

Drug Abuse Warning Network, 2008: National Estimates of Drug-Related Emergency Department Visits

**U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
Substance Abuse and Mental Health Services Administration
Center for Behavioral Health Statistics and Quality**

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HIGHLIGHTS

This publication presents national estimates of drug-related visits to hospital emergency departments (EDs) for 2008, based on data from the Drug Abuse Warning Network (DAWN). Also presented are comparisons of 2008 estimates with those for 2004, 2006, and 2007. DAWN is a public health surveillance system that monitors drug-related ED visits for the Nation and for selected metropolitan areas. DAWN estimates pertain to the entire United States, including Alaska, Hawaii, and the District of Columbia. The Substance Abuse and Mental Health Services Administration (SAMHSA) is the agency responsible for DAWN. SAMHSA is required to collect data on drug-related ED visits under section 505 of the Public Health Service Act.

DAWN relies on a sample of general, non-Federal hospitals operating 24-hour EDs. The sample is national in scope, with oversampling of hospitals in selected metropolitan areas. In each participating hospital, ED medical records are reviewed retrospectively to find the ED visits that involved recent drug use. All types of drugs—illegal drugs, prescription and over-the-counter pharmaceuticals (e.g., dietary supplements, cough medicine), and substances inhaled for their psychoactive effects—are included. Alcohol is considered a reportable drug when consumed by patients younger than 21. For patients aged 21 or older, though, alcohol is reported only when it is used in conjunction with other drugs.

All drug-related ED visits

In 2008, over 118 million ED visits were made to general-purpose hospitals in the United States; DAWN estimates that over 4.3 million (4,383,494)¹ ED visits were associated with drug use, misuse, or abuse. The number of drug-related visits has increased by over 70 percent from 2004 through 2008. This increase reflects jumps seen in the number of drug-related ED visits involving adverse reactions, accidental drug ingestions, and misuse or abuse of prescription drugs and over-the-counter medications.

Drug misuse or abuse

In 2008, DAWN estimates that about 2 million (1,999,861) ED visits resulted from medical emergencies involving drug misuse or abuse. That is the equivalent of more than 650 ED visits per year per 100,000 population.

¹ Because DAWN is based on a probability sample, there is a margin of error around estimates. For example, the 95 percent confidence interval around the estimate of 4,383,494 drug-related ED visits is 3,847,852 to 4,919,137.

Of the 2 million visits associated with drug misuse or abuse in 2008,

- 33.2 percent involved nonmedical use of pharmaceuticals only,
- 25.5 percent involved illicit drugs only,
- 11.5 percent involved illicit drugs with alcohol,
- 10.4 percent involved pharmaceuticals with alcohol,
- 8.4 percent involved illicit drugs with pharmaceuticals,
- 6.6 percent involved alcohol only in patients younger than 21, and
- 4.3 percent involved illicit drugs with pharmaceuticals plus alcohol.

Although the overall number of ED visits attributable to drug misuse or abuse was stable from 2004 to 2008, increases were seen in ED visits involving nonmedical use of pharmaceuticals with no other drug involvement (97% increase), pharmaceuticals with illicit drugs (60% increase), and pharmaceuticals with alcohol (50% increase).

Illicit drugs

For 2008, DAWN estimates that 993,379 ED visits involved an illicit drug. That is, about half (49.7%) of all the drug misuse or abuse ED visits during the year involved one or more illicit drugs taken alone or in combination with pharmaceuticals, alcohol, or both. Considering just visits for illicit drug involvement:

- Cocaine was involved in 482,188 ED visits, or 48.5 percent of visits involving illicit drugs.
- Marijuana was involved in 374,435 ED visits, or 37.7 percent.
- Heroin was involved in 200,666 ED visits, or 20.2 percent.
- Stimulants, including amphetamines and methamphetamine, were involved in 91,939 ED visits, or 9.3 percent.
- Other illicit drugs, such as MDMA (Ecstasy), GHB, flunitrazepam (Rohypnol), ketamine, PCP, LSD, other hallucinogens, and psychoactive inhalants were each involved in less than 4 percent of the visits involving illicit drugs.

For each 100,000 persons in the U.S. population, over the course of 2008, there were just under 160 ED visits (158.6) resulting from medical emergencies involving cocaine. This is followed by marijuana (123.1 ED visits per 100,000 population), heroin (66.0), methamphetamine (21.8), PCP (12.3), and amphetamines (10.4). Lower-incidence drugs had rates below 6 visits per 100,000 population. The rate of cocaine involvement was highest for patients aged 35 to 44 (358.7), heroin was highest for those aged 25 to 29 (155.5), and marijuana was highest for those aged 18 to 20 (467.0). Rates of stimulant involvement were more even across the age range of 18 to 44. For visits involving cocaine, heroin, or marijuana, rates were higher for males than females. A little over 40 percent (42.7%) of the patients had some type of follow-up care (i.e., referral to detoxification services, admission to the hospital, or transfer to another facility); most other patients were treated and released.

The level of ED visits involving illicit drugs from 2004 to 2008 appeared stable for cocaine, marijuana, and heroin. However, in the shorter term, ED visits involving cocaine decreased 13 percent from 2007 to 2008. MDMA (Ecstasy) saw an uptick when 2004 and 2008 were compared. This increase does not appear to be a trend, though, as levels of MDMA involvement in the intervening years fluctuated widely. The involvement of stimulants (i.e., amphetamines and methamphetamine) decreased consistently from 2004 to 2007 and remained steady in 2008 at about 90,000 visits. That is about 70,000 fewer visits than seen in 2004.

Drugs and alcohol taken together

Illicit drugs, often in combination with other illicit drugs or pharmaceuticals, were involved in well over half (60.1%) of ED visits involving alcohol and other drugs. One or more pharmaceuticals were also involved in over half (56.2%) of these visits. Drugs for insomnia and anxiety were involved in 24.5 percent of visits, with the largest part of that being benzodiazepines (20.7%). Pain relievers were involved in 22.1 percent of visits, with narcotic pain relievers accounting for over half of that (13.7%). Psychotherapeutic agents (e.g., antidepressants, antipsychotics) were involved in under 10 percent of such visits.

The rate of ED visits per 100,000 population for males (217.1) was higher than that for females (128.5). Rates by age group showed a general pattern of being lower for those under 18 or over 54 and higher for those aged 18 to 54; they were highest of all for those aged 35 to 54.

Almost half (49.0%) of the patients received some sort of follow-up treatment. Nearly a third (30.9%) of patients were admitted to the hospital, 11.2 percent were transferred to another health care facility, and 6.8 percent were referred to a detoxification program.

From 2004 to 2008, no significant increases or decreases were found in the number of ED visits involving alcohol taken in combination with other drugs or alone.

Alcohol use by youth and young adults

In 2008 for youth and young adults (patients aged 12 to 17 and 18 to 20, respectively), 56,727 ED visits involved drugs taken with alcohol; 132,254 ED visits, or about twice as many, involved the use of alcohol alone. Alcohol use, with and without other drugs, increased markedly between these two age groups. The rate of medical emergencies involving use of drugs with alcohol was 78.9 visits per 100,000 youth compared with 286.3 visits for young adults, almost a fourfold increase. The rate of ED visits involving alcohol used alone was 220.7 visits per 100,000 for youth and 596.3 visits for young adults, almost a threefold increase.

Although there were some short-term drops in the number of visits involving alcohol and other drugs for 12- to 17-year-olds between 2006 and 2008, these drops merely offset increases seen in 2006; 2008 levels were similar to those found in 2004 and 2005.

Nonmedical use of pharmaceuticals

For 2008, DAWN estimates that 971,914 ED visits involved nonmedical use of prescription or over-the-counter pharmaceuticals or dietary supplements. Slightly more than half (52.9%) of these visits involved multiple drugs, and 18.8 percent involved alcohol. The rate of nonmedical use of pharmaceuticals did not differ between males and females. Most patients (60.5%) were treated and released after their ED visits.

Central nervous system agents were present in 73.9 percent of visits involving misuse or abuse of pharmaceutical drugs. Pain relievers were involved in 47.1 percent of visits, with 31.5 percent being narcotic pain relievers. The most frequently involved narcotic pain relievers were oxycodone and hydrocodone.

Drugs to treat insomnia and anxiety (anxiolytics, sedatives, and hypnotics) were involved in a third (33.4%) of visits associated with nonmedical use of pharmaceuticals, with the largest portion of these being benzodiazepines. Alprazolam was the most common type of benzodiazepine involved and was present in over 100,000 visits.

Medical emergencies related to nonmedical use of pharmaceuticals increased 81 percent in the period from 2004 to 2008, going from just over a half million visits (536,247 visits) to almost a million (971,914 visits). Contributing to that increase are significant long-term (2004 to 2008) increases in the number of visits involving narcotic pain relievers that jumped by 111 percent, or over 160,000 visits. Specific drugs with increases over 100 percent were fentanyl, hydrocodone, hydromorphone, morphine, and oxycodone.

Drug-related suicide attempts

DAWN estimates that there were almost 200,000 (199,469) medical emergencies for drug-related suicide attempts in 2008. Females were more likely than males to be seen in the ED for a drug-related suicide attempt (76.6 visits per 100,000 population compared with 53.9). Rates are highest for those aged 18 to 20 (141.0 visits per 100,000 population). Nearly two thirds (64.0%) of ED visits for drug-related suicide attempts involved multiple drugs. Almost all (94.6%) involved a prescription drug, over-the-counter medication, or other pharmaceutical. Over two thirds (71.7%) involved central nervous system agents, which were split between pain relievers (37.3%), benzodiazepines (28.0%), and other drugs to treat insomnia and anxiety (14.2%). Just under a third (29.4%) involved psychotherapeutic agents (e.g., antidepressants, antipsychotics) or alcohol (29.9%); almost a fifth (18.4%) involved illicit drugs.

After the ED visits, few patients (19.7%) were just treated and released. Most (78.2%) received some sort of follow-up care (e.g., transfer to another facility, admittance to the hospital, or referral to a detox program).

Overall, the level of ED visits for drug-related suicide attempts was stable from 2004 through 2008. Increases were seen in ED visits involving narcotic pain relievers, benzodiazepines, and other drugs to treat insomnia and anxiety, though. Involvement of narcotic pain relievers rose 58 percent, with hydrocodone rising 66 percent and oxycodone rising 64 percent. Benzodiazepines increased 51 percent, with alprazolam rising 87 percent. Other anxiolytics rose 68 percent, with zolpidem rising 119 percent.

Seeking detox services

DAWN estimates 177,879 drug-related ED visits in 2008 by patients seeking detox or substance abuse treatment services. Males were more likely than females to seek detox services through the ED (74.6 visits per 100,000 population compared with 42.8 visits).

Cocaine was observed in 38.7 percent of visits, heroin in 29.2 percent, marijuana in 18.5 percent, and stimulants in 7.0 percent. Among pain relievers, narcotic pain relievers were observed in 32.9 percent of visits, including oxycodone in 19.3 percent, hydrocodone in 12.1 percent, and methadone in 5.6 percent. Benzodiazepines were observed in 23.4 percent of visits. Alcohol involvement was noted in 36.6 percent of detox visits. Almost three quarters (73.0%) of visits where patients were seeking detox services involved multiple drugs.

About half (47.1%) of the ED patients classified as seeking detox were treated and released and just under half (20.9%) of those patients were referred to detox or treatment services. Another 20.3 percent were admitted to the chemical dependency/detox unit of the hospital, and 17.5 percent were admitted to other units within the hospital. A little less than 10 percent (7.5%) were transferred to another facility. In total, 66.1 percent of patients had some form of follow-up.

Overall, the number of patients seeking detox services through the ED was relatively stable from 2004 through 2008.

INTRODUCTION

This publication presents estimates of drug-related emergency department (ED) visits from the Drug Abuse Warning Network (DAWN) for 2008, with comparison of estimates for 2004, 2006, and 2007. DAWN is a public health surveillance system that monitors drug-related ED visits for the Nation and for selected metropolitan areas. The Center for Behavioral Health Statistics and Quality (CBHSQ) of the Substance Abuse and Mental Health Services Administration (SAMHSA), U.S. Department of Health and Human Services, has been responsible for DAWN operations since 1992.

This introduction provides a brief description of the major features of DAWN and the statistics presented in this report. Findings are organized in six sections following this Introduction. Each section focuses on a specific type of ED visit. Appendix B: Glossary of DAWN Terms and Appendix C: 2008 DAWN Methodology provide additional detail on the collection and analysis of the 2008 DAWN data, including response rates.

Major features of DAWN

What is a DAWN case?

A DAWN case is any ED visit involving recent drug use that is implicated in the ED visit. The relationship between the ED visit and the drug use need not be causal. That is, implicated drugs may or may not have directly caused the condition generating the ED visit. The reason a patient used a drug is not part of the criteria for considering a visit to be drug related. These criteria broadly encompass all types of drug-related events, including accidental ingestion and adverse reaction, as well as explicit drug abuse. DAWN does not report current medications (i.e., medications and pharmaceuticals taken regularly by the patient as prescribed or indicated) that are unrelated to the ED visit.

