Stadt Zürich
Soziale Einrichtungen
und Betriebe

MDMA

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

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1 Introduction

MDMA (3,4-methylenedioxymethamphetamine) is a synthetic amphetamine derivative and belongs to the group of entactogenic[1] and empathogenic[2] stimulants. MDMA is sold and consumed either in pill or in crystalline form or as a powder. In 2025, the Zurich Drug Information Center (DIZ) analyzed a total of 690 samples declared as MDMA.

The 2025 MDMA evaluation is divided into two parts: The first part focuses on MDMA pills, and the second part on crystalline/powdered MDMA.

The results published here are not representative of the overall market situation regarding substances in the city of Zurich.

2 MDMA Pills

In 2025, 322 pills declared as MDMA were submitted for analysis at the DIZ and during mobile drug checkings. 262 were tested as part of stationary drug checking at the DIZ, and 60 were tested during the nine mobile drug checking events conducted in the city of Zurich in 2025.

2.1 Risk Assessment

In addition to the risks associated with MDMA, there is a risk of taking unexpected active ingredients, pharmacologically active extenders, synthetic by-products and/or a high dosage pills when consuming MDMA pills. Even MDMA pills with the same logo or appearance can vary greatly in their composition. Since 2015, an increasing number of high-dose (>120 mg MDMA*HCl[3]) and extremely high-dose (>200 mg MDMA) pills have been analyzed. From a pharmacological perspective, doses exceeding 1.5 mg of MDMA per kg of body weight for men and 1.3 mg per kg of body weight for women are considered excessive. At higher doses, side effects such as teeth grinding, hallucinations, eye and nerve twitching, and even seizures may occur more frequently. In addition, MDMA has an increasingly negative effect on nerve cells. High doses of MDMA also pose a greater risk of overheating, lead to dehydration, place a heavy strain on the

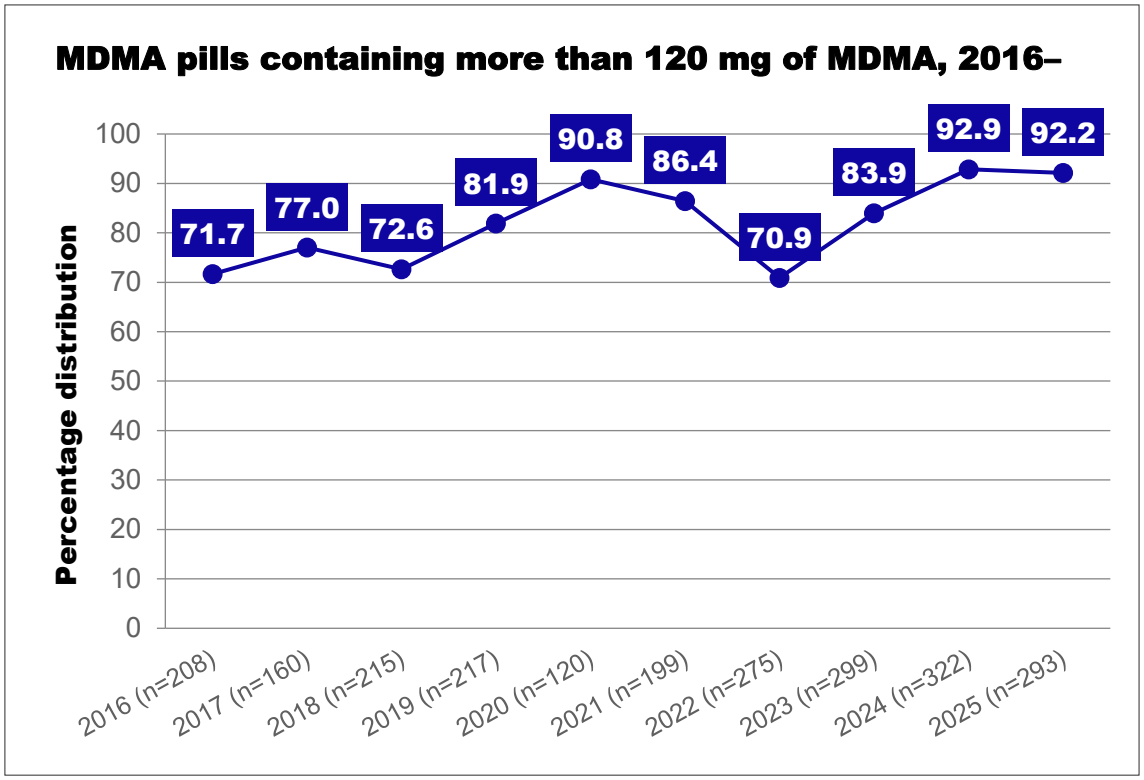
[1] Touching the soul, intensifying emotional perception
[2] Triggering a sense of closeness and connection to other people
[3] MDMA is found exclusively in salt form (classically as hydrochloride). HCl is the chemical abbreviation for hydrochloride. For simplicity, MDMA is used synonymously with MDMA HCl in this document.

cardiovascular system, and result in more severe and prolonged adverse aftereffects (hangover). Taking very high doses of MDMA leads to a high concentration of serotonin in the brain. This increases the risk of life-threatening complications such as serotonin syndrome. With more than 200 mg of MDMA in a single pill, even taking half can lead to an overdose.

