



Cocaine

Evaluation of the substances tested at the Drug Information Center Zurich in 2025

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1 Introduction

Cocaine (benzoylecgonine methyl ester) is extracted from the leaves of the South American coca bush (*Erythroxylum coca*). Cocaine is classified as a stimulant.

In 2025, a total of 1,731 (2024: 1,460) samples declared as cocaine were submitted for analysis at the Drug Information Center (DIZ) in Zurich and at the nine mobile drug checking sites.¹ Of these samples, 1,602 were submitted as part of the stationary drug checking, 78 as part of the nine mobile party drug checkings, and 51 as part of the four mobile drug checkings next to a drug consumption room (K&A Zurich) .

In 2024 and 2025, the number of samples increased significantly compared to previous years. The noticeable rise in the total number of samples can be attributed, among other things, to the introduction of drug checking at the Langstrasse location in November 2023 (which now operates on two evenings per week). These samples were included in the sample count for stationary drug checking.

The results published here are not representative of the entire substance market in the city of Zurich.

1.1 Risk Assessment

Cocaine is a substance with a comparatively high potential for harm and addiction. In addition to the known risks, the frequent presence of pharmacologically active adulterants poses an additional and difficult-to-assess health risk, particularly for regular users. These risks rarely involve acute side effects but primarily long-term consequences.

The higher the cocaine content, the greater the risk of overdose. High-dose cocaine can also place a heavy strain on the cardiovascular system and, under certain circumstances and physical conditions, trigger a heart attack or stroke.

Information and recommendations for minimizing the risks of cocaine use can be found on the DIZ website in the “substance information” section under “cocaine”.²

¹ Samples that were not declared as cocaine but in which cocaine was detected are not included in this analysis.

² <https://www.saferparty.ch/substanzen/kokain>

1.2 Cocaine Content

Figure 1 shows the trend in cocaine content over the last ten years.

In 2025, the average cocaine content of the samples analyzed at the DIZ and during mobile drug checkings was 87.3% cocaine*HCl³ (n=1703).⁴ Compared to the previous year, an increase in the average active ingredient content of 5.5% was observed. 9 out of 10 analyzed samples contained between 80.1% and 100% cocaine.

Both in terms of average content and the distribution of samples by content, the figures for the 2,025 samples analyzed represent the highest values of the past ten years