What drugs are included in DAWN?

DAWN collects data on all types of drugs, including

- illegal drugs, such as heroin, cocaine, marijuana, and Ecstasy;
- prescription drugs, such as Prozac[®], Vicodin[®], Oxycontin[®], alprazolam, and methylphenidate;
- over-the-counter medications, such as aspirin, acetaminophen, ibuprofen, and multi-ingredient cough and cold remedies;
- dietary supplements, such as vitamins, herbal remedies, and nutritional products;
- anesthetic gases;
- substances that have psychoactive effects when inhaled;
- alcohol when used in combination with other drugs (all ages); and
- alcohol alone (only for patients aged 20 and younger).

What is covered in this publication?

This publication focuses primarily on ED visits involving drug misuse or abuse. Seven categories of ED visits associated with drug misuse or abuse are highlighted in this publication:

- overall drug misuse or abuse,
- illicit drugs used alone or in combination with other drugs,
- alcohol used in combination with other drugs (all ages),
- underage drinking (alcohol use by persons aged 20 and younger),
- nonmedical use of pharmaceuticals,
- drug-related suicide attempts, and
- patients seeking detox services.

Drug misuse or abuse is an overarching category that includes all ED visits involving drug misuse or abuse. Visits involving the use of illicit drugs are singled out for analysis because they involve substances that are generally illegal and, by definition, constitute substance abuse. Visits involving alcohol used in combination with other drugs are analyzed as a group to better understand the interactive effects of alcohol and drugs on morbidity. ED visits involving underage drinking are studied as an important barometer of dangerous drinking patterns in youths. Nonmedical use of pharmaceuticals refers to ED visits related to the misuse or abuse of prescription or over-the-counter medications or dietary supplements. This might result from taking a higher-than-prescribed or -recommended dose of a pharmaceutical (i.e., contrary to directions or labeling), taking a pharmaceutical prescribed for another individual, being maliciously poisoned by another individual, and abusing pharmaceuticals. Drug-related suicide attempts involve drug overdoses as well as suicide attempts by other means (e.g., by gun) if drugs were involved. “Seeking detox” includes various situations such as nonemergency requests for admission for detox, visits to obtain medical clearance before entry to a detox program, and acute emergencies in which an individual is in distress (i.e., displaying active withdrawal symptoms) and seeking detox.

These categories are defined by drug and type of case as shown in Table C3 in Appendix C. Note that the categories are not mutually exclusive.

Hospital participation in 2008

For 2008, 231 hospitals submitted data that were used for estimation. The overall weighted response rate was 32.9 percent. For the 13 oversampled metropolitan areas and divisions, the individual response rates ranged from 26.8 percent in the Houston metropolitan area to 83.1 percent in the Detroit metropolitan area.²

DAWN cases are found through a retrospective review of medical records in participating hospitals. Across all participating hospitals in 2008, 9.8 million charts were reviewed to find the drug-related

² Table C1 in Appendix C provides detail on response rates for each metropolitan area.

ED visits that met the DAWN case criteria. On the basis of the review of charts, 383,977 drug-related visits were found and submitted to the DAWN database, a case rate of 3.9 percent. On average, a DAWN member hospital submitted 1,167 DAWN cases. However, the number of submitted cases varied widely across hospitals, from 0 cases to 6,832 cases (median 896) in a single hospital during 2008.

Estimates in this publication

The estimates provided in this publication represent drug-related ED visits for the United States. The universe of hospitals eligible for inclusion in DAWN includes non-Federal, short-stay, general medical and surgical hospitals in the United States that operate EDs 24 hours a day, 7 days a week. The American Hospital Association's (AHA's) 2001 Annual Survey was used to identify the original frame members. Subsequent AHA surveys are used annually to identify "births" of new hospitals that open and the "deaths" of hospitals that close or merge with other hospitals.

The DAWN sample of hospitals includes an oversampling of hospitals in select metropolitan areas, supplemented with a sample of hospitals from the remainder of the United States, which includes other metropolitan areas as well as nonmetropolitan and rural areas. The metropolitan area boundaries correspond to the definitions issued by the Office of Management and Budget (OMB) in June 2003.

Estimates of drug-related ED visits are calculated by applying weights and adjustments to the data provided by the sampled hospitals participating in DAWN. The primary sampling weights reflect the probability of selection, and separate adjustment factors are included to account for sampling of ED visits, nonresponse, data quality, and the known total of ED visits delivered by the universe of eligible hospitals as reported by the most current AHA survey.

DAWN currently collects drug information using more than 17,000 individual codes.³ These highly detailed codes are grouped up (mapped) to 3,200 drug names. Drug names are then mapped into 500 broader drug categories. About 100 of the more common drugs and drug categories were selected for inclusion in the drug detail tables in this report. Because a single ED visit may involve multiple drugs and the same drug may be reported both under its specific drug name and under its drug category, the sum of ED visits from different rows in the drug detail tables will be greater than the total number of visits. For the same reason, percentages will add to more than 100.

Margin of error for estimates

Because DAWN relies on a sample of hospitals, each estimate produced from the DAWN ED data is subject to sampling variability, referred to as the "margin of error." Margin of error is the variation

³ The classification of drugs used in DAWN is derived from the Multum *Lexicon*, © 2009, Multum Information Services, Inc. The classification was modified to meet DAWN's unique requirements (2009). The Multum Licensing Agreement governing use of the *Lexicon* can be found in Appendix A and on the Internet at http://dawninfo.samhsa.gov/drug_vocab.

in the estimate that would be observed naturally if different samples were drawn from the same population using the same procedures. The sampling variability of an estimate in this publication is measured by its relative standard error (RSE). The precision of an estimate is inversely related to its sampling variability, as measured by the RSE. That is, the greater the RSE, the lower the precision.

DAWN estimates with RSE values greater than 50 percent or fewer than 30 ED visits, or both, are regarded as too imprecise for publication and are not shown. An asterisk (*) is displayed in the place of suppressed estimates. Ratios (percentages or rates per 100,000 population) based on suppressed estimates are likewise suppressed.

In this publication, 95 percent confidence intervals (CIs) are included in many of the tables along with the estimates. A 95 percent CI means that if repeated samples were drawn from the same population of hospitals using the same sampling and data collection procedures, the true population value would fall within the confidence interval 95 percent of the time. A CI, which is expressed as a range of values, is useful because the interval reflects both the estimate and its particular margin of error.

Comparisons across years

In this publication, between-year changes are assessed by comparing estimates for 2008 with those for 2004, 2006, and 2007. This publication reports only those between-year changes that are statistically significant at the $p < 0.05$ level.

Major changes to DAWN were instituted during 2003 as the result of a redesign that altered most of DAWN's core features. Changes included the design of the hospital sample, the drug-related cases eligible for DAWN, the data items submitted on these cases, and the protocol for case finding and quality assurance. These improvements created a permanent disruption in trends. As a result, comparisons cannot be made between old DAWN (2003 and prior years) and the redesigned DAWN (2004 and forward).

Rates of ED visits per 100,000 population

Standardized measures are helpful when comparing levels of drug-related ED visits for different age groups and genders. This publication reports rates of ED visits per 100,000 population by age and gender. Rates are based on population data from the U.S. Census Bureau. If an estimate is suppressed, the rate will also be suppressed. Tables in this publication do not report population-based rates for race/ethnicity categories because race/ethnicity information is often missing from ED records; a dash (—) is displayed instead.

Limitations to data

Information on drug-related visits is based on a sample and is, therefore, subject to sampling variability. Readers are advised to consider the standard error measurements provided in many

tables to reflect the sampling variability that occurs by chance because only a sample rather than the entire universe is surveyed. Hospital participation rates in oversampled metropolitan areas typically have been 50 percent or higher. However, the participation rate in the remainder of the United States has been lower, in the range of 20 to 30 percent, since the DAWN redesign in 2003. In any sample survey, a low response rate is of concern because it creates the opportunity for bias. That is, nonparticipating hospitals may have different characteristics than participating hospitals, possibly including differences in the drugs reported, patient disposition, or population demographics. DAWN is addressing these issues by developing statistical and data collection methods that help to avoid or minimize bias and improve response rates within available resources.

Although every effort is made during the data collection phase to collect data accurately and precisely, extant medical records vary in specificity and detail. Therefore, factors that may affect the reliability and accuracy of the findings include the following:

- DAWN data collectors attempt to identify with a high degree of specificity the exact drugs involved in an ED visit. If extant medical records include only a general description of a drug (e.g., "benzodiazepines" or "opiates"), the drug is grouped in a general category (e.g., "benzodiazepines not otherwise specified"). Similarly, records often describe a drug as amphetamines without specifying if it is methamphetamine.
- DAWN seeks to report only drugs that are related to the ED visit, not drugs or medications that the patient may be taking on a regular basis as prescribed by a doctor. If the ED record is not clear on this point, drugs may be included in the data that are not specifically related to the visit. For example, anecdotal evidence suggests that methadone may be overreported when the medical records fail to mention that the patient is in a methadone treatment program. Similarly, pharmaceuticals may be overreported if records fail to indicate that they were obtained through a legitimate prescription, are taken on a regular basis, and are unrelated to the ED visit.

DRUG MISUSE OR ABUSE

ED visits involving drug misuse or abuse, 2008

For 2008, DAWN estimates that there were over 4.3 million drug-related ED visits. Of these, almost 2.0 million ED visits were associated with drug misuse or abuse (Table 1). This estimate includes

- 1,127,681 ED visits, or 56.4 percent, involving nonmedical use of pharmaceuticals alone or use of any pharmaceuticals with illicit drugs or alcohol;
- 993,379 ED visits, or 49.7 percent, involving illicit drugs alone or in combination with other drugs;
- 524,050 ED visits, or 26.2 percent, involving the use of alcohol in combination with other drugs; and
- 132,842 ED visits, or 6.6 percent, involving underage drinking with no other drug involvement.⁴

Table 1. ED visits involving drug misuse or abuse, by drug combinations, 2008

Drug combinations (1)	ED visits (2)	Percent of ED visits	RSE (%)	95% CI: Lower bound	95% CI: Upper bound
Total ED visits, drug misuse or abuse	1,999,861	100.0	7.8	1,692,919	2,306,802
Illicit drugs only	509,773	25.5	12.9	381,203	638,343
Alcohol only (age < 21)	132,842	6.6	9.6	107,746	157,938
Nonmedical use of pharmaceuticals only	664,654	33.2	8.6	552,031	777,278
Combinations	—	—	—	—	—
Illicit drugs with alcohol (3)	229,564	11.5	10.9	180,569	278,560
Illicit drugs with any pharmaceuticals	168,541	8.4	14.9	119,215	217,868
Alcohol with nonmedical use of pharmaceuticals	208,985	10.4	7.8	176,871	241,098
Illicit drugs with alcohol and any pharmaceuticals	85,501	4.3	20.3	51,411	119,591

(1) The classification of drugs used in DAWN is derived from the *Multum Lexicon*, © 2009, Multum Information Services, Inc. The classification was modified to meet DAWN's unique requirements (2009). The Multum Licensing Agreement governing use of the *Lexicon* can be found in Appendix A and on the Internet at http://dawninfo.samhsa.gov/drug_vocab.

(2) Estimates of ED visits are based on a representative sample of non-Federal, short-stay hospitals with 24-hour EDs in the United States.

(3) DAWN excludes ED visits involving alcohol only for patients aged 21 years or older. When present with other drugs, alcohol is reportable for patients of all ages.

NOTE: CI = confidence interval. RSE = relative standard error. A dash (—) indicates a blank cell.

SOURCE: Center for Behavioral Health Statistics and Quality, SAMHSA, Drug Abuse Warning Network, 2008.

⁴ These four categories of ED visits are not mutually exclusive. The sum of visits or rates by category will be greater than the total, and the sum of percentages will be greater than 100.

Of the almost 2.0 million drug misuse or abuse visits, about two thirds (65.4%) were associated with a single drug type (illicit drugs, alcohol, or nonmedical use of pharmaceuticals). Illicit drugs alone were involved in 25.5 percent of drug misuse or abuse visits in 2008, nonmedical use of pharmaceuticals alone was involved in 33.2 percent, and consumption of alcohol (and no other drug) by a minor was involved in 6.6 percent.⁵ The remaining visits (34.6%) involved some combination of illicit drugs, alcohol, and nonmedical use of pharmaceuticals.

These figures do not suggest that the majority of ED drug misuse or abuse visits involved a single drug. In fact, the typical drug-related ED visit involves multiple drugs, but they may be of a common type. For example, an ED visit involving illicit drugs alone often involves more than one illicit drug (e.g., cocaine and marijuana).

