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SUMMARY OF DATA FROM THE EARLY WARNING SYSTEM OF THE AMERICAS (SATA) 2019-2023

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EXECUTIVE SUMMARY

This information bulletin provides a comprehensive summary of data collected by the Early Warning System of the Americas (SATA, by its Spanish-language acronym) from 2019 to 2023 regarding emerging drugs in the Americas. The data were provided by Argentina, Barbados, Brazil, Canada, Chile, Colombia, the Dominican Republic, El Salvador, Trinidad and Tobago, the United States, and Uruguay, which were the countries with functioning early warning systems (EWS) that emitted alerts to the SATA during the time period covered by this information bulletin.

The document highlights the continued appearance of New Psychoactive Substances (NPS) in the Americas, posing significant challenges due to their easy synthesis, difficulty in detection, and lack of regulation under international conventions. Emerging drug categories identified include synthetic cannabinoids, cannabis with high-potency tetrahydrocannabinol (THC), synthetic cathinones, central nervous system (CNS) depressants, amphetamine-type stimulants (ATS), phenethylamines, phenidates, synthetic opioids, piperazines, plant-based substances, phencyclidine-type substances, and tryptamines.

Key Findings:

1. NPS Prevalence and Challenges:

- NPS continue to emerge across the Americas, complicating detection and regulation due to their synthetic nature and lack of international control.
- Categories include synthetic cannabinoids, high-potency cannabis, synthetic cathinones, CNS depressants, ATS, phenethylamines, phenidates, synthetic opioids, piperazines, plant-based substances, phencyclidine-type substances, and tryptamines.

2. Adulterants:

- Common adulterants in drugs like cocaine and methamphetamine include levamisole, phenacetin, caffeine, lidocaine, and others. These can pose significant health risks.

3. Synthetic Cannabinoids:

- Alerts have been received from Barbados, Brazil, and Canada, with substances such as 5F-MDMB-PINACA and ADB-FUBIATA being reported.

4. Cannabis:

- High-potency cannabis, often called "creepy," poses greater health risks due to higher THC content. Significant seizures have been reported in Colombia and Chile.

5. Synthetic Cathinones:

- Known as "bath salts," these substances have been widely reported across South America, posing severe health risks.

6. CNS Depressants:

- Detected in Canada and the United States, including substances like bromazolam and xylazine.

7. ATS:

- Widespread detection across several countries, with notable substances including MDA and MDMA.

8. Phenethylamines:

- The most frequently reported group, with 27 substances detected, including 2C-B and 25I-NBOMe.

9. Phenidates:

- Only Argentina reported the detection of 4F-MPH, a stimulant medication.

10. Synthetic Opioids:

- Fentanyl and its analogs, along with nitazenes, have been reported, posing significant overdose risks in North America. While no synthetic opioids were reported from countries in Central America and the Caribbean, Argentina, Chile, Colombia, and Uruguay reported a variety of synthetic opioids, in South America including tramadol, carfentanyl, and other fentanyl-type substances.

11. Piperazines:

- Detected in Argentina and Brazil, producing ecstasy-like effects.

12. Plant-Based Substances:

- Brazil reported substances like kratom and bufotenin, highlighting their psychoactive properties.

13. Phencyclidine-Type Substances:

- Ketamine and analogs have been reported across several countries, with notable seizures in Trinidad and Tobago.

14. Tryptamines:

- Reported in multiple countries, including DMT and 5-MeO-DMT, known for their hallucinogenic effects.

This information bulletin underscores the ongoing and evolving threat posed by NPS in the Americas. The establishment of EWS and systems like SATA are vital for effective monitoring, detection, and rapid response to mitigate the public health risks associated with these substances.

1. INTRODUCTION

Over the last decade, global drug monitoring systems began to detect a novel group of psychoactive substances whose use was on the rise. Known as new psychoactive substances (NPS), these are defined as "substances of abuse, either in a pure form or preparation, that are not controlled by the 1961 Single Convention on Narcotic Drugs or the 1971 Convention on Psychotropic Substances, but which may pose a public health threat."[1]

Similar to other emerging substances, NPS pose challenges for traditional drug-monitoring methods, because they are easily synthesized, hard to detect, and difficult to legislate, as most of them can be chemically altered. The purity and makeup of the products in NPS are not well known, nor are the adverse effects and long-term risks of using them. Countries need to identify other monitoring methods to control these drugs and innovative, rapid, and effective response systems to detect and react to these new threats.

The Inter-American Drug Abuse Control Commission (CICAD, by its Spanish-language acronym) considers early warning systems (EWS) to be a key mechanism for detection, data collection, assessment, publication of early alerts, and the execution of rapid responses to address the threat of emerging drugs. CICAD's Inter-American Observatory on Drugs (OID, by its Spanish-language acronym) fosters the establishment and strengthening of national EWS in member states. In 2019, CICAD launched the Early Warning System of the Americas (SATA),[2] administered by the OID which interconnects national EWS allowing them to share valuable and timely information on emerging drug threats.

1. *United Nations Office on Drugs and Crime (UNODC), 2013.*

2. *Organization of American States (OAS), Inter-American Drug Abuse Control Commission (CICAD), Inter-American Observatory on Drugs (OID), Early Warning System for the Americas (SATA).*

2. SUMMARY OF THE MAIN EMERGING DRUGS REPORTED TO SATA FROM 2019 TO 2023

The information reported by the OAS member states' EWS by Argentina, Barbados, Brazil, Canada, Chile, Colombia, the Dominican Republic, El Salvador, Trinidad and Tobago, the United States, and Uruguay to the SATA from 2019 to 2023 is summarized below.

2.1. Adulterants

Adulterants are chemical substances often used to decrease the purity and/or intensify the effects of certain drugs like cocaine, fentanyl, and methamphetamine, among others. The most common adulterants or cutting agents are levamisole (or tetramisole), phenacetin, caffeine, lidocaine, diltiazem, hydroxyzine, dimethyl sulfone (MSM), procaine, benzocaine, and sugars (like mannitol, lactose, and glucose).[3]

The Chilean Public Health Institute (ISP, by its Spanish-language acronym) reported through the EWS that phenacetin (banned in Chile since the 1980s) and levamisole (an antiparasitic and immunomodulator) were found in some cocaine samples analyzed between 2019 and 2020.[4] Subsequently, in February of 2023, it reported the seizure of a green-pressed powder consisting of fentanyl cut with caffeine and other substances.[5] In July 2020, Colombia issued a global warning about levamisole, which is increasingly being found as an adulterant in cocaine, fentanyl, and heroin, and has adverse impacts on users' health, leading to a reduction in their white blood cell count (leukopenia) and necrosis.[6]

3. UNODC, Recommended methods for the Identification and Analysis of Cocaine in Seized Materials, 2012.

4. ISP detecta variaciones en la presencia de adulterantes en decomisos de cocaína y otras drogas [ISP detects variations in the presence of adulterants in seizures of cocaine and other drugs] (Santiago, Chile, July 2020).

