-type stimulants

94. Following the international scheduling of the pre-precursors of amphetamine and methamphetamine, P-2-P methyl glycidic acid and a series of its esters, in 2024, which has resulted in a significant decrease in seizures of those substances, criminal networks in Europe appear to have turned to a group of new pre-precursors, namely **esters of 4-phenylacetoacetic acid**.<sup>12</sup> During the first 10 months of 2025, nine incidents involving nearly 5 tons of the methyl ester and/or the ethyl ester were communicated through PICS. Seven incidents occurred at airports, one at a parcel facility and one on an inland road. The substances, which were mislabelled in all cases, reportedly originated in China and were destined for countries in the European Union.

95. Apart from the above-mentioned group of alternative chemicals, which are covered by the extended definitions in the Board's limited international special surveillance list of non-scheduled substances, no seizures of other new designer precursors of amphetamine and methamphetamine were reported on form D. However, there were seizures of internationally non-scheduled designer precursors of other amphetamine-type end products not under international control. Specifically, in November 2024, a total of 227 kg of **3,4-dimethoxy-P-2-P ethyl glycidate**<sup>13</sup> was seized in a warehouse in Germany. The substance is a pre-precursor of 3,4-DMA and 3,4-DMMA, both of which are amphetamine-type stimulants that are not under international control. The Board alerted all national precursor focal points in March 2025 and also drew their attention to other closely related chemical derivatives, such as the methyl ester and carboxamide of 3,4-dimethoxy-P-2-P methyl glycidic acid, which appear to be available from online suppliers on the surface web. **INCB wishes to remind Governments to consult its limited international special surveillance list of non-scheduled chemicals, and the complement to the list launched in 2024,<sup>14</sup> which provides a list of more than 500 chemicals that fall within the extended definitions described in the list and could be used as alternatives to controlled precursors in the illicit manufacture of drugs.**

96. With regard to precursors of MDMA and its analogues, following the international scheduling of eight esters of 3,4-MDP-2-P methyl glycidic acid, no new chemical has emerged as an alternative. Seizures of insignificant amounts of the **sodium salt of IMPAM** (5 kg) and **MAMDPA** (25 kg) were communicated by the Kingdom of the Netherlands in 2024 and 2025, respectively. Both incidents occurred in clandestine laboratories or warehouses. A seizure of a small quantity of MAMDPA was also reported by New Zealand in 2024, at the country's border.

97. Aside from turning to alternatives to controlled precursors, criminal manufacturers also synthesize the chemicals they require. Seizures reported in 2024 suggest the continued synthesis in clandestine laboratories of controlled amphetamine and methamphetamine precursors from non-scheduled pre-precursors. Notable seizures of **benzyl chloride**, **sodium cyanide** and **lead acetate** in Mexico provide evidence of the continued illicit manufacture of phenylacetic acid (and subsequently P-2-P) there. Seizures of those chemicals in South Africa in clandestine laboratories that were copies of laboratories in Mexico confirm that Mexican know-how regarding illicit drug manufacture is spreading geographically, as already reported by the Board in 2024. At nearly 31 tons, Myanmar reported the second largest quantity of sodium cyanide seized since the country started reporting seizures of the substance in 2019.

98. Another related substance, **benzyl alcohol**, was seized in Mexico in 2024, reportedly associated with the illicit manufacture of methamphetamine. Benzyl alcohol can be converted into benzyl chloride and subsequently phenylacetic acid, as detailed above, or it can serve as a precursor of benzaldehyde.

<sup>12</sup> More specifically, the substances were encountered as esters of sodium salts of their enolate forms, e.g. the methyl ester of the sodium salt of the enolate of 4-phenylacetoacetate.

<sup>13</sup> Chemically, ethyl 3-(3,4-dimethoxyphenyl)-2-methyloxirane-2-carboxylate.

<sup>14</sup> See the INCB report on precursors for 2024 (E/INCB/2024/4), para. 27 (a).

99. Data provided on form D for 2024 also suggest continued use of the nitrostyrene method, using **benzaldehyde** and **nitroethane**, to illicitly manufacture P-2-P, albeit on a much smaller scale than the benzyl cyanide-based methods, and predominantly in Europe. In contrast, there have been no further seizures of upstream chemicals for the illicit manufacture of esters of P-2-P methyl glycidic acid. To date, two incidents involving the related chemicals have been communicated through PICS, one in the Kingdom of the Netherlands in 2019 and one in South Africa in 2024.

100. No incidents involving the **illicit manufacture of ephedrine** have been explicitly reported to INCB. However, the Board is aware of an operation in October 2024 in a warehouse in the Thai Province of Tak, bordering Myanmar, that resulted in the seizure of massive amounts of several chemicals, including 16 tons of propiophenone and nearly 170 tons of methylamine, which may indicate the illicit manufacture of ephedrine.

101. In every case of drug synthesis, whether it starts from a controlled precursor, from a non-scheduled alternative or from an upstream chemical or pre-precursor chemical, illicit operators also require a range of auxiliary chemicals, such as acids, bases, catalysts, reagents, separating agents and solvents. An important chemical required to manufacture a number of amphetamine-type stimulants and synthetic cathinones, as well as ephedrine and ketamine, is **methylamine**. In 2024, nine countries reported seizures of that chemical, predominantly countries in South-East Asia, Europe and North America. The quantities seized ranged from 1 kg to more than 20,000 kg and litres combined; Thailand reported a single incident involving almost 170 tons of the substance. Where information was provided, all seizures were associated with the illicit manufacture of methamphetamine. The illicit manufacture of methylamine was not reported in 2024.

102. With regard to methamphetamine, reported seizures of auxiliary chemicals also suggest the continued use of different ephedrines-based manufacturing methods, with apparent regional preferences. They include the use of ephedrine or pseudoephedrine with:

(a) Iodine and phosphorus preparations (such as red phosphorus or hypophosphorous acid) in Europe and Oceania;

(b) Thionyl chloride, then hydrogen and palladium on barium sulphate in South-East Asia. Notably, Myanmar reported seizures of more than 13 tons of thionyl chloride in 2024.

103. Another group of auxiliary chemicals are those that enhance the potency of the end product, typically methamphetamine. In 2024, Mexico, Netherlands (Kingdom of the) and South Africa reported notable seizures of **tartaric acid**, associated with the illicit manufacture of methamphetamine using P-2-P-based methods. The quantities of tartaric acid seized ranged from about 5 tons in Mexico to 12.5 tons in South Africa, and totalled more than 25 tons globally, representing a further increase from 2023 and reflecting the scale and level of industrialization of illicit methamphetamine manufacture in those countries. Furthermore, seizures in more countries of **AIBN** and **methyl thioglycolate** or **thioglycolic acid**, which are used to increase the amount of the desired, more potent variant of methamphetamine, confirm the geographic spread of highly efficient methamphetamine manufacturing methods, including the recycling of previously discarded waste products, to a large extent driven by the involvement and know-how of Mexican criminals operating around the world. The level of sophistication of these clandestine laboratories is also driving technical innovation with alternative chemicals at all stages of the process for illicitly synthesizing methamphetamine. In December 2024, a new alternative to AIBN was encountered in a clandestine laboratory in Kenya with links to Mexican criminals (see box 2).

## BOX 2. THE DARK SIDE OF KNOWLEDGE TRANSFER

Information regarding the existence of clandestine methamphetamine laboratories with links to Mexican criminals has been communicated to INCB since 2016. The laboratories used both ephedrine- and P-2-P-based methods and had in common that they were the first such laboratories dismantled in the respective countries and/or displayed a higher degree of sophistication than the laboratories previously identified in the countries concerned. The details are as follows:<sup>a</sup>

- **2016** Nigeria
- **2020** Kingdom of the Netherlands
- **2024** India, Kenya, Poland and South Africa

INCB notes a similar development related to trafficking in fentanyl precursors with links to Mexican criminals, as well as secondary extraction laboratories for cocaine in Europe, which have perfected processes with the help of Colombian criminals (see para. 118).

<sup>a</sup>The list of countries is not exhaustive.

