Stadt Zürich
Soziale Einrichtungen
und Betriebe

Cocaine

Drug Checking at the Drug Information Center Zurich 2022

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1 Introduction

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

In 2022, a total of 976 samples declared as cocaine was handed in for analysis at the Drug Information Center (DIZ) Zurich and the mobile drug checkings. 872 of these samples were handed in during the stationary drug checking and 104 during the eleven mobile drug checkings. The results published here are not representative of the entire substance market in the city of Zurich.

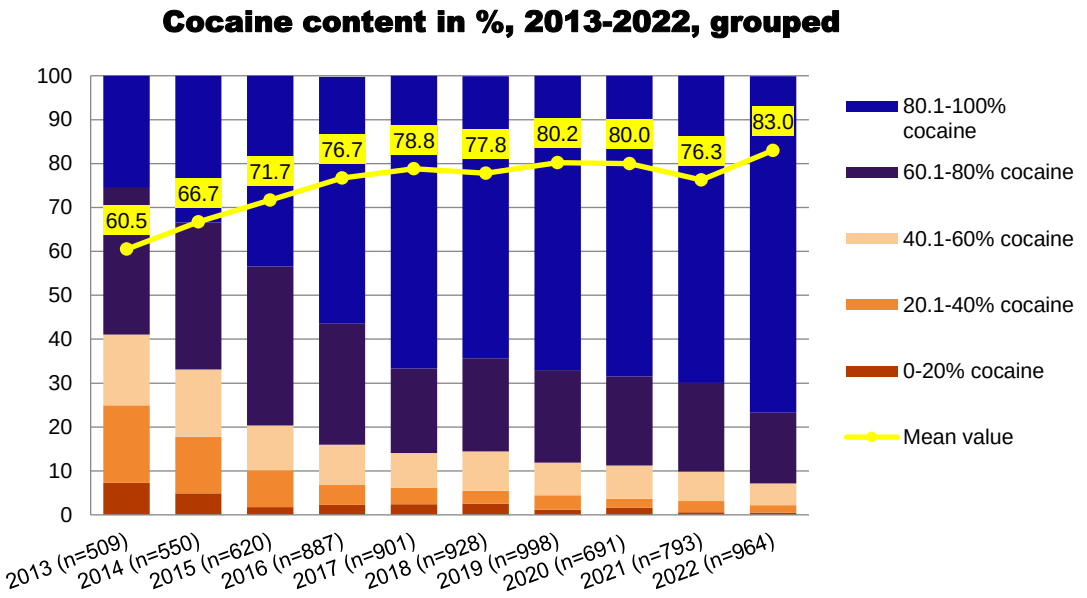
1.1 Risk assessment

In addition to the known side effects and the high psychological dependence potential of cocaine, the frequent occurrence of pharmacologically active extender substances poses an additional health risk that is difficult to assess, especially for regular users. In addition to the pharmacologically active extenders, the high cocaine content is an often underestimated consumption risk. The higher the cocaine content, the greater the risk of overdose. High-dose cocaine can place a heavy burden on the cardiovascular system and, in extreme cases, trigger a heart attack or stroke. Information and recommendations for low-risk use can be found at saferparty.ch under Cocaine Safer Use.

1.2 Cocaine content

In 2022, the average cocaine content of the samples analyzed at the DIZ and during mobile drug checkings was 83.0 % cocaine*HCl[1] . Compared to the previous year, there was an increase of 6.7 %[2] in the average active substance content. The cocaine content of the samples analyzed varied widely, ranging from 14.1 % to 100 %.

[1] Cocaine is classically present in powder form as a salt (usually hydrochloride).
[2] The differences compared with the previous year are shown in brackets below.

