

The DAWN Report

December 4, 2012

Drug-Related Emergency Department Visits Involving Synthetic Cannabinoids

Synthetic cannabinoids are substances that are designed to affect the body in a manner similar to marijuana but that are not derived from the marijuana plant.¹ Because they can be purchased with no age restrictions, their popularity among young people has grown.²

Synthetic cannabinoids are known by a variety of names, such as “Spice” or “K2,” and sometimes are referred to as “synthetic marijuana” or “fake marijuana” because they are marketed with claims that their effects mimic those of marijuana. Synthetic cannabinoids are typically sprayed onto herbal products, many of which are listed as inactive on the product packaging.²

Although certain synthetic cannabinoids and/or specific chemicals contained in these preparations were made illegal in some States, a comprehensive national ban was not enacted until July 2012.³ Therefore, products containing synthetic cannabinoids were frequently marketed as “legal” and “not for human consumption” and could be purchased online and in legal retail outlets such as convenience stores.¹

Because products marketed as synthetic cannabinoids contain different ingredients from each other, it is difficult to identify which physical effects are caused by synthetic cannabinoids.⁴ They have been reported to cause agitation, anxiety, nausea, vomiting, tachycardia, elevated blood pressure, tremor, seizures, hallucinations, paranoid behavior, and nonresponsiveness.^{2,5} These products are relatively new, and related clinical and public health outcomes have not been fully examined. Synthetic cannabinoids are not currently identified using routine screening tests, and the creation of new products of this type makes it difficult to detect these chemicals or regulate these products.

The Drug Abuse Warning Network (DAWN) first detected a measurable number of emergency department (ED) visits involving synthetic cannabinoids in 2010, and this report presents data related to these visits.⁶ DAWN is a public health surveillance system that monitors drug-related ED visits in the United States. To be a DAWN



IN BRIEF

In 2010, an estimated 11,406 emergency department (ED) visits involved a synthetic cannabinoid product, sometimes referred to as “synthetic marijuana” and commonly known by street names such as “Spice” or “K2”

Three fourths of these ED visits involved patients aged 12 to 29 (75 percent), of which 78 percent were male

The majority (76 percent) of these ED visits did not receive follow-up care upon discharge from the ED

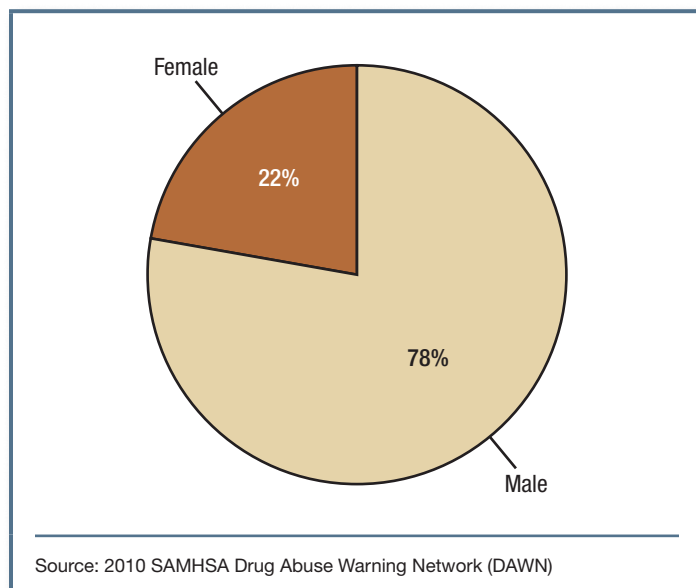
case, an ED visit must have involved a drug, either as the direct cause of the visit or as a contributing factor.

Of the approximately 2,300,000 ED visits that involved drug misuse or abuse in 2010, synthetic cannabinoids were specifically linked to an estimated 11,406 visits. This issue of *The DAWN Report* examines ED visits involving synthetic cannabinoid products in 2010 among patients aged 12 to 29. The report focuses on this age group because ED visits involving synthetic cannabinoids are concentrated in this age range (8,557 visits, or 75 percent of all visits involving synthetic cannabinoids, were made by patients aged 12 to 29 in 2010).

Gender and Age

For patients aged 12 to 29, males made more than three quarters (78 percent) of ED visits involving synthetic cannabinoids in 2010 (Figure 1). The rates of visits per 100,000 population for patients aged 12 to 17, 18 to 20, and 21 to 24 were similar (14.9, 13.9, and 11.8 visits per 100,000 population, respectively) (Table 1). However, the rate for those aged 25 to 29 (4.1 visits per 100,000 population) was lower than those for patients aged 12 to 17 (14.9 visits per 100,000 population) and those aged 18 to 20 (13.9 visits per 100,000 population).

