PA GROUNDHOGS

PUBLIC HEALTH ALERT

ALERT: Potent Synthetic Cannabinoids Reemerge Four Years After China Ban

(PHILADELPHIA) – PAGROUNDHOGS, Pennsylvania's statewide drug checking program, is investigating a series of adverse drug events in Pennsylvania and New Jersey believed to be associated with high potency synthetic cannabinoids, generically known as K2. Not to be confused with emerging semi-synthetic cannabinoids like Delta-8 or Delta-10 THC **(at, left below)** which are sold legally in many states and are synthetized using hemp products), synthetic cannabinoids **(at right below)** are illegal powders or liquids that are sprinkled on mint or damiana leaves and sold on the black market.

Over the past month, first responders in Lancaster County, PA, and communities we monitor in New Jersey–including the state capital of Trenton–have simultaneously reported upticks in K2-related toxicity. The most recent overdose clusters started in March and have continued into April. On April 5, Lancaster Police arrested three people in the vicinity of the park after allegedly witnessing a drug sale. They confiscated four bags of suspected "K2" from a buyer, as well as the alleged dealer's stash.

Around the same time PAGROUNDHOGS began receiving reports of K2-related overdoses in Mercer County, NJ. Fieldworkers with our partner group there, The Kind Collective, have obtained at least two samples of K2 in Mercer County, NJ. These will be forwarded to the Center for Forensic Science, Research and Education (CFSRE) for analysis. According to a source with knowledge of the issue, first responders in New Jersey are experiencing an increase in K2-related calls in 2025 compared to the previous five years.

In some cases these adverse events were reported as opioid overdoses, and there has been speculation that the synthetic cannabinoids may be adulterated with fentanyl. **We believe this is unlikely, and it would mark a unique event in our testing of synthetic cannabinoids**. Instead, a review of our data suggests these adverse drug events, which have resulted in an unknown number of hospitalizations, are most likely the result of several high potency, 3rd & 4th-generation indazole-based synthetic cannabinoids that have reentered the drug supply after being largely eradicated from the US following China's sweeping ban on synthetic cannabinoids in 2021.

BACKGROUND

Third-generation synthetic cannabinoids were identified in 2013, and from 2012-2014 were blamed for more than 200 motor vehicle accidents and at least ten overdose fatalities in Japan.

In the US concurrent use of fentanyl and potent, full agonist synthetic cannabinoids was common in Philadelphia and elsewhere in the years following the widespread introduction of fentanyl. During field reporting in Kensington in 2018, some opioid consumers reported needing as little as one hit to potentiate and extend their fentanyl high (pictured left). That summer synthetic cannabinoids were responsible for sickening hundreds of opioid users in Philadelphia when several drug "sets" began using an especially potent compound known as 5F-ADB as a potentiating adulterant for fentanyl.

In 2021, under international pressure, China's National Narcotics Control Commission (NNCA) issued a class-wide ban on the production of synthetic cannabinoids in the country. In the US K2 use declined precipitously following the Chinese ban; however, last year PAG began receiving reports of serious adverse events associated with K2 in Lancaster County, PA, about 90 minutes west of Philadelphia.

In October 2024 a PAG team traveled to Lancaster to investigate. While there we observed several people in states of unconsciousness who were not suffering opioid-related respiratory distress. Samples obtained from Lancaster and analyzed in November 2024 at CFSRE were identified as **5F-ADB**, a full CB1 agonist that is regularly identified as the most potent 3rd generation synthetic cannabinoid on the illicit market. Samples obtained at the same time in Philadelphia were identified as **MDMB-4EN-PINACA** and **4-CYANO CUMYL-BUTINACA**, two other synthetic cannabinoids with high binding affinity and extremely low EC50 values (indicating high potency).

ANALYSIS

The origin of these reemerging compounds is unknown. Generally when a substance is banned by the Chinese Communist Government, labs there shift to alternative compounds–including legal precursor chemicals–and the banned substances disappear from online vendor's websites. After China's ban, synthetic cannabinoid use declined in Philadelphia and regionally as Chinese labs retooled their efforts to develop compounds capable of skirting legal restrictions.

There is some evidence the K2 blamed for the most recent wave of adverse events originated in the United States. Supplyside sources consulted by PAGROUNDHOGS in April reported ordering their synthetic cannabinoids from domestic suppliers. And last month a 33 year old woman in Albany, NY, pleaded guilty to manufacturing **MDMB-4EN-PINACA** out of constituent chemicals in her residence. The drug was then sprayed on paper and mailed to inmates at various correctional facilities in New York.

A review by PAGROUNDHOGS found that **5F-ADB** is still marketed by a small number of online vendors, often as a semi-finished product (*pictured at left*) requiring several final steps to complete synthesis.

According to Alex Krotulski, director of the CFSRE, these semi-finished compounds, designed to sidestep legal barriers, first appeared shortly after the Chinese ban, in 2022 or 2023.

HARM REDUCTION

The synthetic cannabinoids currently reappearing in the drug supply are among the most potent synthesized to date, but little is still known about the mechanisms of their potentially toxic effects. According to case studies they can cause far stronger psychoactive and physiological effects than THC. Reported side effects have included sedation, seizures, cardiotoxicity, edema, agitation and psychosis, and even death. In some case studies, fatalities were attributed to accidents following use of potent synthetic cannabinoids, including falling from a ladder or aspiration on vomit.

Complicating matters, K2 overdose is frequently misreported as opioid overdose, however naloxone may be contraindicated for opioid dependent individuals suffering K2-related toxicity, sometimes causing severe agitation and even aggressiveness when administered. Use compassionate overdose response guidelines when employing naloxone: Focus on breathing, not responsiveness. If a victim is breathing on their own, monitor until EMTs arrive.

There have been no confirmed fatalities associated with the current clusters of adverse events. Since lab tests are still pending on these substances we urge caution when smoking K2, called “Buddha Bud” in parts of New Jersey.

Please contact tips@pagroundhogs.org with any information and visit The Everything Project for instructions on testing K2 using fentanyl test strips.

PAGROUNDHOGS will continue to monitor the situation and will report any pending test results as they become available.