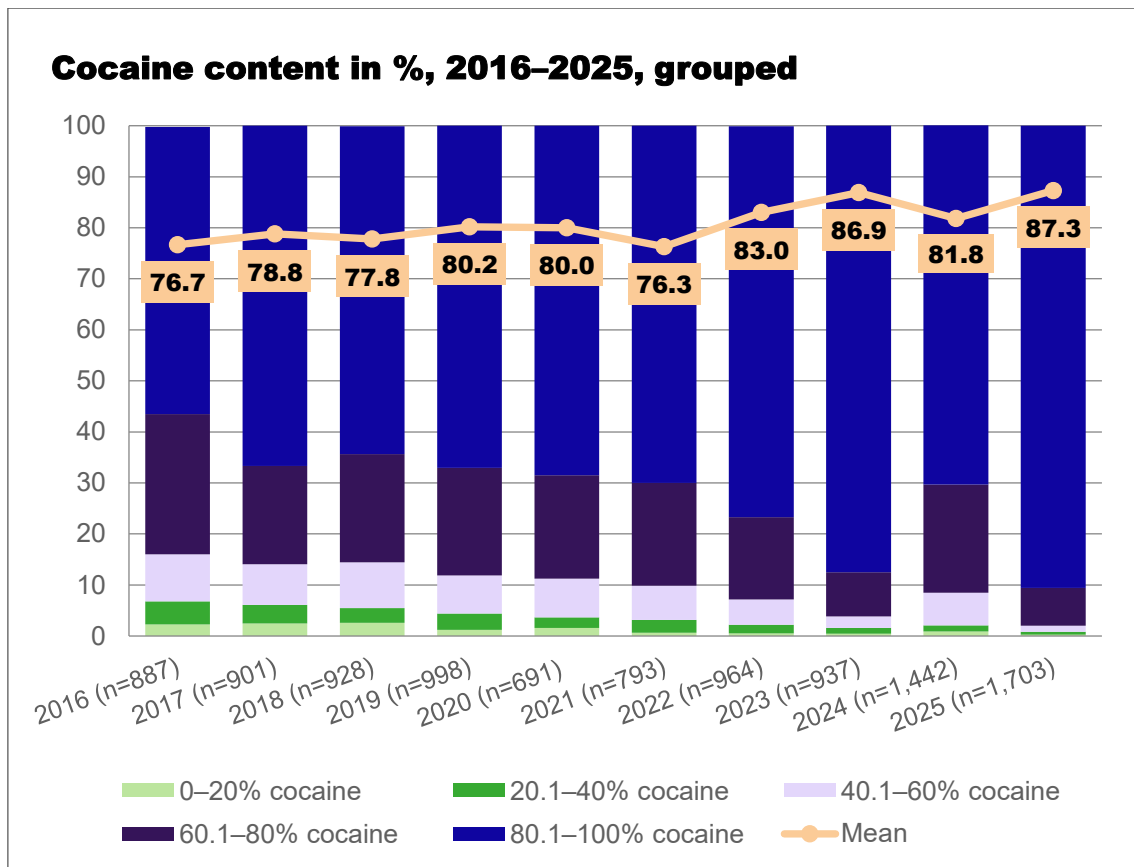


Figure 1 : Cocaine content in %, 2016–2025, grouped

1.3 Unexpected pharmacologically active substances

The cocaine samples submitted to the DIZ are mostly mixtures of cocaine and one or more additional constituents. Some of these unexpected constituents are not

³ Cocaine in powder form is typically present as a salt (mostly hydrochloride/HCl). HCl is the chemical abbreviation for hydrochloride. For simplicity, cocaine is used synonymously with cocaine*HCl in this document.

⁴ The calculation of the average cocaine content included all samples declared as cocaine that contained cocaine (n=1703). Eighteen samples declared as cocaine contained no cocaine at all; two samples could not be quantified due to insufficient sample material. Eight samples consisted of free cocaine base (freebase). These 28 samples are excluded from the calculation.

pharmacologically active (e.g., lactose, starch, cellulose). Unexpected ingredients that have no additional health effects are not reported by the laboratory and are not included in this analysis. However, some of these unexpected substances are intentionally chosen to simulate a higher cocaine content and to induce an enhancement and/or prolongation of the effect.