Figure 1. Emergency Department (ED) Visits Involving Synthetic Cannabinoids among Patients Aged 12 to 29, by Gender: 2010



Drug Combinations

In the majority (59 percent) of ED visits involving synthetic cannabinoids for patients aged 12 to 29, no other substances were involved (Figure 2). This differs from ED visits involving other illicit drugs or nonmedical use of pharmaceuticals, in which the majority of visits involved multiple drugs.⁷ Synthetic cannabinoids were used in combination with one other substance in 36 percent of visits related to their use, but were rarely used in combination with two or more substances (6 percent). The types of drugs most frequently used in combination with synthetic cannabinoids were marijuana (17 percent), pharmaceuticals (17 percent), and alcohol (13 percent).

Disposition of ED Visits

Among ED visits involving synthetic cannabinoids made by patients aged 12 to 29 in 2010, it appears that the majority (76 percent) did not receive follow-up care (admission to the hospital, transfer to another health care facility, or referral to a detoxification/treatment program). Most of the 2,077 visits resulting in follow-up care involved synthetic cannabinoids in combination with other substances (75 percent).

Table 1. Emergency Department (ED) Visits Involving Synthetic Cannabinoids among Patients Aged 12 to 29, by Age Group: 2010

Age Group	Estimated Number of ED Visits	Rate per 100,000 Population*
Total, Aged 12 to 29	8,557	11.1
Aged 12 to 17	3,780	14.9
Aged 18 to 20	1,881	13.9
Aged 21 to 24	2,022	11.8
Aged 25 to 29	873	4.1

* Rates take into consideration the population size of each group; therefore, groups of different sizes may have varying numbers of ED visits but have similar population rates.

Source: 2010 SAMHSA Drug Abuse Warning Network (DAWN).

Synthetic Cannabinoids Compared with Marijuana-Related ED Visits

Because synthetic cannabinoids have been marketed as a legal alternative to marijuana, this section will provide a brief comparison of the patient characteristics of ED visits between marijuana and synthetic cannabinoids. Marijuana-related ED visits outnumber synthetic cannabinoid-related visits (461,028 vs. 11,406 visits). The average patient age for marijuana-related visits was 30 years and the average patient age for synthetic cannabinoid-related visits was 24 years. The age distribution also differed between the two drugs. Synthetic cannabinoid-related visits were concentrated in the younger age groups: 75 percent of the visits involved patients aged 12 to 29, with 33 percent of the patients aged 12 to 17. In comparison, 58 percent of marijuana-related visits involved patients aged 12 to 29, with 12 percent in the 12 to 17 age group (Figure 3).

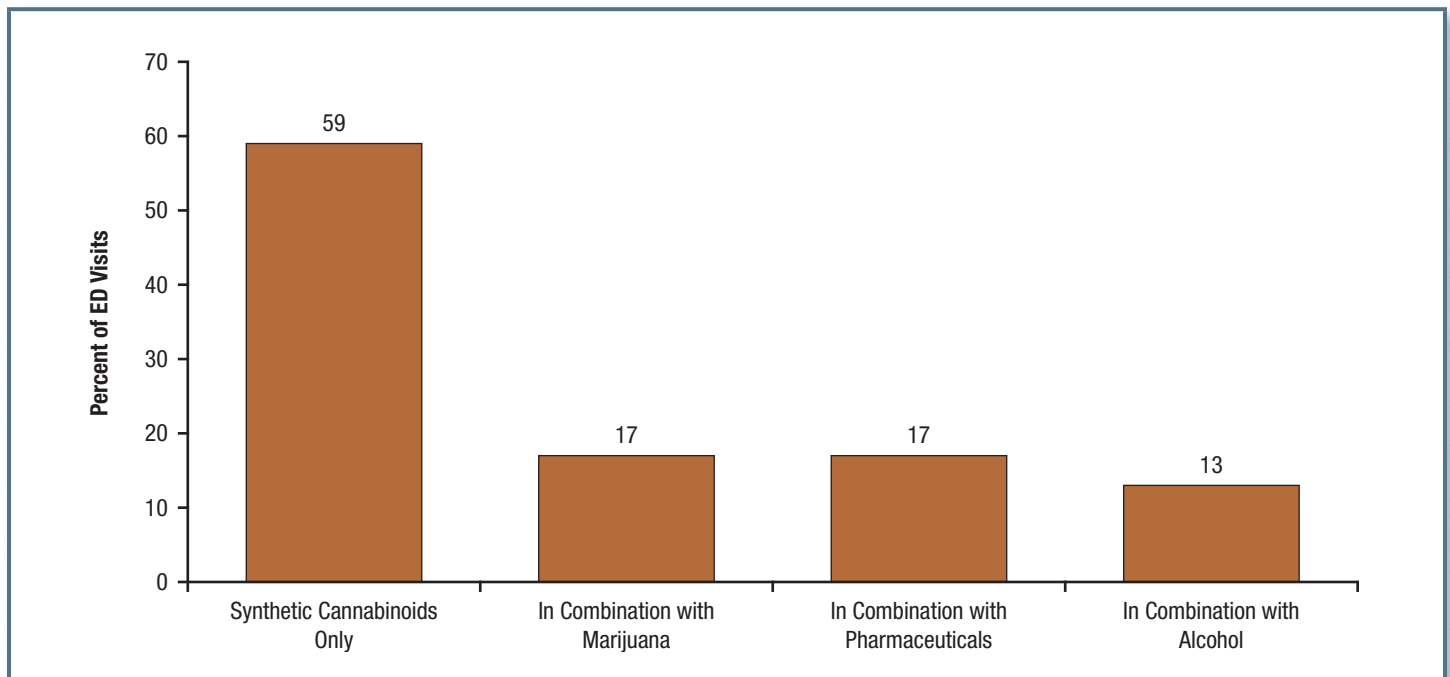
When patients in the 12 to 29 age range were compared, synthetic cannabinoid-related ED visits

