

**United States Sentencing Commission
Synthetic Cannabinoids, Cathinones, and MDMA
Written Testimony: Eric D. Wish, PhD, CESAR Director***

April 18, 2017

I am Dr. Eric Wish, Director of the University of Maryland's Center for Substance Abuse Research, CESAR, and I am thankful for your invitation to present some of our research findings on synthetic cannabinoids and emerging drugs.

Since 1990, CESAR's primary mission has been to inform national and local drug policy by interpreting the latest scientific research and conducting studies in sites around the country as new drug problems emerge. CESAR is currently directing two research projects that are most relevant to the Commission's interest in synthetic drugs. The first is the National Drug Early Warning System (NDEWS) and the second is the Community Drug Early Warning System (CDEWS). Over more than 35 years, I have monitored the emergence and growth of a lot of drugs but nothing has been quite like the recent surge in synthetic drug use. Relevant recent findings from each of these projects are described below.

National Drug Early Warning System (NDEWS, www.ndews.org)

CESAR established the Coordinating Center for the National Drug Early Warning System (NDEWS) with funding from NIH's National Institute on Drug Abuse (NIDA) beginning in 2014. NDEWS is a national public health surveillance system designed to utilize a variety of innovative methodologies to alert the country to emerging drug problems. Some of the NDEWS components are an electronic Network of 1500+ substance abuse experts and concerned citizens, local researchers in 17 NDEWS community sites who identify and monitor New Psychoactive Substances (NPS) and changing drug trends in their communities, and targeted HotSpot studies (www.ndews.org, Figure 1). NDEWS Coordinating Center staff also conduct ongoing social media and news media scans and regularly monitor a set of national and local indicators of drug availability, use, and consequences of use. Relevant selected findings from six of these sources are provided in the following sections.

Selected Findings from Databases Monitored by NDEWS

1. *The National Forensic Laboratory Information System (NFLIS; <https://www.deadiversion.usdoj.gov/nflis/>)*

maintained by the Drug Enforcement Administration collects results from drug chemistry analyses of law enforcement seizures submitted by nearly 300 state and local forensic laboratories across the country.

- Nationwide, NFLIS reports for items seized testing positive for synthetic cannabinoids was highest in 2012 at 40,997 reports and totaled 29,588 in 2015 (Figure 2)
- Nationwide, NFLIS reports for items seized testing positive for cathinones was highest in 2011 at 22,564 reports and have varied slightly since (Figure 2)
- The number of different synthetic cannabinoids identified in NFLIS reports increased steadily – 2 types were identified in drug items in 2009 and 84 in items in 2015 (Figure 3)
- The number of different cathinones identified in NFLIS reports increased steadily – 5 types were identified in drug items in 2009 and 42 in 2014 (decreased to 35 in 2015) (Figure 2)

- NFLIS reports for each of the two synthetic cannabinoids and three cathinones (JWH-018, AM-2201, MDPV, methylene, mephedrone) under review by the commission decreased steadily from 2013 to 2015 (Data not shown)
- 2. *Monitoring the Future (MTF; <https://www.monitoringthefuture.org/>)*** conducted by the University of Michigan is an annual survey of U.S. secondary school students, college students, and young adults to assess behaviors, values, and attitudes on topics such as the use of alcohol and other drugs. Annual use of synthetic cannabinoids, cathinones, and ecstasy have all been decreasing among 12th graders.
 - Past year use of synthetic cannabinoids by 12th graders decreased steadily from 11.4% in 2011 when the question was first asked to 3.5% in 2016 (Figure 4)
 - Past year use of ecstasy peaked in 2001 (9.2%) and decreased from 5.0% in 2014 to 2.7% in 2016 (Figure 4)
 - Use of cathinones (bath salts) remained relatively low ranging from 1.3% in 2012 to 0.8% in 2016 (Figure 5)
 - 3. *National Survey on Drug Use and Health (NSDUH; <https://www.samhsa.gov/data/population-data-nsduh>)*** managed by the Substance Abuse and Mental Health Services Administration (SAMHSA) is an annual household survey of the U.S. civilian, non-institutionalized population aged 12 and older. The survey generates estimates on the prevalence, patterns, and consequences of alcohol, tobacco, and illegal drug use and abuse and mental disorders at the National, state, and substate levels.
 - In 2015, 6.8% of persons aged 12 or older reported using ecstasy at least once in their lives (Figure 6)
 - 4. *American Association of Poison Control Centers (AAPCC; www.aapcc.org)*** coordinates the efforts of 52 poison centers across the country and prepares annual reports on human exposure and drug identification calls. Through a special partnership between NDEWS and AAPCC, NDEWS Coordinating Center staff can post queries to poison center medical directors across the country.
 - The peak months for human exposure calls involving synthetic cannabinoids were in summer 2015 (Figure 7)
 - Human exposure calls related to synthetic cannabinoids reached a high in 2011 at 6,968 and again in 2015 (7,779) which had more than double the number of calls as in 2014; calls dropped sharply to 2,695 in 2016 (Figure 8)
 - In calendar year 2015, every state had human exposure calls related to synthetic cannabinoids (Figure 9)
 - Human exposure calls related to cathinones decreased steadily from 6,137 in 2011 to 522 in 2015 (Data not shown)
 - 5. *District of Columbia Fire and Emergency Medical Services (DCFEMS)*** has been monitoring EMS cases related to synthetic cannabinoids since April 2015.
 - DCFEMS patient cases peaked in August and September 2015 and again in July 2016 (Figure 10)
 - There were an average of 20 cases per day in August and September 2015 and 19 per day in July 2016, but in the first two months of 2017, there were only 3 to 6 per day (DCFEMS staff, Data not shown)
 - 6. *NDEWS News Scans*** NDEWS staff conduct monthly scans of a LexisNexis Academic database of article references from more than 2,250 national and international English language newspapers. Scans are run on approximately 30 drugs and drug terms. The results provide a snapshot of relative trends in what drugs local media are reporting about.
 - Between December 2014 and January 2017, monthly reports about synthetic cannabinoids ranged from 117 to 226; in January 2017, there 134 reports (Figure 11)
 - Between December 2014 and January 2017, monthly reports about cathinones ranged from 95 to 242; in January 2017, there were 181 reports (Figure 12)

Community Drug Early Warning System (CDEWS)

The Community Drug Early Warning System (CDEWS) is funded by the White House Office of National Drug Control Policy (ONDCP) and provides timely information about emerging drug use in high-risk criminal justice populations through expanded re-testing of urine specimens already obtained and tested for a limited panel of drugs by local criminal justice and other testing programs. CDEWS or local staff sample specimens that are ready to be discarded and send them to an independent laboratory for testing for an expanded panel of more than 150 drugs. By using already collected de-identified urine specimens, CDEWS provides a relatively quick and inexpensive snapshot of the types of drugs recently used by participating populations. Studies have been conducted in both juvenile and adult populations as well as in prisons and hospitals.

CDEWS is now in its fourth cycle and includes a test panel of 26 synthetic cannabinoids and 37 designer stimulants (Figure 13). To keep up with the changing nature of synthetic cannabinoids, CDEWS staff query experts around the world to determine the new tests that need to be developed and/or included in the CDEWS panel. CDEWS results indicate that synthetic drugs such as those under consideration by the Commission are often not detected by routine drug testing programs and that persons who test positive for synthetic cannabinoids often test negative for other drugs on local panels. Other relevant results from this research are provided below.