Trends in ED visits involving drug misuse or abuse, 2004–2008

This section presents the trends in the estimates of ED visits involving drug misuse or abuse for the period 2004 through 2008 (Table 2). Differences between years are presented in terms of the percentage increase or decrease in visits in 2008 compared with the estimates for 2004 (long-term trends) and 2006 and 2007 (short-term trends). Only statistically significant changes are discussed and displayed in the table.

The number of ED visits attributable to drug misuse or abuse was stable from 2004 to 2008. The small changes seen in the estimates each year are within the boundaries of expected sample variation. From 2004 to 2008, however, ED visits related to the use of pharmaceuticals with no other drug involvement rose substantially (97%), as did the use of pharmaceuticals with illicit drugs (60%) and pharmaceuticals with alcohol (50%). These increases reflect over 300,000 more ED visits related to pharmaceuticals alone, over 60,000 more ED visits related to pharmaceuticals and illicit drugs, and almost 70,000 more ED visits related to pharmaceuticals and alcohol in 2008 than in 2004.

By way of comparison, hospitals in the United States delivered a total of more than 118 million ED visits in 2008, an increase of 8.7 percent over 2004. The population of the United States increased 3.8 percent, from 293 million to 304 million, over the same period.

⁵ ED patients aged 21 or older for whom alcohol was the only drug associated with their ED visits are not considered DAWN cases.

Table 2. Trends in ED visits involving drug misuse or abuse, by drug combinations, 2004–2008

Drug combinations (1)	ED visits, 2004 (2)	ED visits, 2005 (2)	ED visits, 2006 (2)	ED visits, 2007 (2)	ED visits, 2008 (2)	Percent change, 2004, 2008 (3)	Percent change, 2006, 2008 (3)	Percent change, 2007, 2008 (3)
All types of drug misuse or abuse	1,619,054	1,616,311	1,742,887	1,883,272	1,999,861	—	—	—
Illicit drugs only	502,136	517,558	536,554	522,650	509,773	—	—	—
Alcohol only (age < 21)	150,988	110,599	126,704	137,369	132,842	—	—	—
Nonmedical use of pharmaceuticals only	336,987	444,309	486,276	582,187	664,654	97	37	—
Combinations	—	—	—	—	—	—	—	—
Illicit drugs with alcohol	338,638	221,823	219,521	237,936	229,564	—	—	—
Illicit drugs with pharmaceuticals	105,017	127,245	142,535	143,783	168,541	60	—	—
Alcohol with nonmedical use of pharmaceuticals	139,716	140,275	171,743	189,444	208,985	50	—	—
Illicit drugs with alcohol and pharmaceuticals	45,571	54,500	59,553	69,903	85,501	—	—	—

(1) The classification of drugs used in DAWN is derived from the Multum *Lexicon*, © 2009, Multum Information Services, Inc. The classification was modified to meet DAWN's unique requirements (2009). The Multum Licensing Agreement governing use of the *Lexicon* can be found in Appendix A and on the Internet at http://dawninfo.samhsa.gov/drug_vocab.

(2) Estimates of ED visits are based on a representative sample of non-Federal, short-stay hospitals with 24-hour EDs in the United States.

(3) This column denotes statistically significant ($p < 0.05$) increases or decreases between estimates for the periods shown.

NOTE: A dash (—) indicates a blank cell.

SOURCE: Center for Behavioral Health Statistics and Quality, SAMHSA, Drug Abuse Warning Network, 2008.

ILLICIT DRUGS

ED visits involving illicit drugs, 2008

For 2008, DAWN estimates that 993,379 ED visits involved one or more illicit drugs (Table 3). Among the approximately 2.0 million drug misuse or abuse ED visits that occurred during 2008, almost half (49.7%) involved one or more illicit drugs. Among visits involving illicit drugs, cocaine was the most commonly involved drug, with 482,188 ED visits (48.5%). Marijuana followed cocaine, with 374,435 ED visits (37.7%). Heroin was involved in 200,666 ED visits, or 20.2 percent of ED visits involving illicit drugs.⁶ Stimulants, including amphetamines and methamphetamine, were involved in 91,939 ED visits (9.3%).

Other illicit drugs involved in ED visits at lower levels include the following:

- PCP in 37,266 visits;
- MDMA (Ecstasy) in 17,865 visits;
- miscellaneous hallucinogens in 6,028 visits;
- LSD in 3,287 visits;
- GHB in 1,441 visits; and
- ketamine in 344 visits.

The rates of ED visits involving illicit drugs are reported in Table 4. For each 100,000 persons in the U.S. population, over the course of a year, more than 600 (657.7) ED visits involved drug misuse or abuse. About half (326.7) of those visits involved illicit drugs. Cocaine was involved at a rate of 158.6 ED visits per 100,000 population in the United States, followed by marijuana (123.1 ED visits per 100,000 population), heroin (66.0), and stimulants (30.2). Lower-incidence drugs had rates below 13 visits per 100,000 population.

Figure 1 displays the rates of ED visits per 100,000 population for the four major types of illicit drugs: cocaine, marijuana, heroin, and stimulants.

⁶ Heroin ED visits may be underestimated. When drugs related to an ED visit are determined through toxicology tests, often the results do not distinguish heroin from the non-illicit drug category of "unspecified opiates." The number of drug misuse or abuse ED visits involving unspecified opiates is estimated at 73,997 visits, and just under half of these (35,819) were determined through toxicology testing. What portion of these toxicology results is attributable to heroin is unknown.

Table 3. ED visits involving illicit drugs, 2008

Drugs (1)	ED visits (2,3)	Percent of ED visits (3)	RSE (%)	95% CI: Lower bound	95% CI: Upper bound
Total ED visits, illicit drugs	993,379	100.0	11.5	770,215	1,216,543
Visits involving a single illicit drug	417,633	42.0	13.3	308,791	526,474
Visits involving multiple drugs	575,746	58.0	11.2	449,127	702,365
Cocaine	482,188	48.5	15.4	336,462	627,913
Heroin	200,666	20.2	11.4	155,928	245,404
Marijuana	374,435	37.7	15.1	263,546	485,324
Stimulants	91,939	9.3	16.9	61,464	122,415
Amphetamines	31,534	3.2	17.9	20,460	42,609
Methamphetamine	66,308	6.7	20.8	39,253	93,363
MDMA (Ecstasy)	17,865	1.8	13.7	13,080	22,650
GHB	1,441	0.1	27.4	668	2,213
Flunitrazepam (Rohypnol)	*	*	*	*	*
Ketamine	344	0.0	46.4	31	657
LSD	3,287	0.3	18.6	2,087	4,488
PCP	37,266	3.8	39.0	8,751	65,780
Miscellaneous hallucinogens	6,028	0.6	19.9	3,674	8,382
Inhalants	7,115	0.7	27.6	3,268	10,962
Combinations NTA	3,512	0.4	21.9	2,007	5,016

(1) The classification of drugs used in DAWN is derived from the *Multum Lexicon*, © 2009, Multum Information Services, Inc. The classification was modified to meet DAWN's unique requirements (2009). The Multum Licensing Agreement governing use of the *Lexicon* is provided in Appendix A and on the Internet at http://dawninfo.samhsa.gov/drug_vocab.

(2) Estimates of ED visits are based on a representative sample of non-Federal, short-stay hospitals with 24-hour EDs in the United States.

(3) ED visits often involve multiple drugs. Such visits will appear multiple times in this table (e.g., a visit involving both cocaine and marijuana will appear twice in this table). The sum of visits or rates by drug will be greater than the total, and the sum of percentages by drug will be greater than 100.

NOTE: CI = confidence interval. RSE = relative standard error. An asterisk (*) indicates that an estimate with an RSE greater than 50% or an estimate based on fewer than 30 visits has been suppressed. NTA = not tabulated above.

SOURCE: Center for Behavioral Health Statistics and Quality, SAMHSA, Drug Abuse Warning Network, 2008.

Table 4. Rates of ED visits per 100,000 population involving illicit drugs, 2008

Drugs (1)	Rate of ED visits per 100,000 population (2,3)	RSE (%)	95% CI: Lower bound	95% CI: Upper bound
Total ED visits, illicit drugs	326.7	11.5	253.3	400.1
Cocaine	158.6	15.4	110.7	206.5
Heroin	66.0	11.4	51.3	80.7
Marijuana	123.1	15.1	86.7	159.6
Stimulants	30.2	16.9	20.2	40.3
Amphetamines	10.4	17.9	6.7	14.0
Methamphetamine	21.8	20.8	12.9	30.7
MDMA (Ecstasy)	5.9	13.7	4.3	7.4
GHB	0.5	27.4	0.2	0.7
Flunitrazepam (Rohypnol)	*	*	*	*
Ketamine	0.1	46.4	<0.1	0.2
LSD	1.1	18.6	0.7	1.5
PCP	12.3	39.0	2.9	21.6
Miscellaneous hallucinogens	2.0	19.9	1.2	2.8
Inhalants	2.3	27.6	1.1	3.6
Combinations NTA	1.2	21.9	0.7	1.6

(1) The classification of drugs used in DAWN is derived from the Multum *Lexicon*, © 2009, Multum Information Services, Inc. The classification was modified to meet DAWN's unique requirements (2009). The Multum Licensing Agreement governing use of the *Lexicon* can be found in Appendix A and on the Internet at http://dawninfo.samhsa.gov/drug_vocab.

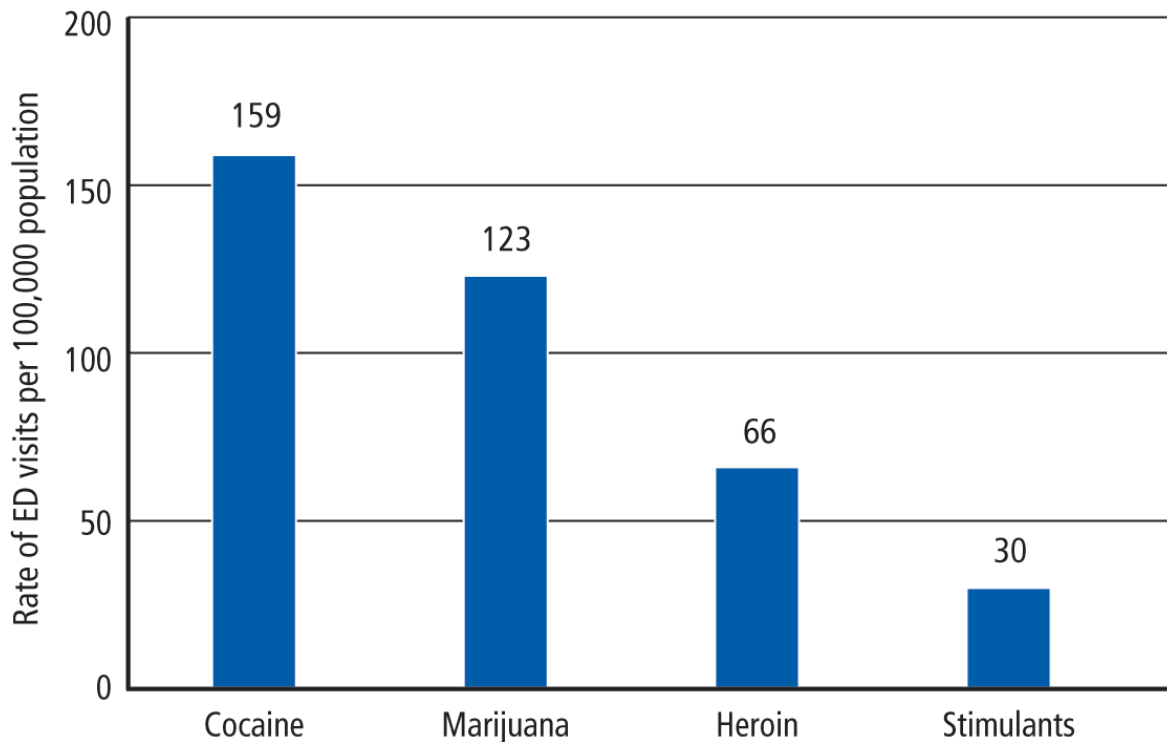
(2) All rates are ED visits per 100,000 population. Estimates of ED visits are based on a representative sample of non-Federal, short-stay hospitals with 24-hour EDs in the United States. Population estimates are drawn from the 2008 U.S. Census Bureau Postcensal Resident Population National Population Dataset as of July 1, 2008.

(3) ED visits often involve multiple drugs. Such visits will appear multiple times in this table (e.g., a visit involving both cocaine and marijuana will appear twice in this table). The sum of visits or rates by drug will be greater than the total, and the sum of percentages by drug will be greater than 100.

NOTE: CI = confidence interval. RSE = relative standard error. An asterisk (*) indicates that an estimate with an RSE greater than 50% or an estimate based on fewer than 30 visits has been suppressed. NTA = not tabulated above.

SOURCE: Center for Behavioral Health Statistics and Quality, SAMHSA, Drug Abuse Warning Network, 2008.