were more likely to involve male patients than were marijuana-related visits (78 vs. 66 percent) (Figure 4). Further, synthetic cannabinoids were more likely to be the only drug implicated in the visit, whereas marijuana was more frequently combined with other drugs (59 vs. 31 percent, respectively; data not shown).

Discussion

As synthetic cannabinoids have become more available, the number of ED visits involving synthetic cannabinoids has increased. The higher proportion of ED visits in younger age groups, especially in patients aged 12 to 17, combined with results from a national survey of high school seniors revealing that 11 percent reported using “synthetic marijuana” in 2011, is cause for concern.⁸ Because it is difficult to regulate these products that are easily available online, synthetic cannabinoids may be more accessible to young people than marijuana.⁹ Educators can help prevent use of synthetic cannabinoids by addressing use of these

Figure 2. Emergency Department (ED) Visits Involving Synthetic Cannabinoids Only or in Combination with Other Substances* among Patients Aged 12 to 29: 2010



* Because multiple drugs may be involved in each visit, percentages add to more than 100 percent.

Source: 2010 SAMHSA Drug Abuse Warning Network (DAWN).

substances in programs designed to prevent use of illicit drugs. Parents can also discuss the dangers of these drugs with their children and use parental controls for online purchases.

Because of limited availability of tests for synthetic cannabinoids, data collection efforts in the ED may have missed visits in which they were involved. However, even in the absence of positive drug test results, health care providers can remain alert to symptoms that may be attributed to synthetic cannabinoids and, when appropriate, inquire about their use.⁴ Further monitoring will be necessary to determine whether synthetic cannabinoid-related health problems continue to be reported. This monitoring can help improve awareness among health care professionals of the possible adverse health effects of these substances. Because most synthetic cannabinoid-related ED visits result in discharge from the ED, a patient's time in the ED is a valuable opportunity for intervention and education.

Figure 4. Emergency Department (ED) Visits Involving Synthetic Cannabinoids Compared with Visits Involving Marijuana among Patients Aged 12 to 29, by Gender*: 2010