Information and recommendations for the safest possible use can be found on the saferparty.ch website under MDMA / Safer Use.

2.2 MDMA Content

On average, the MDMA pills analyzed by the DIZ in 2025 contained 173.7 mg of MDMA (n=293)[4] . This is an average of 3.0 mg less MDMA than in the previous year[5] . In general, the tested pills have a high MDMA content. For 92.2%[6] (-0.7% compared to the previous year) of the analyzed MDMA pills, a warning was issued due to a high MDMA content (>120 mg MDMA). 22.9% (-3.8%) of the pills were extremely high-dosed (more than 200 mg).



Graph1 : MDMA pills containing more than 120 mg of MDMA, 2016–2025

[4] When calculating the average MDMA content in MDMA pills, only whole MDMA pills that actually contained the active ingredient MDMA were included. This amounted to 293 samples. In 29 samples, either only parts of the pill were submitted for analysis, or the pill contained other active ingredients or none at all instead of MDMA.
[5] The differences in percentage points compared to the previous year are indicated in parentheses below.
[6] Only whole pills that actually contained MDMA were included in the calculation.

Figure 2 shows the trend in MDMA content in MDMA pills over the past ten years. It is evident that the MDMA content in pills varies significantly. In 2025, the range was from 52.0 mg to 394.5 mg of MDMA per pill.

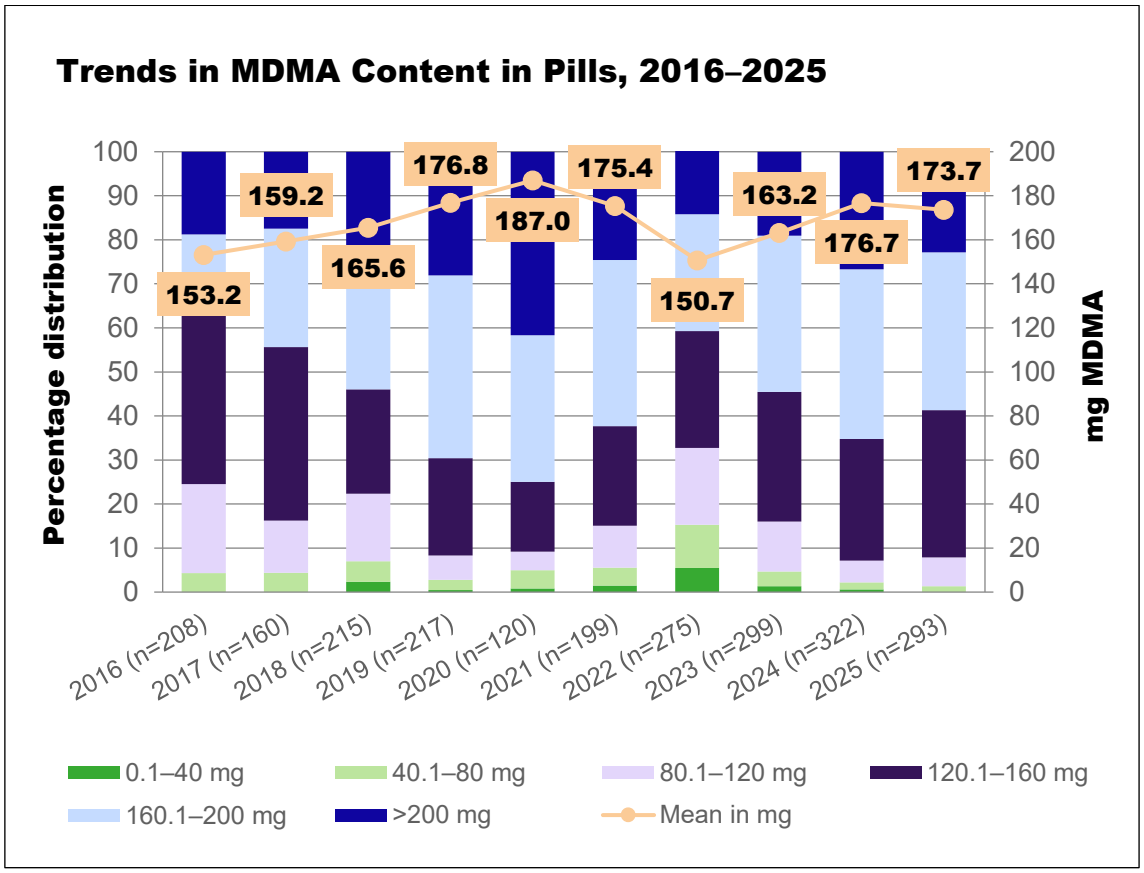
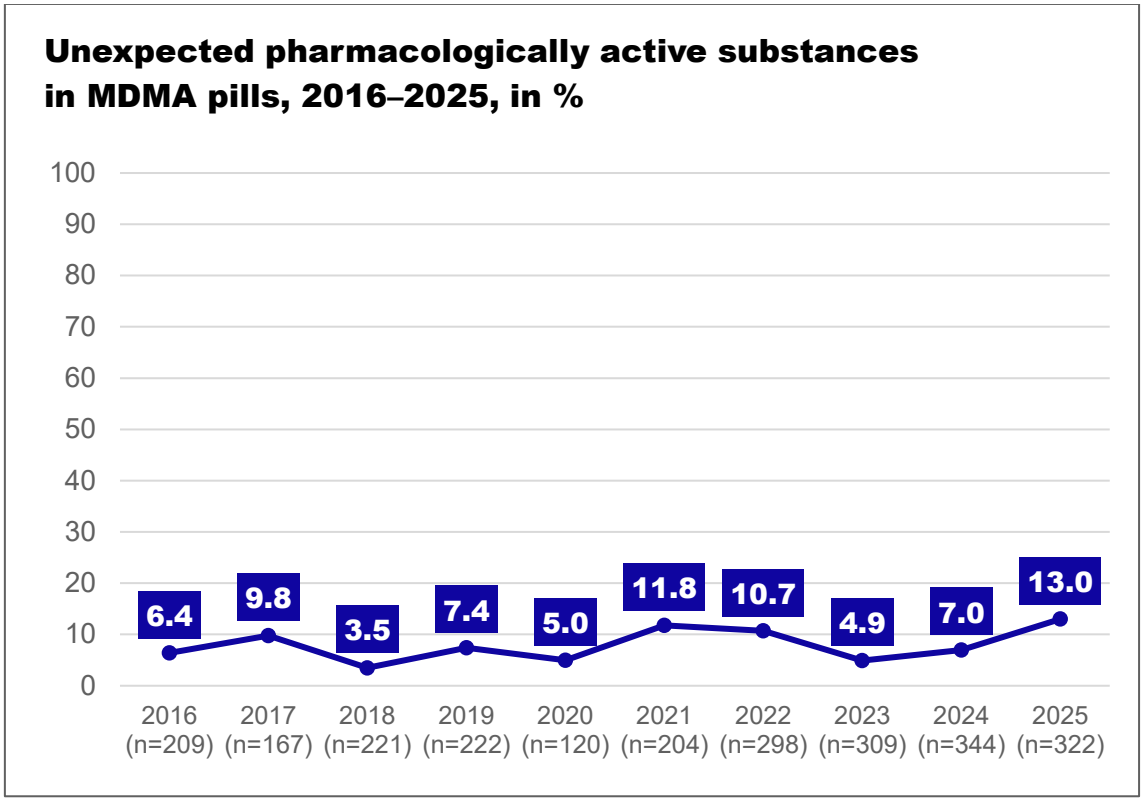