104. The industrialization of the process of illicit methamphetamine manufacture has also been accompanied by compartmentalization, sometimes across borders. One tactic that continued to be used in 2024, albeit on a smaller scale than before, was the smuggling of methamphetamine in solutions. Crystalline methamphetamine is recovered from such solutions in conversion laboratories using large quantities of the Table II solvent, **acetone**. In 2024, eight methamphetamine conversion laboratories were dismantled in the United States, down from 34 in 2023.<sup>15</sup> A similar trend of compartmentalization across borders was seen with amphetamine base in Europe.

105. Incidents involving various non-scheduled auxiliary chemicals and pre-precursors were communicated through PICS in the first 10 months of 2025. The most notable incidents involved methylamine (more than 14,000 litres in 29 incidents in Europe, North America and Oceania), lead acetate (7.5 tons in one incident in North America) and tartaric acid (3.7 tons in 13 incidents in Europe and North America).

106. **In order to determine the manufacturing methods and associated chemicals predominantly used in specific regions, INCB encourages Governments with the relevant capabilities to conduct and offer to other interested Governments the use of forensic profiling analyses.** The information about the precursors required and auxiliary chemicals thus generated will assist with the subsequent identification of their sources and points of diversion and related weaknesses in monitoring systems.

107. **Since most auxiliary chemicals have legitimate uses and are traded in notable amounts, INCB welcomes the fact that exporting countries increasingly use the PEN Online Light system to inform the authorities in importing countries or territories about planned shipments in legitimate trade of these chemicals, thus aiding understanding of patterns of trade and possible vulnerabilities.**

## B. Substances used in the illicit manufacture of cocaine

### 1. Potassium permanganate

108. Potassium permanganate is the principal oxidizing agent used in the illicit manufacture of cocaine. The continued wide availability of potassium permanganate as an oxidizing agent in such manufacture has been confirmed by forensic profiling results.<sup>16</sup>

<sup>15</sup>United States Drug Enforcement Administration, *2025 National Drug Threat Assessment (2025)*, p. 40.

<sup>16</sup>United States Drug Enforcement Administration, Special Testing and Research Laboratory, "CY 2024: annual cocaine report", PRB No. 2025-42 (2025); based on samples seized in the United States.

### *Licit trade*

109. Between 1 November 2024 and 1 November 2025, the authorities of 32 exporting countries and territories sent 1,929 pre-export notifications to 117 importing countries and territories relating to a total of about 44,000 tons of potassium permanganate, which represents an increase in trade in the substance compared with the previous reporting year. The main exporters were China, followed by India, the United States and Canada.

110. 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%) of the total global amount imported. Imports of the substance by other countries in South America totalled 1,353 tons, which represents a slight increase compared with the amount reported the previous year. Of those countries, Brazil and Chile issued pre-export notifications regarding exports of potassium permanganate, involving a total of 7.1 tons.

### *Trafficking*

111. On form D for 2024, 15 countries and territories reported seizures of potassium permanganate totalling over 230 tons, representing the second highest annual amount seized in the past decade, exceeded only by the peak in 2016. That increase reflects developments in the global cocaine market, particularly the record-high estimated global levels of illegal production, which rose by 34% to reach 3,708 tons in 2023.

112. As in previous years, countries in South America accounted for the vast majority – over 99% – of the total amount of potassium permanganate reported seized in 2024, with Colombia alone reporting seizures of more than 211 tons, the second largest annual amount seized by the country in the past decade. Similarly, Ecuador and Peru reported the highest ever annual amount of the substance seized (about 2 tons and 14.2 tons, respectively). Ecuador reported all seizures as a transit country, with consignments destined for Colombia. For most of the other seizures, the Board received limited contextual information. However, the data available continue to suggest that in the majority of cases, the substance originated in the country in which it was seized. **INCB therefore reiterates its previous calls to all Governments of countries in South America to review their domestic control mechanisms, including the requirement to declare the end use of potassium permanganate, and any thresholds that may be exploited by traffickers.**

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

113. INCB has noted previously that cocaine processing has undergone a notable transformation over the years, with an increase in terms of both sophistication and efficiency. As a result, a wider range of chemicals are now employed in the process, with traditional precursors often having been replaced or being manufactured on site. Other chemicals complement traditional precursors or their alternatives to increase efficiency. While these processing chemicals are not under international control, many of them have long been controlled in countries in South America. As they are often common chemicals with legitimate uses, domestic distribution channels are typically the source of supply. Individual seizures frequently 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.

114. While not a recent development, the most notable replacements for traditional precursors in cocaine processing were acetone and ethyl ether, two solvents in Table II of the 1988 Convention (see figure 14). Today, however, the solvents most frequently used in the final crystallization step of cocaine manufacture, in which cocaine base is converted into cocaine hydrochloride, are various **acetate solvents** and combinations thereof. In 2024, as in the past, the widest range of acetate solvents was reported by Colombia (see figure 15).

Figure 14. Seizures of ethyl ether, as reported by Governments on form D, 2000–2024

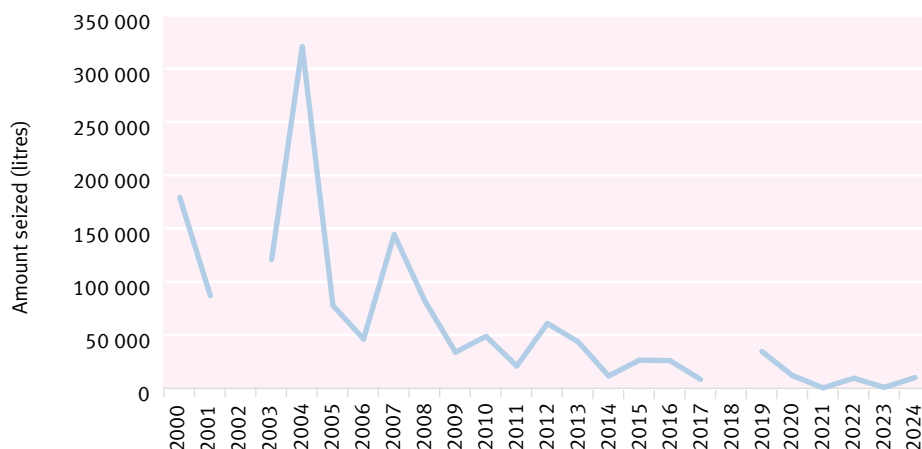
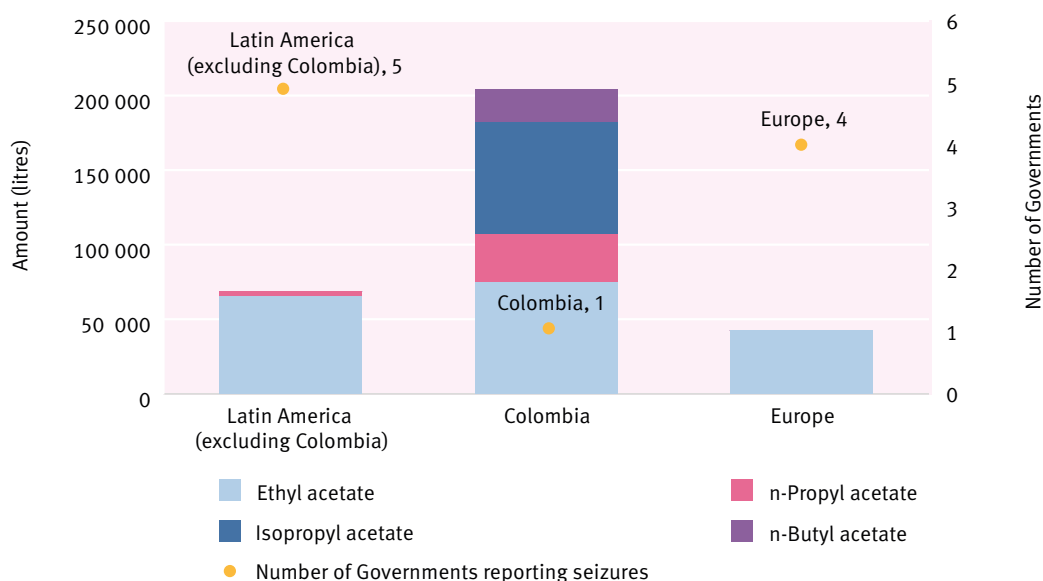


Figure 15. Seizures of acetate solvents, as reported by Governments in Latin America and Europe on form D, 2024



Note: The use of acetate solvents is not limited to cocaine hydrochloride processing.