5. Chilean EWS on drugs, Reporte de Detección de Mezcla de Sustancias Psicoactivas [Report on the Detection of a Mixture of Psychoactive Substances].

6. Colombia EWS, Levamisol: Un adulterante tóxico encontrado en las drogas ilegales que se consumen en las calles [Levamisole: A toxic adulterant found in illegal street drugs], July 2020.

Uruguay's EWS has reported finding caffeine used as a cutting agent in pills sold as ecstasy (2019); in green gummy-like substances that also contained DOB, 2C-B, MDMA, cocaine, and ketamine (2020); in a "tusi"-like[7] pink powder, which analysis showed to contain ketamine, MDMA, and cocaine, in addition to the caffeine (2020); and in methamphetamine pills with MDA and MDMA (2021).[8]

Since 2019, El Salvador has been analyzing packets of cocaine hydrochloride and cocaine base and has detected the following adulterants: benzocaine (from 2019 to 2022), caffeine (2019 to 2022), levamisole (2019 to 2022), and lidocaine (2020). In 2022, the country issued alerts on the methamphetamine being sold at bars and night clubs, which contained methamphetamine and cocaine, as well as the adulterants MSM and caffeine. Lastly, in the first half of 2023, El Salvador's EWS reported some pink powders being sold as "tusi" that were confirmed in forensic laboratory analyses to contain ketamine, ecstasy, and caffeine.[9]

2.2. Synthetic cannabinoids

Synthetic cannabinoids are chemical substances made in laboratories and also known as synthetic cannabinoid receptor agonists;[10] regardless of their structure or origin, they bind to the body's cannabinoid receptors, including in the brain and central nervous system. They are functionally similar to THC (delta-9-tetrahydrocannabinol), but are typically much more potent and dangerous, since they act like full agonists rather than partial ones like THC. They were originally developed for use in studies of the endocannabinoid system and to help foster an understanding of diseases and develop medications. Early in the 2000s, in Europe, they began to be sold as "legal" substitutes for marijuana, and they currently constitute one of the largest groups of NPS identified globally. Consuming synthetic cannabinoids is riskier than using natural ones. Notably, synthetic cannabinoids are often mixed with natural, plant-based products and marketed under the names *spice, K2, Kronic*, etc.

7. "Tusi" is also called "tusibi" or "pink cocaine," and is 2C-B cut with other psychoactive substances like ketamine and MDMA.

8. Uruguay EWS on drugs. Bulletin No. 8. (December 2021).

9. El Salvador, Informe Nacional Sobre la Situación de las Drogas 2023 [National Report on the Drug Situation in 2023].

10. An agonist is a drug or substance that binds to a receptor inside a cell or on its surface and causes the same action as the substance that would typically bind to the receptor.

Most of the synthetic cannabinoid alerts reported to the SATA are from Brazil, where the substance 5F-MDMB-PINACA was detected for the first time in 2019 and 4F-MDMB-BINACA was detected in 2020. Furthermore, the substance ADB-FUBIATA was found for the first time in 2021, and was included in Brazil's List of Prohibited Psychotropic Substances. That same year, the country also detected, for the first time, the substances ADB-4en-PINACA, ADB-BUTINACA, and MDMB 4en-PINACA, classified from moderate to serious.[11] Barbados also issued, in August 2023, an alert that it had detected the substances 4-fluoro MDMB-BUTICA and MDMB-4en-PINACA.[12] According to the alerts reported to CICAD, Canada also found two synthetic cannabinoids in 2020.

2.3. Cannabis

In Colombia, in addition to "conventional" cannabis with an average THC content of 5%, there are varieties of cannabis grown from strains with higher THC levels, popularly known as "creepy," "cripy," or "cripa," and sold as plant matter that is typically smoked or ingested orally with food or beverages, in addition to as wax or in oil for vaping. Due to its high THC content (average of 10.57%, as reported by Colombia's EWS in 2019), it poses a greater risk of negative effects on the user's physical and mental health, inducing relaxation, calm, euphoria, hilarity, inhibition, disorientation, and psychosis. Extracted from the plant's flowers, the wax can be inhaled when heated, typically with a vaporizer, which provides a controlled temperature and does not give off marijuana's characteristic odor.

In its 2020 Report, Chile's Drug Trafficking Observatory reported a 700% increase in seizures of "creepy" from 2017 to 2020. In 2020 alone, 5.5 tons of "creepy" were seized; this amount includes the largest seizure of 4 tons, taken in a single raid. In turn, El Salvador's EWS has issued several alerts on seizures carried out between 2020 and 2022 of liquids, oily substances, and gummy-type sweets that contained cannabidiol, delta-9-THC, delta-8-THC, and cannabinol.[13,14]

11. *Brazil, Primer Informe del Subsistema de Alerta Temprana sobre Drogas [First Report of the Early Warning Subsystem on Drugs] (2021).*

12. *Barbados, Early Warning System Drug Alert: Synthetic Cannabinoids (2023).*

13. *El Salvador, Informe Nacional Sobre la Situación de las Drogas 2023 [National Report on the Drug Situation in 2023].*

14. *Chile, Drug Trafficking Observatory, 2020 Report.*

2.4. Synthetic cathinones

Synthetic cathinones (known as "bath salts") are a class of psychoactive substances made in laboratories and structurally related to cathinone, an alkaloid found in the khat plant (Catha edulis).[15] These substances are designed to imitate the effects of amphetamine-type stimulants (ATS), like methamphetamine and MDMA (ecstasy). Research shows that illegal consumption of synthetic cathinones can cause serious health problems (tachycardia, palpitations, hallucinations, agitation, anxiety, psychosis, paranoia, muscle spasms, difficulty breathing, nausea, teeth clenching, aggressiveness, and increased endurance and pain tolerance), and can be life-threatening. Furthermore, the use of these substances may be dangerous and potentially addictive.[16]

From 2020 to 2023, Argentina issued alerts about five synthetic cathinones.[17] In turn, Brazil issued alerts on 17 synthetic cathinones seized by the Federal Police in the 2019-2020 period; N-butylpentylone was identified for the first time in 2019, and five more substances were identified in 2020 (3-CDC, MD-PV8, N,N-diethylpentylone, N-ethylheptedrone, and N-ethylhexedrone).[18] In 2019, Colombia reported that it had seized nine different types of synthetic cathinones,[19] while Uruguay detected N-ethylpentylone for the first time in 2020 and eutylone in 2021.[20] Moreover, Canada has informed CICAD that it detected two synthetic cathinones in 2020 and one in 2021.[21]

2.5. Central nervous system depressants

Central nervous system (CNS) depressants are medications that slow down brain activity, making the muscles relax and the patient calm down and feel relief. CNS depressants are used medically to treat insomnia, anxiety, panic attacks, and seizures, as anxiolytics, analgesics, sedatives, and sleeping pills. That said, they are also used for non-therapeutic purposes as recreational drugs or drugs of abuse. The most common depressants are alcohol, opioids, barbiturates, and benzodiazepines.[22]

15. Shrub grown in eastern Africa and southern Arabia, with stimulating effects.

16, Sage Journals, Clinical Toxicology and Management of Intoxications With Synthetic Cathinones ("Bath Salts").