Figure2 : Trends in MDMA content in MDMA pills in milligrams, 2015–2025, grouped

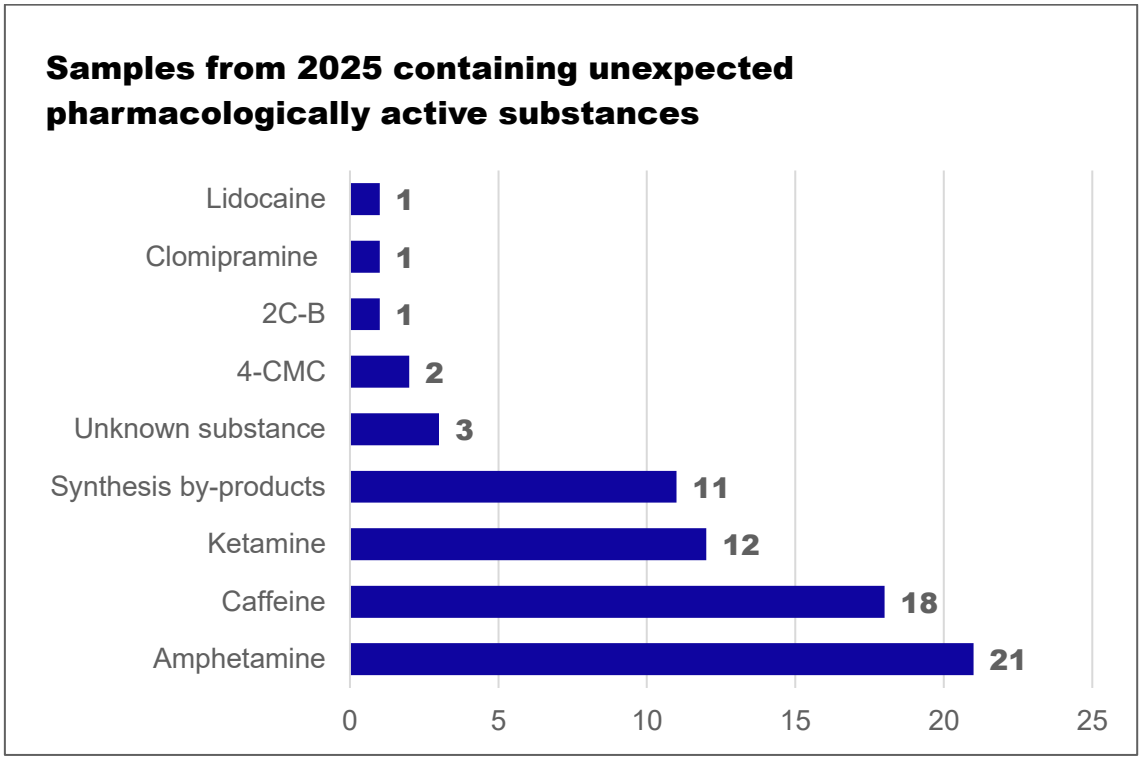
2.3 Unexpected pharmacologically active substances

In 2025, 84.5% of the pills declared as MDMA contained no other pharmacologically active substances besides MDMA (n=322). 42 samples, or 13.0% (+6.0%) of the analyzed MDMA pills, contained at least one unexpected pharmacologically active substance in addition to or in place of MDMA. These include mislabeled products, pharmacologically active cutting agents, and/or synthetic byproducts. These are described below. In addition to pharmacologically active substances, MDMA pills always contain pharmacologically inactive additives (e.g., lactose, sorbitol, etc.) and tableting agents (e.g., starch), which have no additional psychological and/or physical effects when consumed.[7] 8 samples, or 2.5% of the analyzed MDMA pills, contained no pharmacologically active substance.