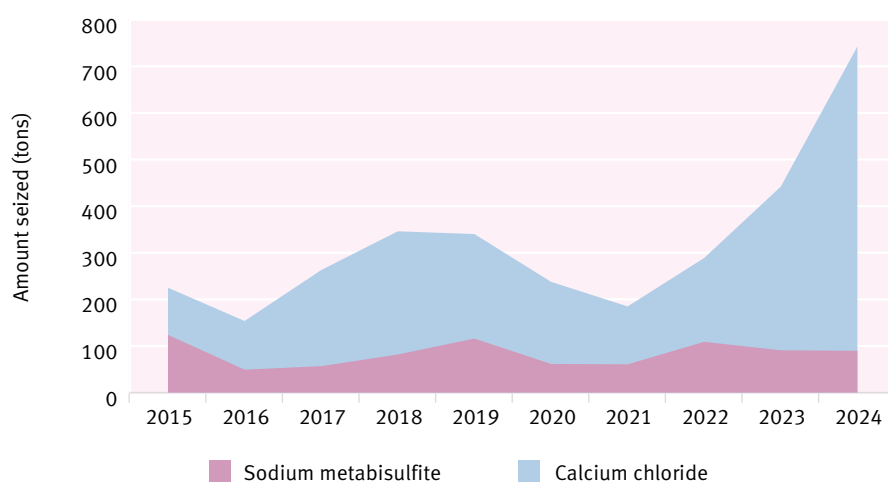
115. Seizures of chemicals used to illicitly manufacture controlled cocaine precursors and of other cocaine processing chemicals have been reported on form D, thus suggesting their illicit manufacture. Although the extent of such manufacture is unknown, there has been knowledge of the clandestine manufacture of the key cocaine precursor, potassium permanganate, in Colombia, and the country has regularly reported seizures of **potassium manganate** over the past 25 years, and later of **manganese dioxide** (pyrolusite) too. While notable quantities of both chemicals were seized, including in 2024, the amounts largely remained short of the amounts of potassium permanganate seized.

116. Ethyl ether and hydrochloric acid are other internationally controlled precursors that are clandestinely manufactured, typically on site, in the same locations where cocaine is processed. The starting materials are **ethanol** and **sodium chloride**, respectively. A few other chemicals needed in cocaine processing are also manufactured

clandestinely, such as ammonia, which is manufactured from **urea**. In 2024, 14 countries reported seizures of one or more of the required starting materials, with the largest amounts reported by countries in Latin America.

117. In 2024, seizures of **sodium metabisulfite** and **calcium chloride** continued to be reported. Neither chemicals are direct precursors of cocaine but are closely associated with highly sophisticated and efficient cocaine manufacturing operations and have regularly been seized in significant amounts (see figure 16). Calcium chloride helps traffickers to recycle and reduce their need for fresh solvents, and sodium metabisulfite helps them to maximize yields despite using cocaine base from different extraction laboratories. As in past years, Ecuador mainly reported seizures of the two substances as a transit country. However, one seizure of sodium metabisulfite in 2024 appears to have been linked with a cocaine processing laboratory in Ecuador.

**Figure 16. Seizures of sodium metabisulfite and calcium chloride, as reported by Governments in South America on form D, 2015–2024**



118. Seizures of potassium permanganate, sodium metabisulfite and other cocaine processing chemicals not under international control in the Netherlands (Kingdom of the) and Spain in 2024 and the first 10 months of 2025 reflect the continued recovery of, and performance of the final processing steps for, cocaine in Europe using similar methods as those used in South America.

119. Countries also reported seizures of cutting agents associated with cocaine on form D. In 2024, seven countries reported such seizures. Brazil reported the most diverse range of substances, including caffeine, lidocaine, phenacetin, tetracaine, tetramisole and octadecyl 3-(3,5-di-*tert*-butyl-4-hydroxyphenyl)propionate.<sup>17</sup> The latter was also reported by the Plurinational State of Bolivia, which additionally identified ketamine as a cutting agent for cocaine. As in the past, the substance most widely reported and in the largest quantities was **caffeine**. It was reported to be used to cut cocaine, but was more frequently associated with heroin and methamphetamine.

## C. Substances used in the illicit manufacture of heroin

### 1. Acetic anhydride

120. 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).

<sup>17</sup>An antioxidant commonly used as polymer stabilizer.

*Licit trade*

121. Acetic anhydride is one of the most widely traded substances in Table I of the 1988 Convention. From 1 November 2024 to 1 November 2025, the authorities of 23 exporting countries and territories used the PEN Online system to submit 2,297 pre-export notifications regarding shipments of acetic anhydride. The shipments were destined for 88 importing countries and territories.

122. Data from the PEN Online system confirm that the European Union was the primary destination for internationally traded acetic anhydride in 2024. The Board notes that that global trade involving acetic anhydride, as communicated through the PEN Online system, does not include the significant trade occurring between the 27 European Union member States, as under European Union legislation, such trade is considered domestic trade and is not subject to international pre-export notification.

123. During the reporting period, competent national authorities objected to 105 of the pre-notified shipments of acetic anhydride (4.6%), primarily for administrative reasons. A notable proportion of those objections – approximately 19% – concerned shipments that were destined for Viet Nam, and a further 15% concerned shipments originating in the United States and destined for Mexico.

*Trafficking*

124. According to information provided by Governments on form D, the total quantity of acetic anhydride seized globally more than doubled in 2024, reaching 52,209 litres. That represents a significant increase from the 23,695 litres seized in 2023, which was the second lowest amount recorded since 2000. China and the Netherlands (Kingdom of the) together accounted for approximately 94% of worldwide acetic anhydride seizures in 2024. Smaller amounts of the substance were also reported by Canada, India, Mexico, Pakistan, the Russian Federation and Türkiye. It is worth mentioning that according to available information, the Kingdom of the Netherlands was among the European countries that identified heroin laboratories in their territories in 2024.

125. In China, the total quantity of the substance seized increased significantly, from 15,794 litres in 2023 to 34,225 litres in 2024. The details regarding the circumstances of the seizures were not available to the Board.

126. The Kingdom of the Netherlands reported its largest-ever seizures of acetic anhydride on form D in 2024, totalling 15,038 litres. Of that amount, 15,000 litres were recovered following the theft of 27,000 litres of the substance in August 2024. The recovered acetic anhydride was found alongside sizeable amounts of solvents, including methyl ethyl ketone and ethyl acetate, although a conclusive connection to the illicit manufacture of a specific drug could not be established. Pakistan reported seizures of 2,494 litres of acetic anhydride in 2024, a decrease from the 4,230 litres seized in the country in 2023.

127. In 2024, through PICS, seizures of smaller quantities of acetic anhydride, not exceeding 500 litres, were also communicated by Canada, India and the Russian Federation. Notably, no seizures of the substance in 2025 had been communicated through PICS by the end of the reporting period (1 November 2025).

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

128. The illicit manufacture of heroin may require, in addition to acetic anhydride, a variety of other common chemicals not under international control. Among them is **acetyl chloride**, which was included on the limited international special surveillance list of non-scheduled substances because of its potential use as an acetylating agent. In 2024, Türkiye was the only country that communicated seizures of acetyl chloride, in the amount of 1,200 litres.

129. In the past, **glacial acetic acid** has been suspected of being used in the acetylation of morphine to yield heroin. It was probably mixed with acetic anhydride and also used as a cover load, both as a means of concealing contraband acetic anhydride. In 2024 and 2025, seizures of glacial acetic acid totalling over 25,000 litres were communicated through PICS by six countries. The largest seizures were made in Mexico (20,000 litres) and the

United Republic of Tanzania (4,510 litres), with smaller quantities reported by Italy, Netherlands (Kingdom of the), South Africa and Uruguay. Peru reported additional seizures of 1,330 litres of glacial acetic acid on form D for 2024.