17. Argentina, EWS, Estado de situación [Situation status] 2020-2023.

18. Brazil, Primer Informe del Subsistema de Alerta Temprana sobre Drogas [First Report of the Early Warning Subsystem on Drugs] (2021).

19. Colombia, Continúan identificándose nuevas catinonas sintéticas en el mercado de drogas de Colombia [New synthetic cathinones continue to be identified in Colombia's drug market], August 2020.

20. Uruguay EWS on drugs. Bulletin No. 8. (December 2021).

21. Government of Canada (2022). Health Canada Drug Analysis Service. At-a-glance: Newly reported psychoactive substances in Canada 2020-2021.

22. Madrid Salud, Drogas depresoras del sistema nervioso central: fármacos depresores [Central nervous system depressant drugs: depressant medications].

Canada informed CICAD that it had detected various CNS depressants: SL-140 in 2020, bromazolam, chlorodiazepam, and norfludiazepam in 2021,[23] and xylazine from 2020 to 2022.[24] From 2020 to 2022, the United States also informed CICAD that it had detected benzodiazepines and xylazine.[25]

2.6. Amphetamine-type stimulants (ATS)

ATS are a class of psychoactive substances that share properties with and have similar effects to amphetamines.[26] These substances affect the CNS and typically have stimulating properties, increase brain activity and wakefulness, and improve concentration and energy levels. Some common examples of ATS include amphetamine, methamphetamine, and other ecstasy-like substances (for example, MDA, MDMA, MDE/MDEA, and analogs), known for their capacity to increase the release and activity of neurotransmitters in the brain (e.g., serotonin, dopamine, and norepinephrine).[27]

Notably, the use of ATS can entail health risks and abuse can lead to negative side effects like dependence, psychological and physical disorders, anxiety, depression, insomnia, tachycardia, hypertension, irritability, and mental health problems. Consequently, many of these substances are controlled, given their potential for abuse and impact on public health.

From 2020 to 2023, Argentina reported that it had detected five ATS,[28] including 4 fluoromethamphetamine, which was also reported by Chile in 2021.[29] Brazil's EWS issued alerts about three ATS, including 5-APDB, which has not been reported by any other country.[30] The substances 5-MAPB and 6-MAPB were only reported by Chile in 2021.[31] The most common ATS, reported by nearly all countries in South America that belong to the SATA, were MDA and MDMA (ecstasy), from 2019 to 2023.

El Salvador's EWS issued an alert on amphetamines found in 2021 as well as several alerts on MDMA (ecstasy) and methamphetamines seized between 2020 and 2023,[32] including crystal methamphetamine in 2020. In the Caribbean, both Trinidad & Tobago[33] and the Dominican Republic[34] issued alerts on seizures of MDMA (ecstasy) carried out in 2022;

23. Government of Canada (2022). Health Canada Drug Analysis Service. At-a-glance: Newly reported psychoactive substances in Canada 2020-2021.

24. Canadian Community Epidemiology Network on Drug Use (CCENDU) Drug Alert: Xylazine. July 2022.

25. National Drug Early Warning System (NDEWS). September 2022.

26. UNODC, Amphetamine-type Stimulants in Latin America, 2014.f

27. NIH, National Institute on Drug Abuse. What are MDMA's effects on the brain?, 2017.

28. Argentina, EWS, Estado de situación [Situation status] 2020-2023.

29. Chile, EWS on drugs, Reporte de Detección de Droga Sintética 2021 [Synthetic Drug Detection Report 2021].

30. Brazil, Primer Informe del Subsistema de Alerta Temprana sobre Drogas [First Report of the Early Warning Subsystem on Drugs] (2021).

31. Chile, EWS on drugs, APB Reporte de Detección de Droga Sintética 2021 [Synthetic Drug Detection Report 2021 - APB].

32. El Salvador, Informe Nacional Sobre la Situación de las Drogas 2023 [National Report on the Drug Situation in 2023].

33. Trinidad and Tobago, Media Advisory, October 2022.

34. Dominican Republic, Observatory on Drugs, Informe Estadístico Anual 2022 [Annual Statistical Report 2022.

this is notable due to the countries' geographic proximity. The Barbados EWS issued an alert on methamphetamine found in March 2023.[35] Lastly, Canada also sent two alerts to CICAD on the substances N-dimethyl-3,4-dimethoxyamphetamine and N-pyrrolidino-3,4-dimethoxyamphetamine detected in 2019.[36]

2.7. Phenethylamines

Phenethylamines are a class of chemical compounds with hallucinogenic, physical, mental, and emotional effects. As strong stimulants, they speed up the user's heart rate and respiration, and increase their blood pressure and body temperature. Consequently, users may get dehydrated if they do not make sure to drink enough water. Most phenethylamines act like CNS stimulants or as hallucinogens; stimulants secrete dopamine, norepinephrine, and/or serotonin, imitating the effects of traditional drugs like cocaine, amphetamine, methamphetamine, and ecstasy, while classic hallucinogens (psychedelics) interfere with the serotonin receptors and produce hallucinations. The substances in this group imitate the effects of traditional drugs like 2C B, LSD, and DMT, but may also provide residual stimulation.[37]

This is the group with the most substances reported to CICAD: a total of 27 phenethylamines were reported in the 2019-2023 period, as shown in Tables 1 and 2. 2C-B was the most-reported substance, detected by five countries: Argentina, Brazil, Colombia, El Salvador, and Uruguay; meanwhile, 2C-E was reported by Argentina, Brazil, Chile, and Uruguay. In general, the most frequent substances belonged to the following families: NBO (25B-NBOH, 25B-NBOMe, 25C-NBOH, 25C-NBOMe, 25E-NBOH, 25I-NBOH, and 25I-NBOMe), 2C (2C-B, 2C-C, 2C-C-NBOMe, 2C-E, 2C-I, and 2C-T-2), and DO (DOB, DOC, DOET, DOI, and DOM). Furthermore, Canada informed CICAD of the detection of methallylescaline (2020) and 4-fluorophenibut (2021).

2.8. Phenidates

Phenidates are a class of compounds that include stimulant medications primarily used to treat attention deficit and hyperactivity disorder (ADHD). The most

35. Barbados, Early Warning System Drug Alert: Methamphetamine (2023).

36. Government of Canada (2022). Health Canada Drug Analysis Service. At-a-glance: Newly reported psychoactive substances in Canada 2020-2021.

