The UNIVERSITY of VERMONT
Vermont Legislative Research Service
https://www.uvm.edu/cas/polisci/vermont-legislative-research-service-vlrs

Synthetic Drugs

Synthetic drugs, also known as "designer drugs" or "new psychoactive substances," are a class of drug which aim to mimic effects of existing drugs in order to obtain access to the effects of existing substances, or to supplement existing drugs to create a stronger perceived effect. Synthetic drugs are commonly synthesized from prescription drugs and research chemicals.[1] While synthetic drugs were formally outlawed in 2012 by the Obama administration, new variations of these drugs are manufactured every year with increasing strength.[2] There is a large variety of synthetic drugs currently circulating, with the most common being synthetic cannabinoids, cathinones, and opioids.[3] This report focuses on two classes of synthetic drugs, synthetic cathinones and cannabinoids. A separate report on synthetic opioids, such as fentanyl and nitazene, "The State of the Opioid Crisis in Vermont," can be found here on the VLRS website.

Synthetic Cannabinoids

According to the National Institute of Drug Abuse (NIDA), synthetic cannabinoids, also called K2 or spice, are human-made chemicals that have similar effects to naturally grown cannabis. They can be sprayed onto dried plant material to be smoked or made into a liquid and put inside an e-cigarette. The sprayed plant material can be mixed with regular marijuana to smoke or put into a tea bag to drink.[4] Synthetic cannabinoids are often called "fake weed" because they produce the same results, but they may be more powerful and unsafe for the brain.[5]

[1] Sherri L. Kacinko and Donna M. Papsun, "The Evolving Landscape of Designer Drugs," *Methods in Molecular Biology*, 2019, 129–35, https://doi.org/10.1007/978-1-4939-8823-5_13.
[2] Office of National Drug Control Policy, *Synthetic Drugs (a.k.a. K2, Spice, Bath Salts, Etc.),* The President Obama White House Archives, accessed September 27, 2023, https://obamawhitehouse.archives.gov/ondcp/ondcp-fact-sheets/synthetic-drugs-k2-spice-bath-salts.
[3] Kenichi Tamama, "Synthetic Drugs of Abuse," *Advances in Clinical Chemistry*, 2021, 191–214, https://doi.org/10.1016/bs.acc.2020.10.001.
[4] Department of Justice/Drug Enforcement Administration, "Drug Fact Sheet: K2/Spice," October, 2022, accessed October 24, 2023, https://www.dea.gov/sites/default/files/2023-04/K2-Spice%202022%20Drug%20Fact%20Sheet.pdf.
[5] Center for Disease Control and Prevention, "Synthetic Cannabinoids: What are they? What are their effects?," April 11, 2022, accessed November 1, 2023 https://www.cdc.gov/nceh/hsb/chemicals/sc/default.html.

In 2015, the United States Drug Enforcement identified eighty-four new cannabinoid variations seized by law enforcement around the country.[6] According to the Drug Enforcement Administration, these drugs can be found easily on the internet, gas stations, or in novelty stores. In order to shield from criminal prosecution, the drugs are labeled "not for human consumption" by the sellers.[7] Because synthetic cannabinoids are easily accessible, they have become more popular in people ages 20-30.[8]

Synthetic cannabinoids work similar to THC, the psychoactive ingredient in marijuana. The National Institute of Health says that the effects of THC include euphoria, relaxation, heightened sensory perception, laughter, altered perception of time, and an increase in appetite. Some more severe effects include distrust, panic, hallucinations, and delusions.[9] There are fewer studies on the effects of these drugs as they have not been around for very long. According to the NIDA, some variations bind more strongly to cell receptors in the brain than marijuana. They state that effects are elevated mood, relaxation, altered perception, symptoms of psychosis, anxiety, confusion, paranoia and hallucination. Hospitalizations have occurred for severe effects such as rapid heart rate, vomiting, violent behavior, and suicidal thoughts. The NIDA states that while the effects of synthetic marijuana are very similar to grown marijuana, the potency can be much higher because of added chemicals.[10]

Synthetic Cathinones

Cathinones are a psychoactive compound related to substances found in the khat plant native to Africa.[11] Synthetic cathinones first caught public attention with the widespread availability of a type of substituted cathinone nicknamed "Bath Salts" in 2012.[12] Since then, there have been a variety of synthetic cathinones produced and distributed under names such as eutylone, methylone, and pentylone.[13] The structure of synthetic cathinones can be altered and rearranged to produce similar effects of intoxication. This flexibility allows synthetic cathinones to frequently circumvent legislation, as regulation is typically based upon specific structure rather

---

[6] Centers for Disease Control and Prevention, "Synthetic Cannabinoids (SPICE): An Overview for Healthcare Providers," April 18, 2022, accessed October 19, 2023, https://www.cdc.gov/nceh/hsb/envepi/outbreaks/sc/healthcare.html.