130. **Ammonium chloride** is another chemical that is not under international control but is on the limited international special surveillance list of non-scheduled substances and is frequently encountered in connection with the illicit manufacture of heroin (and methamphetamine). Peru reported seizures of 3,760 kg of the substance on form D for 2024, and Myanmar and South Africa communicated through PICS in 2024 seizures of 2,350 kg and 1,500 kg of the substance, respectively. Seizures of small amounts of the substance were also communicated by Italy and Uruguay.

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

131. With illicit markets for synthetic drugs worldwide dominated by amphetamine-type stimulants, synthetic opioids and new psychoactive substances, there is limited information on, and no notable developments related to, precursors of other synthetic narcotic drugs and psychotropic substances. This continues to be the case for both licit trade in and seizures of **precursors of phencyclidine and other phencyclidine-type drugs** (i.e. piperidine) and **precursors of methaqualone** (i.e. anthranilic acid and *N*-acetyl anthranilic acid).

132. With regard to precursors of LSD, namely **ergotamine**, India reported having stopped two shipments of the substance, including one shipment of 7.5 kg destined for Sri Lanka. INCB is also aware of the theft in Paraguay of 6 kg of the substance following its legitimate importation, as it was being transported from the airport to the importing company.

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

### *Licit trade*

133. During the reporting period, trade in most fentanyl precursors under international control continued to be limited to small amounts for research and development purposes (see table 5). As in the past, the most notable trade was in NPP, which is used as a starting material for the legitimate manufacture of fentanyl. Compared with the same period last year, the amounts for which pre-export notifications were communicated increased slightly. Like last year, 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. Notable trade was also seen in 4-piperidone and 4-piperidone monohydrate hydrochloride, which are used as building blocks in the manufacture of pharmaceutical substances.

**Table 5. Planned transactions in international trade involving controlled precursors of fentanyl pre-notified through the PEN Online system, 1 November 2024–1 November 2025**

<i>Substance</i>	<i>Number of exporters</i>	<i>Number of importers</i>	<i>Number of pre-export notifications</i>	<i>Total amount traded (kg)</i>
NPP	3	3	6	1,047
ANPP	2	8	18	0.002
4-AP	1	2	2	0.003
1-Boc-4-AP	1	2	4	10.050
Norfentanyl, including norfentanyl hydrochloride	2	19	47	0.101
4-Piperidone, including monohydrate hydrochloride	2	5	7	10,103
1-Boc-4-piperidone	3	3	6	3,000.970*

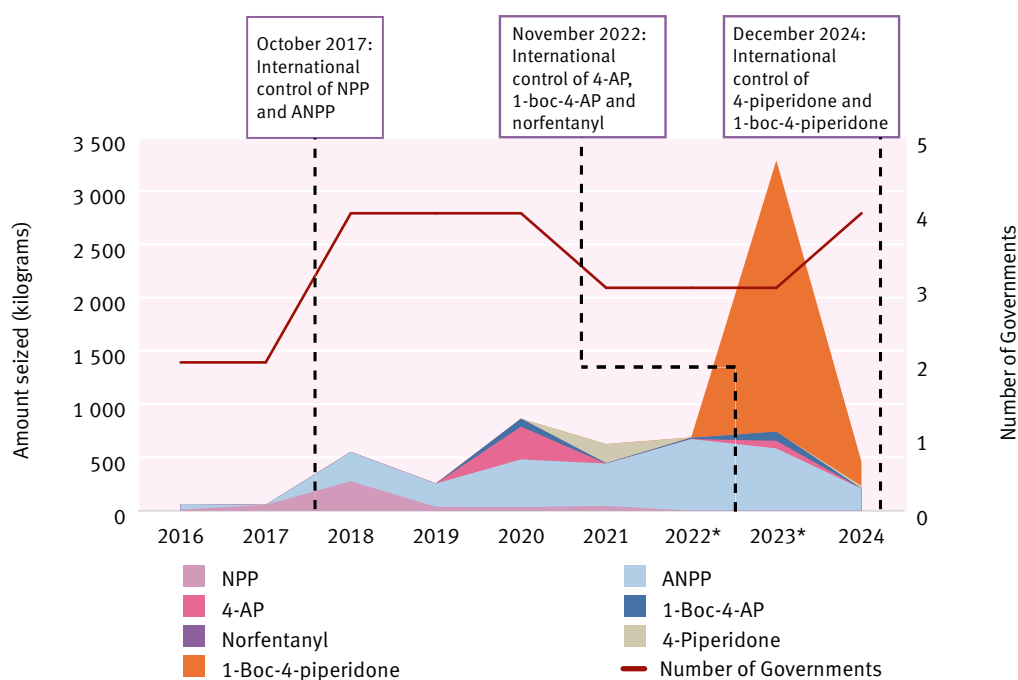
\* Of which 3,000 kg were subject to a diversion attempt (see para. 137 below)

134. In May 2025, India started to notify importing countries, through the PEN Online Light system, of planned exports of several fentanyl precursors not under international control. As at 1 November 2025, it had sent pre-export notifications regarding 24 exports to five importing countries. The substances, which have legitimate uses in the manufacture of a number of pharmaceutical products, are not controlled in India but were included on the limited international special surveillance list of non-scheduled substances owing to them being “masked” fentanyl precursors or early intermediates in the Janssen method of fentanyl manufacture. Similarly, Canada notified importing countries about shipments involving a derivative of 4-piperidone not explicitly listed as a class A precursor. These examples show that it is possible, through the proactive engagement of industries, to notify importing countries of exports even when a chemical is not controlled nationally or is not explicitly listed in their national lists of controlled precursors. **INCB commends all Governments that use the PEN Online Light system to help enhance knowledge of legitimate markets and operators and secure supply chains of chemicals that could be used as precursors in illicit drug manufacture.**

### Trafficking

135. On form D for 2024, the United States reported the greatest variety of fentanyl precursors, with six of the seven internationally controlled precursors reported seized, in quantities ranging from nearly 200 kg of **1-boc-4-piperidone** and about 175 kg of **ANPP** to less than 1 kg for most of the other substances. Mexico and Netherlands (Kingdom of the) were the only other countries that reported notable seizures of controlled fentanyl precursors (ANPP and 1-boc-4-piperidone, respectively). ANPP continued to be the fentanyl precursor seized most widely and most consistently over the years (see figure 17), while seizures of **NPP**, the fentanyl precursor that is most widely traded (see table 5), were negligible.

**Figure 17. Seizures of fentanyl precursors under international control, as reported by Governments on form D, 2016–2024**



\*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.

136. Since **1-boc-4-piperidone** was only scheduled internationally in December 2024, reporting of seizures of the substance on form D for 2024 has not been systematic. In addition to Netherlands (Kingdom of the) and the United States, which reported seizures on form D, two additional countries communicated incidents

involving 1-boc-4-piperidone for that year through PICS, namely Guatemala (71 kg in three incidents) and Spain (9 kg in two incidents). The origin of the substance in all but one of the incidents communicated through PICS was India.

137. India was also the origin of 1-boc-4-piperidone in one of the most prominent cases of attempted diversion uncovered during 2025. In March 2025, India pre-notified the United Republic of Tanzania of two shipments involving 2 tons and 1 ton of 1-boc-4-piperidone, respectively, through the PEN Online system. Authorities in the United Republic of Tanzania objected to the shipments as there were doubts about the licit use of the substance concerned and because the import certificates were not issued in a bona fide manner. The shipments therefore did not proceed, preventing the potential illicit manufacture of about 1.4 to 3.3 tons of fentanyl. The matter is presently under investigation in both countries. **The Board commends the Governments concerned for their efforts and cooperation to prevent fentanyl precursors from reaching illicit laboratories and encourages all Governments, in particular in Africa, to be aware of the possible misuse of their territories for precursor diversion and trafficking attempts.**

138. While most of the key fentanyl precursors are now under international control and the implementation of those controls is starting to have an impact, with indications of declining fentanyl purity,<sup>18</sup> the reporting of alternative, non-scheduled fentanyl precursors remains limited. In 2024, only the United States reported such seizures on form D, involving a new pre-precursor, **4-hydroxypiperidine**, albeit in a small amount. Subsequently, in May 2025, the United States also seized the “masked” analogue of that precursor from a misdeclared air shipment that originated in China and was suspected of being smuggled onwards to Mexico.