[7] Some of these pharmacologically inactive additives can trigger allergic reactions in certain individuals (such as redness or stomach discomfort, e.g., due to lactose intolerance).



Graph3 : MDMA pills containing unexpected pharmacologically active substances, 2015–2025, as a percentage of samples[8]



[8] The difference in the number of samples between Figures 2 and 3 is due to the fact that in Figure 2, MDMA pills declared as MDMA but containing no MDMA (e.g., misdeclarations) were not included in the analysis. In Figure 3, all pills declared as MDMA were included in the analysis.

Figure4 : Overview of unexpected pharmacologically active substances in MDMA pills, 2025

2.3.1 Amphetamine

Amphetamine is a synthetically produced stimulant classified within the phenethylamine group of substances. The release of the body's own neurotransmitters norepinephrine (noradrenaline) and dopamine triggered by amphetamine use can produce a feeling of increased performance, a boost in self-esteem, an elevation in body temperature, the suppression of fatigue, hunger and thirst, an increased willingness to take risks, and a reduced sensitivity to pain, and can lead to euphoria and an increased urge to talk.

Amphetamine is likely added to MDMA pills because of its stimulating effects.

In 2025, amphetamine was detected in 21 pills declared as MDMA (6.5%) (+4.5%).

2.3.2 Caffeine

Caffeine keeps you awake, accelerates the heart rate, and temporarily boosts mental performance. In higher doses (300 mg or more / approx. 8 cups of coffee), it also induces euphoria. At high doses, side effects such as sweating, heart palpitations, frequent urination, arrhythmia, perceptual disturbances, tremors, nervousness, and sleep disturbances are possible. Caffeine also stimulates circulation and suppresses appetite.

Caffeine is likely added to MDMA pills because of its stimulating effect.

In 2025, caffeine was detected in 18 pills labeled as MDMA (5.6%) (+3.3%).

2.3.3 Ketamine

The effects of ketamine as a psychoactive substance are dose-dependent: at lower doses, it acts, similar to alcohol, as a disinhibitor and relaxant. Higher doses can induce trance-like states, ranging up to out-of-body or near-death experiences ("K-hole"). This can lead to a fragmentary dissolution of the environment and bodily sensations; thoughts may break off, and feelings of weightlessness or floating may arise. Sensory perceptions and the sense of space and time change.

Very high doses can lead to detachment from one's own body and/or ego dissolution or merging with the environment. After the trip, a feeling of drowsiness sets in, and recall of the experience is often only partial.

Ketamine puts a strain on the cardiovascular system and it can cause addiction with psychological symptoms. Chronic use damages the liver, bladder, and kidneys and can lead to depressive moods and anxiety.

In 2025, ketamine was detected in 12 pills declared as MDMA (3.7%) (+3.4%).

2.3.4 Synthesis by-products

Synthesis by-products indicate improper manufacturing, which is primarily related to the fact that the substance is produced in illegal laboratories with widely varying quality standards and levels of expertise. There is generally no reliable information available regarding the risks, side effects, long-term consequences, and interactions of these synthetic by-products. Information on psychoactivity, toxicity, side effects, and long-term

consequences is scarce. Consumption of pills or substances contaminated with synthetic by-products is not recommended.

In 2025, synthetic by-products were detected in 11 pills declared as MDMA (3.4%) (-0.4%).

2.3.5 4-CMC

Clephedron (4-CMC, 4-chloromethcathinone) is a synthetic cathinone derivative structurally related to mephedrone (4-MMC) and is classified as a New Psychoactive Substance (NPS). 4-CMC is described as a potent performance enhancer and euphoric agent and exhibits empathogenic properties. There is very little reliable information available on the risks, toxicity, side effects, and long-term consequences of 4-CMC. Chemically, 4-CMC resembles the potent neurotoxin 4-chloromethamphetamine, and there are initial indications of cytotoxicity (cell damage) associated with 4-CMC. Accordingly, its use is not recommended. Some users report severe headaches, as well as kidney or liver pain in the days following use. Additionally, it is reported that the substance can trigger a strong urge to re- dose, which increases the risk of overdose and the potential for addiction.

4-CMC is likely added to MDMA pills due to its similar spectrum of effects, its legal status in certain countries, and its low production and acquisition costs.

In 2025, 4-CMC was detected in 2 pills labeled as MDMA (0.6%) (± 0.0%).

2.3.6 Unknown Substances

In 2025, unknown substances were analyzed in 3 pills declared as MDMA (0.9%). No statements can be made regarding effects and risks. Consumption is generally not recommended.