Figure 1. Rates of ED visits per 100,000 population involving illicit drugs, 2008



SOURCE: Center for Behavioral Health Statistics and Quality, SAMHSA, Drug Abuse Warning Network, 2008.

Table 5 presents estimates of the number of ED visits in 2008 involving illicit drugs for males and females, different age groups, and race/ethnicity categories. To facilitate comparisons, Table 6 and Figure 2 present the rates of ED visits per 100,000 population for these same groups. The rates for visits involving cocaine, heroin, marijuana, and stimulants were consistently higher for males than for females. Rates of ED visits vary by age: 18- to 20-year-olds had the highest rate of medical emergencies involving marijuana (467.0 per 100,000 population), 25- to 29-year-olds had the highest rates for heroin (155.5), and 35- to 44-year-olds had the highest rates for cocaine (358.7).

Estimates of ED visits related to illicit drugs reveal that 47.9 percent of patients were White, 29.7 percent were Black, 10.9 percent were Hispanic, 1.1 percent were of other or multiple races/ethnicities, and 10.3 percent were of unknown race/ethnicity. DAWN does not produce population-based rates for race/ethnicity categories because race/ethnicity information is often missing in ED records.

EDs are a potential site to intercept patients for follow-up treatment for drug use problems. Table 7 displays patient disposition after ED visits involving illicit drugs. A majority (58.7%) of patients were treated and released, about a quarter (26.0%) were admitted to the hospital, and the balance (15.2%) had other outcomes. Overall, 42.7 percent had some form of follow-up, whether it was specifically a referral to a drug detox/dependency program, admission to the hospital, or transfer to another health care facility.

Table 5. ED visits involving illicit drugs, by patient demographics, 2008

Patient demographics	All illicit (1)	Cocaine	Heroin	Marijuana	Stimulants	MDMA (Ecstasy)	GHB	LSD	PCP
Total ED visits, illicit drugs (2,3)	993,379	482,188	200,666	374,435	91,939	17,865	1,441	3,287	37,266
Gender	—	—	—	—	—	—	—	—	—
Male	640,704	306,651	138,607	245,553	52,189	9,439	950	2,483	24,020
Female	352,136	175,465	62,018	128,435	39,744	8,425	487	805	13,246
Unknown	*	*	*	*	*	*	*	*	*
Age	—	—	—	—	—	—	—	—	—
0–5 years	1,282	*	*	*	*	*	*	*	*
6–11 years	793	*	*	*	*	*	*	*	*
12–17 years	58,913	6,229	1,724	46,969	4,494	3,188	*	551	1,423
18–20 years	89,068	15,030	15,217	60,310	9,896	4,012	*	873	*
21–24 years	112,944	33,432	22,452	59,524	12,680	3,790	*	496	6,516
25–29 years	144,840	62,292	33,174	55,519	17,011	4,578	377	648	8,448
30–34 years	110,505	56,899	21,883	37,950	12,641	1,020	181	85	7,095
35–44 years	239,282	152,447	49,555	65,210	20,976	943	309	*	4,854
45–54 years	185,748	124,832	42,596	39,411	10,958	*	*	*	3,195
55–64 years	43,674	27,408	12,495	7,234	2,311	*	*	*	*
65 years and older	5,826	2,817	1,359	1,667	322	*	*	*	*
Unknown	503	*	*	*	*	*	*	*	*
Race/ethnicity	—	—	—	—	—	—	—	—	—
White	475,816	181,461	102,986	215,149	55,834	7,857	1,089	2,535	10,421
Black	295,350	193,082	40,756	93,165	5,468	4,718	*	116	23,522
Hispanic	108,601	55,397	30,225	31,097	10,246	2,356	*	87	1,702
Other or two or more race/ ethnicities	10,824	5,587	1,062	2,744	1,614	611	*	*	*
Unknown	102,788	46,661	25,636	32,280	*	2,324	214	426	1,599

(1) The classification of drugs used in DAWN is derived from the Multum *Lexicon*, © 2009, Multum Information Services, Inc. The classification was modified to meet DAWN's unique requirements (2009). The Multum Licensing Agreement governing use of the *Lexicon* can be found in Appendix A and on the Internet at http://dawninfo.samhsa.gov/drug_vocab.

(2) Estimates of ED visits are based on a representative sample of non-Federal, short-stay hospitals with 24-hour EDs in the United States.

(3) ED visits often involve multiple drugs. Such visits will appear multiple times in this table (e.g., a visit involving both cocaine and marijuana will appear twice in this table). The sum of visits or rates by drug will be greater than the total, and the sum of percentages by drug will be greater than 100.

NOTE: An asterisk (*) indicates that an estimate with a relative standard error greater than 50%, or an estimate based on fewer than 30 visits, has been suppressed. A dash (—) indicates a blank cell.

SOURCE: Center for Behavioral Health Statistics and Quality, SAMHSA, Drug Abuse Warning Network, 2008.

Table 6. Rates of ED visits per 100,000 population involving illicit drugs, by patient demographics, 2008

Patient demographics	All illicits (1)	Cocaine	Heroin	Marijuana	Stimulants	MDMA (Ecstasy)	GHB	LSD	PCP
Rates of ED visits, illicit drugs (2,3)	326.7	158.6	66.0	123.1	30.2	5.9	0.5	1.1	12.3
Gender	—	—	—	—	—	—	—	—	—
Male	427.4	204.5	92.5	163.8	34.8	6.3	0.6	1.7	16.0
Female	228.5	113.8	40.2	83.3	25.8	5.5	0.3	0.5	8.6
Age	—	—	—	—	—	—	—	—	—
0–5 years	5.1	*	*	*	*	*	*	*	*
6–11 years	3.3	*	*	*	*	*	*	*	*
12–17 years	235.4	24.9	6.9	187.7	18.0	12.7	*	2.2	5.7
18–20 years	689.6	116.4	117.8	467.0	76.6	31.1	*	6.8	*
21–24 years	670.6	198.5	133.3	353.4	75.3	22.5	*	2.9	38.7
25–29 years	678.9	292.0	155.5	260.2	79.7	21.5	1.8	3.0	39.6
30–34 years	563.9	290.3	111.7	193.6	64.5	5.2	0.9	0.4	36.2
35–44 years	563.0	358.7	116.6	153.4	49.4	2.2	0.7	*	11.4
45–54 years	418.6	281.3	96.0	88.8	24.7	*	*	*	7.2
55–64 years	129.7	81.4	37.1	21.5	6.9	*	*	*	*
65 years and older	15.0	7.2	3.5	4.3	0.8	*	*	*	*

(1) The classification of drugs used in DAWN is derived from the Multum *Lexicon*, © 2009, Multum Information Services, Inc. The classification was modified to meet DAWN's unique requirements (2009). The Multum Licensing Agreement governing use of the *Lexicon* can be found in Appendix A and on the Internet at http://dawninfo.samhsa.gov/drug_vocab.

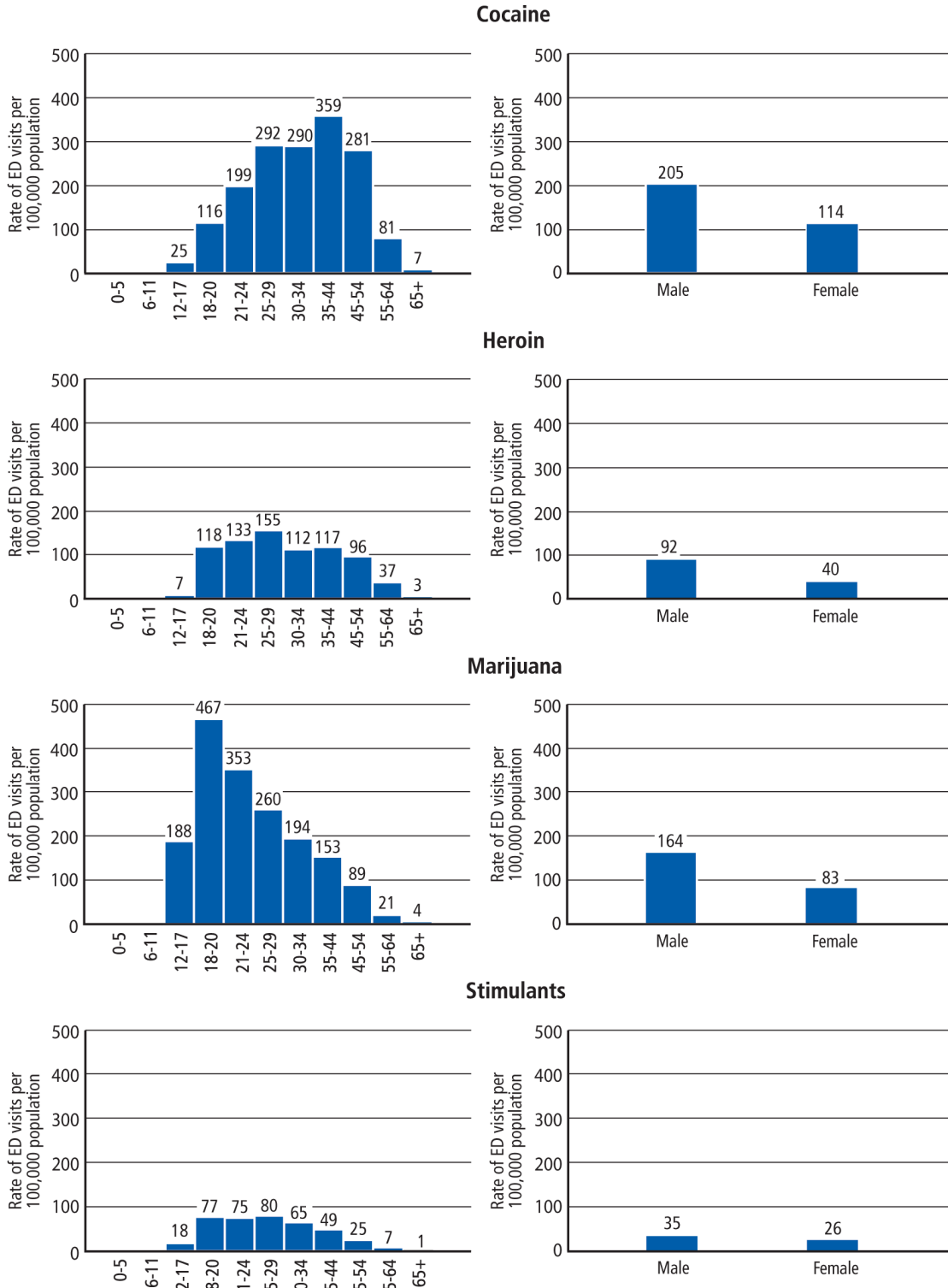
(2) All rates are ED visits per 100,000 population. Estimates of ED visits are based on a representative sample of non-Federal, short-stay hospitals with 24-hour EDs in the United States. Population estimates are drawn from the 2008 U.S. Census Bureau Postcensal Resident Population National Population Dataset as of July 1, 2008.

(3) ED visits often involve multiple drugs. Such visits will appear multiple times in this table (e.g., a visit involving both cocaine and marijuana will appear twice in this table). The sum of visits or rates by drug will be greater than the total, and the sum of percentages by drug will be greater than 100.

NOTE: An asterisk (*) indicates that an estimate with a relative standard error greater than 50%, or an estimate based on fewer than 30 visits, has been suppressed. A dash (—) indicates a blank cell. Rates are not provided for race and ethnicity subgroups because of data limitations.

SOURCE: Center for Behavioral Health Statistics and Quality, SAMHSA, Drug Abuse Warning Network, 2008.

Figure 2. Rates of ED visits per 100,000 population involving illicit drugs, by selected drugs, age, and gender, 2008



SOURCE: Center for Behavioral Health Statistics and Quality, SAMHSA, Drug Abuse Warning Network, 2008.

Table 7. ED visits and rates involving illicit drugs, by patient disposition, 2008

Patient disposition	ED visits (1)	Percent of ED visits	Rate of ED visits per 100,000 population (2)
Total ED visits, illicit drugs	993,379	100.0	326.7
Treated and released	583,501	58.7	191.9
Discharged home	461,678	46.5	151.8
Released to police/jail	48,881	4.9	16.1
Referred to detox/treatment	72,942	7.3	24.0
Admitted to this hospital	258,535	26.0	85.0
ICU/critical care	31,610	3.2	10.4
Surgery	2,193	0.2	0.7
Chemical dependency/detox	34,529	3.5	11.4
Psychiatric unit	66,689	6.7	21.9
Other inpatient unit	123,514	12.4	40.6
Other disposition	151,343	15.2	49.8
Transferred	92,854	9.3	30.5
Left against medical advice	21,905	2.2	7.2
Died	1,467	0.1	0.5
Other	27,945	2.8	9.2
Not documented	7,173	0.7	2.4

(1) Estimates of ED visits are based on a representative sample of non-Federal, short-stay hospitals with 24-hour EDs in the United States.