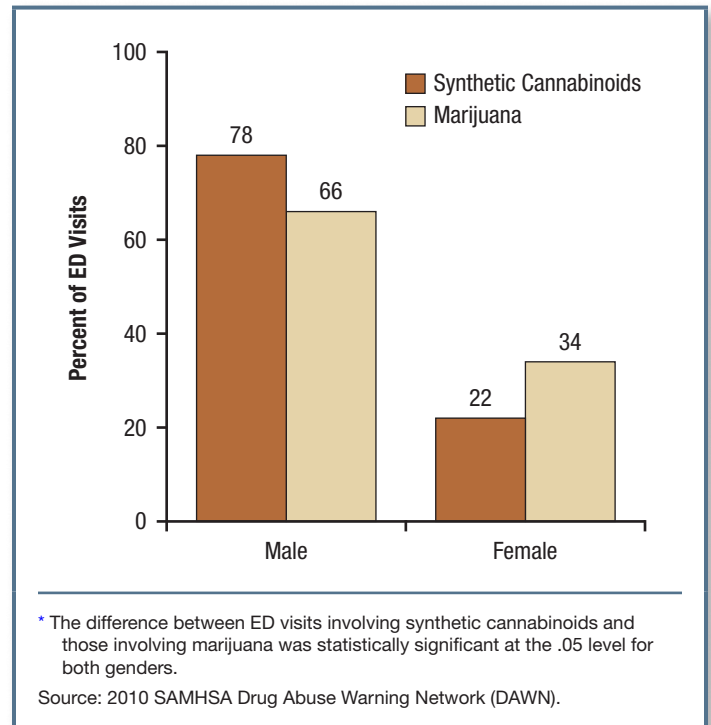
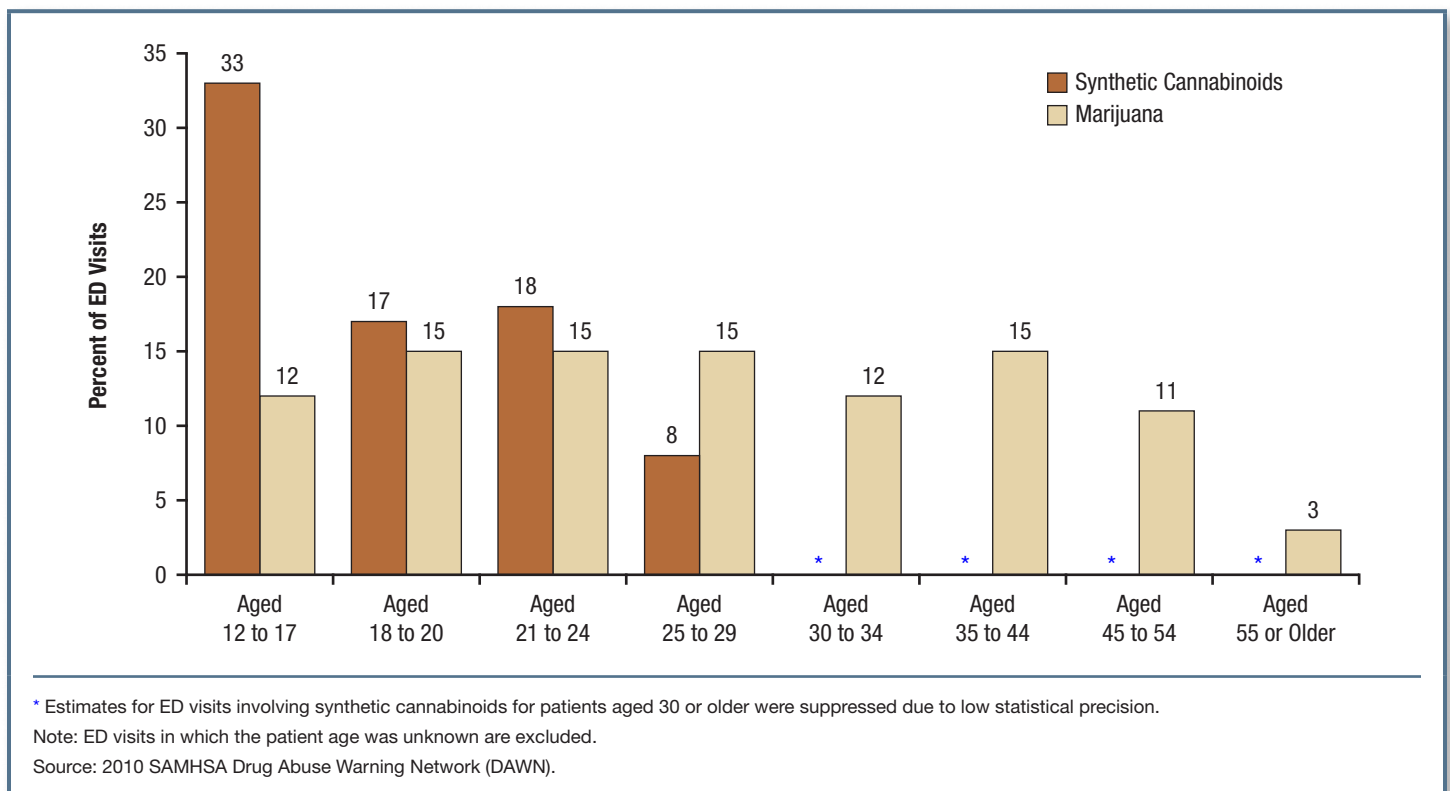