2.3.7 Mislabeling

In addition, a single sample each containing clomipramine, lidocaine, and 2C-B were detected. These three samples, as well as one sample containing an unknown substance, are mislabeled; these pills did not contain MDMA. All other unexpected pharmacologically active substances are ingredients detected in pills in addition to MDMA.

3 Crystalline / powdered MDMA

MDMA is always traded in salt form (mostly as hydrochloride) and is therefore always crystalline as a solid, regardless of whether it is pressed into pills or traded as crystals or powder. This section discusses crystalline or powdered MDMA. In the context of MDMA, the term “crystalline” refers to coarse-grained material (crystals that are still visible to the naked eye, ranging in size from several millimeters to even centimeters). “Powder” refers to crystalline MDMA that has been finely ground. In 2025, 367 crystalline MDMA samples[9] were submitted for analysis at the Drug Information Center (DIZ) in Zurich and during mobile drug checkings. 308 were tested at the stationary drug-checking services in Zurich, and an additional 59 crystalline MDMA samples were analyzed during the nine mobile drug checkings.

The results published here are not representative of the overall market situation regarding substances in the city of Zurich.

3.1 Risk Assessment

The risk assessment is analogous to the MDMA pills in chapter 2.1.

[9] For the sake of clarity, only the term “crystalline MDMA” is used below. This always includes powdered MDMA as well.

3.2 MDMA content

In 2024, the crystalline MDMA samples analyzed by the DIZ contained an average of 88.7% (+0.3% compared to the previous year)[10] MDMA*HCl. The MDMA content ranged from 0.8% to 100% MDMA (n=342)[11] . The average MDMA content in crystalline MDMA has remained fairly constant over the years.

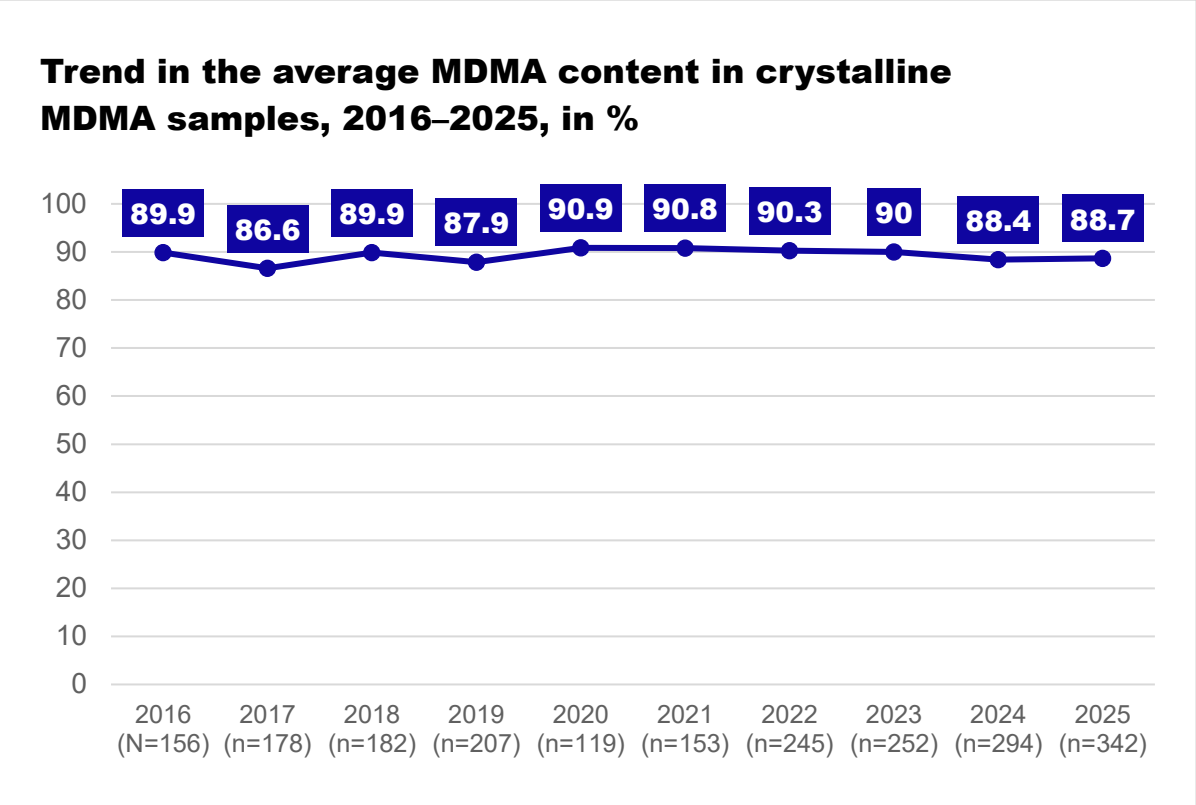


Figure5 : Trend in the average MDMA content in crystalline MDMA samples, 2015–2025, in %

[10] The differences compared to the previous year are indicated in parentheses below.

[11] For the average MDMA content in crystalline MDMA samples, only crystalline MDMA samples that actually contained the active ingredient MDMA were included. There were 342 such samples. Twenty-five samples contained other active ingredients or none at all (misdeclarations) or, due to the small sample size at the time of submission, were analyzed by the laboratory only qualitatively (i.e., without a quantitative result).