- Synthetic Cannabinoids are most often detected in specimens provided by young persons; Persons testing positive for opioids tend to be the oldest (Figure 14)
- Synthetic cannabinoids tend to be found in persons who pass the local limited routine drug test panel, suggesting that persons whose drug use is monitored use synthetic cannabinoids to avoid a positive drug test (Figure 15)
- The three studies of probationers in Washington, DC, show tremendous changes in synthetic cannabinoid metabolites detected over time (Figure 16)
- The synthetic cannabinoid metabolites detected varied considerably by site (Figure 17)
- Only one metabolite (UR-144) was found in urine specimens from juveniles in Tampa, FL, but most CDEWS studies found multiple metabolites in synthetic cannabinoid positive specimens (Figure 17)

Conclusions & Recommendations

1. There is clear evidence of the use and availability of synthetic drugs across the U.S. There have been considerable changes in the types of synthetics and level of use over the past several years. Persons who use these substances are playing Russian roulette with their health.
2. The Commission should look beyond the five synthetic drugs specified and address the full range of synthetic cannabinoids, cathinones, and other synthetic substances currently in use.
3. Sanctions based on particular chemical structures become obsolete almost immediately. The commission might look towards local innovations in policies and laws such as those here in Washington, DC. A local law has been implemented to focus on the marketing and intent of distributors and characteristics of the materials sold rather than on specific substances. (*DC Executive Office of the Mayor, Mayor Bowser Signs "Sale of Synthetic Drugs Emergency Amendment Act of 2015" Into Law, July 10, 2015*)
4. Drug testing programs, especially those in which it is critical to identify use and diagnose substance use disorders, should weigh the value of adding Synthetic Cannabinoid metabolites to their testing protocols and adopting an annual CDEWS type of process for reviewing and updating the drugs included in their testing protocols.

References:

AAPCC Website Synthetic Cannabinoids Alert, Accessed via the Internet Archive (<https://web.archive.org/web/20170124040413/http://www.aapcc.org/alerts/synthetic-cannabinoids/>).

Institute of Social Research, University of Michigan, Monitoring the Future National Survey Results on Drug Use, 1975-2016 (available online at <https://www.monitoringthefuture.org/>).

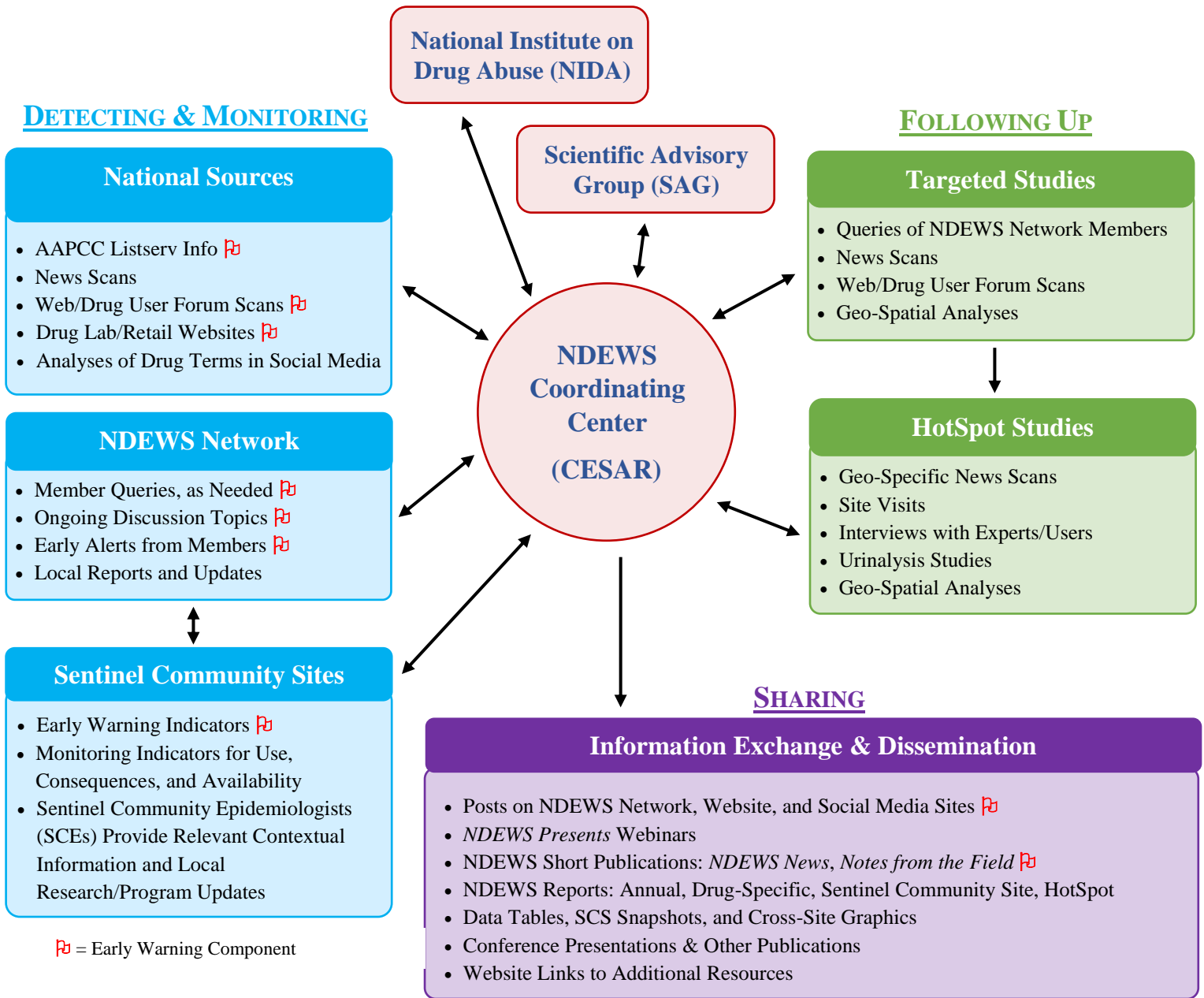
Substance Abuse and Mental Health Services Administration, National Survey on Drug Use and Health, 2002-2015 (available online at <https://www.samhsa.gov/samhsa-data-outcomes-quality/major-data-collections/reports-detailed-tables-2015-NSDUH>).

U.S. Drug Enforcement Administration (DEA), Diversion Control Division, NFLIS Special Reports (available online at <https://www.dea.gov/diversion-control/nflis/>).

Wish, E.D., Artigiani, E.E. & Billing, A.S. (2013). Community drug early warning system: The CDEWS pilot project. Office of National Drug Control Policy. Washington, DC: Executive Office of the President.