[7] Department of Justice/Drug Enforcement Administration, "Drug Fact Sheet: K2/Spice," October 2022, accessed October 24, 2023, https://www.dea.gov/sites/default/files/2023-04/K2-Spice%202022%20Drug%20Fact%20Sheet.pdf.

[8] Centers for Disease Control and Prevention, "Synthetic Cannabinoids."

[9] National Institutes of Health, "What Are Marijuana's Effects?" April, 2021, accessed October 19, 2023, https://nida.nih.gov/publications/research-reports/marijuana/what-are-marijuana-effects.

[10] National Institutes on Drug Abuse, National Institutes of Health, "Synthetic Cannabinoids," March 2022, accessed October 19, 2023, https://nida.nih.gov/research-topics/synthetic-cannabinoids.

[11] European Monitoring Centre for Drugs and Drug Addiction, "*Synthetic Cathinones Drug Profile,*" accessed September 27, 2023, https://www.emcdda.europa.eu/publications/drug-profiles/synthetic-cathinones_en.

[12] Laurent Karila, Bruno Megarbane, Olivier Cottencin, and Michel Lejoyeux, "Synthetic Cathinones: A New Public Health Problem," *Current Neuropharmacology* 13, no. 1 (January 13, 2015): 12–20, https://doi.org/10.2174/1570159x13666141210224137.

[13] Patryk Kuropka, Marcin Zawadzki, and Paweł Szpot, "A Review of Synthetic Cathinones Emerging in Recent Years (2019–2022)," *Forensic Toxicology* 41, no. 1 (2022): 25–46, https://doi.org/10.1007/s11419-022-00639-5.

than effect.[14] Cathinones can contribute to significant negative cardiac effects such as mild tachycardia, myocardial infarction, and arrest.[15] An article from 2023 has suggested synthetic cathinone use contributes to neuroclinical toxic syndromes, such as agitated delirium syndrome and serotonin syndrome, which are both life threatening conditions.[16]

What Are States and Communities Doing to Deal with the Problem?

Vermont

Synthetic cannabinoids have been the subject of Vermont regulation as recently as April of 2023. The State of Vermont Cannabis Control Board issued an emergency rule on synthetic and hemp-derived cannabinoids effective April 24, 2023. The emergency rule states the prohibition of sale, marketing, and manufacturing of delta-8, delta-9, and delta-10 or any other variations created by manipulating the plant Cannabis sativa L. This emergency rule also includes the prohibition of any manipulations of delta-9 that could be artificially introduced into hemp or other products. This emergency rule does not apply to products regulated by the Cannabis Control Board, other cannabinoid products that have been specifically authorized for sale by medical dispensaries, or manufactured drugs approved by the FDA.[17] In an interview with WCAX, the Chair of the Cannabis Control Board, James Pepper, said about the new rule, "When you have people creating products with delta 8 in them, they're claiming that they're totally unregulated… We needed this rule, in effect, so we can start the enforcement, start moving these products off the shelves or funneling them through our existing medical or existing cannabis dispensaries."[18]

Maine

Maine has separate laws pertaining to the scheduling of bath salts and other synthetic hallucinogens and synthetic cannabinoids. As of 2013, under Maine Criminal Code Title 17-A, possession of synthetic cannabinoids is punishable by up to six months incarceration and a $1,000 fine.[19] Possession of bath salts is punishable by up to 364 days incarceration and a $2,000 fine under Title 17-A as well.

---

[14] Chicora F. Oliver, Joseph J. Palamar, Alberto Salomone, Steven J. Simmons, Helene L. Philogene-Khalid, Nick Stokes-McCloskey, and Scott M. Rawls, "Synthetic Cathinone Adulteration of Illegal Drugs," *Psychopharmacology* 236, no. 3 (March 2019): 869–79, https://doi.org/10.1007/s00213-018-5066-6.

[15] Office of National Drug Control Policy, "*Synthetic Drugs (a.k.a. K2, Spice, Bath Salts, Etc.),*" The President Obama White House Archives, accessed September 27, 2023, https://obamawhitehouse.archives.gov/ondcp/ondcp-fact-sheets/synthetic-drugs-k2-spice-bath-salts.

[16] Daziani Gloria, Alfredo Fabrizio Lo Faro, Vincenzo Montana, Gaia Goteri, Mauro Pesaresi, Giulia Bambagiotti, Eva Montanari, Raffaele Giorgetti, and Angelo Montana, 2023, "Synthetic Cathinones and Neurotoxicity Risks: A Systematic Review," *International Journal of Molecular Sciences* 24, no. 7: 6230, https://doi.org/10.3390/ijms24076230.

[17] State of Vermont Cannabis Control Board, "Emergency Rule: Synthetic and Hemp-Derived Cannabinoids," Accessed September 28, 2023, https://ccb.vermont.gov/sites/ccb/files/2023-04/Emergency.Hemp_.Rule_2023-4-24.pdf.