3.3 Unexpected pharmacologically active substances

In 2025, 88.6% of crystalline samples declared as MDMA contained no other pharmacologically active substances besides MDMA. 10.1% (+1.3%) of crystalline samples declared as MDMA contained unexpected pharmacologically active substances instead of or in addition to MDMA. 1.4% of crystalline MDMA samples declared as MDMA contained no pharmacologically active substances.

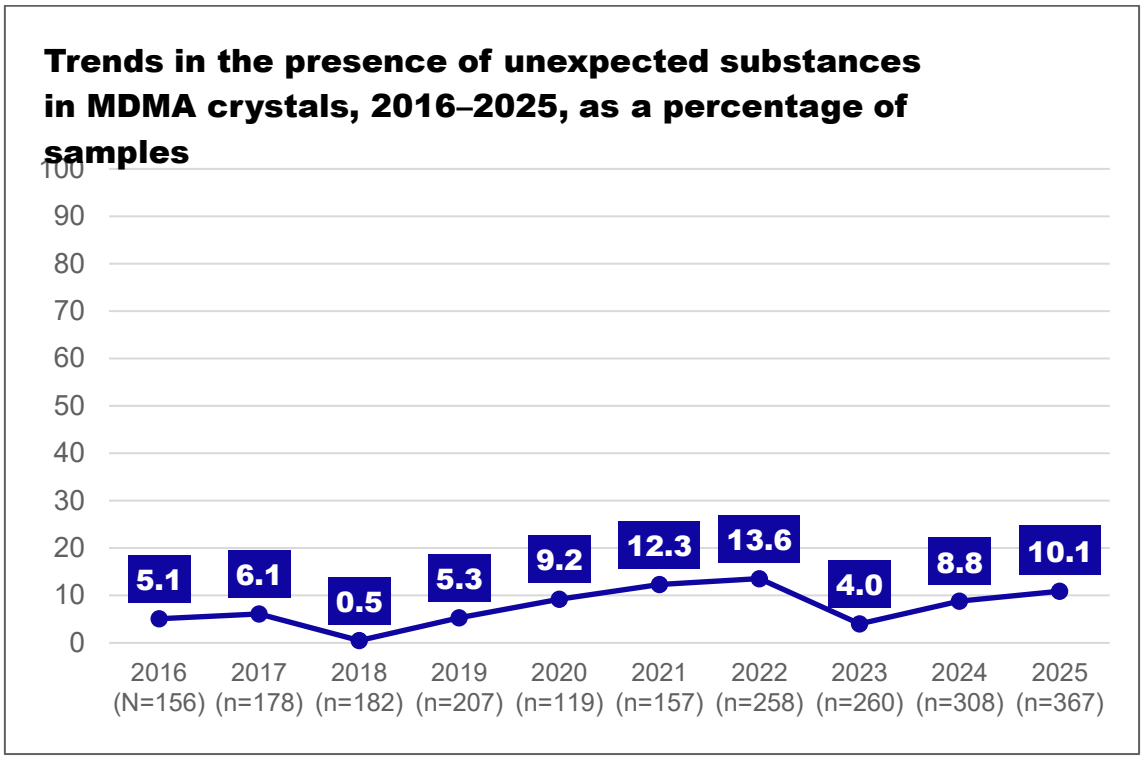


Figure6 : MDMA crystals containing unexpected pharmacologically active substances, 2016–2025, as a percentage of samples

The following pharmacologically active substances were detected in crystalline MDMA samples in 2025:

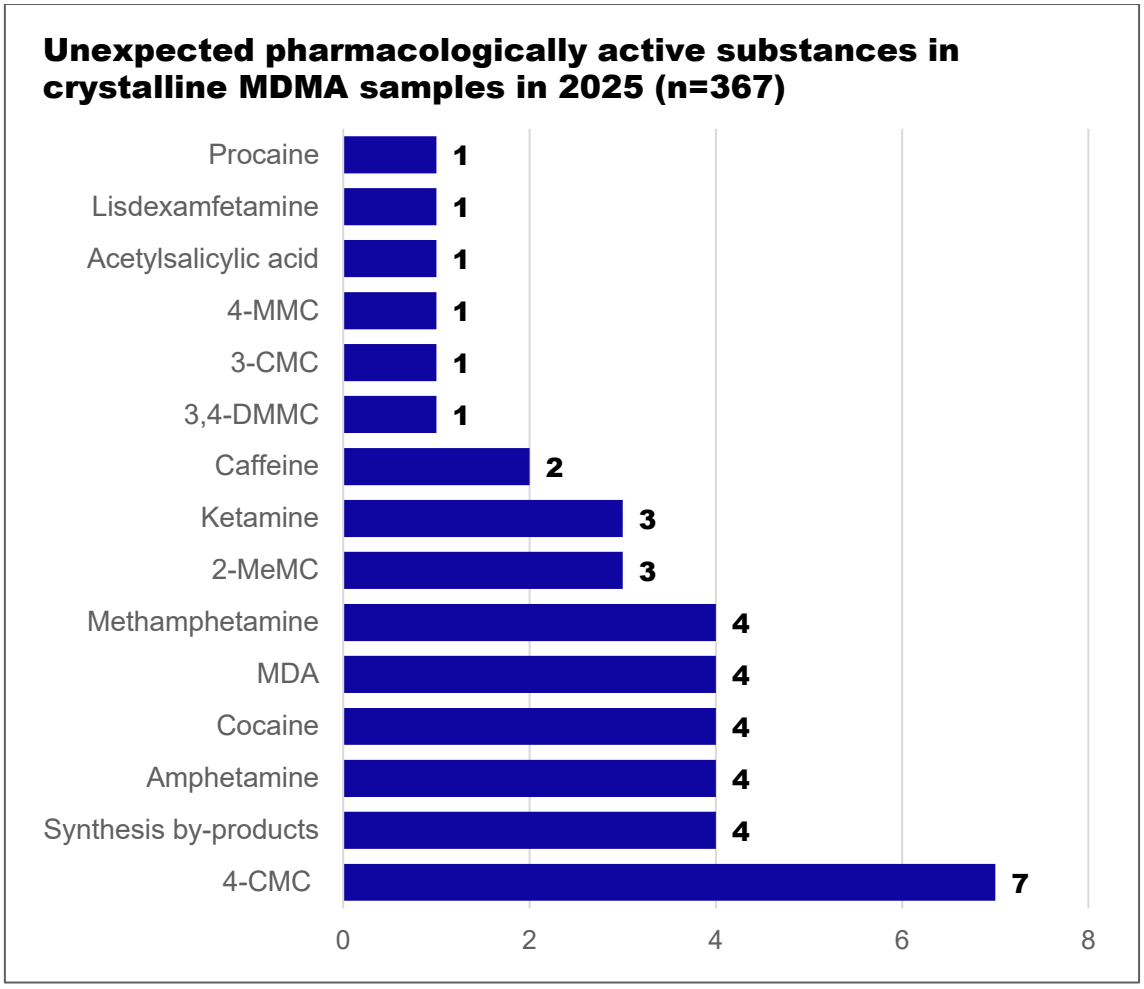


Figure7 : Unexpected pharmacologically active substances in crystalline MDMA samples in 2025

3.3.1 4-CMC

4-CMC (4-chloromethcathinone) belongs to the group of synthetic cathinones. Synthetic cathinones have gained popularity in recent years. The term refers to many different substances. Certain cathinones have been known for a long time. In recent years, however, an increase in new cathinone compounds has been observed on the illicit market. Cathinones generally have a stimulating and energizing effect, but there are differences in potency (dosage) and health risks.

In the DIZ's drug checking, 4-CMC primarily appears as a mislabeled substance in 4-MMC (mephedrone) samples. 4-MMC is a popular cathinone, but it often contains other substances, such as 4-CMC. The chemical structure of 4-CMC is similar 4-MMC. There is very little information available on the risks, side effects, and long-term consequences of 4-CMC. It is assumed that 4-CMC has a very high neurotoxic effect.

In 2025, 4-CMC was detected in 7 crystalline MDMA samples (1.9%) (+1.6%). Six of the seven samples were mislabeled, meaning they contained no MDMA at all.

3.3.2 Synthesis by-products

Synthesis by-products indicate improper manufacturing, which is primarily due to the fact that the substance is produced in illegal laboratories with highly varying quality standards and levels of expertise. No reliable information is available regarding the risks, side effects, and long-term consequences of these synthesis by-products. The potential for interactions between synthesis impurities and MDMA is entirely unknown. Information regarding psychoactivity, toxicity, side effects, and long-term consequences is scarce. Consumption of substances contaminated with synthesis by-products is not recommended.

In 2025, synthetic by-products were analyzed in 4 crystalline MDMA samples (1.1%) (-3.8%). In 3 of the 4 samples, these were detected in addition to MDMA.

3.3.3 Amphetamine

Amphetamine is a synthetically produced stimulant classified within the phenethylamine group of substances. The release of the body's own neurotransmitters, norepinephrine (noradrenaline) and dopamine, triggered by amphetamine use can produce a feeling of increased performance, a boost in self-esteem, an elevation in body temperature, the suppression of fatigue, hunger, and thirst, an increased willingness to take risks, and a reduced sensitivity to pain, and can lead to euphoria and an increased urge to talk.

In 2025, amphetamine was detected in 4 crystalline MDMA samples (1.1%) (+0.8%). All 4 samples were mislabeled, meaning they did not contain any MDMA at all.

3.3.4 Cocaine

Cocaine (benzoylecgonine methyl ester) is derived from the leaves of the South American coca bush (Erythroxylum coca) and is classified as a stimulant. The increased release and additional inhibition of reuptake of the body's own neurotransmitters, dopamine and norepinephrine (noradrenaline), lead to the suppression of fatigue, hunger, and thirst, euphoria, feelings of increased performance, greatly heightened self-confidence, an urge to move, restlessness, talkativeness, the loss of inhibitions and fears, suppressed pain perception, and an increased willingness to take risks.

In 2025, cocaine was detected in 4 crystalline MDMA samples (1.1%) (+0.8%). In 3 of the 4 samples, this was a case of mislabeling—samples that contained no MDMA at all.

3.3.5 MDA

MDA (3,4-methylenedioxyamphetamine) is a synthetic amphetamine derivative. Its effects are similar to those of MDMA in certain respects, but it is described as harsher, stronger, and "colder" than MDMA. The entactogenic effect is significantly weaker, and a dose-dependent psychedelic effect is possible. The neurotoxic effects of MDA are not yet fully understood based on current knowledge. However, it is assumed that the damage to nerve cells is more pronounced than with MDMA. MDA is also suspected of being hepatotoxic (liver-damaging).