37. UNODC, United Nations Office on Drugs and Crime. Early Warning Advisory on New Psychoactive Substances.

well-known phenidate is methylphenidate, which is the active ingredient in medications like Rubifen, Medikinet, Ritalin, and Concerta. These medications stimulate the CNS and may help improve attention and impulse control in persons with ADHD. However, like all medications, they have side effects and should be used under medical supervision.[38] Only Argentina's EWS reports having detected the substance 4F-MPH between 2020 and 2023.[39]

2.9. Synthetic opioids

Synthetic opioids are chemical substances designed to imitate the effects of natural opioids derived from opium, like morphine and codeine. Often called designer opioids, they are made in laboratories, and their chemical structures may be similar to natural opioids or may differ significantly. They are designed to interact with the CNS opioid receptors, producing analgesic effects for pain management and, in some cases, euphoria. However, they can also be abused, and can cause addiction, overdose, and other grave side effects, with major health risks.[40] The most common synthetic opioids are fentanyl analogs, which have multiple medical uses. However, others that belong to a structurally different group also continue to be reported; known as "nitazenes,"[41] they were reported to CICAD by Canada and the United States from 2019 to 2022. To date, the countries of Latin America and the Caribbean have not reported any nitazenes to the SATA.

In May 2021, the Chilean Public Health Institute (ISP) reported the seizure of 15 ampoules of fentanyl.[42] In February 2023, the ISP reported the seizure of a green pressed powder that contained fentanyl, caffeine, morphine, etizolam, phenylpropanolamine, xylazine, acetylcodeine, and 6 monoacetylmorphine. This was the first time fentanyl had been detected in Chile in a format other than the ampoule used in hospitals, which suggests the drug is present in highly pure form.[43]

Of particular concern is the presence of carfentanyl (subject to international oversight since 2018),[44] which is 100 times stronger than fentanyl and has not been approved for medical use in humans. In February 2022, used as an adulterant in cocaine, it caused 24 deaths in Argentina.

38. *Cañamo, La Revista de la Cultura del Cannabis [Journal of Cannabis Culture].*

39. *Argentina, EWS, Estado de situación [Situation status] 2020-2023.*

40. *Department of Justice/Drug Enforcement Administration, Synthetic Opioids.*

41. *FuserNews, Nitazeno: nueva droga pone en alerta a los E.E.U.U. [Nitazene: new drug puts the USA on guard].*

42. *ISP, Sistema de Alerta Temprana da a conocer dos drogas de alta toxicidad [Early Warning System discloses two highly toxic drugs] (May 11, 2021).*

43. *Chilean EWS on drugs, Reporte de Detección de Mezcla de Sustancias Psicoactivas [Report of the Detection of a Mixture of Psychoactive Substances].*

44. *UNODC, Current NPS Threats, Volume 5, October 2022.*

Several fentanyls were reported by the EWS in Argentina, Brazil, Chile, Colombia, and Uruguay in the 2019-2023 period, as shown in Tables 1 and 2. Canada reported various nitazenes and fentanyls found between 2020 and 2021 (5-amino-isotonitazene, bromofentanyl, chlorofentanyl, etodesnitazene, flunitazene, and hexanoyl fentanyl). The United States informed CICAD of its detection of fentanyl from 2019 to 2022. In addition to the fentanyl analogs, two series U compounds were reported: U 47700 by Brazil in 2019[45] and UF 17 by Colombia in 2022, consisting of two sheets of 5x5mm paper, mixed with a lesser proportion of 2C-B.[46] Lastly, tramadol is also included in this category; it is an opioid analgesic that provides very effective pain treatment but can produce euphoria like oxicodone.[47] It is currently prescribed legally and is not subject to international control. Uruguay's EWS on drugs reported detecting it in 2020, in the analysis of a "tusi"-type[48] pink powder, in which ketamine, MDMA, cocaine, and caffeine were also found to be present.[49] The Chilean Public Health Institute also reported detecting tramadol in some samples of ecstasy analyzed between 2019 and 2020.[50]

2.10. Piperazines

Piperazines are class of chemical compounds that contain a piperazine functional group and are widely used in medicine as antipsychotics, antidepressants, anxiolytics, antihistamines, and to treat certain parasitic infections (in anthelmintic medications, against intestinal parasites).[51] That said, while some substances that contain the piperazine group have been used as medications, they have also been identified in recreational drugs, which can be dangerous and pose health risks.[52]

In its "Early Warning System, Situation Status 2020-2023" bulletin, Argentina reported detecting piperazine P-CPP.[53] In turn, Brazil's EWS identified TFMPP in 2020. Both of these substances produce ecstasy-like stimulating, hallucinatory effects.[54] No other countries reported having detected piperazines to the SATA.

45. Brazil, Primer Informe del Subsistema de Alerta Temprana sobre Drogas [First Report of the Early Warning Subsystem on Drugs] (2021).

46. Colombia, Alerta Informativa acerca de la aparición del UF-17 [Informational alert on the appearance of UF-17], August 2022.

47. International Narcotics Control Board (INCB), Alert 7 on Control of Psychotropic Substances. Tramadol, review of the global situation. (Viena, June 2018).

48. "Tusi" is also called "tusibi" or "pink cocaine," and is 2C-B cut with other psychoactive substances like ketamine and MDMA.

49. Uruguay EWS on drugs, Bulletin No. 8, (December 2021).

50. ISP detecta variaciones en la presencia de adulterantes en decomisos de cocaína y otras drogas [ISP detects variations in the presence of adulterants in seizures of cocaine and other drogs] (Santiago, Chile, July 2020).

51. Echele Cabeza project.

52. Revista Independientes, Revista especializada en adicciones [Journal specialized in addictions].

53. Argentina, EWS, Estado de situación [Situation status] 2020-2023.

54. Brazil, Primer Informe del Subsistema de Alerta Temprana sobre Drogas [First Report of the Early Warning Subsystem on Drugs] (2021).

2.11. Plant-based substances

This group of substances includes plants with psychoactive properties whose use has increased over the past few years. The most common are: kratom (Mitragyna speciosa), a plant native to Southeast Asia with stimulating effects at low doses and sedative ones at higher doses; salvia divinorum, native to the cloud forests in Oaxaca, Mexico, which contains the active molecule salvinorin A, a hallucinogenic substance; and khat (Catha edulis), a plant native to eastern Africa and the Arabian peninsula, whose chemical structure is similar to amphetamine. The leaves of this latter plant are chewed, and release the stimulants cathinone and cathine.[55]

Only Brazil's EWS reported two plant-based substances: bufotenin and kratom, both in 2020.[56] Bufotenin[57] is a psychoactive compound found in certain mushrooms and plants, as well as in the gland secretions of certain amphibians. Notably, bufotenin is classified as a psychoactive substance and its use can have both psychological and physiological effects. Some countries regulate the possession and use of bufotenin by law, due to its psychoactive properties. In turn, kratom[58] leaves contain alkaloids like mitragynine, the principal component responsible for the psychoactive effects, similar to those of opioids and other stimulants. Kratom has been used for its stimulating and analgesic properties. as well as in cultural and ceremonial practices.