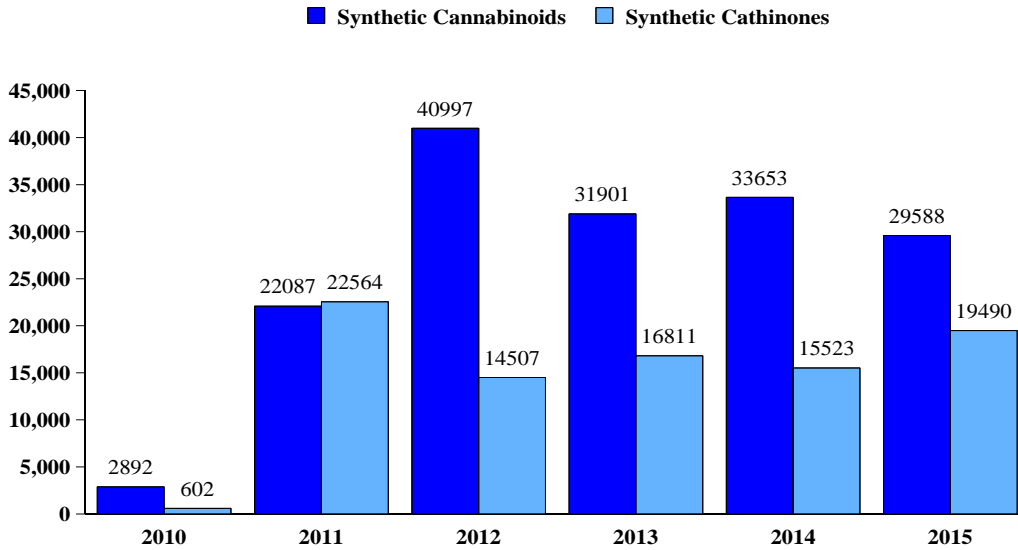
Wish, E.D., Billing, A.S., & Artigiani, E.E. (2015). Community drug early warning system: The CDEWS-2 replication study. Office of National Drug Control Policy. Washington, DC: Executive Office of the President.

Figure 1: NDEWS Components



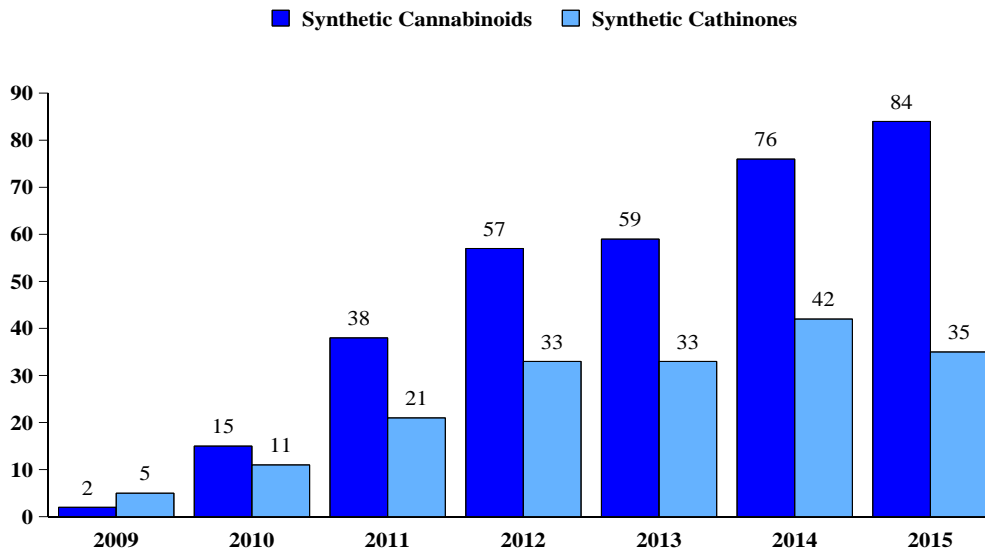
Law Enforcement Seizures of Synthetic Cannabinoids and Cathinones

Figure 2: National Annual Estimates of Synthetic Cannabinoids and Synthetic Cathinones in Reports in NFLIS, 2010-2015



NOTES: NFLIS estimates are calculated using the National Estimates Based on All Reports (NEAR) methodology, which has strong statistical advantages for producing national and regional estimates. Estimates shown here are based on drug cases and items submitted to participating state and local laboratories during the calendar year and analyzed within three months of the end of the calendar year. For each drug item (or exhibit) analyzed by a laboratory in the NFLIS program, up to three drugs can be reported to NFLIS and counted in the estimation process. A drug-specific case is one for which the specific drug was identified as the first, second, or third drug report for any item associated with the case. A drug-specific report is the total number of reports of the specific drug. State and local policies related to the enforcement and prosecution of specific drugs may affect drug item submissions to laboratories for analysis. Laboratory policies and procedures for handling drug evidence vary. For example, some analyze all items submitted, while others analyze only selected case items. Many laboratories do not analyze drug evidence if the criminal case was dismissed from court or if no person could be linked to the item. Thus, NFLIS data might underestimate the availability of drugs in the illicit market that state or local labs do not systematically identify.

Figure 3: Number of Different Synthetic Cannabinoids and Synthetic Cathinones in Reports in NFLIS, 2009-2015

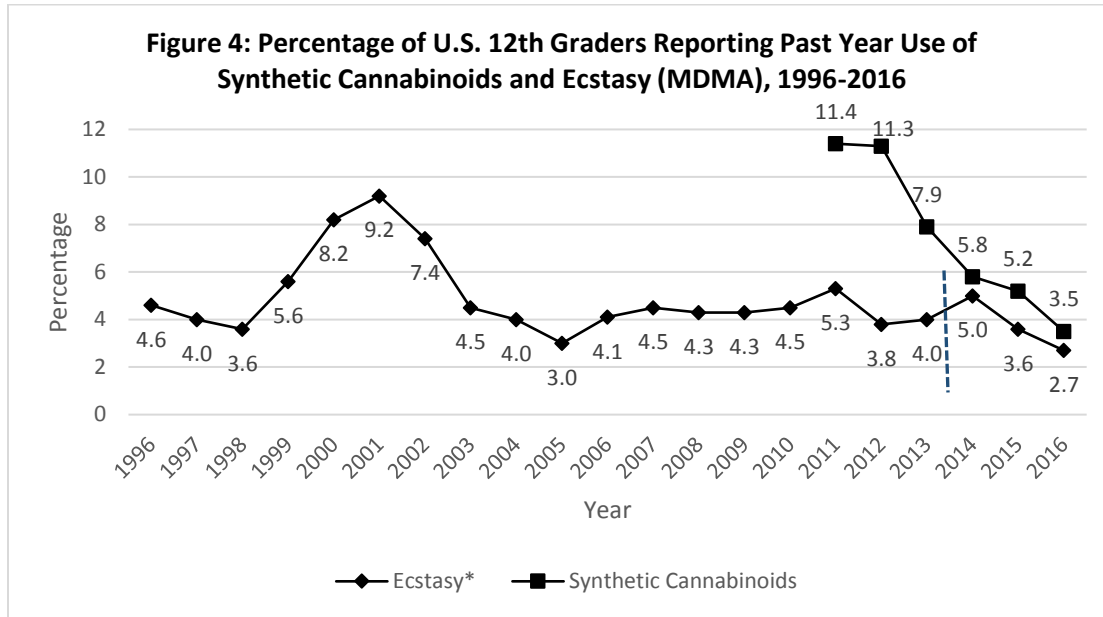


NOTES: Data shown here are based on drug cases and items submitted to participating state and local laboratories during the calendar year and analyzed within three months of the end of the calendar year. For each drug item (or exhibit) analyzed by a laboratory in the NFLIS program, up to three drugs can be reported to NFLIS and counted in the estimation process. A drug-specific case is one for which the specific drug was identified as the first, second, or third drug report for any item associated with the case. A drug-specific report is the total number of reports of the specific drug. State and local policies related to the enforcement and prosecution of specific drugs may affect drug item submissions to laboratories for analysis. Laboratory policies and procedures for handling drug evidence vary. For example, some analyze all items submitted, while others analyze only selected case items. Many laboratories do not analyze drug evidence if the criminal case was dismissed from court or if no person could be linked to the item. Thus, NFLIS data might underestimate the availability of drugs in the illicit market that state or local labs do not systematically identify.