139. The United States was also the only country to report seizures of non-scheduled precursors of fentanyl analogues, especially **precursors of para-fluorofentanyl**, on form D for 2024. The seized amounts of all such precursors combined did not exceed 2 kg. Canada communicated an incident involving a “masked” **precursor of ortho-methylfentanyl** and of several related fentanyl analogues through PICS in April 2024. The unmasked analogue of that precursor, **ortho-methyl 4-AP**, was seized in Guatemala in April 2025 in a misdeclared shipment from China. The Board alerted all national precursor focal points to that new precursor.

140. Other common, non-scheduled chemicals that are required at different stages in several fentanyl synthesis methods were seized in Mexico in 2024 and 2025. They included **aniline, 2-phenethyl bromide and propionyl chloride**.

141. On form D for 2024, the Russian Federation reported three incidents – two incidents involving clandestine laboratories and one incident of trafficking – involving a total of 154 kg of 1-dimethylamino-2-chloropropane, a **methadone precursor**. Between 2023 and April 2025, seizures of the substance in the Russian Federation amounted to about 2 tons, the bulk of which was seized at the border during attempts to smuggle it into the territory of the Russian Federation. In 2021, Ukraine had reported a seizure of almost 133 kg of the substance from an air shipment. Additionally, INCB is aware of the dismantling of a methadone laboratory in Ukraine in 2020 and of another in Poland in 2024. In the first 10 months of 2025, through PICS, Hungary communicated two incidents involving methadone precursors and the Kingdom of the Netherlands one incident involving 1-dimethylamino-2-chloropropane. The quantities seized in the two countries ranged from several hundred kilograms to several tons.

142. **The Board reminds Governments that because of the potency of fentanyls and other synthetic opioids, often only small quantities of precursors are sufficient to produce millions of deadly doses of the corresponding end products. Therefore, it is critical for Governments not to disregard what may appear to be small seizures but to instead conduct backtracking investigations, respond to requests to share information, including requests made by INCB, undertake joint investigations and/or communicate information about such seizures through PICS in a timely manner, or, at a minimum, on form D for the year in question.**

<sup>18</sup> United States Drug Enforcement Administration, *2025 National Drug Threat Assessment (2025)*, p. 23.

## 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

143. Seizures of precursors and pre-precursors of GHB, namely **GBL** and **1,4-butanediol**, continued to be reported in 2024. However, as in previous years, reporting was not systematic given that some countries might not control the two chemicals as precursors but as psychotropic substances because of their in vivo convertibility, upon ingestion, into GHB. The largest quantities reported for 2024 were almost 11,000 litres of GBL by the Kingdom of the Netherlands and about 7.5 litres of 1,4-butanediol by Sweden.

144. Because of the widespread legitimate uses of GBL and 1,4-butanediol, they are traded widely and in significant amounts. Since the launch of the PEN Online Light system in October 2022, pre-export notifications for GBL have been sent by four countries, in particular China. China also reported on form D that it had stopped 70 shipments involving a total of more than 2.8 million litres of GBL in 2024, a more than fivefold increase compared with 2022 (almost 573,000 litres).

### 2. Precursors of ketamine

145. While there are increasing concerns worldwide about rising ketamine misuse, reflected also in an increase in ketamine seizures, information about seizures of ketamine precursors and their sources remains limited. China and Netherlands (Kingdom of the) were the only countries to report seizures of ketamine precursors on form D for 2024. In addition, Malaysia mentioned the existence of illicit ketamine laboratories on its form D. During the first 10 months of 2025, no incidents involving ketamine precursors were communicated through PICS. However, the Board is aware of the dismantling of a closed industrial facility in the State of Maharashtra, India, in July 2025, which was being used as a clandestine laboratory to manufacture ketamine. Related precursors and laboratory equipment were seized.

146. As with other drugs of illicit origin, misuse of ketamine cannot be addressed without considering its precursors. Since no ketamine precursors are under international control and many have legitimate uses and trade, **the Board encourages all countries to make effective, voluntary use of the PEN Online Light system to submit notifications regarding planned exports of relevant chemicals so as to enhance knowledge of the legitimate markets for those chemicals and the operators involved. Where diversion has occurred, the Board encourages Governments to communicate seizures and other trafficking incidents through PICS so as to enable effective cross-border cooperation to identify points of diversion and modi operandi, and to build knowledge of the key precursors used in clandestine laboratories, including with a view to generating the necessary information for precursor scheduling assessments.**

### 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

147. On form D for 2024, a number of Governments reported seizures of precursors of new psychoactive substances or recently scheduled substances, in particular precursors of synthetic cathinones. Similar evidence exists for the clandestine manufacture of synthetic and semi-synthetic cannabinoids. For both groups of end products, this development is the result of an increasing number of them having been placed under international and national control. The implementation in an increasing number of countries of generic controls, which often exclude certain intermediate substances, has likely been a major driving factor. **INCB encourages all Governments to review their generic control definitions and close regulatory gaps, if any and to the extent possible, and to ensure that relevant authorities are aware of and have the capacity to identify precursors of new psychoactive substances or recently scheduled substances or cooperate with relevant counterparts nationally, or in countries that have such capability.**

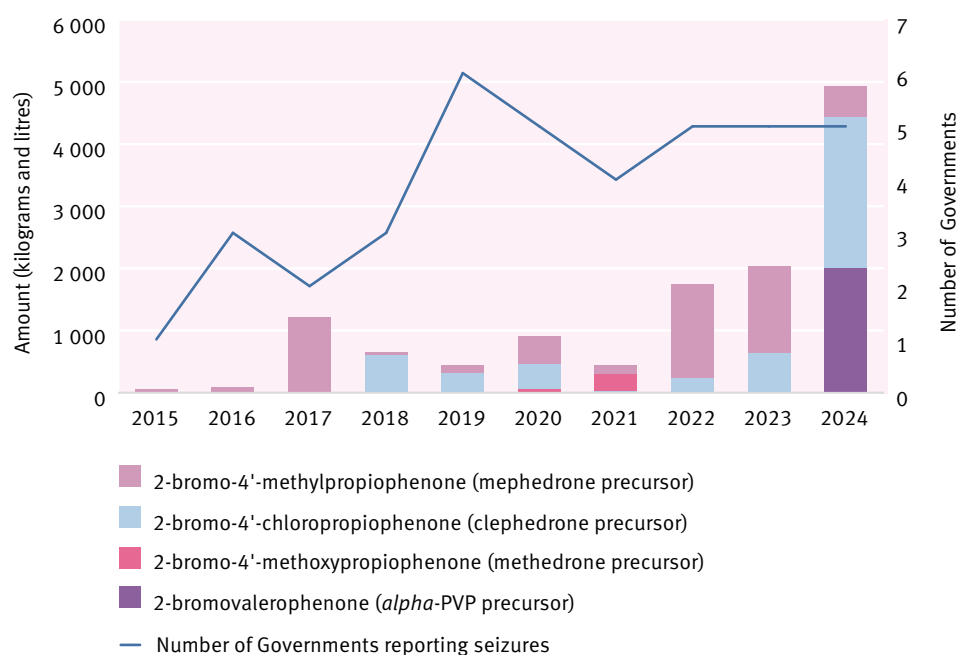
### Precursors of synthetic cathinones

148. The precursors of synthetic cathinones reported seized most frequently and in the largest quantities in 2024 were precursors of mephedrone (4-MMC), clephedrone (4-CMC) and *alpha*-PVP, in that order.