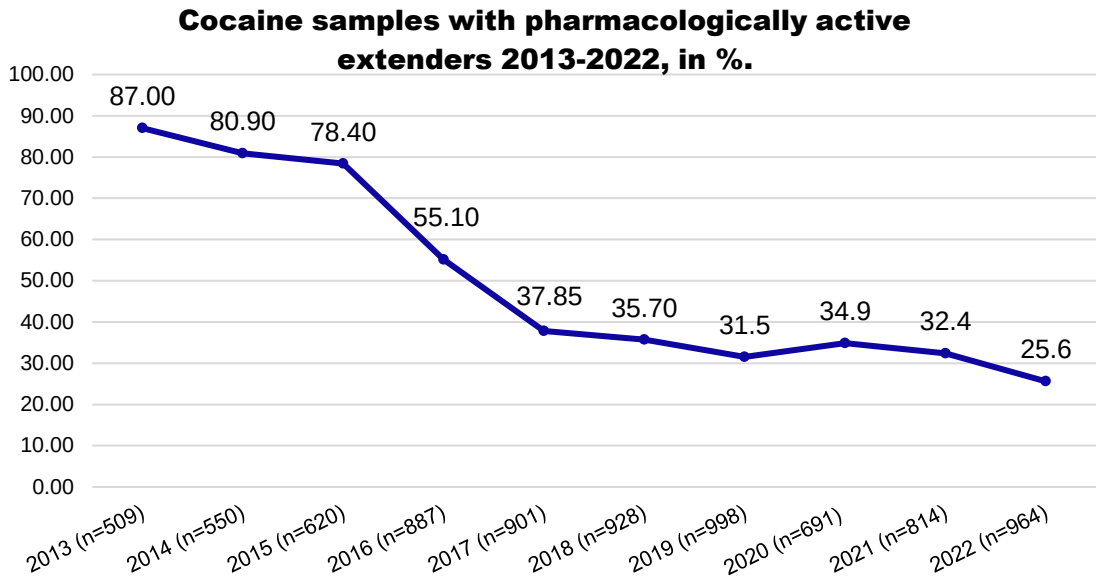


Graphic 1: Cocaine content in %, 2013-2022, grouped

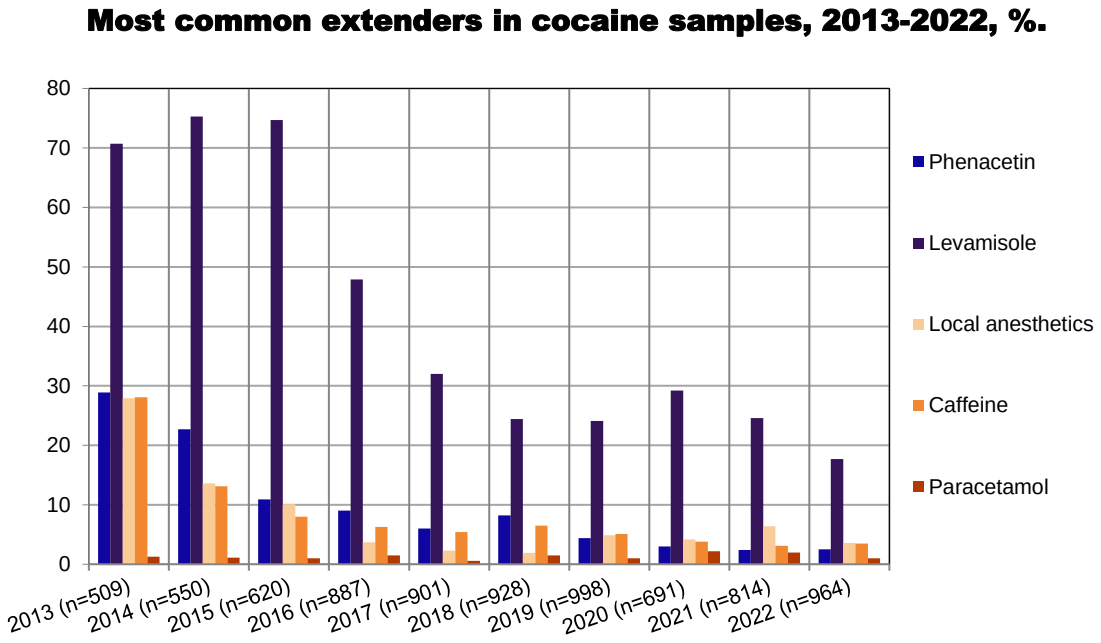
1.3 Unexpected pharmacologically active substances

The cocaine analyzed at the DIZ is often a mixture of cocaine and one or more extenders. Some of these extenders are not pharmacologically active (e.g., lactose, starch, cellulose) and have no additional health effects. However, the extenders are often chosen to simulate a higher cocaine content and to cause an effect enhancement and/or prolongation.