2.12. Phencyclidine-type substances

Phencyclidine, commonly known as PCP (phenylcyclohexyl piperidine), belongs to a class of substances that act as CNS stimulants or dissociatives. Stimulants affect the action of dopamine, norepinephrine, and/or serotonin, imitating the effects of traditional drugs like cocaine, amphetamines, methamphetamines, and ecstasy. Dissociatives form a class of hallucinogenic substances that modulate effects at the N-methyl-D-aspartate (NMDA) receptor in the brain and produce feelings of a mind-body disconnection.[59]

55. UNODC, United Nations Office on Drugs and Crime. Early Warning Advisory on New Psychoactive Substances.

56. Brazil, Primer Informe del Subsistema de Alerta Temprana sobre Drogas [First Report of the Early Warning Subsystem on Drugs] (2021).

57. International Center for Ethnobotanical Education, Research, and Service (ICEERS).

58. ICEERS.

59. UNODC, United Nations Office on Drugs and Crime. Early Warning Advisory on New Psychoactive Substances.

One of the most common phencyclidine-type substances is ketamine, an anesthetic commonly used in veterinary, and, to a lesser extent, human medicine. At lower dosages, ketamine can induce dissociative effects similar to those of PCP. In South America, it was reported by the EWS in Brazil (2019-2020), Colombia (2019 and 2022), and Uruguay (2020-2022). In 2020, Brazil also identified, for the first time, the substance 2-fluorodeschloroketamine,[60] which is a ketamine analog. Very little information is known about the pharmacology, metabolism, and toxicity of this substance, which has a very short history of use in humans.[61]

El Salvador issued a public alert in the first half of 2023 on pink powders that were being sold as "tusi" but were confirmed by forensic laboratory analyses to contain mixtures of substances like ketamine, ecstasy, and caffeine. In 2022, Trinidad and Tobago also reported a major seizure of 12.7 kg of ketamine, which had apparently been rerouted from medical to recreational use.[62,63]

As for other phencyclidine-type substances, 2F-DCK was reported only by Argentina, in its "Early Warning System, Situation Status 2020-2023 bulletin",[64] and 3-MeO-PCP was reported only by Brazil, in 2019. In North America, Canada informed CICAD that it had detected five phencyclidine-type substances in 2020, namely: (3-hydroxy PCE, deoxymethoxetamine, deschloro-N-ethyl-ketamine, fluoro phencyclidine, and methoxisopropamine).[65,66]

2.13. Tryptamines

Tryptamines are a class of chemical compounds that contain a tryptamine functional group, characterized by an indole-type ring,[67] which consists of a fused benzene and pyrrole ring. Tryptamine is a derivative of the essential amino acid tryptophan,[68] from which it takes its name.[69] As new psychoactive substances, some tryptamines act like neurotransmitters in the CNS, while others have psychoactive properties and are known as hallucinogens or psychedelics.[70] Examples of psychoactive tryptamines include psilocin and psilocybin (extracted from the magic mushroom Psilocybe cubensis), present in psilocybin mushrooms, as well as dimethyltryptamine (DMT),[71] found in certain

60. Brazil, Primer Informe del Subsistema de Alerta Temprana sobre Drogas [First Report of the Early Warning Subsystem on Drugs] (2021).

61. Energy Control, 2-Fluoro-descloroketamina [2-Fluorodeschloroketamine].

62. Trinidad and Tobago, Media Advisory, October 2022.

63. El Salvador, Informe Nacional Sobre la Situación de las Drogas 2023 [National Report on the Drug Situation in 2023].

64. Argentina, EWS, Estado de situación [Situation status] 2020-2023.

65. Government of Canada (2022). Health Canada Drug Analysis Service, At-a-glance: Newly reported psychoactive substances in Canada 2020-2021.

66. Brazil, Primer Informe del Subsistema de Alerta Temprana sobre Drogas [First Report of the Early Warning Subsystem on Drugs] (2021).

67. Química.es, Síntesis enantioselectiva de derivados del indol [Enantioselective synthesis of indole derivates].

68. Mederi Nutrición Integrativa, What are essential amino acids and why should we take them?

69. SP, Guía de Pericias Químicas [Guide to Chemical Concepts].

70. Plants and mushrooms

71. UBUscientia.

plants and used in some traditional practices and rituals (like chacruna, used in drinks like ayahuasca).[72] The tryptamine skeleton can also be identified within the structure of more complex compounds, such as LSD.[73] Notably, the use of psychoactive substances, including tryptamines, can have diverse health effects, and should be approached with caution and under appropriate medical supervision.

Dimethyltryptamine (DMT) was reported by the EWS in Argentina (2020-2023), Chile (2019), Colombia (2019), and Uruguay (2021). In Uruguay, the tryptamine DMT was mixed with the phenethylamine 2C-C-NBOMe, according to the country's EWS on drugs. Argentina reported detecting, in addition to DMT, three other tryptamines (4-AcO-DMT, 5-MeO-DMT, and bufotenin) in the same period.[74] Brazil's EWS also reported finding bufotenin in 2019. In May 2021, Chile reported the seizure of the synthetic drug 4-hydroxy-DMT, which has hallucinogenic effects and leads to cardiac toxicity, and in the case of an overdose can cause cardiorespiratory arrest and even death.[75] Chile was the only country to detect the substance 5-MeO-MiPT (Moxy) in 2021,[76] and Colombia the only one to detect 1P-LSD in 2019.[77] In turn, Canada informed CICAD that it had found six tryptamines between 2020 and 2021.[78,79,80]

2.14. Other substances

This section covers all other substances that do not fall within any of the foregoing groups. In its "Early Warning System, Situation Status 2020-2023" bulletin, Argentina reported having detected a substance called harmine, which is a beta-carboline or harmala alkaloid[81] and a reversible inhibitor[82] of monoamine oxidase A (MAO-A),[83] an enzyme that breaks down monoamines, including neurotransmitters (serotonin, dopamine), hormones (melatonin), and drugs, as well as many hallucinogens (psilocybin, dimethyltryptamine (DMT), and mescaline).[84]

The Chilean Public Health Institute also reported having detected sertraline as a cutting agent in samples of ecstasy seized between 2019 and 2020.[85] Sertraline is an antidepressant, mood stabilizing pharmaceutical product that belongs to the group of selective

72. THC Cultura Cannábica.

73. Plants and mushrooms

74. Argentina, EWS, Estado de situación [Situation status] 2020-2023.

75. ISP. Sistema de Alerta Temprana da a conocer dos drogas de alta toxicidad [Early Warning System discloses two highly toxic drugs] (May 11, 2021).