149. Precursors of synthetic cathinones generally fall into the following two groups: (a) upstream chemicals; and (b) halogenated intermediates that are just one step away from the respective synthetic cathinone end product. While upstream chemicals are typically commercially available and have legitimate uses, intermediates are usually designer precursors with no known legitimate uses. Figure 18 illustrates seizures of halogenated intermediates of mephedrone, clephedrone, methedrone, *alpha*-PVP and clophedrone (3-CMC). The latter was reported seized for the first time in 2024, by Hungary, albeit in a negligible amount.

150. Unlike the situation in most countries, in the Russian Federation seizures of precursors of the most prominent synthetic cathinones, mephedrone and *alpha*-PVP, also included notable quantities of the respective upstream chemicals.

**Figure 18. Seizures of selected precursors of synthetic cathinones, as reported by Governments on form D, 2015–2024**



151. In the first 10 months of 2025, 16 incidents involving nearly 8,000 kg and litres of synthetic cathinone precursors, predominantly precursors associated with the clandestine manufacture of mephedrone and *alpha*-PVP, followed by clophedrone, were communicated through PICS. That included seven incidents communicated by the Kingdom of the Netherlands and seven communicated by the Russian Federation. The largest amount was seized in a clandestine laboratory in Kazakhstan and involved 3.5 tons of the mephedrone precursor **2-bromo-4'-methylpropiofenone**. Kazakhstan and Kyrgyzstan were also identified by the Russian Federation as transit countries for mephedrone precursors shipped by land from China.

### Precursors of synthetic and semi-synthetic cannabinoids

152. Precursors of synthetic and semi-synthetic cannabinoids are structurally very diverse, reflecting the structural diversity of the related end products, which has evolved over time. They range from common chemicals to very specific designer precursors that are custom-made intermediates in the synthesis process and natural components found in the *Cannabis sativa L.* plant.

153. The clandestine manufacture of synthetic cannabinoids and the seizure of related precursors first came to the Board's attention in 2014, when the synthesis of cannabinoids of the JWH series was reported by Australia.

154. The use of custom-made intermediates as starting materials that are just one step away from the desired synthetic cannabinoid end products came to the Board's attention for the first time in 2023, when Germany reported the dismantling of a laboratory used for the illicit manufacture of synthetic cannabinoids, including MDMB-4-en-PINACA, from the related intermediate precursors. A similar laboratory was also dismantled in Switzerland in 2024, from which **ADB-INACA** and **MDMB-INACA** powders were seized.<sup>19</sup> To the Board's knowledge, the definitions of synthetic cannabinoids in national legislation in countries that have established generic controls over those substances usually do not cover the intermediate substances of concern, and Singapore is currently the only country that explicitly controls two such intermediates, along with their isomers.

155. In January 2025, a special alert related to incidents involving MDMB-INACA was issued under the INCB Global Rapid Interdiction of Dangerous Substances (GRIDS) Programme. Most of the incidents were communicated by the United States. The substances were destined for the United States and originated in China, including Hong Kong, China. Seizures amounted to 184 kg, with a typical seizure involving about 1 kg. Since then, the number of incidents involving MDMB-INACA and similar intermediates used in the manufacture of other synthetic cannabinoids has increased to nearly 300, involving a combined total of about 445 kg of such intermediates.

156. **INCB is concerned about this development, as these intermediates, which are sometimes referred to as "semi-finished synthetic cannabinoids", are another manifestation of the concept of designer precursors. They are custom-made to evade controls and can be converted into the desired end products by readily applicable means and with very limited technical knowledge. In addition to seizures in clandestine laboratory settings, the substances have also been encountered as part of "do-it-yourself" kits that are offered online for buyers to complete the synthesis process.**<sup>20</sup>

157. In 2024 and 2025, France, Mauritius and Netherlands (Kingdom of the) seized the chemical **5-bromo-1-pentene**, which is required to convert the intermediate semi-finished MDMB-INACA into MDMB-4-en-PINACA. With the exception of 100 litres seized in the Kingdom of the Netherlands, the amounts seized in individual incidents were less than 2.5 kg or litres. Mauritius also reported two seizures amounting to a total of about 7 kg of MDMB-INACA, as well as two seizures that involved MDMB-INACA in combination with 5-bromo-1-pentene (of a total amount of less than 1.5 kg). Seizures were also made in the three countries of "do-it-yourself" kits, which included the relevant solvent in which the conversion is carried out.

158. On form D for 2024, some countries raised concerns about the use of **CBD** as a precursor in the manufacture of synthetic and semi-synthetic cannabinoids, such as *delta*-9-THC, *delta*-8-THC, HHC and HHC-O, but did not provide any evidence of its actual use in clandestine laboratories. However, forensic analysis of HHC products, which were not controlled internationally until 6 December 2025,<sup>21</sup> suggested that the synthetic pathway used to manufacture HHC began with CBD. The two-step process is relatively simple and does not require sophisticated equipment or highly trained personnel.

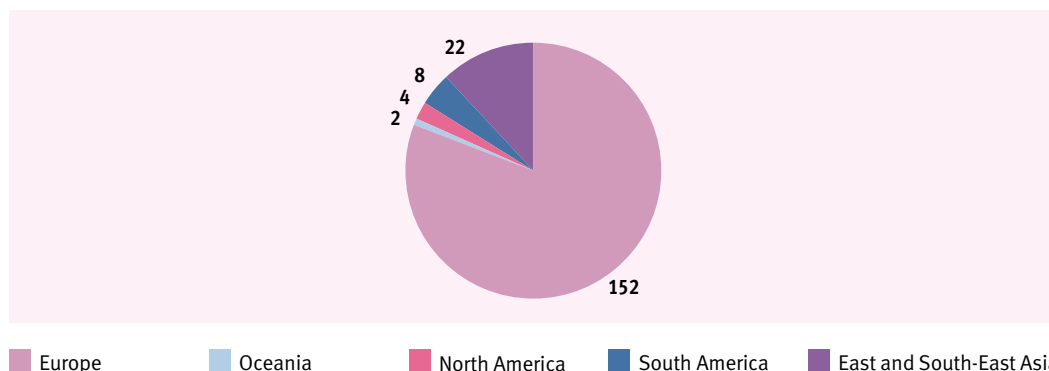
159. In response to concerns regarding the use of CBD in the clandestine manufacture of various semi-synthetic and synthetic cannabinoids, China placed CBD under domestic control as a precursor in September 2024. China subsequently started to voluntarily notify importing countries of planned exports of CBD through the PEN Online Light system. As at 1 November 2025, 24 importing countries, the majority of which were in Europe, had been notified about 188 planned exports (see figure 19).

<sup>19</sup>Manuela Carla Monti and others, "Tail-less precursors in synthetic cannabinoid production: investigating a clandestine laboratory, seized samples, and CB1 activity", *Archives of Toxicology* (2025) (published online).

<sup>20</sup>Marie H. Deventer, Alex J. Krotulski, Christophe P. Stove, "'Do it yourself' synthetic cannabinoid receptor agonist precursors as a ban-evasion strategy: comparison of the pharmacological characteristics of precursors and their final products", *Drug Testing and Analysis* (2025).

<sup>21</sup>HHC was added to Schedule II of the Convention on Psychotropic Substances of 1971 pursuant to a decision that became effective on 6 December 2025.

Figure 19. Number of planned exports of CBD notified through the PEN Online Light system, 2024–2025, by importing region



160. The amounts of CBD proposed for export were considerable, which points to the need for a better understanding of the licit market for CBD. Supported and facilitated by INCB, competent national authorities in China and importing countries are working together to enhance knowledge of legitimate CBD supply chains and operators as well as options to ensure that trade meets legitimate needs while avoiding the diversion of CBD for the clandestine manufacture of semi-synthetic cannabinoids.