(2) All rates are ED visits per 100,000 population. Population estimates are drawn from the 2008 U.S. Census Bureau Postcensal Resident Population National Population Dataset as of July 1, 2008.

SOURCE: Center for Behavioral Health Statistics and Quality, SAMHSA, Drug Abuse Warning Network, 2008.

Trends in ED visits involving illicit drugs, 2004–2008

This section presents the trends in the estimates of ED visits involving illicit drugs for the period 2004 through 2008 (Table 8). Differences between years are presented in terms of the percentage increase or decrease in visits in 2008 compared with the estimates for 2004 (long-term trends) and 2006 and 2007 (short-term trends). Only statistically significant changes are discussed and displayed in the table.

Overall, the level of ED visits involving illicit drugs from 2004 to 2008 was stable. There were some changes at the drug level, though. There was a 75 percent increase in the involvement of MDMA (Ecstasy) overall between 2004 and 2008, but the level of involvement is relatively small (17,865 visits in 2008), and the trend is uneven. A 46 percent increase in amphetamines-related visits between 2007 and 2008 reverses a large dip seen in 2007 and returns visits to the levels seen in 2004–2006. There was also a small dip (13%) in cocaine involvement between 2007 and 2008.

Table 8. Trends in ED visits involving illicit drugs, by selected drugs, 2004–2008

Drugs (1)	ED visits, 2004 (2,3)	ED visits, 2005 (2,3)	ED visits, 2006 (2,3)	ED visits, 2007 (2,3)	ED visits, 2008 (2,3)	Percent change, 2004, 2008 (4)	Percent change, 2006, 2008 (4)	Percent change, 2007, 2008 (4)
ED visits, illicit drugs	991,363	921,127	958,164	974,272	993,379	—	—	—
Cocaine	475,425	483,865	548,608	553,530	482,188	—	—	-13
Heroin	214,432	187,493	189,780	188,162	200,666	—	—	—
Marijuana	281,619	279,664	290,563	308,547	374,435	—	—	—
Stimulants	162,435	137,650	107,575	85,043	91,939	—	—	—
Amphetamines	34,085	34,928	32,240	21,545	31,534	—	—	46
Methamphetamine	132,576	109,655	79,924	67,954	66,308	—	—	—
MDMA (Ecstasy)	10,220	11,287	16,749	12,748	17,865	75	—	—
GHB	1,789	1,036	1,084	2,207	1,441	—	—	—
Flunitrazepam (Rohypnol)	*	*	*	*	*	—	—	—
Ketamine	*	303	270	291	344	—	—	—
LSD	2,146	2,001	4,002	3,561	3,287	—	—	—
PCP	31,342	14,825	21,960	28,035	37,266	—	—	—
Miscellaneous hallucinogens	3,150	3,194	3,898	4,839	6,028	—	—	—
Inhalants	9,523	5,156	5,643	7,920	7,115	—	—	—
Combinations NTA	*	3,201	2,055	3,989	3,512	—	—	—

(1) The classification of drugs used in DAWN is derived from the Multum *Lexicon*, © 2009, Multum Information Services, Inc. The classification was modified to meet DAWN's unique requirements (2009). The Multum Licensing Agreement governing use of the *Lexicon* can be found in Appendix A and on the Internet at http://dawninfo.samhsa.gov/drug_vocab.

(2) Estimates of ED visits are based on a representative sample of non-Federal, short-stay hospitals with 24-hour EDs in the United States.

(3) ED visits often involve multiple drugs. Such visits will appear multiple times in this table (e.g., a visit involving both cocaine and marijuana will appear twice in this table). Thus, the sum of visits or rates by drug will be greater than the total, and the sum of percentages by drug will be greater than 100.

(4) This column denotes statistically significant ($p < 0.05$) increases or decreases between estimates for the periods shown.

NOTE: An asterisk (*) indicates that an estimate with a relative standard error greater than 50%, or an estimate based on fewer than 30 visits, has been suppressed. A dash (—) indicates a blank cell. NTA = not tabulated above.

SOURCE: Center for Behavioral Health Statistics and Quality, SAMHSA, Drug Abuse Warning Network, 2008.

ALCOHOL

In 2008, over half a million ED visits involved drugs combined with alcohol (Table 9). This represented more than a quarter (26.2%) of all the ED visits involving drug misuse or abuse that year. The combination of drugs and alcohol is of particular concern because many drugs have additive or interactive effects with alcohol that can result in acute intoxication and impairment. According to the National Institute on Alcohol Abuse and Alcoholism (NIAAA), more than 150 medications interact harmfully with alcohol. These interactions may result in increased risk of illness, injury, and even death. Alcohol's effects are heightened by drugs that depress the central nervous system, such as heroin, opiate pain relievers, benzodiazepines, antihistamines, and antidepressants. Medications for certain disorders, including diabetes, high blood pressure, and heart disease, also can have harmful interactions with alcohol.⁷

Table 9. ED visits involving alcohol, 2008

Alcohol use category (1)	ED visits (2)	Percent of drug misuse/abuse visits	RSE (%)	95% CI: Lower bound	95% CI: Upper bound
Alcohol with drugs (all ages) (3)	524,050	26.2	8.9	432,719	615,381
Alcohol alone (patients < 21) (3)	132,842	6.6	9.6	107,746	157,938

(1) The classification of drugs used in DAWN is derived from the Multum *Lexicon*, © 2009, Multum Information Services, Inc. The classification was modified to meet DAWN's unique requirements (2009). The Multum Licensing Agreement governing use of the *Lexicon* can be found in Appendix A and on the Internet at http://dawninfo.samhsa.gov/drug_vocab.

(2) Estimates of ED visits are based on a representative sample of non-Federal, short-stay hospitals with 24-hour EDs in the United States.

(3) For patients of all ages, DAWN always records whether alcohol is involved in a drug-related visit. ED visits involving alcohol and no other drug are reportable to DAWN only if the patient is younger than 21. Consequently, DAWN estimates do not represent visits involving just alcohol for adults aged 21 or older.

NOTE: CI = confidence interval. RSE = relative standard error.

SOURCE: Center for Behavioral Health Statistics and Quality, SAMHSA, Drug Abuse Warning Network, 2008.

The use of alcohol alone by those under age 21 is also of substantial concern. In 2008, there were over 130,000 medical emergencies involving only alcohol for patients under the age of 21. Alcohol abuse has many immediate adverse consequences for youth, and also can lead to higher levels and dangerous patterns of drinking in later years. As an indicator of the prevalence and severity of underage drinking, its consequences, and its trends through the teen years, DAWN reports on ED visits for underage drinking separately for adolescents aged 12 to 17 and 18 to 20.

⁷ National Institute on Alcohol Abuse and Alcoholism (NIAAA). (2007, February). *Frequently asked questions for the general public*. Retrieved November 18, 2009, from http://www.niaaa.nih.gov/FAQs/General-English/default.htm#taking_medications.

ED visits involving drugs and alcohol taken together

The types of drugs that accompany alcohol use are displayed in Table 10. Illicit drugs, often in combination with other illicit drugs or pharmaceuticals, were involved in well over half (60.1%) of ED visits involving alcohol and other drugs. One or more pharmaceuticals were also involved in over half (56.2%) of such visits. Drugs for insomnia and anxiety were involved in 24.5 percent of visits, with the largest part of that being benzodiazepines (20.7%). Pain relievers were involved in 22.1 percent of visits, with narcotic pain relievers accounting for over half of that (13.7%). Psychotherapeutic agents (e.g., antidepressants, antipsychotics) were involved in less than 10 percent of such visits.

The rate of ED visits per 100,000 population for males (217.1) was higher than that for females (128.5) (Table 11 and Figure 3). Rates by age group showed a general pattern of being lower for those under 18 or over 54 and higher for those aged 18 to 54.

Considering race/ethnicity, 57.8 percent of patients were White, 21.0 percent were Black, 11.0 percent were Hispanic, 1.2 percent were of other or multiple race/ethnic groups, and 9.0 percent were of unknown race/ethnicity. DAWN does not produce population-based rates for race/ethnicity categories because race/ethnicity information is often missing from ED records.

The disposition of the drug-and-alcohol combination ED visits is shown in Table 12. About half (49.0%) received some sort of follow-up care: 30.9 percent were admitted to the hospital, 11.2 percent were transferred to another facility, and 6.8 percent were referred to detox.

Table 10. ED visits involving drugs and alcohol taken together, by most frequent combinations, 2008

Drugs reported with alcohol (1)	ED visits (2,3)	Percent of ED visits (3)	Rate of ED visits per 100,000 population (3,4)
Total ED visits, drugs with alcohol	524,050	100.0	172.4
Illicit drugs	315,065	60.1	103.6
Cocaine	180,219	34.4	59.3
Heroin	39,951	7.6	13.1
Marijuana	133,201	25.4	43.8
Stimulants	21,209	4.0	7.0
Methamphetamine	15,901	3.0	5.2
Pharmaceuticals	294,486	56.2	96.9
Psychotherapeutic agents	43,684	8.3	14.4
Antidepressants	31,828	6.1	10.5
SSRI antidepressants	15,871	3.0	5.2
Antipsychotics	16,957	3.2	5.6
Atypical antipsychotics	14,536	2.8	4.8
Central nervous system agents	222,516	42.5	73.2
Pain relievers	115,812	22.1	38.1
Opiates/opioids	86,320	16.5	28.4
Opiates/opioids, unspecified	16,032	3.1	5.3
Narcotic pain relievers	71,592	13.7	23.5
Hydrocodone products	28,599	5.5	9.4
Oxycodone products	26,449	5.0	8.7
Miscellaneous pain reliever products (5)	24,324	4.6	8.0
Acetaminophen products	18,334	3.5	6.0
Anticonvulsants	13,195	2.5	4.3
Anxiolytics, sedatives, and hypnotics	128,222	24.5	42.2
Benzodiazepines	108,646	20.7	35.7
Alprazolam	44,042	8.4	14.5
Clonazepam	20,421	3.9	6.7
Benzodiazepines not otherwise specified	22,790	4.3	7.5
Misc. anxiolytics, sedatives, and hypnotics	22,673	4.3	7.5
Drug unknown	37,551	7.2	12.3

(1) The classification of drugs used in DAWN is derived from the Multum *Lexicon*, © 2009, Multum Information Services, Inc. The classification was modified to meet DAWN's unique requirements (2009). The Multum Licensing Agreement governing use of the *Lexicon* can be found in Appendix A and on the Internet at http://dawninfo.samhsa.gov/drug_vocab.

(2) Estimates of ED visits are based on a representative sample of non-Federal, short-stay hospitals with 24-hour EDs in the United States.

(3) ED visits often involve multiple drugs. Such visits will appear multiple times in this table (e.g., a visit involving both cocaine and marijuana will appear twice in this table). The sum of visits or rates by drug will be greater than the total, and the sum of percentages by drug will be greater than 100.

(4) All rates are ED visits per 100,000 population. Population estimates are drawn from the 2008 U.S. Census Bureau Postcensal Resident Population National Population Dataset as of July 1, 2008.

(5) Miscellaneous pain reliever products include acetaminophen, tramadol, and pain relievers that were not specified by name. It does not include nonsteroidal anti-inflammatory drugs (such as ibuprofen) or salicylates (such as aspirin).

SOURCE: Center for Behavioral Health Statistics and Quality, SAMHSA, Drug Abuse Warning Network, 2008.