76. Chile, EWS on Drugs, Reporte de Detección de Mezcla de Sustancias Psicoactivas [Report on the Detection of a Mixture of Psychoactive Substances], 2021.

77. Colombia, Alerta Informativa acerca de la aparición de análogos del LSD como alternativa a su consumo [Informational alert on the appearance of LSD analogs as an alternative to LSD use], 2019.

78. Government of Canada. (2022). Health Canada Drug Analysis Service. At-a-glance: Newly reported psychoactive substances in Canada 2020-2021.

79. Uruguay EWS on drugs. Bulletin No. 8. (December 2021).

80. Brazil, Primer Informe del Subsistema de Alerta Temprana sobre Drogas [First Report of the Early Warning Subsystem on Drugs] (2021).

81. Argentina, EWS, Estado de situación [Situation status] 2020-2023.

82. Eugenomic, Inhibidor Enzimático [Enzymatic inhibitor].

83. Mayo Clinic, Inhibidores de la monoaminooxidasa (IMAO).

84. e-Lactancia, Harmine. Harmaline. Tetrahydroharmine (THH).

85. ISP detecta variaciones en la presencia de adulterantes en decomisos de cocaína y otras drogas [ISP detects variations in the presence of adulterants in seizures of cocaine and other drogs] (Santiago, Chile, July 2020).

serotonin reuptake inhibitors (SSRIs). It is indicated for the treatment of major depression, anxiety disorder, obsessive compulsive disorder, social phobia, and post-traumatic stress disorder.[86] In its Bulletin No. 8, Uruguay's EWS on Drugs also reported finding, in 2021, a powder in wrappers with a "pink panther" logo, which included methamphetamine, MDA, ketamine, and sertraline.[87]

In 2020, Canada[88] reported that it had detected seven substances: 1 (1,3 benzodioxol 5 yl) 2,2-dibromo-1-pentanone, a chemical compound derived from cathinone with potential bioactive properties,[89] 1-benzyl-4-piperidone, a precursor used to produce fentanyl using the Janssen method;[90] bromantane (or bromantan), sold under the trade name Ladasten, an atypical psychostimulant and anxiolytic drug in the adamantylamine family, related to amantadine and memantine and used in Russia in the treatment of neurasthenia;[91] methyl 2-phenylacetoacetate, a precursor in the synthesis of amphetamine and methamphetamine;[92] RAD149, a chemical substance that works like a selective androgen receptor modulator (SARMS), imitating the activity of testosterone in the body;[93] octodrine, also known as 6-methyl-2-heptanamine or 2-amino-6-methylheptane, a stimulating drug that is in the psychotropic alkylamine family; it is also a local anesthetic and vasoconstrictor;[94] and, lastly, tiletamine, a dissociative anesthetic for veterinarian use, classified pharmacologically as a NMDA receptor antagonist and chemically related to ketamine, but with greater anesthetic power.[95]

86. Elsevier, Offarm Journal, Sertralina [Sertraline].

87. Uruguay EWS on drugs, Bulletin No. 8. (December 2021).

88. Government of Canada (2022). Health Canada Drug Analysis Service. At-a-glance: Newly reported psychoactive substances in Canada 2020-2021.

89. Chemical Book.

90. Insight Crime, Making Synthetic Drugs: a Primer.

91. Psicologia y Mente, Bromantan: propriedades y efectos de este fármaco [Bromantan: properties and effects of this medication].

92. Cayman Chemical.

93. VITRUVE, Que son los SARMS [What are SARMS?].

94. Wikiwand, Octodrina: Síntesis y usos [Octodrine: Synthesis and uses].

95. Scielo, Estudio comparativo del efecto de las asociaciones anestésicas atropina-tiletamina/zolazepam y atropina-ketamina/diazepam en emúes (Dromaius novaehollandiae) adultos. [Effects of the anaesthetic associations atropine-tiletamine/zolazepam and atropine ketamine/diazepam on adult emus (Dromais novaehollandiae).