161. **INCB commends Governments that cooperate through the PEN Online Light system in relation to planned shipments of CBD. Although this involves a learning experience at both ends of the supply chain, cooperation on a potential drug precursor is exactly what the PEN Online Light system was designed for: to be a practical tool to facilitate voluntary, proactive cross-border cooperation to prevent the illicit manufacture of drugs while minimizing the administrative burden. INCB encourages all Governments to learn from this case and expand their use of the system. INCB also encourages Governments to consider raising awareness among operators of the national laws and regulations applicable to the trade in and distribution and placing on the market of CBD and products containing CBD.**

### Precursors of nitazene-type opioids

162. In view of increasing global concern about nitazene-type opioids – a class of synthetic opioids stronger than fentanyl – and with 10 such nitazene-type opioids having been added to the schedules of the Single Convention on Narcotic Drugs of 1961 as amended by the 1972 Protocol since 2021,<sup>22</sup> INCB has proactively considered some of the related precursors. Specifically, through its network of precursor focal points under Project Prism and Project Cohesion, as well as during the sixty-eighth session of the Commission on Narcotic Drugs, in March 2025, the Board alerted Governments to a group of six chemicals that were not under international control and that could be used to synthesize various nitazene-type drugs. The chemicals belong to the family of “halo-nitrobenzenes”.

163. While no seizures of those chemicals or clandestine nitazene laboratories have been reported to INCB to date, there are suspicious Internet postings that suggest demand for the nitazene precursors for illicit purposes. In light of the potency and the health risks associated with the misuse of nitazenes, INCB has therefore added the six chemicals to the 2025 update of its limited international special surveillance list of non-scheduled substances and continues to gather information about the nature and extent of their licit and illicit use. **To assist with those efforts, the Board encourages all Governments to communicate to it relevant incidents involving nitazene precursors, including seizures and trafficking incidents, as well as suspicious orders and transactions in international trade.**

<sup>22</sup>Two additional nitazenes were under review by the Expert Committee on Drug Dependence of the World Health Organization in October 2025.

### Precursors of other new psychoactive substances

164. In 2024, other notable developments related to the manufacture of new psychoactive substances and their precursors included the dismantling of a warehouse in Bangkok in December 2024. More than 2,000 litres and 250 kg of common chemicals were seized that could have been used for the illicit manufacture of about 200 kg of etomidate, which is frequently misused in vape mixtures, especially in some countries in East and South-East Asia. **The Board wishes to remind Governments of the importance of communicating seizures of chemicals found in illicit manufacturing contexts as a basis for establishing trends and evidence for multilateral and regulatory actions.**

# III. Other matters related to illicit drug manufacture

## HIGHLIGHTS

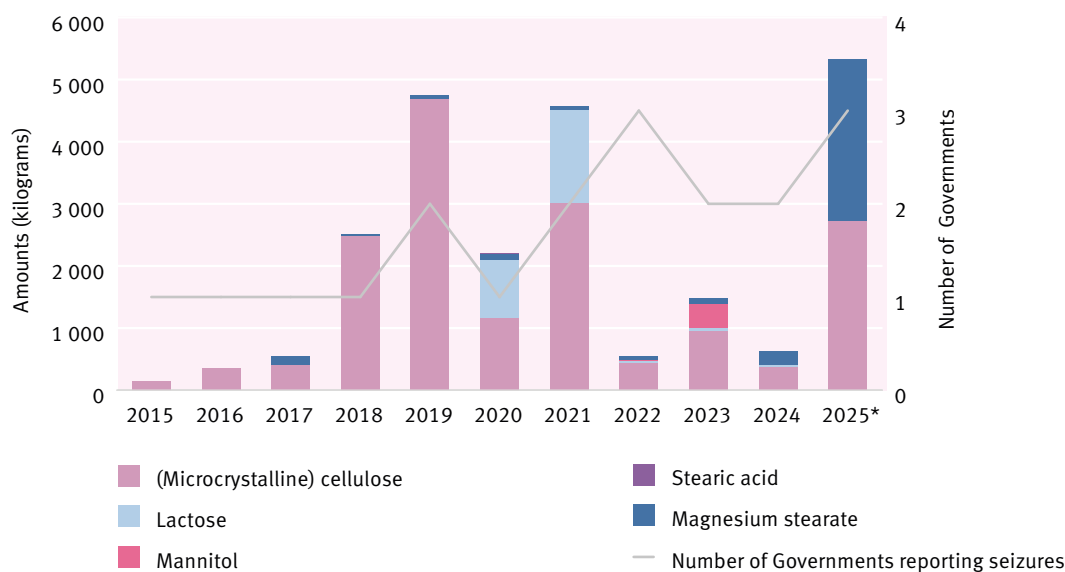
- ▶ INCB launched its second technical report on equipment used in illicit drug manufacture and article 13 of the United Nations Convention against Illicit Traffic in Narcotic Drugs and Psychotropic Substances of 1988 in November 2025.
- ▶ In December 2024, the Board convened an international conference in Vienna on the theme “Engaging the private sector to address illicit drug manufacture – know your industries”. The outcomes of the conference were subsequently incorporated into a guidance document entitled “Guiding industry partnerships: a policy framework for preventing chemical diversion”, which was released in March 2025.
- ▶ The INCB industry mapping exercise also continued, at different stages, in a few countries. In addition, some Governments that benefited from the initiative have begun follow-up actions based on the findings.
- ▶ The monitoring of virtual markets remains relevant for discerning trends in the use of chemicals for illicit drug manufacture and for providing investigative leads. The Board’s monitoring of online markets reveals the continued presence on those markets of recently scheduled designer precursors of MDMA or its analogues and methamphetamine, namely 3,4-MDP-2-P ethyl glycidate and P-2-P methyl glycidic acid, despite the declining number of seizures of those substances. There are also a significant number of Internet postings regarding some non-scheduled precursors of fentanyl and of fentanyl analogues.

## A. Equipment used in illicit drug manufacture

165. In November 2025, INCB launched its second technical report on equipment used in illicit drug manufacture and article 13 of the United Nations Convention against Illicit Traffic in Narcotic Drugs and Psychotropic Substances of 1988. The report reiterates the need to enhance the operational implementation of article 13, specifically to prevent and investigate the diversion of essential equipment used in the illicit production and manufacture of narcotic drugs and psychotropic substances. It also highlights a persistent gap in national legislation, which continues to limit effective monitoring and enforcement related to equipment used in illicit drug manufacture. Globally, in the absence of national regulatory frameworks, equipment seizures are predominantly reported in the context of the dismantling of clandestine laboratories, while seizures at borders remain infrequent. This trend suggests a significant missed opportunity for early intervention aimed at disrupting the diversion of equipment before it reaches illicit laboratories.

166. Tableting machines remain the most frequently seized piece of equipment across all regions. The technical report notes that the illicit manufacture of tablets requires not only tableting machines but also excipients to compress powder mixtures containing drugs into tablets. According to the data shared by Governments on form D and through PICS, excipients such as cellulose (including microcrystalline cellulose), mannitol, lactose and magnesium stearate are regularly encountered alongside tablet presses in clandestine laboratories (see figure 20). The Board is also aware of the increased detection of ready-made excipient mixtures intended for the illicit manufacture of drugs and counterfeit pharmaceutical medicines.

Figure 20. Incidents involving selected excipients communicated through PICS, 2015–2025



\*The data for 2025 cover only the first 10 months of the year.

167. The technical report further highlights a trend towards an increase in the sophistication and professionalization of illicit drug manufacturing laboratories, with the use of high-quality pharmaceutical equipment and advanced process-engineering methodologies, leading to improvements in both the yield and purity of the illicit drugs being manufactured. This escalation presents new operational challenges for law enforcement agencies. Additionally, second-hand equipment used in illicit drug manufacture is acquired either from local markets or online sources and is subsequently modified to meet the specific requirements of traffickers. The use of custom-made or modified industrial equipment is complicating law enforcement efforts to trace its origin or conduct backtracking investigations. Consequently, the report emphasizes the need to improve monitoring of and control over second-hand and custom-made equipment to address that evolving threat.