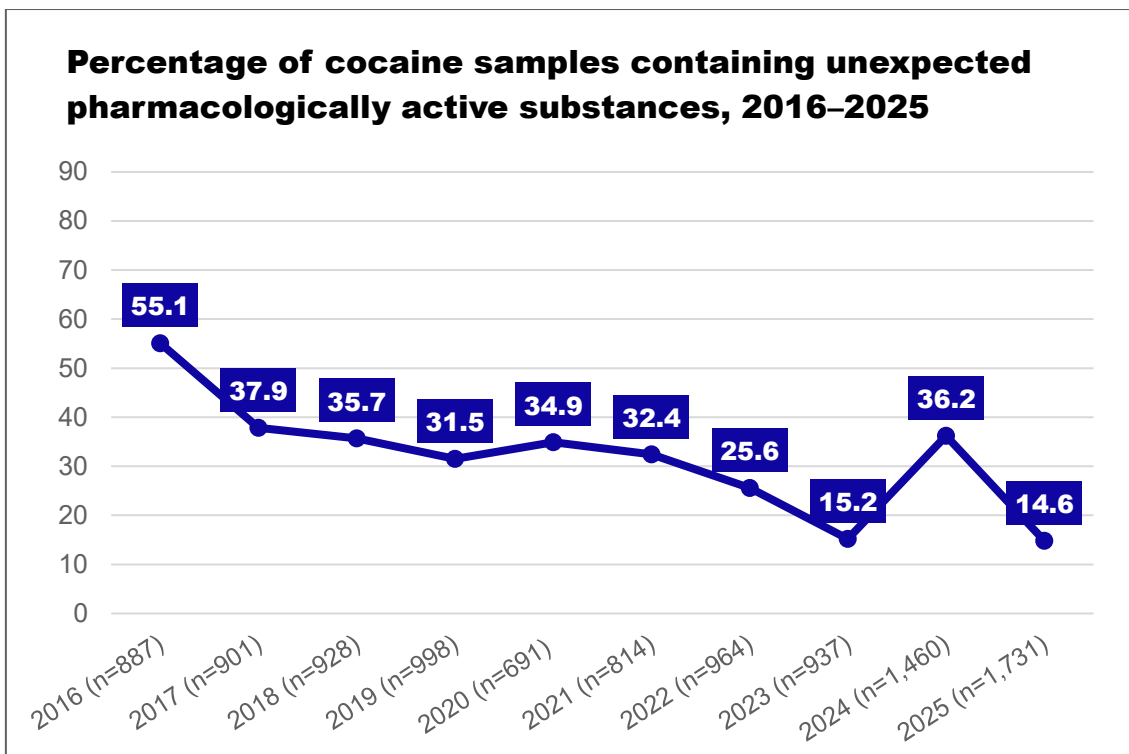


Figure2 : Cocaine samples containing unexpected pharmacologically active substances, 2016–2025, in %⁵

In 2025, 14.6% (-21.6%) of samples declared as cocaine contained at least one pharmacologically active substance in addition to cocaine (n=1,731). This represents a significant decrease in the proportion of unexpected substances compared to the previous year. Except for 2024, this corresponds to the long-term trend of a decline in unexpected pharmacologically active substances in cocaine samples. In 2016, more than half of all samples contained unexpected pharmacologically active substances. By 2021, this had dropped to one in three samples, and by 2025, to one in seven samples.

⁵ The difference in the number of samples between Figure 1 and Figure 2 (n=1,703 and n=1,731) is due to the fact that in Figure 1, samples declared as cocaine that contained no cocaine, had no quantifiable content, or contained free cocaine base were not included in the analysis. In Figure 2, all samples declared as cocaine were included in the analysis.