Figure 3. Age Distribution of Synthetic Cannabinoid and Marijuana-Related Emergency Department (ED) Visits: 2010



End Notes

1. Office of National Drug Control Policy. (2012). *Fact Sheet: Synthetic drugs (a.k.a. K2, Spice, bath salts, etc.)*. Retrieved from <http://www.whitehouse.gov/ondcp/ondcp-fact-sheets/synthetic-drugs-k2-spice-bath-salts>
2. Drug Enforcement Agency (DEA). (2012). *Drug fact sheet: K2 or Spice*. Retrieved from http://www.justice.gov/dea/druginfo/drug_data_sheets/K2_Spice.pdf
3. Food and Drug Administration Safety and Innovation Act, Title XI—Other provisions, subtitle D—Synthetic drugs. S. 3187. IX.D § 1151-1154 (2012).
4. Seely K. A., Lapoint, J., Moran, J. H., & Fattore L. (2012, April 26). Spice drugs are more than harmless herbal blends: A review of the pharmacology and toxicology of synthetic cannabinoids. *Progress in Neuro-Psychopharmacology and Biological Psychiatry*. Advance online publication. doi:10.1016/j.pnpbp.2012.04.017
5. Fattore, L., & Fratta, W. (2011). Beyond THC: The new generation of cannabinoid designer drugs. *Frontiers in Behavioral Neuroscience*, 5(60), 1-12.
6. Synthetic cannabinoids were reported to DAWN under the following names: Spice, K2, K2 Incense, K2 Joint, K2 Spice, K2 Spice Incense, K2 Summit, K2 Synthetic Marijuana, Black Mamba, Blaze Incense, Cloud 9, Damiana Leaf, JWH-018, JWH-250, Serenity Now Herbal Incense, Spike99 Ultra, Synthetic Cannabis, Synthetic Marijuana, and Wicked XXX Herbal Incense.
7. Substance Abuse and Mental Health Services Administration, Center for Behavioral Statistics and Quality. (2012, July 12). *The DAWN Report: Outcomes of drug-related emergency department visits associated with polydrug use*. Rockville, MD.
8. University of Michigan News Service. (2011). *Marijuana use continues to rise among U.S. teens, while alcohol use hits historic lows* [Press release]. Retrieved from <http://www.monitoringthefuture.org/pressreleases/11drugpr.pdf>
9. United Nations Office on Drugs and Crime. (2011). Synthetic cannabinoids in herbal products. Retrieved from http://www.unodc.org/documents/scientific/Synthetic_Cannabinoids.pdf

Suggested Citation

Substance Abuse and Mental Health Services Administration, Center for Behavioral Health Statistics and Quality. (December 4, 2012). *The DAWN Report: Drug-Related Emergency Department Visits Involving Synthetic Cannabinoids*. Rockville, MD.

The Drug Abuse Warning Network (DAWN) is a public health surveillance system that monitors drug-related morbidity and mortality. DAWN uses a probability sample of hospitals to produce estimates of drug-related emergency department (ED) visits for the United States and selected metropolitan areas annually. DAWN also produces annual profiles of drug-related deaths reviewed by medical examiners or coroners in selected metropolitan areas and States.

Any ED visit related to recent drug use is included in DAWN. All types of drugs—licit and illicit—are covered. Alcohol involvement is documented for patients of all ages if it occurs with another drug. Alcohol is considered an illicit drug for minors and is documented even if no other drug is involved. The classification of drugs used in DAWN is derived from the Multum *Lexicon*, copyright 2010 Lexi-Comp, Inc., and/or Cerner Multum, Inc. The Multum Licensing Agreement governing use of the *Lexicon* can be found at <http://www.samhsa.gov/data/DAWN.aspx>.

DAWN is one of three major surveys conducted by the Substance Abuse and Mental Health Services Administration's Center for Behavioral Health Statistics and Quality (SAMHSA/CBHSQ). For more information on other CBHSQ surveys, go to <http://www.samhsa.gov/data/>. SAMHSA has contracts with Westat (Rockville, MD) and RTI International (Research Triangle Park, NC) to operate the DAWN system and produce publications.

For publications and additional information about DAWN, go to <http://www.samhsa.gov/data/DAWN.aspx>.



U.S. DEPARTMENT OF HEALTH & HUMAN SERVICES
Substance Abuse & Mental Health Services Administration
Center for Behavioral Health Statistics and Quality
www.samhsa.gov/data