In 2022, 25.6% (-6.8%) of all cocaine samples submitted for analysis at the DIZ and the mobile drug checking facilities contained at least one pharmacologically active substance. This is a significant decrease of extenders in cocaine samples. Levamisole was again the most frequently added substance (in 17.7% of the samples). Other extenders were local anesthetics, found in 3.6% of all samples, caffeine in 3.5%, phenacetin in 2.5% and paracetamol in 1.0% of the samples submitted.



Graph 2: Cocaine samples with pharmacologically active extenders 2013-2022, in %.



Graph 3: Most common extenders in cocaine samples, 2013-2022, in %.

The following sections describe the extenders detected in cocaine samples in 2022.

1.3.1 Levamisole

Levamisole is nowadays used in veterinary medicine against worm infestation. It was originally used in humans as an agent against threadworms (anthelmintic) but has not been used in human medicine since 2004 due to adverse drug reactions. Common acute side effects include vomiting and diarrhea. Digestion may still be disturbed the following day. In addition, allergic reactions (shortness of breath, skin rashes, swelling of the lips, tongue or face), nervous system disorders (numbness up to unconsciousness, severe fatigue) and speech problems may occur.

The most dangerous side effects of levamisole are aplastic anemia, agranulocytosis, and vasculitis. Aplastic anemia results in a greatly reduced defense against serious infections (immunodeficiency) due to a deficiency of white blood cells. Agranulocytosis is a severe reduction in granulocytes, a subgroup of white blood cells. The disease begins nonspecifically with a disturbance of the general condition and fever. Later, mucosal ulcers, skin necrosis, and localized lymphoma (tumors of the lymphatic tissue) appear. Vasculitis leads to death of skin areas (necrosis) due to the occlusion of small blood vessels.

Studies[3] suggest that there is an additional danger from the breakdown of levamisole to aminorex (amphetamine-like substance) in the human body. Aminorex had to be withdrawn from the market as an appetite suppressant because it leads to pulmonary hypertension (= life-threatening pulmonary hypertension). This risk accumulates with repeated use of Aminorex. Pulmonary hypertension does not occur acutely during use, but may only manifest itself after several months in the form of increasingly impaired physical performance, circulatory disorders and fatigue. Symptoms such as chills, infections in the respiratory tract, anal region, throat, etc. may be associated with the use of levamisole. These must be accompanied by a doctor and treated with antibiotics.

Two studies[4] from the University of Zurich have also shown that cognitive performance decreases in people who have regularly used cocaine with levamisole. The areas examined were attention, working memory, long-term memory and higher planning functions. It was found that the cortex of the middle frontal brain was thinner in people who used levamisole regularly than in people who used less levamisole. This has a connection with the decrease in cognitive performance since the planning function of humans is embedded in the middle frontal brain.

Levamisole is probably used as an extender due to its effect enhancing and effect prolonging effect.

[3] https://pubmed.ncbi.nlm.nih.gov/21531521/
[4] https://www.media.uzh.ch/de/medienmitteilungen/2018/Kokain.html

In 2022, levamisole was analyzed in 17.7 % of the cocaine samples (-6.9 % compared to the previous year); on average, 13.3 % levamisole (+1.4 %) was contained in the samples. The highest levamisole content was 80.5 %.

1.3.2 Local anesthetics

Local anesthetics are locally anesthetizing drugs. In 2022, **procaine** (31 samples) and **lidocaine** (4 samples) were detected in cocaine samples. In addition to side effects in the central nervous system (e.g., agitation, seizures, coma), cardiac arrhythmias, hypotension, and allergic reactions may occur from the use of local anesthetics. Intravenous consumption of cocaine mixed with local anesthetics is particularly dangerous. This can lead to paralysis of the central nervous system and to delay or blockade of the cardiac excitation conduction system between the atria and the ventricles. Severe forms of this so-called AV block lead to a heartbeat that is too slow (bradycardia, bradyarrhythmia). In extreme cases, the ventricles can come to a complete standstill, which is life-threatening without medical treatment. Local anesthetics are used as an extender due to their anesthetic effect. Consumers falsely conclude from the tongue and gum test for "quality control" that it is particularly pure cocaine.