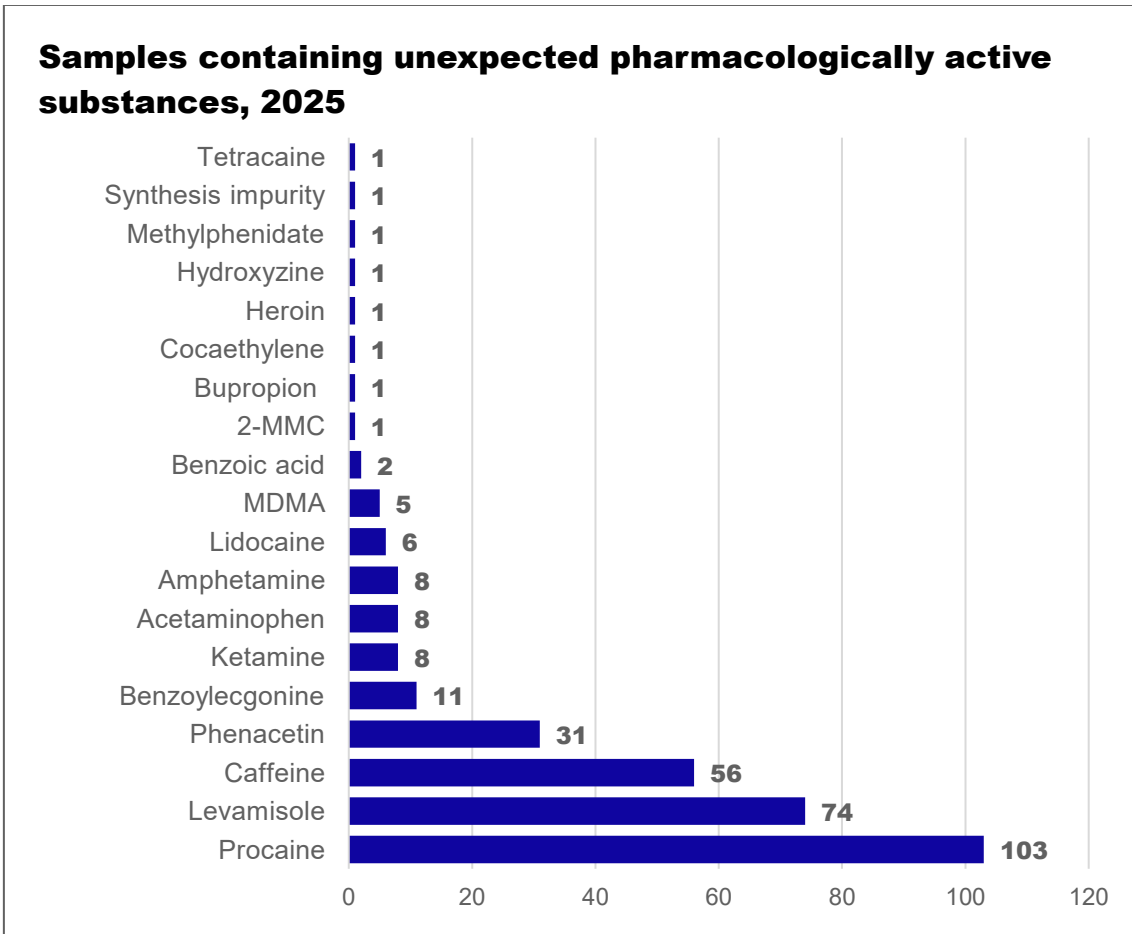


Figure 3 : Samples containing unexpected pharmacologically active substances, 2025

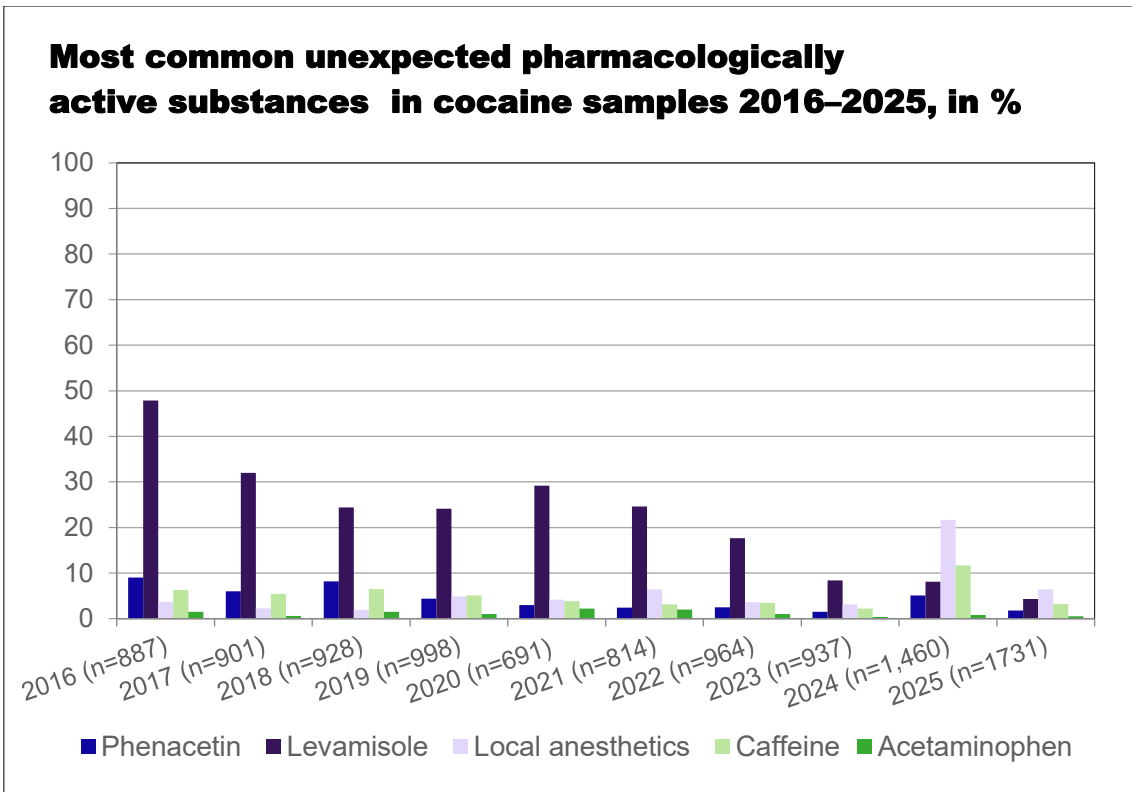


Figure 4 : Most common unexpected pharmacologically active substances in cocaine samples, 2016–2025, in %

Over the past 10 years, levamisole has been the most common unexpected pharmacologically active substance in cocaine samples. The number of samples adulterated with levamisole declined steadily during this period (with a slight increase in 2020). In 2025, levamisole was detected in 4.3% (2024: 8.1%) of cocaine samples. This again represents a significant decline from the previous year.