Table 11. ED visits involving drugs and alcohol taken together, by patient demographics, 2008

Patient demographics	ED visits (1)	Percent of ED visits	Rate of ED visits per 100,000 population (2)
Total ED visits, drugs with alcohol	524,050	100.0	172.4
Gender	—	—	—
Male	325,456	62.1	217.1
Female	198,102	37.8	128.5
Unknown	*	*	—
Age	—	—	—
0–5 years	*	*	*
6–11 years	*	*	*
12–17 years	19,752	3.8	78.9
18–20 years	36,975	7.1	286.3
21–24 years	59,900	11.4	355.7
25–29 years	70,038	13.4	328.3
30–34 years	56,112	10.7	286.3
35–44 years	129,368	24.7	304.4
45–54 years	111,375	21.3	251.0
55–64 years	31,083	5.9	92.3
65 years and older	8,600	1.6	22.1
Unknown	*	*	—
Race/ethnicity	—	—	—
White	303,011	57.8	—
Black	109,862	21.0	—
Hispanic	57,465	11.0	—
Other or two or more race/ethnicities	6,474	1.2	—
Unknown	47,239	9.0	—

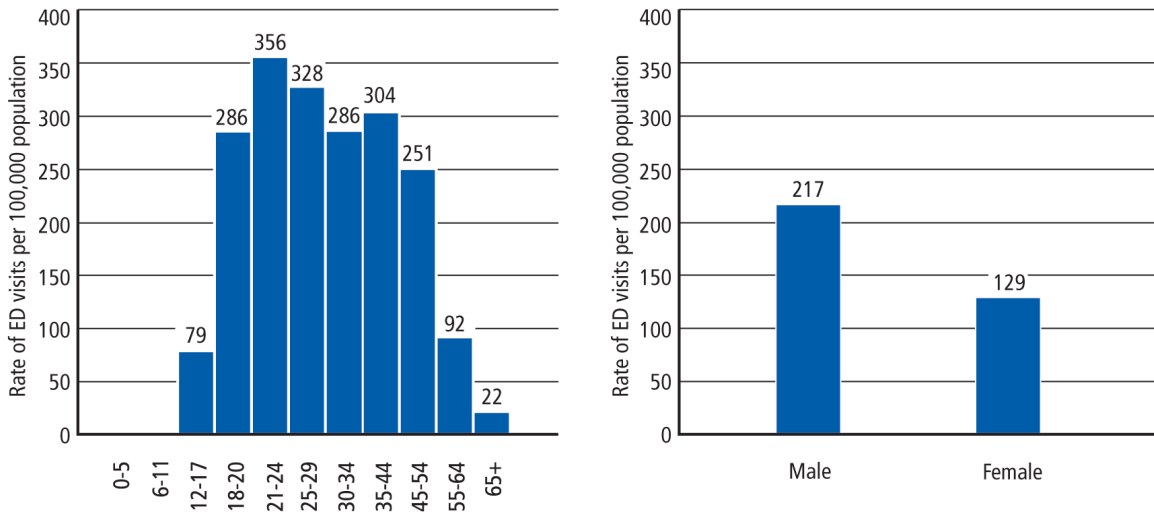
(1) Estimates of ED visits are based on a representative sample of non-Federal, short-stay hospitals with 24-hour EDs in the United States.

(2) All rates are ED visits per 100,000 population. Population estimates are drawn from the 2008 U.S. Census Bureau Postcensal Resident Population National Population Dataset as of July 1, 2008.

NOTE: An asterisk (*) indicates that an estimate with a relative standard error greater than 50%, or an estimate based on fewer than 30 visits, has been suppressed. A dash (—) indicates a blank cell. Rates are not provided for race and ethnicity subgroups because of data limitations.

SOURCE: Center for Behavioral Health Statistics and Quality, SAMHSA, Drug Abuse Warning Network, 2008.

Figure 3. Rates of ED visits per 100,000 population involving alcohol, by age and gender, 2008



SOURCE: Center for Behavioral Health Statistics and Quality, SAMHSA, Drug Abuse Warning Network, 2008.

Table 12. ED visits involving drugs and alcohol taken together, by patient disposition, 2008

Patient disposition	ED visits (1)	Percent of ED visits	Rate of ED visits per 100,000 population (2)
Total ED visits, drugs with alcohol	524,050	100.0	172.4
Treated and released	275,747	52.6	90.7
Discharged home	218,935	41.8	72.0
Released to police/jail	21,173	4.0	7.0
Referred to detox/treatment	35,639	6.8	11.7
Admitted to this hospital	162,024	30.9	53.3
ICU/critical care	28,601	5.5	9.4
Surgery	1,147	0.2	0.4
Chemical dependency/detox	19,775	3.8	6.5
Psychiatric unit	47,245	9.0	15.5
Other inpatient unit	65,256	12.5	21.5
Other disposition	86,279	16.5	28.4
Transferred	58,916	11.2	19.4
Left against medical advice	9,288	1.8	3.1
Died	977	0.2	0.3
Other	*	*	*
Not documented	3,469	0.7	1.1

(1) Estimates of ED visits are based on a representative sample of non-Federal, short-stay hospitals with 24-hour EDs in the United States.

(2) All rates are ED visits per 100,000 population. Population estimates are drawn from the 2008 U.S. Census Bureau Postcensal Resident Population National Population Dataset as of July 1, 2008.

NOTE: An asterisk (*) indicates that an estimate with a relative standard error greater than 50%, or an estimate based on fewer than 30 visits, has been suppressed.

SOURCE: Center for Behavioral Health Statistics and Quality, SAMHSA, Drug Abuse Warning Network, 2008.

Alcohol use by youth and young adults

In 2008 for youth and young adults (patients aged 12 to 17 and 18 to 20, respectively), 56,727 ED visits involved drugs taken with alcohol; 132,254 ED visits, or about twice as many, involved the use of alcohol alone (Table 13 and Figure 4). Alcohol use, with and without other drugs, increases markedly between these two age groups. The rate of medical emergencies involving use of drugs with alcohol was 78.9 visits per 100,000 youth compared with 286.3 visits for young adults, almost a fourfold increase. The rate of ED visits involving alcohol used alone was 220.7 visits per 100,000 for youth and 596.3 visits for young adults, almost a threefold increase.

Table 13. ED visits involving alcohol, by presence of other drugs, by age groups 12 to 17 and 18 to 20, 2008

Alcohol use category (1)	ED visits (2)	Rate of ED visits per 100,000 population (3)	RSE (%)	95% CI: Lower bound (ED visits)	95% CI: Upper bound (ED visits)
Alcohol with drugs, patients aged 12 to 17	19,752	78.9	13.0	14,715	24,789
Alcohol with drugs, patients aged 18 to 20	36,975	286.3	9.6	30,004	43,947
Alcohol alone, patients aged 12 to 17	55,236	220.7	9.9	44,496	65,977
Alcohol alone, patients aged 18 to 20	77,018	596.3	11.0	60,401	93,634

(1) The classification of drugs used in DAWN is derived from the Multum *Lexicon*, © 2009, Multum Information Services, Inc. The classification was modified to meet DAWN's unique requirements (2009). The Multum Licensing Agreement governing use of the *Lexicon* can be found in Appendix A and on the Internet at http://dawninfo.samhsa.gov/drug_vocab.

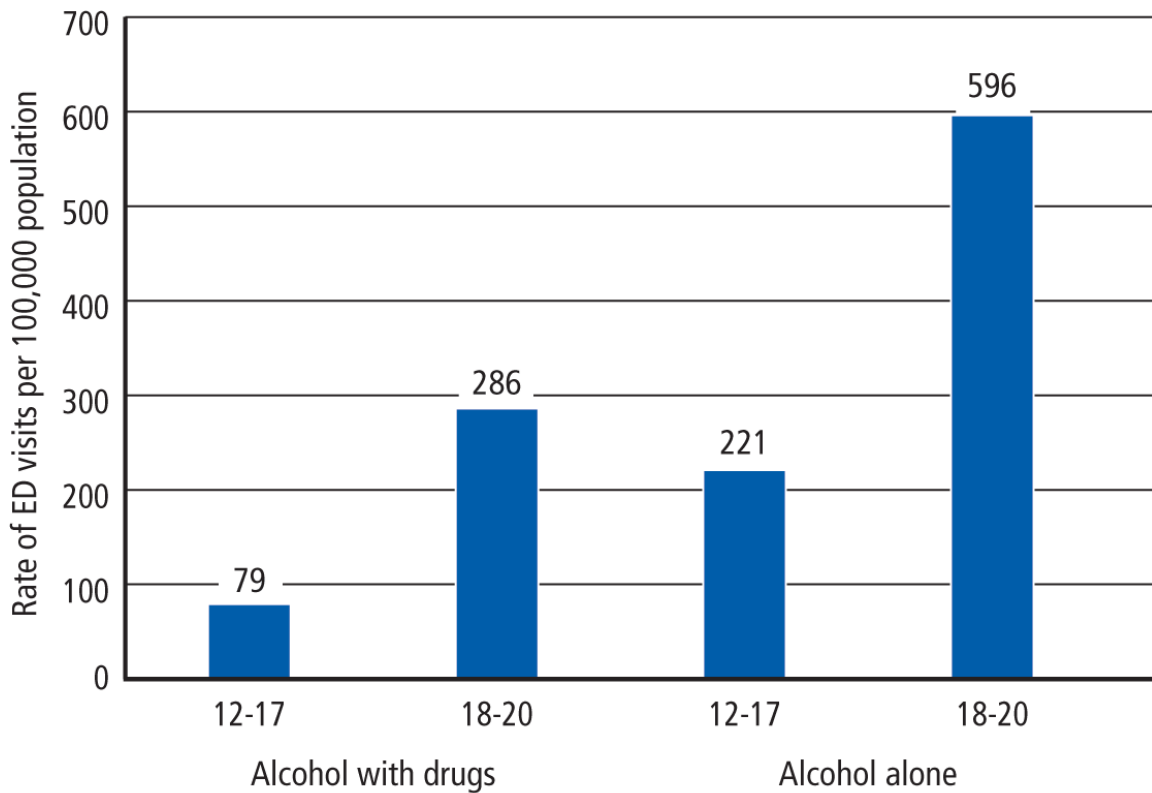
(2) Estimates of ED visits are based on a representative sample of non-Federal, short-stay hospitals with 24-hour EDs in the United States.

(3) All rates are ED visits per 100,000 population. Population estimates are drawn from the 2008 U.S. Census Bureau Postcensal Resident Population National Population Dataset as of July 1, 2008.

NOTE: CI = confidence interval. RSE = relative standard error.

SOURCE: Center for Behavioral Health Statistics and Quality, SAMHSA, Drug Abuse Warning Network, 2008.

Figure 4. Rates of ED visits per 100,000 population involving alcohol in combination and alcohol alone, by age groups 12 to 17 and 18 to 20, 2008



SOURCE: Center for Behavioral Health Statistics and Quality, SAMHSA, Drug Abuse Warning Network, 2008.

Trends in ED visits involving alcohol, 2004–2008

This section presents the trends in the estimates of ED visits involving alcohol for the period 2004 through 2008 (Table 14). Differences between years are presented in terms of the percentage increase or decrease in visits in 2008 compared with the estimates for 2004 (long-term trends) and 2006 and 2007 (short-term trends). Only statistically significant changes are discussed and displayed in the table.

Looking across patients aged 12 to 20, no significant changes were found from 2004 to 2008 in the number of ED visits related to drinking alcohol, irrespective of whether other drugs were involved.

Although there were some short-term drops in the number of visits involving alcohol and other drugs for 12- to 17-year-olds between 2006 and 2008, these drops merely offset increases seen in 2006; 2008 levels were similar to those found in 2004 and 2005 (Table 15).

Table 14. Trends in ED visits involving alcohol, by presence of other drugs, 2004–2008

Alcohol use category (1)	ED visits, 2004 (2)	ED visits, 2005 (2)	ED visits, 2006 (2)	ED visits, 2007 (2)	ED visits, 2008 (2)	Percent change, 2004, 2008 (3)	Percent change, 2006, 2008 (3)	Percent change, 2007, 2008 (3)
Total ED visits, alcohol	674,914	527,198	577,521	634,652	656,892	—	—	—
Alcohol in combination	523,926	416,599	450,817	497,283	524,050	—	—	—
Alcohol alone	150,988	110,599	126,704	137,369	132,842	—	—	—

(1) The classification of drugs used in DAWN is derived from the Multum *Lexicon*, © 2009, Multum Information Services, Inc. The classification was modified to meet DAWN's unique requirements (2009). The Multum Licensing Agreement governing use of the *Lexicon* can be found in Appendix A and on the Internet at http://dawninfo.samhsa.gov/drug_vocab.

(2) Estimates of ED visits are based on a representative sample of non-Federal, short-stay hospitals with 24-hour EDs in the United States.

(3) This column denotes statistically significant ($p < 0.05$) increases or decreases between estimates for the periods shown.

NOTE: A dash (—) indicates a blank cell.

SOURCE: Center for Behavioral Health Statistics and Quality, SAMHSA, Drug Abuse Warning Network, 2008.

Table 15. Trends in ED visits involving alcohol, by presence of other drugs, by age groups 12 to 17 and 18 to 20, 2004–2008

Alcohol use category (1)	ED visits, 2004 (2)	ED visits, 2005 (2)	ED visits, 2006 (2)	ED visits, 2007 (2)	ED visits, 2008 (2)	Percent change, 2004, 2008 (3)	Percent change, 2006, 2008 (3)	Percent change, 2007, 2008 (3)
Total ED visits, alcohol, aged 12 to 17	67,589	62,459	76,760	82,364	74,988	—	—	—
Total ED visits, alcohol, aged 18 to 20	135,313	95,166	105,675	112,563	113,993	—	—	—
Alcohol with drugs, aged 12 to 17	21,555	19,720	24,418	26,403	19,752	—	-19	-25
Alcohol with drugs, aged 18 to 20	31,926	27,784	31,702	32,308	36,975	—	—	—
Alcohol alone, aged 12 to 17	46,034	42,739	52,342	55,960	55,236	—	—	—
Alcohol alone, aged 18 to 20	103,387	67,382	73,973	80,255	77,018	—	—	—

(1) The classification of drugs used in DAWN is derived from the Multum *Lexicon*, © 2009, Multum Information Services, Inc. The classification was modified to meet DAWN's unique requirements (2009). The Multum Licensing Agreement governing use of the *Lexicon* can be found in Appendix A and on the Internet at http://dawninfo.samhsa.gov/drug_vocab.