3. FIGURES

3.1. **Figure 1** Number of substances reported to the SATA, by year

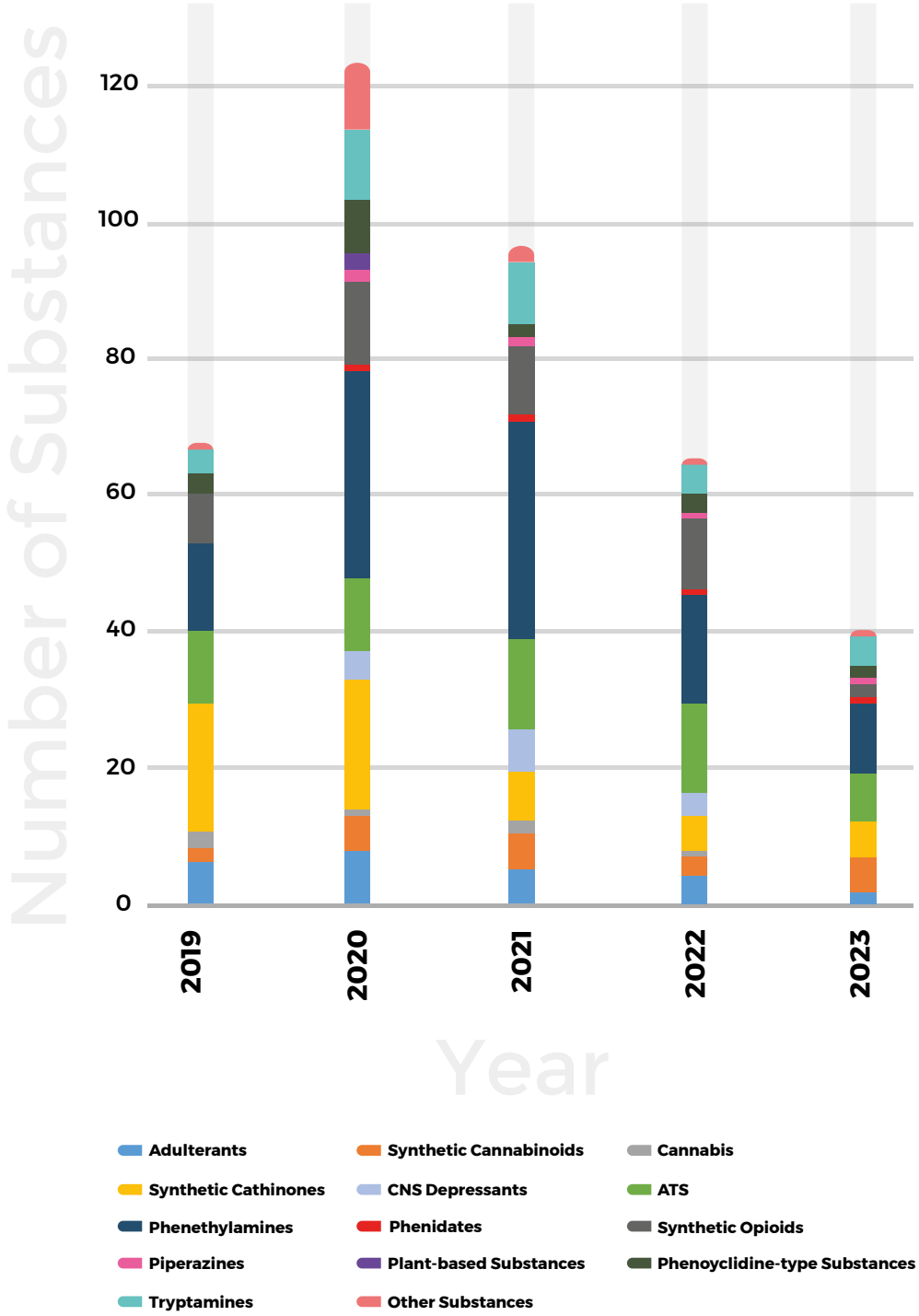

Figure 1 shows the number of times a substance was identified and reported to the SATA from 2019 to 2023. As can be observed, over the course of this period, phenethylamines were, on average, the group of substances most often reported to the SATA, followed by synthetic cathinones, ATS, and synthetic opioids.

3.2. Figure 2 - Substances reported to the SATA, by country, 2019-2023

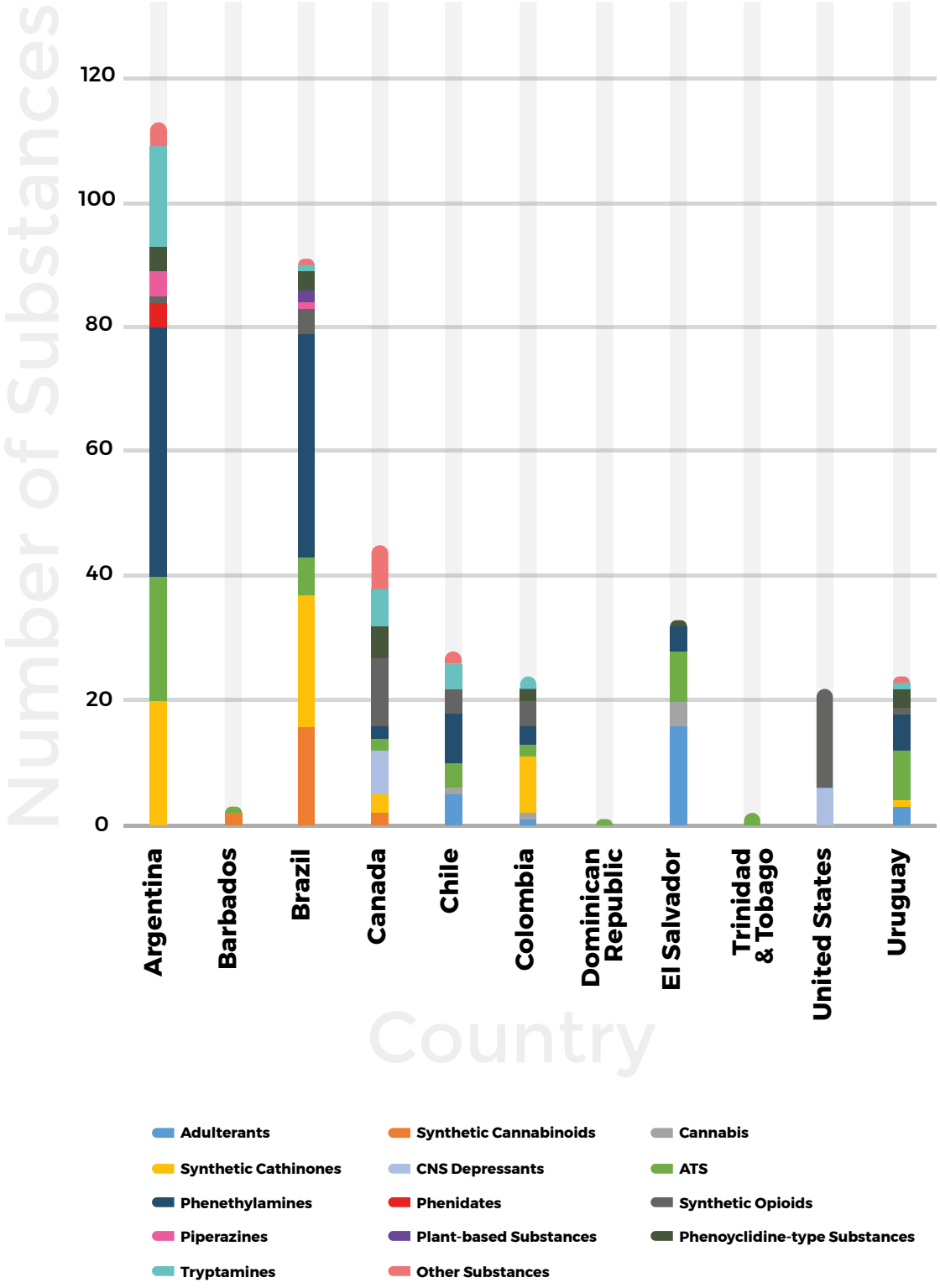

Figure 2 shows the number of times a substance was identified and reported to the SATA by each country from 2019 to 2023. As can be observed, Argentina and Brazil are the countries that detected and reported the most substances to the SATA over this period.

4. SUMMARY TABLES OF THE MAIN EMERGING DRUGS REPORTED TO SATA FROM 2019 TO 2023

The following tables reflect the emerging drugs reported to SATA in the 2019 to 2023 period. The tables have been divided into subregions: North America, Central America, the Caribbean, and South America.

4.1. Table 1

This table lists the substances reported to SATA by each of the six countries located in North America, Central America, and the Caribbean that have established EWS: Barbados, Canada, the Dominican Republic, El Salvador, Trinidad and Tobago, and the United States.