MDA is likely mixed into crystalline MDMA samples or sold under false pretenses as MDMA due to their similar spectrum of effects. Additionally, depending on the MDMA synthesis route, it may also be a by-product of synthesis.

In 2025, MDA was detected in 4 crystalline MDMA samples (1.1%) (+1.1%). MDA was detected in addition to MDMA in 2 samples. The other 2 samples were mislabeled, meaning they contained no MDMA at all.

3.3.6 Methamphetamine

Methamphetamine belongs to the phenylethylamine class of substances and has a strongly stimulating effect. Unlike MDMA, methamphetamine is less entactogenic (touching the inner self, heightened awareness of one's own emotions) and less empathogenic (promoting empathy).

Since methamphetamine is dosed at much lower levels than MDMA and has a significantly longer duration of action, confusion between these substances can quickly lead to a psychologically overwhelming and highly risky overdose with harmful side effects.

In 2025, methamphetamine was detected in 4 crystalline MDMA samples (1.1%) (+1.1%). Methamphetamine was found in addition to MDMA in 2 samples. The other 2 samples were mislabeled, meaning they contained no MDMA at all.

3.3.7 2-MMC

2-MMC belongs to the group of synthetic cathinones. This group of substances has been tested with increasing frequency in drug checkings in recent years. Cathinones generally have a stimulating and energizing effect.

2-MMC is often marketed as a substitute for 4-MMC (mephedrone) or 3-MMC. According to user reports, the effects of 2-MMC are compared to those of amphetamine. Unlike MDMA, the effects of 2-MMC are described as having little euphoric effect.

In 2025, 2-MMC was detected in 3 crystalline MDMA samples (0.8%) (+0.1%). All 3 samples were mislabeled, meaning they contained no MDMA at all.

3.3.8 Ketamine

The effects of ketamine as a psychoactive substance are dose-dependent: at lower doses, it acts, similar to alcohol, as a disinhibitor and relaxant. Higher doses can induce trance-like states, ranging up to out-of-body or near-death experiences ("K-hole"). This can lead to a fragmentary dissolution of the environment and bodily sensations; thoughts may break off, and feelings of weightlessness or floating may arise. Sensory perceptions and the sense of space and time change.

Very high doses can lead to detachment from one's own body and/or ego dissolution or merging with the environment. After the trip, a feeling of drowsiness sets in, and recall of the experience is often only partial.

Ketamine puts a strain on the cardiovascular system and it can cause addiction with psychological symptoms. Chronic use damages the liver, bladder, and kidneys and can lead to depressive moods and anxiety.

In 2025, ketamine was detected in 3 crystalline MDMA samples (0.8%) (+0.1%). Ketamine was found in all 3 samples in addition to MDMA.

3.3.9 Caffeine

Caffeine stimulates alertness, accelerates the heart rate, and temporarily enhances mental performance. In higher doses (300 mg or more / approx. 8 cups of coffee), it also induces euphoria. At high doses, side effects such as sweating, heart palpitations, frequent urination, cardiac arrhythmias, perceptual disturbances, tremors, nervousness, and sleep disturbances are possible. Caffeine also stimulates circulation and suppresses appetite. Caffeine is likely added for its stimulating effects.

In 2025, caffeine was analyzed in two crystalline MDMA samples (0.5%) (+0.2%). In both samples it was detected in addition to MDMA.

3.3.10 Other unexpected pharmacologically active substances

In addition to the substances described above, 3,4-DMMC, 3-CMC, 4-MMC, acetylsalicylic acid (aspirin), lisdexamfetamine, and procaine were each detected once in crystalline MDMA samples. All of these samples were mislabeled, meaning they did not contain MDMA.

4 Conclusion

General

– As in previous years, MDMA remains one of the most frequently tested substances.
– The number of samples containing unexpected pharmacologically active substances increased for both pills and crystalline samples. Compared to the past 10 years, the amount of unexpected pharmacologically active substances is relatively high for both pills and crystalline samples.

MDMA pills

– At 173.7 mg, the MDMA content in MDMA pills is very close to last year's levels and is in line with the average over the past 10 years.
– 92.2% of all tested pills are high-dosed (over 120 mg of MDMA per pill). Nearly one in four of all pills tested is extremely high-dosed (over 200 mg of MDMA per pill).
– 13% of all pills tested contained an unexpected psychoactive ingredient in addition to or instead of MDMA. This represents the highest level in the past 10 years. There were no new unexpected substances, but rather an increase in all unexpected substances already known from previous years. The most significant increases were observed for amphetamine, caffeine, and ketamine.
– In contrast to the crystalline samples, synthetic cathinones occurred only sporadically.

MDMA Crystals

– As in previous years, the average MDMA content remains high.
– One in ten samples contained unexpected pharmacologically active substances in addition to or in place of MDMA.
– The number of samples with synthetic impurities decreased.
– Synthetic cathinones are now the most frequently occurring unexpected substances. In most cases, these were mislabeled samples, i.e., samples that contained no MDMA at all. The synthetic cathinone 4-CMC is the most frequently occurring unexpected substance in crystalline MDMA samples.

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