[18] Bendavid, Ike, "Vt. Regulators to Crack down on Synthetic Cannabis," May 10, 2023, Accessed September 28, 2023, https://www.wcax.com/2023/05/10/vt-regulators-crack-down-synthetic-cannabis/.

[19] State of Maine, "Title 17-A, §1107-A: Unlawful Possession of Scheduled Drugs," Accessed September 28, 2023, https://legislature.maine.gov/statutes/17-A/title17-Asec1107-A.html.

New York

New York categorizes both bath salts and synthetic cannabinoids as Schedule I drugs.[20] New York has made moves to update their laws on the sale and possession of synthetic drugs as recently as January 5, 2023. A bill has been introduced to make the possession or sale of synthetic drugs a Class E felony, which under New York state law can result in the punishment of up to four years imprisonment (the bill is in committee at the time of this report).[21] Synthetic drugs, in this case, include synthetic cannabinoids as well as bath salts and an extensive list of other synthetic drugs.[22]

Connecticut

In Connecticut, synthetic cannabinoids have been designated as a Schedule I drugs since 2011.[23] Most cathinones (bath salts) are also classified as Schedule I drugs by federal or state law in Connecticut as well.[24] According to a statement from the Connecticut Department of Consumer Protections, the possession and sale are both illegal and continued retail sale could result in felony charges.[25]

California

In 2011, the penalty for the sale, distribution, or the possession with the intent to sell synthetic marijuana is a misdemeanor, punishable by up to six months in jail and the possibility of a fine up to $1,000 dollars.[26] California state law now considers bath salts and their equivalents as a Schedule II controlled substances, which makes their possession a misdemeanor, punishable by a jail term of up to six month, a fine of up to $1,000, or both. The possession for sale of cathinones is a felony punishable by sixteen months, two years, or three years in state prison. The transportation, sale, or furnishing of khat or cathinone is a felony punishable by two to four years in state prison and a fine of up to $10,000.[27]

---

[20] New York Senate, "NYS Open Legislation," NYSenate.gov, Accessed September 28, 2023, https://www.nysenate.gov/legislation/laws/PBH/3306.
[21] New York Senate, "Article 70," NYSenate.gov, Accessed October 17, 2023, https://www.nysenate.gov/legislation/laws/PEN/70.00.
[22] New York Senate, "2023-S595," NYSenate.gov, Accessed September 28, 2023, https://www.nysenate.gov/legislation/bills/2023/S595.
[23] State of Connecticut, "Synthetic Cannabis," CT.gov, Accessed September 28, 2023, https://portal.ct.gov/DCP/Drug-Control-Division/Drug-Control/Synthetic-Cannabis.
[24] State of Connecticut, "Bath Salts Cathinones," CT.gov, Accessed September 28, 2023, https://portal.ct.gov/DCP/Drug-Control-Division/Drug-Control/Bath-Salts-Cathinones.
[25] State of Connecticut, "The Sale of Synthetic Products," CT.gov, Accessed September 28, 2023, https://portal.ct.gov/-/media/DCP/drug_control/pdf/Syntheticspdf.pdf.
[26] Legislative Council of California, "Senate Bill 420," last modified October 2, 2011, accessed October 23, 2012, http://www.leginfo.ca.gov/pub/11-12/bill/sen/sb_0401-0450/sb_420_bill_20111002_chaptered.pdf.
[27] California Senate Committee on Public Safety, "Senate Bill 139," July 14, 2015, accessed September 28, 2023, http://www.leginfo.ca.gov/pub/15-16/bill/sen/sb_0101-0150/sb_139_cfa_20150713_105258_sen_comm.html.

Conclusion

Regulation on sale and possession of cathinones are much easier to create because the composition is more straightforward. Cathinones are a dangerous psychoactive drug that has different regulations by state but is generally classified as a high-level drug. Synthetic cannabinoids are more difficult to control by law because the chemical composition can change easily, making it legal unless the composition is specifically stated in law. The compositions that are regulated have very different classifications state by state. There is a limited amount of research on the effects of cathinones and synthetic cannabinoids on the brain and body. Since there is no federal law against synthetic cannabinoids, it is easily bought online making it difficult to control statewide.

This report was completed on November 8, 2023, by Fi Barthel, Eva Sanford, and Petra Waterstreet under the supervision of VLRS Director, Professor Anthony "Jack" Gierzynski. It is a revision of a report completed on January 9, 2013, by Michael Gibson, Olivia Peterson, and Liam Walsh under the supervision of Associate Director Kate Fournier and Professor Gierzynski.

Contact: Professor Anthony "Jack" Gierzynski, 517 Old Mill, The University of Vermont, Burlington, VT 05405, phone 802-656-7973, email agierzyn@uvm.edu.