		NORTH AMERICA		CENTRAL AMERICA	THE CARIBBEAN		
TYPE	SUBSTANCE	CANADA	UNITED STATES	EL SALVADOR	BARBADOS	DOMINICAN REPUBLIC	TRINIDAD AND TOBAGO
Adulterants	Benzocaine			2019-2022			
	Caffeine			2019-2023			
	Dimethyl sulfone (MSM)			2021-2022			
	Levamisole			2019-2022			
	Lidocaine			2020			
Synthetic cannabinoids	4-Cyano CUMYL-BUTINACA	2020					
	4-Fluoro MDMB-BUTICA				2023		
	ACHMINACA	2020					
	MDMB-4en-PINACA				2023		
Cannabis	Substances with CBD, CBN, and Delta-9-THC			2020-2022			
Synthetic cathinones	4-fluoro-3-methyl-alpha-pyrrolidinopentiophenone	2020					
	Alpha-pyrrolidino-2-phenylacetophenone	2020					
	Alpha-pyrrolidino cyclohexanophenone	2021					
Central nervous system depressants	Benzodiazepine		2020-2022				
	Bromazolam	2021					
	Chlorodiazepam	2021					
	Norfludiazepam	2021					
	SL-164	2020					
	Xylazine	2020-2022	2020-2022				
ATS	Amphetamine			2021			
	MDMA (ecstasy)			2020, 2023		2022	2022
	Methamphetamine			2021-2022	2023		
	Crystal methamphetamine			2020			
	N,N-dimethyl-3,4-dimethoxyamphetamine	2019					
	N-pyrrolidino-3,4-dimethoxyamphetamine	2019					
Phenethylamines	25B-NBOMe			2020, 2022			
	2C-B			2020, 2022			
	4-Fluorophenibut	2021					
	Methallylescaline	2020					

Synthetic opioids	5-amino-isotonitazene	2021					
	Bromofentanyl	2021					
	Chlorofentanyl	2020					
	Etodesnitazene	2020					
	Fentanyl		2019-2022				
	Flunitazene	2020					
	Hexanoyl fentanyl	2020					
	Isotonitazene		2019-2022				
	Metonitazene	2020	2019-2022				
	N-pyrrolidino etonitazene (Etonitazepyne)	2021					
	Nitazene		2019-2022				
	Parafluorofentanyl	2021					
	Protonitazene	2020					
	W-19	2021					
Phencyclidine-type substances	3-hydroxy PCE	2020					
	Deoxymethoxetamine	2020					
	Deschloro-N-ethyl-keta-mine	2020					
	Fluoro phencyclidine	2020					
	Ketamine			2023			2022
	Methoxisopropanamine	2020					
Tryptamines	1-cP-LSD	2021					
	4-acetoxy MALT	2020					
	4-acetoxy MET	2020					
	4-AcO-MiPT	2020					
	5-MeO-MALT	2020					
	Ethylpropyltryptamine	2020					
Other substances	1-(1,3-benzodio-xol-5-yl)-2,2-dibromo-1-pentanone	2020					
	1-Benzyl-4-piperidone	2020					
	Bromantane	2020					
	Methyl 2-phenylacetoa-cetate	2020					
	Octodrine	2020					
	RAD140	2020					
	Tiletamine	2020					

4.2. Table 2

The following table shows the substances reported to SATA by each of the five countries in South America that have established EWS: Argentina, Brazil, Chile, Colombia, and Uruguay.

		SOUTH AMERICA				
TYPE	SUBSTANCE	ARGENTINA	BRAZIL	CHILE	COLOMBIA	URUGUAY
Adulterants	Caffeine			2023		2019-2021
	Phenacetin			2019, 2020		
	Levamisole			2019, 2020	2020	
Synthetic cannabinoids	4F-MDMB-BINACA		2020			
	5F-MDMB-PICA		2020			
	5F-MDMB-PINACA		2019-2023			
	ADB-4en-PINACA		2021			
	ADB-BUTINACA		2021-2023			
	ADB-FUBIATA		2021			
	ADB-FUBINACA		2019			
	MDMB-4en-PINACA		2021-2023			
Cannabis	Creepy (cripy o cripa)			2020	2019	
Synthetic cathinones	3-CDC	2020				
	3-CMC	2020				
	4-CDC	2021				
	4-CEC					
	4-Chloro-PVP					
	4-CMC					
	4-chloroethylmethcathinone					
	4-methylpentedrone					
	bk-DMBDP					
	BMDP					
	Clephedrone					
	Dibutylone					
	Dipentylone					
	Ethylone					
	Eutylone					
	MDPPP					
	MD-PV8					
	N-butylhexedrone					
	N-butylpentylone					
	N-ethylcathinone					
	N-ethylheptedrone					
	N-ethylhexedrone					
	N-ethylpentylone					
	N,N-diethylpentylone					
	N,N-dimethylpentylone					
	Pentylone					
	tBuONE					

ATS	4-fluoromethamphetamine	2020-2023		2021		
	5-APDB		2019			
	5-MAPB			2021		
	6-MAPB			2021		
	m-ALPHA	2020-2023				
	MDA	2020-2023	2019-2020			2019, 2022
	MDMA (ecstasy)		2019-2020	2019	2019, 2022	2019-2022
	Methamphetamine	2020-2023				2021
	n-moc-MDMA	2020-2023				
Phenethyl-amines	25B-NBOH	2020-2023	2019-2021			
	25B-NBOMe		2020-2021		2022	
	25C-NBOH		2019-2021			
	25C-NBOMe		2019-2021		2022	
	25E-NBOH	2020-2023	2019-2021			
	25I-NBOH	2020-2023	2019-2021			
	25I-NBOMe	2020-2023	2019-2021			
	2-APB			2021		
	2C-B	2020-2023	2021		2022	2019-2022
	2C-C	2020-2023	2020-2021			
	2C-C-NBOMe					2021
	2C-E	2020-2023	2019-2020	2020		2021
	2C-I	2020-2023	2019-2021			
	2C-T-2	2020-2023				
	3-fluorophenmetrazine		2019			
	4-APB			2021		
	6-APB			2021		
	6-Br-DMPEA		2020			
	7-APB			2021		
	DOB	2020-2023		2021		
	DOC		2019	2021		2020
	DOET		2020			
	DOI		2020			
	DOM			2021		
	MDPV		2019-2020			
	MMMP (Caccure 907)		2019-2020			
Phenidates	4F-MPH	2020-2023				
Synthetic opioids	Betahydroxythiofentanyl				2022	
	Carfentanyl	2022				
	Fentanyl		2022-2023	2021, 2023	2022	
	Furanylfentanyl		2019			
	P-fluorofentanyl				2022	
	Tramadol			2019, 2020		2020
	U-47700		2019			
	UF-17				2022	

Piperazines	P-CPP	2020-2023				
	TFMPP		2020			
Plant-based substances	Bufotenin		2020			
	Kratom		2020			
Phencyclidine-type substances	2F-DCK	2020-2023				
	2-fluorodeschloroketamine		2020			
	3-MeO-PCP		2019			
	Ketamine		2019-2020	2019, 2020	2019, 2022	2020-2022
Tryptamines	1P-LSD				2019	
	4-AcO-DMT	2020-2023				
	4-hydroxy-DMT			2021		
	5-MeO-DMT	2020-2023	2020	2021		
	5-MeO-MiPT (Moxy)			2021		
	Bufotenin	2020-2023	2019			
	DMT	2020-2023		2019	2019	2021
Other substances	Harmine	2020-2023				
	Sertraline			2019, 2020		2021

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