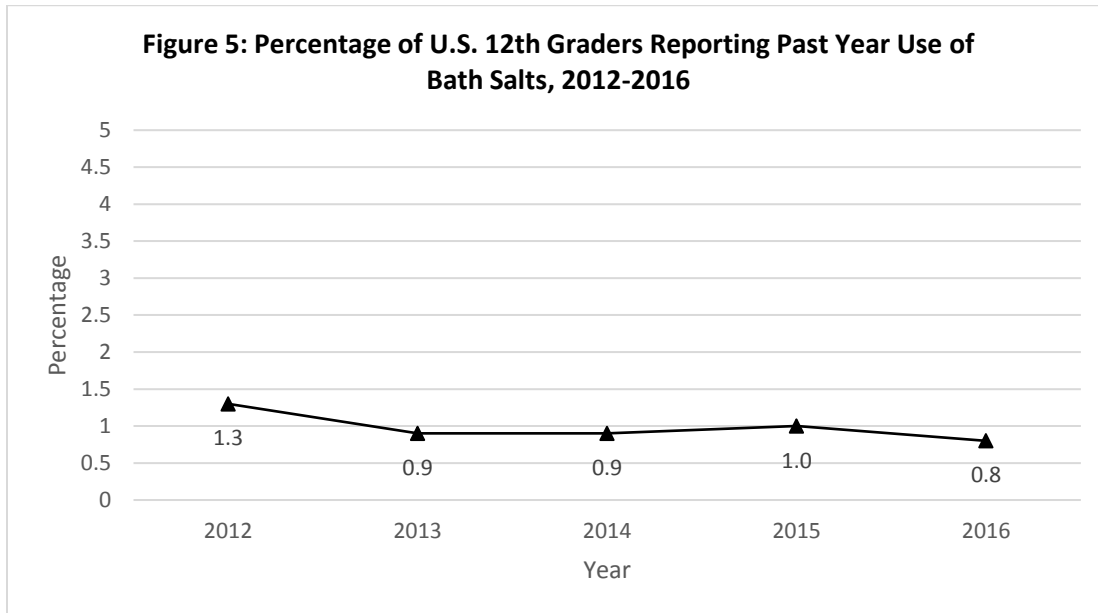
SOURCE: Adapted by the National Drug Early Warning System (NDEWS) Coordinating Center from data from the U.S. Drug Enforcement Administration (DEA), Diversion Control Division, NFLIS Special Reports (available online at <https://www.deadiversion.usdoj.gov/nflis/>).

Use of Synthetic Cannabinoids, Cathinones, and Ecstasy

Use by Youth from Monitoring the Future (MTF; Annual National School Survey)

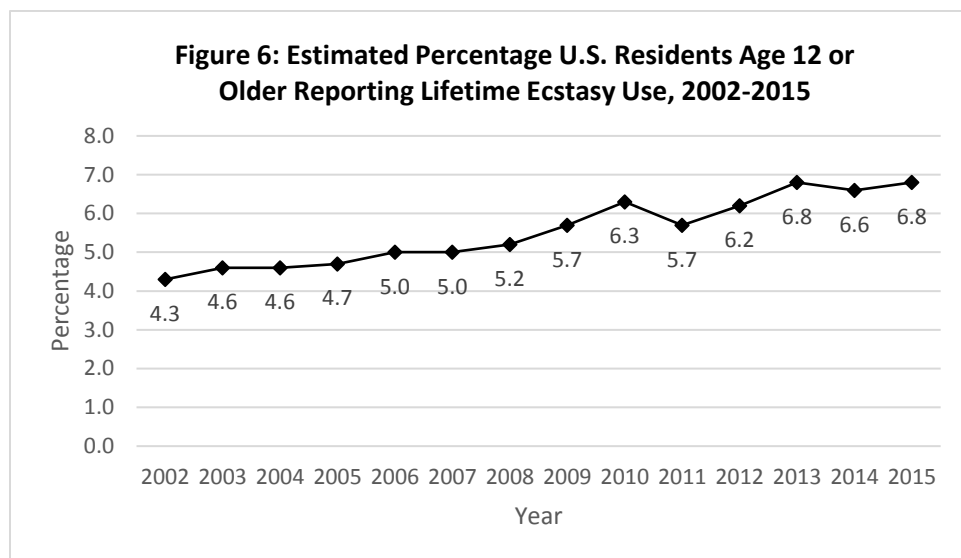


NOTE: *The questionnaire was revised starting in 2014 to include the word “molly”. The revised data are presented for years 2014 through 2016.



SOURCE: Adapted by the National Drug Early Warning System (NDEWS) Coordinating Center from Institute of Social Research, University of Michigan, Monitoring the Future National Survey Results on Drug Use, 1975-2016 (available online at <https://www.monitoringthefuture.org/>).

National Survey on Drug Use and Health (NSDUH; Household Survey)



SOURCE: Adapted by the National Drug Early Warning System (NDEWS) Coordinating Center from Substance Abuse and Mental Health Services Administration, National Survey on Drug Use and Health, 2002-2015 (available online at <https://www.samhsa.gov/samhsa-data-outcomes-quality/major-data-collections/reports-detailed-tables-2015-NSDUH>).

Consequences of Use

Human Exposure Calls (Source: American Association of Poison Control Centers, <http://www.aapcc.org>)

Figure 7: Number of Calls to U.S. Poison Control Centers about Exposure* to Synthetic Cannabinoids, by Month January 2010- February 2017[†]