168. International cooperation is a fundamental pillar in preventing and investigating the diversion of manufacturing equipment. **The Board encourages Governments to conduct backtracking investigations following equipment seizures and to share incident-related data through PICS. Furthermore, Governments are encouraged to actively monitor the Internet and online marketplaces for suspicious advertisements related to specialized equipment.**

169. The technical report also emphasizes the important role of public-private partnerships in fostering proactive collaboration with national industries towards the timely reporting of suspicious orders or purchases, enabling effective enforcement interventions and corrective action before a transaction is made. To support Governments in addressing this challenge, INCB is working on a review of the categories of industries involved in the manufacture, trade and distribution of certain equipment potentially attractive to traffickers. The objective of the initiative is to generate substantive knowledge about licit markets, including the geographical distribution, commercial practices and operational networks of legitimate suppliers, thereby enhancing Governments' understanding of legitimate supply chains and their key actors. The review is scheduled to be launched in early 2026.

170. In a major step towards improving global monitoring of certain equipment, INCB has updated the international monitoring list of equipment used in the illicit manufacture of drugs to incorporate newly established unique Harmonized System codes, as approved by WCO.<sup>23</sup> This will enhance Governments' capabilities to monitor international trade flows of certain equipment and mitigate the risk of diversion to illicit channels. To further support this effort, INCB is exploring the possibility of setting up an electronic platform for the voluntary communication of pre-export notifications regarding planned exports of relevant equipment, modelled on the PEN Online Light system. This initiative is aimed at supporting Governments in verifying the legitimacy of specific transactions and progressively building comprehensive knowledge of global supply chains to identify and address potential points of diversion.

171. **The Board encourages all Governments to take the measures necessary to enhance monitoring of international trade in certain equipment by strengthening national legislation, international cooperation, active cooperation with the private sector and the use of new tools such as unique Harmonized System codes and voluntary notification mechanisms. The Board also encourages Governments to take appropriate measures to prevent equipment from being diverted for the illicit manufacture of narcotic drugs and psychotropic substances, in line with article 13 of the 1988 Convention.**

## B. Cooperation with industry

172. Proactive cooperation between competent national authorities and relevant sectors of industry remains one of the fundamental pillars for preventing the diversion of controlled precursors, non-scheduled chemicals and equipment that might be used in the illicit manufacture of drugs. Throughout the reporting period, the Board undertook a series of initiatives to support Governments in establishing or further strengthening cooperation frameworks with industry stakeholders, including associations.

173. In December 2024, the Board convened an international conference in Vienna on the theme "Engaging the private sector to address illicit drug manufacture – know your industries". The event brought together over 70 government representatives from 30 countries across all continents, representing economies with diverse industrial profiles and a broad spectrum of industry associations (international, regional and national), including associations of manufacturers and distributors from the chemical, pharmaceutical and fragrance sectors. Four international and regional organizations also took part.

<sup>23</sup>The unique Harmonized System codes for selected equipment on the international monitoring list of equipment used in the illicit manufacture of drugs were approved by WCO in June 2025 and are expected to be made available in the 2028 edition of the Harmonized System Nomenclature.

174. The conference achieved the following:

- Served as a strategic platform for the exchange of experiences and best practices, including national cooperation models, some of which complemented the national practices and case studies featured in the INCB publication entitled “National practices related to public-private partnerships in the area of drug precursors and non-scheduled chemicals used in illicit drug manufacture”
- Provided insights gained from the national industry mapping exercise
- Highlighted the pivotal role and considerable potential of national, regional and international industry associations in supporting efforts to prevent chemical diversion. In that context, the Board initiated exploratory efforts to strengthen cooperation with relevant international industry associations and continued to assess the existence and operational scope of regional industry associations with a view to fostering broader engagement, outreach and awareness
- Raised awareness of existing INCB tools, along with various initiatives and resources developed by industry associations to support public-private collaboration in the area

175. The outcomes of the conference were subsequently incorporated into a guidance document entitled “Guiding industry partnerships: a policy framework for preventing chemical diversion”, which was released in March 2025 and made available on the Board’s website.

176. The INCB industry mapping exercise also continued, at different stages, in a few countries. In addition, some Governments that benefited from the initiative have begun follow-up actions based on the findings, including:

- Utilizing the mapping reports for educational and awareness-raising purposes, including the training of new personnel within government agencies
- Identifying specific industry sectors that were not previously on the radar of competent national authorities and were therefore not yet integrated into existing cooperation and awareness-raising mechanisms
- Requesting industries to voluntarily notify their national authorities of planned exports of non-controlled chemicals that are on the limited international special surveillance list of non-scheduled substances and could be used in illicit drug manufacture. This approach was taken by the authorities of India, which submitted pre-export notifications regarding such planned exports through the PEN Online Light system (see para. 134)

**177. The Board commends those Governments that have already undertaken the industry mapping exercise and have commenced follow-up actions. This critical activity serves as a strategic instrument for assisting Governments in identifying industries that manufacture, consume or otherwise handle chemicals – whether or not subject to control – that may be used as precursors in the illicit manufacture of drugs, while simultaneously enabling the detection of systemic vulnerabilities within national chemical control frameworks and enhancing institutional capacities to prevent the diversion of chemicals. The Board reiterates its encouragement to all other Governments to initiate or advance similar efforts.**

## C. Virtual markets

178. During the reporting period, the Board continued to actively monitor online marketplaces for suspicious precursor-related postings on the Internet using automated monitoring tools. That was done initially through the development version of the Automated Monitoring of Virtual Chemical and Equipment Markets software solution,<sup>24</sup> which monitored 55 global e-commerce platforms. The monitoring fed into some alerts issued by the Board in the reporting period, including the alert on the new pre-precursor of amphetamine and methamphetamine, methyl 4-phenylacetoacetate, and the alert related to nitazene precursors.

<sup>24</sup>See the INCB report on precursors for 2024 (E/INCB/2024/4), para. 176.

179. More recently, the Board's Scanning of Novel Opioids on Online Platforms (SNOOP) tool developed under the INCB GRIDS Programme has been used to target online marketplaces offering select designer precursors of amphetamine-type stimulants. The SNOOP tool actively monitors more than 120 global English-language e-commerce platforms for the bulk sale (through business-to-business and business-to-consumer channels) of synthetic opioids and benzodiazepines with no known legitimate uses.

180. Although the SNOOP tool is not specifically designed to monitor precursors other than fentanyl precursors, during the reporting period, it was used to detect vendor marketplace offers for 3,4-MDP-2-P ethyl glycidate – a designer precursor of MDMA or its analogues, and P-2-P methyl glycidic acid – a designer precursor of amphetamine and methamphetamine, both of which were placed in Table I of the 1988 Convention in December 2024. The number of suspicious offers involving those substances on online marketplaces is contrary to the declining trend in seizures of the substances noted following their placing under international control (see paras. 85, 86 and 91).

181. The SNOOP tool also detected a number of offers for the substance para-fluoro-1-boc 4-AP, which is a precursor of the fentanyl analogue para-fluorofentanyl. The substance was advertised using its various synonyms, including its Chemical Abstracts Service registry number. The total quantities of all precursors of fentanyl analogues seized in 2024 were small but not insignificant given the potency of the end product (see para. 139). Furthermore, the fact that the substances are widely listed on online marketplaces indicates possible interest in them by traffickers.

182. The same is true for some non-scheduled pre-precursors of fentanyl, namely 4-hydroxypiperidine and its "masked" analogue, *N*-boc-4-hydroxypiperidine, for which a significant number of online postings were found while the quantities reported seized were very small (see para. 138).

183. A typical feature of several suspicious postings is the large portfolio of substances offered by vendors, including precursors, new psychoactive substances and other end products. Furthermore, vendors often offer assurance of customs clearance and secure door-to-door delivery, even for very large quantities.

184. The internet postings identified by the SNOOP tool sometimes also offered equipment, particularly tabletting machines, associated with offers of the target substances. Rotary evaporators and punches and dies also featured in a few postings. The fact that the tablet presses were offered in conjunction with precursor chemicals indicates the suspicious nature of such postings.

185. The Board's monitoring of online markets confirms that virtual markets continue to be relevant for the supply of precursors (and equipment) for illicit drug manufacture. **The Board recommends that Governments monitor the Internet for suspicious postings related to precursors and equipment used in illicit drug manufacture. Such postings provide some indication of the trend of the use of chemical substances by the illicit drug manufacturing industry and the changes over time, besides also providing intelligence input, which can be used for law enforcement interventions.**

## 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](http://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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