In 2024, local anesthetics were the most frequently analyzed unexpected pharmacologically active substances for the first time. In 2025, as in the previous year, the local anesthetic procaine was the most frequently analyzed unexpected substance. Procaine was detected in 6.0% of all cocaine samples. This represents a decrease of 15.3%.

In addition to procaine and levamisole, caffeine and phenacetin are the most frequently occurring unexpected substances, as in previous years. The following sections provide a more detailed explanation of the unexpected pharmacologically active substances detected in cocaine samples in 2025.

1.3.1 Local anesthetics

Local anesthetics are medications used in medicine for local anesthesia. Due to their numbing effect, local anesthetics are used as cutting agents. When performing the “quality test” by touching the tongue and gum, users mistakenly conclude from the numbing effect that the cocaine is particularly pure.

In addition to side effects affecting the central nervous system (e.g., agitation, seizures, coma), the use of local anesthetics can also cause cardiac arrhythmia, a drop in blood pressure, and allergic reactions. Intravenous use of cocaine laced with local anesthetics or its use in large quantities is particularly risky. It can lead to paralysis of the central nervous system and to a delay or blockage of the cardiac conduction system between the atria and ventricles. Severe forms of this so-called AV block lead to a slowed heart rate (bradycardia, bradyarrhythmia). In extreme cases, it can result in a complete stoppage of the ventricles, which is life-threatening without medical treatment.

In 2025, the local anesthetic procaine was the most frequently detected unexpected pharmacologically active substance in cocaine samples. Procaine is now rarely used for local anesthesia, as more effective substances, such as lidocaine, are available for this purpose. Today, procaine is mainly used as a therapeutic agent (e.g., in neural therapy for pain relief).

Other local anesthetics detected were lidocaine (in 6 samples) and tetracaine (in one sample).

In 2025, procaine was detected in 6.0% of all cocaine samples (-15.3%); on average, the proportion of procaine in these samples was 9.7% (-8.6%). In 9 out of 10 samples containing procaine, the concentration was below 20%. The highest procaine concentration was 96.8%.

1.3.2 Levamisole

Levamisole, originally used in humans as a treatment for roundworms (anthelmintic), has not been used in human medicine since 2004 due to undesirable side effects, but is now used exclusively in veterinary medicine to treat worm infestations.

Common acute side effects of levamisole in humans include vomiting and diarrhea. Digestive problems may persist even the day after taking the medication. In addition, allergic reactions (shortness of breath, skin rashes, swelling of the lips, tongue, or face), nervous system disorders (numbness up to and including loss of consciousness, severe fatigue), and speech difficulties may occur.

The most dangerous side effects of levamisole are aplastic anemia, agranulocytosis, and vasculitis. Aplastic anemia leads to a severely reduced ability to fight serious infections (immunosuppression) due to a lack of white blood cells. Agranulocytosis is a severe reduction in granulocytes, a subgroup of white blood cells. The condition begins nonspecifically with malaise and fever. As it progresses, mucosal ulcers, skin necrosis, and localized lymphomas (tumors of the lymphatic tissue) develop. Vasculitis leads to the death of areas of skin (necrosis) due to the blockage of small blood vessels.

Studies⁶ suggest that the metabolization of levamisole into aminorex in the body poses an additional risk. Aminorex, an amphetamine-like substance, had to be withdrawn from the market as an appetite suppressant because it can lead, among other things, to pulmonary hypertension (life-threatening high blood pressure in the lungs). This risk accumulates with repeated use of levamisole. Pulmonary hypertension does not develop acutely during use but may, under certain circumstances, manifest only after several months as progressively reduced physical performance, circulatory disorders, and fatigue. Symptoms such as chills, infections of the respiratory tract, anal region, throat, etc., may be associated with the use of levamisole. These symptoms must be treated with antibiotics under medical supervision.

Two studies⁷ conducted by the University of Zurich have also shown that cognitive performance declines in people who regularly use cocaine laced with levamisole. The study examined attention, working and long-term memory, as well as higher-order planning functions. It was found that the cerebral cortex of the medial prefrontal cortex was significantly thinner in people who regularly consumed levamisole than in those who consumed cocaine cut with levamisole less frequently. The thinner cerebral cortex of the medial prefrontal cortex is associated with a decline in cognitive performance, as the medial prefrontal cortex is where human planning functions are located.