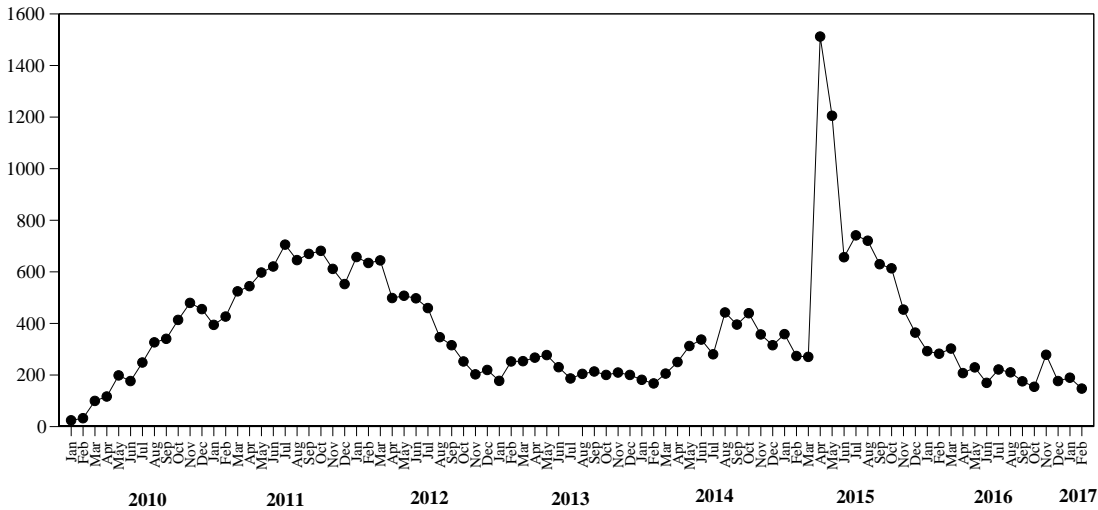
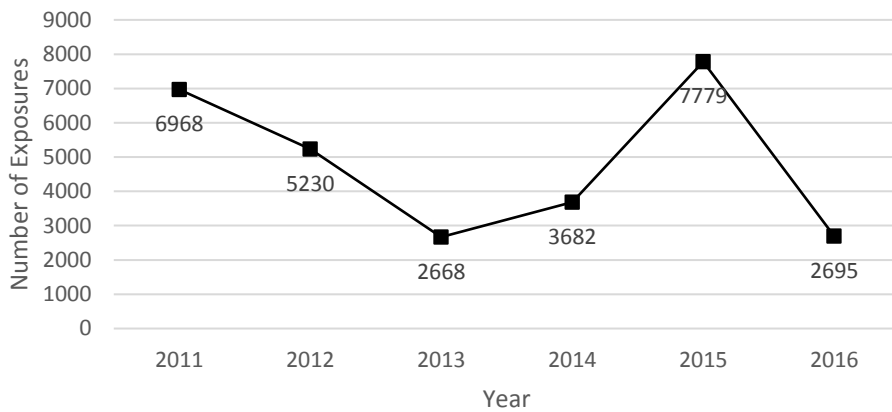


Figure 8: Human Exposures to Synthetic Cannabinoids Reported to Poison Centers, by Year 2011-2016



*The term exposure means someone has had contact with the substance in some way; for example, ingested, inhaled, absorbed by the skin or eyes, etc. Not all exposures are poisonings or overdoses. These data are only representative of calls received by the poison centers and may not reflect the actual severity of the problem.

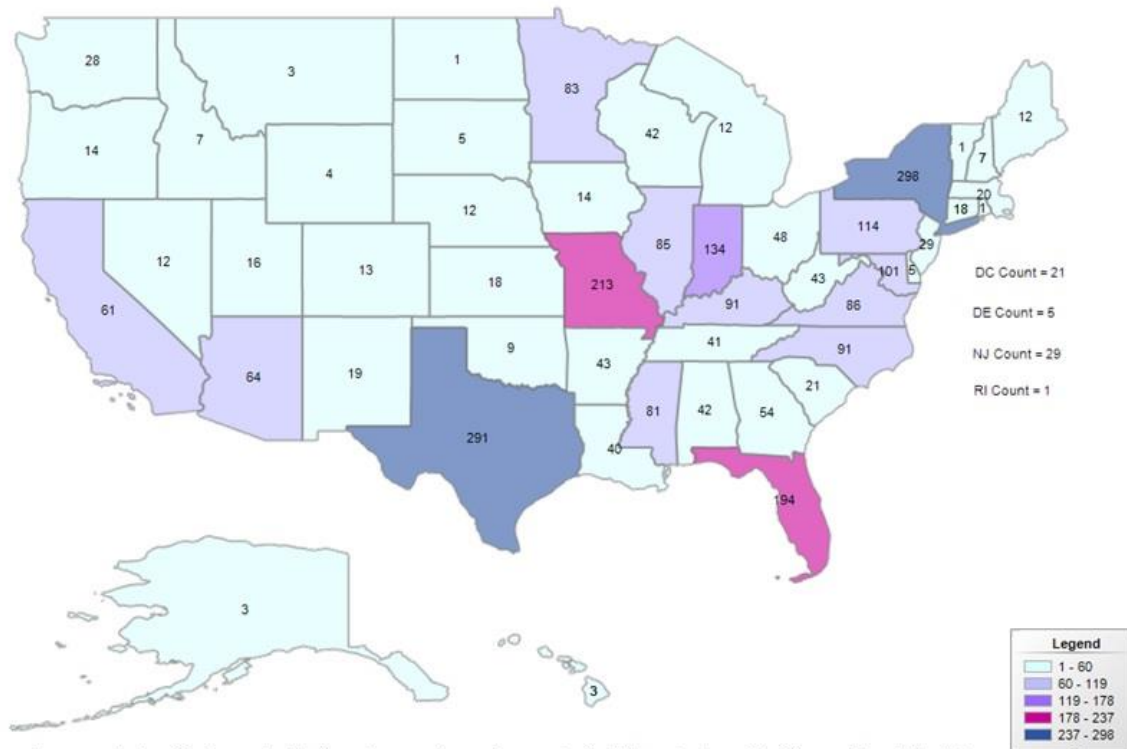
[†] AAPCC data for 2016 and 2017 are considered preliminary because it is possible that a poison center may update a case anytime during the year if new information is obtained. In the fall of each year, the data for the previous year is locked, and no additional changes are made.

SOURCE: Adapted by the National Drug Early Warning System (NDEWS) Coordinating Center from data from the American Association of Poison Control Centers (AAPCC).

Figure 9:



Synthetic Cannabinoid Calls to U.S. Poison Centers (1/1/16-12/31/16)



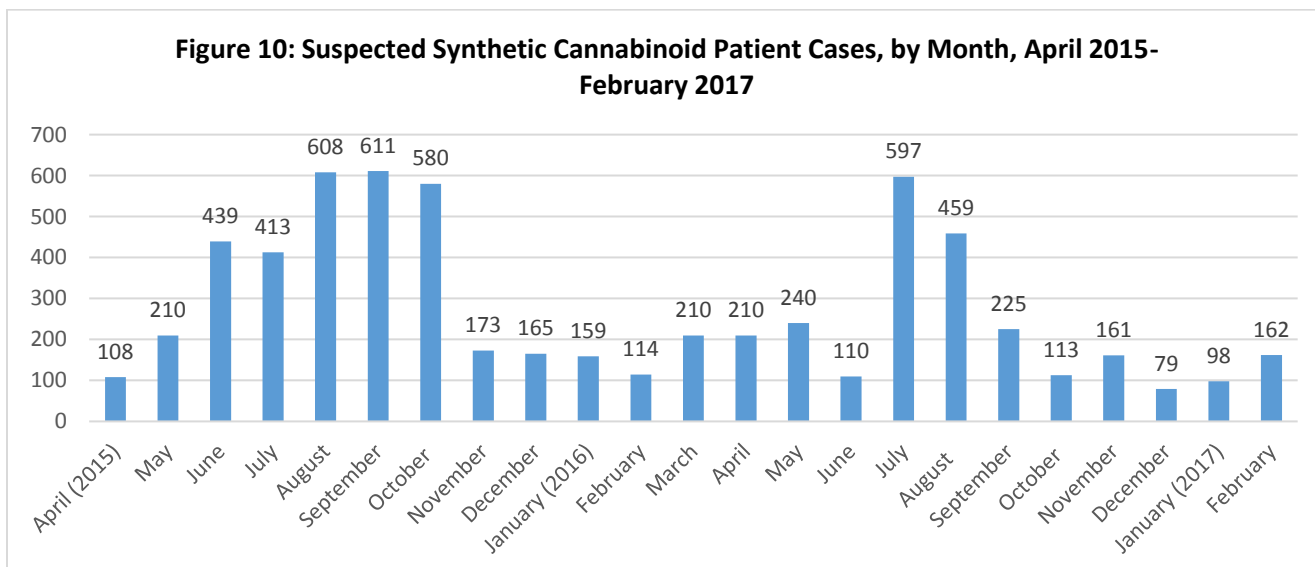
PLEASE NOTE:

- These data are only representative of calls received by the poison centers and may not reflect the actual severity of the problem in the U.S. or any specific geographic location.
- As there is no mandatory reporting, there may be emergency room presentations and hospital admissions of which poison centers are unaware.
- Subject to the above bullets, these numbers are largely reflective of those users/abusers who have experienced adverse effects from the use of these products significant enough to warrant poison center or other health professional intervention; not all individuals who use/abuse such products call poison centers or visit emergency rooms.
- Nevertheless, the data are a good surrogate marker for rising use/abuse patterns and patterns of adverse medical outcomes associated with their use.
- For more information about the American Association of Poison Control Centers (AAPCC) data, please visit: <http://www.aapcc.org/data-system/>

Source: AAPCC Website Synthetic Cannabinoids Alert, Accessed via the Internet Archive (<https://web.archive.org/web/20170124040413/http://www.aapcc.org/alerts/synthetic-cannabinoids/>).

DC Fire and Emergency Medical Services (FEMS) Patient Cases

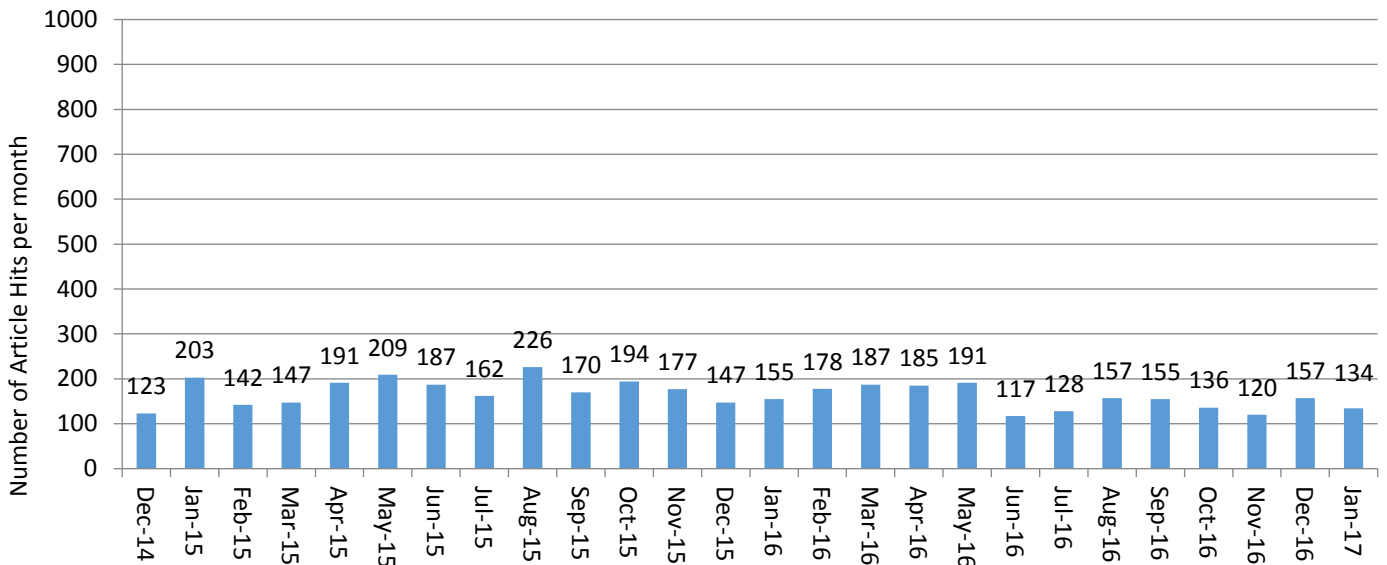
Figure 10: Suspected Synthetic Cannabinoid Patient Cases, by Month, April 2015-February 2017



Source: Adapted by the National Drug Early Warning System (NDEWS) Coordinating Center from data from the District of Columbia Fire and Emergency Medical Services Department

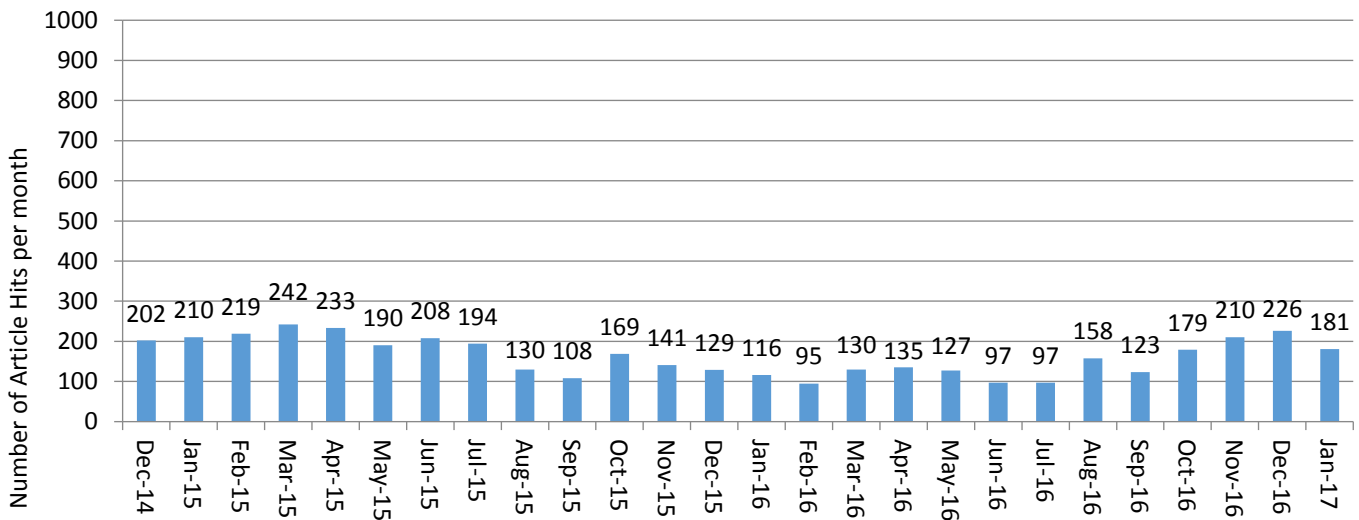
NDEWS News Scan Results

Figure 11: Newspaper Reports About Synthetic Cannabinoids, Dec. 2014 - Jan. 2017



NDEWS analysis of searches of the LexisNexis Academic ALLNEWS database for the terms "(synthetic w/1 cannabinoid) OR (synthetic w/1 marijuana) OR (synthetic w/1 cannabis) OR JWH OR (UR w/1 144) OR (XLR w/1 11) OR Chminaca OR Fubinaca OR Pinaca OR (PB w/1 22) OR THJ." The ALLNEWS database contains articles from more than 2,400 English-language newspapers and web news sources. Duplicates were removed with the "moderate similarity" filter in LexisNexis.