(2) Estimates of ED visits are based on a representative sample of non-Federal, short-stay hospitals with 24-hour EDs in the United States.

(3) This column denotes statistically significant ($p < 0.05$) increases or decreases between estimates for the periods shown.

NOTE: A dash (—) indicates a blank cell.

SOURCE: Center for Behavioral Health Statistics and Quality, SAMHSA, Drug Abuse Warning Network, 2008.

NONMEDICAL USE OF PHARMACEUTICALS

ED visits involving nonmedical use of pharmaceuticals, 2008

As used by DAWN, nonmedical use of pharmaceuticals includes

- taking more than the prescribed dose of a prescription pharmaceutical or more than the recommended dose of an over-the-counter pharmaceutical or supplement;
- taking a pharmaceutical prescribed for another individual;
- deliberate poisoning with a pharmaceutical by another person; and
- documented misuse or abuse of a prescription drug, an over-the-counter pharmaceutical, or a dietary supplement.

Nonmedical use of pharmaceuticals may involve pharmaceuticals alone or pharmaceuticals in combination with illicit drugs or alcohol. DAWN reporters are careful to distinguish appropriate medical use from nonmedical, or inappropriate, use; only the latter is included in this grouping.⁸

For 2008, DAWN estimates that 971,914 ED visits involved nonmedical use of prescription medicines, over-the-counter drugs, or other types of pharmaceuticals (Table 16). This represents about a quarter of all drug-related ED visits and about half of ED visits for drug abuse or misuse. Of the total number of medical emergencies requiring immediate care resulting from nonmedical use of pharmaceuticals, over half (52.9%) involved multiple drugs. Alcohol is one of those other drugs in 18.8 percent of visits.

At 73.9 percent, central nervous system agents were the most common type of drugs reported in the nonmedical-use category of ED visits. These were split between pain relievers (47.1%) and drugs that treat anxiety and insomnia, such as anxiolytics, sedatives, and hypnotics (33.4%). Among pain relievers, the specific drugs seen at higher levels were the narcotic pain relievers oxycodone, hydrocodone, and methadone (10.8%, 9.2%, and 6.5%, respectively).⁹

⁸ DAWN tries to capture only pharmaceuticals that are related to the ED visit and actively discourages reporting of current medications that are unrelated to the visit. Given the limitations of medical record documentation, though, it is not always possible to distinguish and exclude current medications that are unrelated to the visit. This limitation may have the effect of overstating the variety of pharmaceuticals involved in ED visits.

⁹ ED records frequently do not distinguish methadone used properly for the treatment of opiate addiction (and not specifically related to the ED visit) from nonmedical methadone use (related to the ED visit). This could result in overreporting the estimated number of ED visits related to methadone, but the extent of the overreporting is unknown.

Table 16. ED visits involving nonmedical use of pharmaceuticals, 2008

Drug category and selected drugs (1)	ED visits (2,3)	Percent of ED visits (3)	RSE (%)	95% CI: Lower bound	95% CI: Upper bound
Total ED visits, nonmedical use	971,914	100.0	8.9	801,751	1,142,077
Visits involving a single drug	457,974	47.1	7.6	389,575	526,373
Visits involving multiple drugs	513,940	52.9	11.4	398,867	629,013
Visits involving alcohol	182,959	18.8	10.9	143,855	222,063
PSYCHOTHERAPEUTIC AGENTS	124,331	12.8	10.0	100,040	148,622
Antidepressants	80,881	8.3	10.6	64,129	97,632
MAO inhibitors	*	*	*	*	*
SSRI antidepressants	39,780	4.1	15.5	27,673	51,887
Tricyclic antidepressants	13,246	1.4	15.5	9,231	17,261
Miscellaneous antidepressants	6,956	0.7	15.3	4,872	9,040
Antipsychotics	55,005	5.7	9.7	44,518	65,492
CENTRAL NERVOUS SYSTEM AGENTS	718,119	73.9	9.9	579,000	857,237
Pain relievers	458,210	47.1	10.1	367,365	549,055
Antimigraine agents	1,877	0.2	33.3	651	3,102
Cox-2 inhibitors	*	*	*	*	*
Opiates/opioids	366,815	37.7	12.7	275,208	458,423
Opiates/opioids, unspecified	66,585	6.9	15.6	46,279	86,890
Narcotic pain relievers	305,885	31.5	12.7	229,834	381,935
Buprenorphine products	12,544	1.3	26.2	6,105	18,983
Codeine products	8,235	0.8	15.7	5,702	10,768
Fentanyl	20,179	2.1	16.5	13,649	26,709
Hydrocodone products	89,051	9.2	19.7	54,750	123,352
Hydromorphone products	12,142	1.2	18.1	7,827	16,458
Meperidine products	1,435	0.1	44.1	194	2,676
Methadone	63,629	6.5	15.9	43,758	83,499
Morphine products	28,818	3.0	22.3	16,236	41,399
Oxycodone products	105,214	10.8	15.8	72,679	137,749
Propoxyphene products	13,364	1.4	40.0	2,896	23,832
Nonsteroidal anti-inflammatory agents	30,343	3.1	10.5	24,091	36,594
Ibuprofen	23,539	2.4	12.0	18,011	29,067
Naproxen	4,525	0.5	17.0	3,017	6,034
Salicylates products	13,005	1.3	15.2	9,134	16,877
Misc. pain relievers products	69,146	7.1	8.4	57,807	80,484
Acetaminophen products	49,859	5.1	10.4	39,669	60,049
Tramadol products	11,850	1.2	14.5	8,480	15,219
Tramadol	11,665	1.2	14.6	8,319	15,011

Table 16. ED visits involving nonmedical use of pharmaceuticals, 2008 (continued)

Drug category and selected drugs (1)	ED visits (2,3)	Percent of ED visits (3)	RSE (%)	95% CI: Lower bound	95% CI: Upper bound
Acetaminophen-tramadol	*	*	*	*	*
Pain medication products NTA	1,521	0.2	20.1	922	2,121
Anorexiant	1,526	0.2	26.1	747	2,305
Anticonvulsants	37,439	3.9	10.3	29,864	45,013
Antiemetic/antivertigo agents	1,661	0.2	30.2	678	2,643
Anti-Parkinson agents	3,802	0.4	25.2	1,921	5,683
Anxiolytics, sedatives, and hypnotics	325,041	33.4	14.5	232,563	417,519
Barbiturates	9,603	1.0	15.1	6,766	12,440
Benzodiazepines	271,698	28.0	15.9	187,260	356,136
Alprazolam	104,762	10.8	20.1	63,475	146,048
Clonazepam	48,385	5.0	8.1	40,734	56,035
Diazepam	26,518	2.7	13.8	19,329	33,707
Lorazepam	36,602	3.8	16.7	24,629	48,574
Benzodiazepines NOS	65,113	6.7	22.2	36,785	93,441
Misc. anxiolytics, sedatives, and hypnotics	58,983	6.1	10.1	47,320	70,645
Diphenhydramine	13,531	1.4	12.3	10,259	16,803
Hydroxyzine	5,647	0.6	26.2	2,747	8,547
Zolpidem	28,262	2.9	15.8	19,495	37,028
Anxiolytics, sedatives, and hypnotics NOS	5,255	0.5	15.5	3,659	6,852
CNS stimulants	18,768	1.9	11.5	14,529	23,006
Amphetamine-dextroamphetamine	6,500	0.7	20.0	3,957	9,042
Caffeine	1,876	0.2	23.3	1,019	2,733
Dextroamphetamine	*	*	*	*	*
Methylphenidate	3,173	0.3	21.0	1,864	4,481
General anesthetics	*	*	*	*	*
Muscle relaxants	54,151	5.6	25.5	27,111	81,191
Carisoprodol	34,155	3.5	27.8	15,561	52,749
Cyclobenzaprine	12,748	1.3	31.7	4,815	20,680
Miscellaneous CNS agents	2,034	0.2	37.3	547	3,522
RESPIRATORY AGENTS	31,414	3.2	9.9	25,297	37,530
Antihistamines	8,282	0.9	26.3	4,019	12,544
Bronchodilators	3,046	0.3	18.7	1,928	4,165
Decongestants	1,160	0.1	23.2	633	1,688
Expectorants	2,089	0.2	39.6	468	3,710
Upper respiratory combinations	14,901	1.5	9.9	12,019	17,782
Respiratory agents NTA	3,660	0.4	13.8	2,668	4,652

Table 16. ED visits involving nonmedical use of pharmaceuticals, 2008 (continued)

Drug category and selected drugs (1)	ED visits (2,3)	Percent of ED visits (3)	RSE (%)	95% CI: Lower bound	95% CI: Upper bound
CARDIOVASCULAR AGENTS	41,522	4.3	7.4	35,490	47,554
Antiadrenergic agents, centrally acting	6,197	0.6	14.1	4,488	7,905
Beta-adrenergic blocking agents	13,000	1.3	13.7	9,519	16,481
Calcium channel blocking agents	5,857	0.6	16.5	3,966	7,749
Diuretics	4,814	0.5	22.3	2,709	6,919
Cardiovascular agents NTA	22,359	2.3	7.8	18,921	25,798

(1) The classification of drugs used in DAWN is derived from the Multum *Lexicon*, © 2009, Multum Information Services, Inc. The classification was modified to meet DAWN's unique requirements (2009). The Multum Licensing Agreement governing use of the *Lexicon* can be found in Appendix A and on the Internet at http://dawninfo.samhsa.gov/drug_vocab.

(2) Estimates of ED visits are based on a representative sample of non-Federal, short-stay hospitals with 24-hour EDs in the United States.

(3) ED visits often involve multiple drugs. Such visits will appear multiple times in this table (e.g., a visit involving both methadone and tramadol will appear twice in this table). The sum of visits or rates by drug will be greater than the total, and the sum of percentages by drug will be greater than 100.

NOTE: CI = confidence interval. CNS = central nervous system. NOS = not otherwise specified. NTA = not tabulated above. RSE = relative standard error. An asterisk (*) indicates that an estimate with an RSE greater than 50% or an estimate based on fewer than 30 visits has been suppressed.

SOURCE: Center for Behavioral Health Statistics and Quality, SAMHSA, Drug Abuse Warning Network, 2008.

Among drugs that treat anxiety and insomnia, benzodiazepines were involved in 28.0 percent of ED visits related to nonmedical use of pharmaceuticals, with alprazolam indicated in 10.8 percent of such visits. Appearing in 3 to 6 percent of ED visits involving nonmedical use of pharmaceuticals were acetaminophen, muscle relaxants, anticonvulsants, and nonsteroidal anti-inflammatory agents (e.g., ibuprofen, naproxen).

Psychotherapeutic agents (e.g., antidepressants and antipsychotics) were involved in 12.8 percent of ED visits related to nonmedical use of pharmaceuticals. The two other major categories of pharmaceuticals are respiratory agents and cardiovascular agents; each was involved in about 3 to 4 percent of these ED visits.

When population size and the margin of error are taken into account, visits for nonmedical use of pharmaceuticals did not differ between males and females (308.9 and 329.8 visits per 100,000 population, respectively) (Table 17 and Figure 5). The rate of ED visit rates for patients aged 18 to 29 was over 500 visits per 100,000 population, whereas the rate for patients aged 30 to 54 was over 400 visits.