In 2022, local anesthetics were analyzed in 3.6 % of the cocaine samples (-2.8 %). (-2.8 %); on average, 9.5 % local anesthetics (-3.5 %) were contained in the samples. The highest content was 31.4 %.

1.3.3 Caffeine

Caffeine makes you awake, accelerates the heartbeat, temporarily increases mental performance and has an appetite-suppressing effect. In higher doses, from 300 mg (about 8 cups of coffee), caffeine also produces euphoria. At high doses, the following side effects are possible: sweating, heart fluttering, urinary urgency, cardiac arrhythmia, perceptual disturbances, tremors, nervousness, and sleep disturbances. With permanent, regular consumption, there is a risk of dependence with physical symptoms.

Caffeine is used as an extender because of its stimulant effect and effect-enhancing potential.

In 2022, caffeine was analyzed in 3.5 % of the cocaine samples (-0.4 %); on average, 14.5 % caffeine (+3.0 %) was contained in the samples. The highest caffeine content was 77.8 %.

1.3.4 Phenacetin

Phenacetin is an aminophenol derivative and has been used as a drug to treat pain and reduce fever. Since phenacetin is harmful to the kidneys ("phenacetin kidney") when consumed frequently in high doses, as well as increasing the risk of ureteral and bladder cancer, it has not been used medicinally in Europe since 1986.

Phenacetin in high doses can cause excitement and euphoria, as well as mild dazed and dulled cognition, which is probably why it is used as an extender.

In 2022, phenacetin was analyzed in 2.5 % of the cocaine samples (+0.1 %); on average, 11.6 % phenacetin (-2.1 %) was contained in the samples. The highest phenacetin content was 37.5 %.

1.3.5 Paracetamol

Paracetamol is an analgesic and antipyretic drug from the group of non-opioid analgesics. Paracetamol does not cause any psychoactive effect even in high doses. An influence on the effect of cocaine can also be ruled out.

Why paracetamol is added to cocaine cannot be said with certainty.

In 2022, paracetamol was analyzed in 1.0 % of the cocaine samples (-1.0 %); on average, 13.2 % paracetamol (-3.3 %) was contained in the samples. The highest paracetamol content was 39.5 %.

1.3.6 Other pharmacologically active substances analyzed

In addition to the most common extenders described above, ketamine (3 samples), amphetamine (2 samples), hydroxyzine (2 samples), ephedrine (1 sample) and propyphenazone (1 sample) were analyzed as further pharmacologically active substances in individual cocaine samples. In the case of amphetamine and ketamine, itcan be assumed that there was mix-up during sale or unintentional contamination (smear contamination in the Minigrip).

2 Conclusion

- The trend towards ever higher average active ingredient levels in cocaine is continuing. This development can be observed throughout Europe and is mainly related to the bumper crops in the growing countries.
- A high cocaine content means a greater risk of overdose, especially if this value is not known.
- The amount of active ingredient in the analyzed samples varies relatively widely, making it extremely difficult to dose cocaine at lower risk without drug checking.
- Cocaine is a substance with a comparatively high potential for harm and dependence. The fact that a sample does not contain any extenders should in no way be taken to mean that its use is harmless.
- Despite the high average active ingredient content, around every 4th cocaine sample in 2022 contained a pharmacologically active extender. This represents an additional health risk.
- There are numerous myths circulating in the scene and among experts about cocaine extenders (e.g. "rat poison"). The extenders detected in the DIZ in recent years have been constant and corresponding fears cannot be confirmed. Extenders are not used to cause additional harm to users. They are used to optimize profits. The criteria for the use of extenders are accordingly low purchase price, availability, similar chemical properties (melting point), similar appearance and effect enhancement (to pretend better quality).

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