Levamisole is presumably used as a cutting agent due to its potency-enhancing and duration-prolonging effects.

In 2025, levamisole was detected in 4.3% of all cocaine samples (-3.8%); on average, the samples contained 6.9% levamisole (-1.9%). 72 of 74 samples containing levamisole had a levamisole content of less than 20%. The highest levamisole content was 48.5%.

1.3.3 Caffeine

Caffeine is a stimulant that accelerates the heart rate, temporarily boosts mental performance, and suppresses appetite. In higher doses, starting at 300 mg (approx. 8 cups of coffee), caffeine also induces euphoria. At high doses, the following side effects are

⁶ <https://pubmed.ncbi.nlm.nih.gov/21531521/>

⁷ [Cocaine adulterants are suspected of causing brain damage | UZH News | UZH](#)

possible: sweating, heart palpitations, frequent urination, arrhythmia, perceptual disturbances, tremors, nervousness, and sleep disturbances. With prolonged, regular consumption, there is a risk of dependence which can manifest as physical symptoms.

Caffeine is used as a cutting agent due to its stimulating effect and its potential to enhance the drug's effects.

In 2025, caffeine was detected in 3.2% of all cocaine samples (-8.5%); on average, these samples contained 12.4% caffeine (+3.1%). Eight out of ten samples containing caffeine had a caffeine content of less than 20%. The highest caffeine content was 99.9%.

1.3.4 Phenacetin

Phenacetin is an aminophenol derivative and was used as a medication for pain relief and fever reduction. Because phenacetin can cause kidney damage with frequent, high-dose use ("phenacetin kidney⁸ ") and increases the risk of ureteral and bladder cancer, it has not been used for medical purposes in Europe for about 40 years.

In high doses, phenacetin can induce excitement and euphoria as well as mild drowsiness and impaired perception, which is presumably why it is used as a cutting agent.

In 2025, phenacetin was detected in 1.8% of cocaine samples (-3.3%); on average, the samples contained 15.8% phenacetin (-2.8%). Seven out of ten samples containing phenacetin had a phenacetin content of less than 20%. The highest phenacetin content was 61.5% (-4.8%).

1.3.5 Other pharmacologically active substances analyzed

In addition to the most common unexpected substances described above, benzoylecgonine⁹ e (11 samples), amphetamine (8 samples), ketamine (8 samples), paracetamol (8 samples), MDMA (5 samples), and benzoic acid (2 samples) were analyzed as additional pharmacologically active substances in individual cocaine samples. The following substances were detected in one sample each: 2-MMC, bupropion, cocaethylene, heroin, hydroxyzine, methylphenidate, and a synthetic impurity.

⁸ <https://pubmed.ncbi.nlm.nih.gov/2651928/>

⁹ Benzoylecgonine is the main metabolite (breakdown product) of cocaine and is produced in the human body through the breakdown of cocaine in the liver. In the human body, benzoylecgonine is excreted in the urine, which is why urine tests screen for benzoylecgonine. Benzoylecgonine may already be present in cocaine samples prior to consumption, which may indicate improper storage, aging, or moisture exposure. The substance itself has, if any, a significantly lower psychoactive effect than cocaine.

2 Conclusion

- The average cocaine content of samples handed in at the DIZ in 2025 reached a record high of 87.3%. This continues a long-standing trend (following a slight decline in 2024). This trend is observable across Europe and is attributable to record-high cultivation volumes in the countries of origin for cocaine.¹⁰
- Accordingly, the number of samples containing an unexpected pharmacologically active substance (“cutter”) reached a record low in 2025. While every second sample still contained unexpected substances in 2016, by 2025 these were found in only one in seven samples.
- As in the previous year, procaine was the most common unexpected pharmacologically active substance in cocaine samples in 2025. However, its proportion declined significantly: the percentage is now only one-third of the 2024 figure.
- Cocaine is a substance with a high potential for harm and addiction. The trend toward cocaine containing fewer adulterants should under no circumstances lead to the conclusion that its use is safe.
- If users do not know the active ingredient content of the cocaine they have purchased, they can hardly reduce the risks associated with its use. Therefore, it is recommended to use drug checking whenever possible.

¹⁰ [World Drug Report 2025 - Key findings](#)