Figure 12: Newspaper Reports About Cathinones, Dec. 2014 - Jan. 2017



NDEWS analysis of searches of the LexisNexis Academic ALLNEWS database for the terms "(Bath w/1 salts) OR Cathinones OR mephedrone OR methylene OR MDPV OR ethylone OR (bk w/1 MDEA) OR flakka OR alpha-PVP OR (a w/1 PVP) OR Pentedrone OR Pentylone." The ALLNEWS database contains articles from more than 2,400 English-language newspapers and web news sources. Duplicates were removed with the "moderate similarity" filter in LexisNexis.

Note: Outbreaks of drug problems often come to public attention first via media reports. NDEWS conducts periodic reviews of published news articles and special scans for specific drugs. This graph represents a rough estimate of the number of news articles reporting on a drug or drug use issue. Not all newspapers and web news sources are catalogued in LexisNexis, and the sources may change at any time. Although a duplicate filter was used in the original LexisNexis search, duplicate articles may remain in the results. In addition, this is a count of articles not incidents, as many articles may report on the same incident.

Community Drug Early Warning System (CDEWS)

Figure 13: CDEWS Test Panels for Designer Stimulants and Synthetic Cannabinoids, 2017

| DESINER STIMULANT PANEL | |
|-------------------------|------------------------------|
| 1 | 25B-NBoMe |
| 2 | 25I-NBoMe |
| 3 | 25C-NBoMe |
| 4 | 2C-B |
| 5 | 2C-B-FLY |
| 6 | 2C-T |
| 7 | 2C-T-7 |
| 8 | 4-ANPP |
| 9 | 4-Fluoroamphetamine |
| 10 | 4-Fluoromethamphetamine |
| 11 | 4-Methylethcathinone (4-MEC) |
| 12 | 5-APDB/6-APDB |
| 13 | B-Methylphenethylamine |
| 14 | Bromo-DragonFLY |
| 15 | Buphedrone |
| 16 | Butylone |
| 17 | Benzylpiperazine |
| 18 | Cathinone |
| 19 | Dibutylone |
| 20 | Dimethylone |
| 21 | Methcathinone/Ephedrone |
| 22 | Ethylone |
| 23 | Eutylone |
| 24 | Flephedrone |
| 25 | MBDB |
| 26 | MDPV |
| 27 | a-PVP |
| 28 | Mephedrone |
| 29 | Methodrone |
| 30 | Methylone |
| 31 | Naphyrone |
| 32 | Pentedrone |
| 34 | Pentylone |

| | |
|----|---------------|
| 35 | Phenmetrazine |
| 36 | Phentermine |
| 37 | PMMA |

| SYNTHETIC CANNABINOID PANEL | |
|-----------------------------|------------------------------|
| 1 | JWH-018-5-COOH |
| 2 | JWH-019-6-OH |
| 3 | JWH-073-4-COOH |
| 4 | JWH-081-5-OH |
| 5 | JWH-122-5-OH |
| 6 | JWH-210-5-OH |
| 7 | JWH-250-5-OH |
| 8 | AM2201-4-OH |
| 9 | MAM-2201-5-COOH/JWH 122 COOH |
| 10 | RCS-4-5-COOH |
| 11 | UR-144-5-COOH |
| 12 | XLR-11-4-OH |
| 13 | AKB-48 COOH |
| 14 | 5F AKB-48 metabolite |
| 15 | BB-22 metabolite |
| 16 | PB-22 Carb Indole |
| 17 | 5F PB-22 Carb Indole |
| 18 | AB-PINACA |
| 19 | 5F AB PINACA |
| 20 | ADB-PINACA-5-COOH |
| 21 | ADBICA-5-COOH |
| 22 | AB-FUBINACA (Parent) |
| 23 | AB-CHMINACA (Parent) |
| 24 | AB-CHMINACA metab 4 |
| 25 | AB-CHMINACA metab 6 |
| 26 | ADB-FUBINACA (Parent) |

Note: Table includes cathinones, phenethylamines, amphetamines, and a piperazine

Figure 14: Mean Age of Persons Positive For Specific Drugs in Washington, DC Adult Parolees and Probationers for CDEWS-1 and CDEWS-2

| | CDEWS-1 (11/2012-3/2013) Average Age | | | CDEWS-2 ^a (12/2013-3/2014) Average Age | | |
|---|--|-----------|--------|---|-----------|--------|
| | (n) | \bar{x} | (SD) | (n) | \bar{x} | (SD) |
| Percent Positive by CDEWS Lab for: | | | | | | |
| Marijuana | (55) | 29.5 | (8.7) | (47) | 27.5 | (9.1) |
| Synthetic Cannabinoids | (45) | 28.1 | (7.6) | (67) | 30.8 | (9.2) |
| PCP | (19) | 32.8 | (5.4) | (16) | 31.6 | (6.3) |
| Codeine | (43) | 48.0 | (10.2) | (32) | 47.5 | (13.3) |
| Cocaine | (31) | 49.5 | (8.8) | (46) | 46.5 | (10.7) |
| Oxymorphone | (9) | 45.8 | (12.6) | (11) | 48.6 | (10.9) |
| Opiates | (50) | 47.8 | (10.7) | (45) | 48.0 | (12.1) |
| Oxycodone | (9) | 45.1 | (12.6) | (13) | 47.5 | (12.6) |
| Morphine | (45) | 48.5 | (10.3) | (40) | 50.4 | (9.6) |
| Buprenorphine | (25) | 46.2 | (11.8) | (12) | 52.0 | (12.5) |
| Methadone | (24) | 50.6 | (8.6) | (15) | 53.1 | (6.8) |

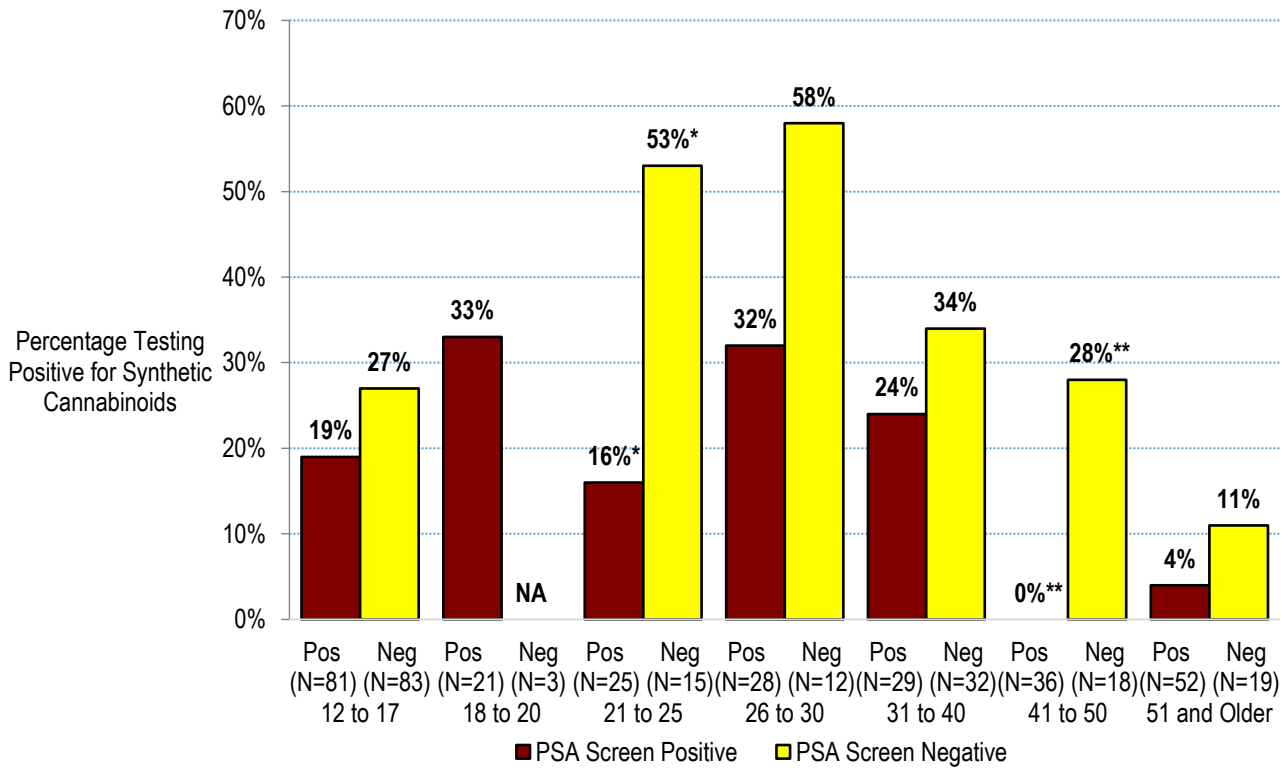
^aTo make the PSA positive specimens from CDEWS-2 comparable to those from CDEWS-1, the 30 amphetamine positive specimens oversampled in CDEWS-2 were omitted from this table.

Note: This table only includes drugs for which there were a minimum of 9 positive specimens.

Source: Center for Substance Abuse Research (CESAR), Community Drug Early Warning System (CDEWS-2), March 2015.

Figure 15: Percentage of Specimens for Adult Male DC Parolees/Probationers and Juvenile Males Testing Positive* for Synthetic Cannabinoids, by PSA Drug Screening Result and Age, 2014

(N=453)‡



*Positive specimens from the DC parole and probation sample were weighted due to oversampling of amphetamine positive specimens. See the DC Adult Parolees and Probationers results section of the full report.

‡The sum of all categories adds up to 454 because data are weighted resulting in some rounding effects.

*p<.05 by Fisher's exact test; **p<.01 by Fisher's exact test.

Note: PSA positive specimens were oversampled. Therefore, separate estimates for the "PSA Screen Positive" and "PSA Screen Negative" groups should not be averaged to create an overall estimate.

Source: Center for Substance Abuse Research (CESAR), Community Drug Early Warning System (CDEWS-2), March 2015.

Figure 16: Metabolites Identified in SC Positive Specimens from Washington, DC, CDEWS-1, CDEWS-2, and CDEWS-3 Studies

| | CDEWS-1 Adult Parole & Probation Population (11/2012-3/2013; N=45) | CDEWS-2 Adult Parole & Probation Population (12/2013-3/2014; N=67) [^] | CDEWS-3 Adult Parole & Probation Population (8/2015-10/2015; N=31) [^] |
|--|---|--|--|
| Percentage Positive by CDEWS Lab For: | | | |
| UR-144 | 91%*** | 99%*** | √ |
| XLR-11 | 40%*** | 5%*** | √ |
| JWH-018 | 7% | 0% | Not Detected |
| JWH-073 | 2% | 0% | Not Detected |
| AB-PINACA | Not Tested | 0%*** | √ |
| 5F-PB-22 | Not Tested | 10%*** | √ |
| PB-22 | Not Tested | 40%** | √ |
| 5F-AB-PINACA | Not Tested | 0%* | √ |
| ADB-PINACA | Not Tested | 0% | √ |
| AKB-48 | Not Tested | 2% | Not Detected |
| AB-CHMINACA (metab 4) | Not Tested | Not Tested | √ |
| AB-CHMINACA (Parent) | Not Tested | Not Tested | √ |
| ADB-FUBINACA (Parent) | Not Tested | Not Tested | √ |
| AB-CHMINACA (metab 6) | Not Tested | Not Tested | √ |
| AB-FUBINACA (Parent) | Not Tested | Not Tested | √ |

[^]To make the PSA positive specimens from CDEWS-2 and CDEWS-3 comparable to those from CDEWS-1, the amphetamine positive specimens oversampled in CDEWS-2 and CDEWS-3 were omitted from this table.

*p<.05 by chi-square or Fisher's exact test.

**p<.01 by chi-square or Fisher's exact test.

***p<.001 by chi-square or Fisher's exact test.

√ = substance found in at least one specimen; actual percentages can be provided after full report is released

Source: Center for Substance Abuse Research (CESAR), Community Drug Early Warning System (CDEWS-2), March 2015, and CDEWS-3.

Figure 17: Metabolites Found In All Synthetic Cannabinoid Positive Specimens, By CDEWS-2 Population

| | Adult Parole & Probation – Washington, DC (N=70)*† | Juvenile Family Court – Washington, DC (N=38)^ | Adult Drug Court – Denver, CO (N=19)*‡ | Juvenile Assessment Center – Tampa, FL (N=10)* |
|---|--|--|--|--|
| (Dates SC positives collected) | (12/5/13-3/18/14) | (5/21/14-7/30/14) | (8/25/13-2/12/14) | (9/20/14-10/31/14) |
| Metabolites Detected | | | | |
| UR-144 | 99% | 71% | 53% | 100% |
| PB-22 | 41 | 5 | 37 | 0 |
| 5F-PB-22 | 13 | 21 | 21 | 0 |
| XLR-11 | 4 | 26 | 11 | 0 |
| AKB-48 | 1 | 0 | 0 | 0 |
| MAM-2201± | 0 | 0 | 32 | 0 |
| JWH-018 | 0 | 3 | 32 | 0 |
| JWH-122 | 0 | 0 | 21 | 0 |
| JWH-073 | 0 | 3 | 11 | 0 |
| AB-PINACA | 0 | 13 | 5 | 0 |
| ADBICA± | 0 | 0 | 5 | 0 |
| 5F-AB-PINACA± | 0 | 3 | 0 | 0 |
| Number of Above Metabolites (of 12) Detected | | | | |
| 1 | 57% | 68% | 63% | 100% |
| 2 | 30 | 24 | 11 | 0 |
| 3+ | 13 } 43% | 8 } 32% | 26 } 37% | 0 |
| Total | 100% | 100% | 100% | 100% |

*Positive specimens were oversampled, therefore these results may not be representative of the general parolee/probationer or drug court populations.

†70 positive for SC of 319 specimens.

^38 positive for SC of 194 specimens.

‡19 positive for SC of 294 specimens.

±10 positive for SC of 218 specimens.

±These metabolites have not yet been scheduled by the DEA as of January 2015.

Source: Center for Substance Abuse Research (CESAR), Community Drug Early Warning System (CDEWS-2), March 2015.