Table 17. ED visits and rates involving nonmedical use of pharmaceuticals, by patient demographics, 2008

Patient demographics	ED visits (1)	Percent of ED visits	Rate of ED visits per 100,000 population (2)
Total ED visits, nonmedical use	971,914	100.0	319.6
Gender	—	—	—
Male	463,187	47.7	308.9
Female	508,379	52.3	329.8
Unknown	349	0.0	—
Age	—	—	—
0–5 years	4,655	0.5	18.6
6–11 years	4,724	0.5	19.8
12–17 years	70,230	7.2	280.6
18–20 years	71,187	7.3	551.2
21–24 years	97,580	10.0	579.4
25–29 years	115,853	11.9	543.1
30–34 years	89,166	9.2	455.0
35–44 years	182,607	18.8	429.7
45–54 years	184,071	18.9	414.8
55–64 years	81,342	8.4	241.5
65 years and older	70,124	7.2	180.4
Unknown	375	0.0	—
Race/ethnicity	—	—	—
White	680,382	70.0	—
Black	113,037	11.6	—
Hispanic	71,464	7.4	—
Other or two or more race/ethnicities	11,719	1.2	—
Unknown	95,311	9.8	—

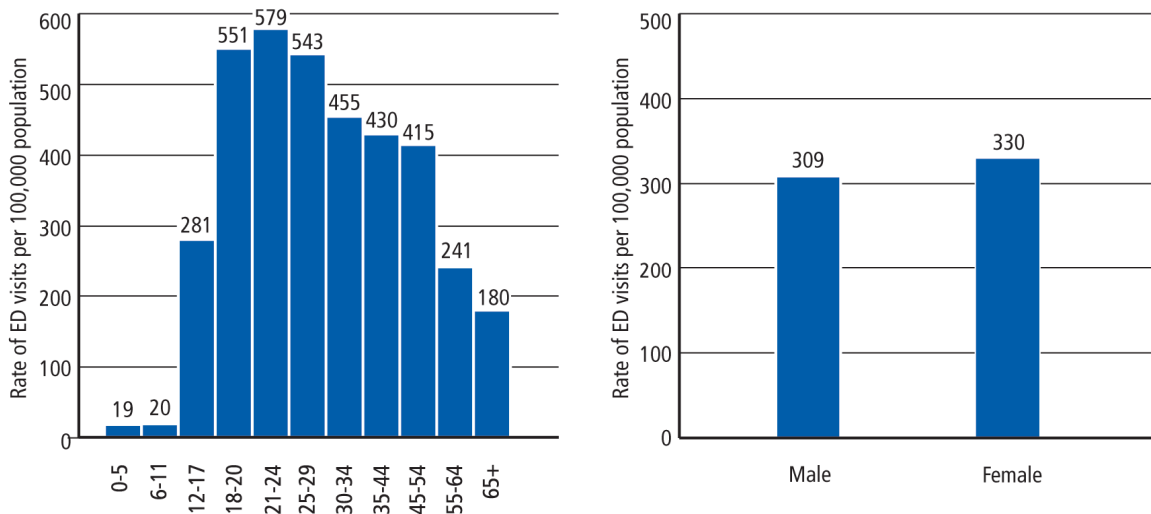
(1) Estimates of ED visits are based on a representative sample of non-Federal, short-stay hospitals with 24-hour EDs in the United States.

(2) All rates are ED visits per 100,000 population. Population estimates are drawn from the 2008 U.S. Census Bureau Postcensal Resident Population National Population Dataset as of July 1, 2008.

NOTE: A dash (—) indicates a blank cell. Rates are not provided for race and ethnicity subgroups because of data limitations.

SOURCE: Center for Behavioral Health Statistics and Quality, SAMHSA, Drug Abuse Warning Network, 2008.

Figure 5. Rates of ED visits per 100,000 population involving nonmedical use of pharmaceuticals, by age and gender, 2008



SOURCE: Center for Behavioral Health Statistics and Quality, SAMHSA, Drug Abuse Warning Network, 2008.

In terms of race and ethnicity, 70.0 percent of visits related to nonmedical use of pharmaceuticals involved patients who were White, 11.6 percent were Black, and 7.4 percent were Hispanic. DAWN does not produce population-based rates for race/ethnicity categories because race/ethnicity information is often missing on ED records.

Patient disposition after ED visits associated with nonmedical use of pharmaceuticals appears in Table 18. The majority (60.5%) of patients were treated and released, which is similar to the percentage found for ED visits involving illicit drugs (Table 7, 58.7%). About a quarter (25.5%) of patients were admitted to the hospital, and the balance (14.0%) had other outcomes.

Table 18. ED visits and rates involving nonmedical use of pharmaceuticals, by patient disposition, 2008

Patient disposition	ED visits (1)	Percent of ED visits	Rate of ED visits per 100,000 population (2)
Total ED visits, nonmedical use	971,914	100.0	319.6
Treated and released	587,687	60.5	193.3
Discharged home	533,547	54.9	175.5
Released to police/jail	24,358	2.5	8.0
Referred to detox/treatment	29,782	3.1	9.8
Admitted to this hospital	247,703	25.5	81.5
ICU/critical care	69,473	7.1	22.8
Surgery	*	*	*
Chemical dependency/detox	3,237	0.3	1.1
Psychiatric unit	49,689	5.1	16.3
Other inpatient unit	124,217	12.8	40.9
Other disposition	136,524	14.0	44.9
Transferred	88,719	9.1	29.2
Left against medical advice	16,761	1.7	5.5
Died	*	*	*
Other	24,123	2.5	7.9
Not documented	5,291	0.5	1.7

(1) Estimates of ED visits are based on a representative sample of non-Federal, short-stay hospitals with 24-hour EDs in the United States.

(2) All rates are ED visits per 100,000 population. Population estimates are drawn from the 2008 U.S. Census Bureau Postcensal Resident Population National Population Dataset as of July 1, 2008.

NOTE: An asterisk (*) indicates that an estimate with a relative standard error greater than 50%, or an estimate based on fewer than 30 visits, has been suppressed.

SOURCE: Center for Behavioral Health Statistics and Quality, SAMHSA, Drug Abuse Warning Network, 2008.

Trends in ED visits involving nonmedical use of pharmaceuticals, 2004–2008

This section presents the trends in the estimates of ED visits involving nonmedical use of pharmaceuticals for the period 2004 through 2008 (Table 19). Differences between years are presented in terms of the percentage increase or decrease in visits in 2008 compared with the estimates for 2004 (long-term trends) and 2006 and 2007 (short-term trends). Only statistically significant changes are discussed and displayed in the table.

Medical emergencies related to nonmedical use of pharmaceuticals increased 81 percent in the period from 2004 to 2008, rising from just over a half million (536,247) visits to almost a million (971,914) visits. Contributing to this rise are significant long-term (2004 to 2008) increases in the number of visits involving narcotic pain relievers, which increased 111 percent, or over 160,000 visits. ED visits for specific drugs in this category that more than doubled over this period were fentanyl, hydrocodone, hydromorphone, morphine, and oxycodone.

Table 19. Trends in ED visits involving nonmedical use of pharmaceuticals, by selected drugs, 2004–2008

Drug category and selected drugs (1)	ED visits, 2004 (2,3)	ED visits, 2005 (2,3)	ED visits, 2006 (2,3)	ED visits, 2007 (2,3)	ED visits, 2008 (2,3)	Percent change, 2004, 2008 (4)	Percent change, 2006, 2008 (4)	Percent change, 2007, 2008 (4)
Total ED visits, nonmedical use	536,247	669,214	741,425	855,838	971,914	81	31	—
PSYCHOTHERAPEUTIC AGENTS	91,268	101,451	112,856	119,787	124,331	—	—	—
Antidepressants	66,917	67,051	79,682	82,009	80,881	—	—	—
MAO inhibitors	*	*	*	*	*	—	—	—
SSRI antidepressants	32,285	30,374	35,370	37,446	39,780	—	—	—
Tricyclic antidepressants	12,412	14,515	16,564	16,600	13,246	—	—	—
Miscellaneous antidepressants	9,414	7,452	7,561	9,687	6,956	—	—	-28
Antipsychotics	35,198	44,393	44,733	52,752	55,005	56	—	—
CENTRAL NERVOUS SYSTEM AGENTS	402,246	489,351	532,584	586,323	718,119	79	35	22
Pain relievers	241,578	294,251	323,579	363,621	458,210	90	42	26
Antimigraine agents	868	1,018	1,191	2,284	1,877	—	—	—
Cox-2 inhibitors	1,935	765	*	635	*	—	—	—
Opiates/opioids	172,726	217,594	247,669	286,521	366,815	112	48	28
Opiates/opioids, unspecified	31,846	52,670	50,978	52,997	66,585	109	—	—
Narcotic pain relievers	144,644	168,376	201,280	237,143	305,885	111	52	29
Buprenorphine products	*	*	4,440	7,136	12,544	—	—	—
Codeine products	7,171	6,180	6,928	5,648	8,235	—	—	—
Fentanyl products	9,823	11,211	16,012	15,947	20,179	105	—	—
Hydrocodone products	39,844	47,192	57,550	65,734	89,051	123	—	—
Hydromorphone products	3,385	4,714	6,780	9,497	12,142	259	79	—
Meperidine products	782	383	1,440	997	1,435	—	—	—
Methadone	36,806	42,684	45,130	53,950	63,629	73	—	—
Morphine products	13,966	15,762	20,416	29,591	28,818	106	—	—
Oxycodone products	41,701	52,943	64,888	76,587	105,214	152	62	37
Propoxyphene products	6,744	7,648	6,220	7,401	13,364	—	—	—
Nonsteroidal anti-inflammatory agents	27,362	28,837	27,662	30,822	30,343	—	—	—
Ibuprofen	22,127	22,268	20,541	20,892	23,539	—	—	—
Naproxen	4,715	5,190	6,651	7,208	4,525	—	-32	-37

Table 19. Trends in ED visits involving nonmedical use of pharmaceuticals, by selected drugs, 2004–2008 (continued)

Drug category and selected drugs (1)	ED visits, 2004 (2,3)	ED visits, 2005 (2,3)	ED visits, 2006 (2,3)	ED visits, 2007 (2,3)	ED visits, 2008 (2,3)	Percent change, 2004, 2008 (4)	Percent change, 2006, 2008 (4)	Percent change, 2007, 2008 (4)
Salicylates products	9,580	12,123	10,399	9,724	13,005	—	—	—
Miscellaneous pain reliever products	44,857	51,881	54,313	56,534	69,146	54	—	—
Acetaminophen products	39,167	43,558	44,314	43,872	49,859	—	—	—
Tramadol products	4,849	5,918	6,048	8,039	11,850	144	96	—
Tramadol	3,948	5,427	5,961	7,662	11,665	195	96	—
Acetaminophen-tramadol	909	*	*	*	*	—	—	—
Pain medication combinations NTA	977	653	898	2,120	1,521	—	—	—
Anorexiant	*	1,757	1,168	758	1,526	—	—	—
Anticonvulsants	28,652	27,641	31,169	35,403	37,439	—	—	—
Antiemetic/antivertigo agents	1,678	1,771	1,360	1,646	1,661	—	—	—
Anti-Parkinson agents	2,472	1,692	3,816	3,764	3,802	—	—	—
Anxiolytics, sedatives, and hypnotics	177,394	227,486	233,875	259,983	325,041	83	—	—
Barbiturates	11,721	14,693	10,991	9,877	9,603	—	—	—
Benzodiazepines	143,546	189,704	195,625	218,640	271,698	89	—	—
Alprazolam	46,526	57,419	65,236	80,313	104,762	125	—	—
Clonazepam	28,178	30,648	33,557	40,920	48,385	72	44	—
Diazepam	15,619	18,433	19,936	19,674	26,518	70	—	—
Lorazepam	17,674	23,210	23,720	26,213	36,602	107	—	—
Benzodiazepines NOS	36,039	61,486	58,347	55,346	65,113	—	—	—
Misc. anxiolytics, sedatives, and hypnotics	31,554	35,561	40,626	43,960	58,983	87	45	34
Diphenhydramine	10,452	10,294	12,291	12,539	13,531	—	—	—
Hydroxyzine	2,363	2,179	2,678	2,447	5,647	—	—	131
Zolpidem	12,792	14,730	17,257	18,464	28,262	121	64	53
Anxiolytics, sedatives, and hypnotics NOS	2,657	4,421	3,629	3,364	5,255	98	—	56
CNS stimulants	9,801	10,965	13,892	18,561	18,768	91	—	—
Amphetamine-dextroamphetamine	2,303	2,669	5,027	6,372	6,500	182	—	—
Caffeine	2,736	4,567	4,407	2,165	1,876	—	-57	—
Dextroamphetamine	*	*	*	*	*	—	—	—

Table 19. Trends in ED visits involving nonmedical use of pharmaceuticals, by selected drugs, 2004–2008 (continued)

Drug category and selected drugs (1)	ED visits, 2004 (2,3)	ED visits, 2005 (2,3)	ED visits, 2006 (2,3)	ED visits, 2007 (2,3)	ED visits, 2008 (2,3)	Percent change, 2004, 2008 (4)	Percent change, 2006, 2008 (4)	Percent change, 2007, 2008 (4)
Methylphenidate	2,446	2,519	2,192	4,782	3,173	—	—	—
General anesthetics	*	*	*	*	*	—	—	—
Muscle relaxants	25,934	33,695	38,918	40,769	54,151	—	—	—
Carisoprodol	14,736	20,082	24,505	27,128	34,155	132	—	—
Cyclobenzaprine	6,183	7,629	7,142	6,197	12,748	—	—	—
Miscellaneous CNS agents	869	900	999	924	2,034	—	—	—
RESPIRATORY AGENTS	22,286	28,017	28,867	31,008	31,414	—	—	—
Antihistamines	5,761	4,429	4,130	5,096	8,282	—	—	—
Bronchodilators	2,294	3,043	2,920	3,043	3,046	—	—	—
Decongestants	1,864	1,309	1,511	1,758	1,160	—	—	—
Expectorants	832	1,960	2,125	2,293	2,089	—	—	—
Upper respiratory combinations	10,314	15,837	15,115	16,677	14,901	—	—	—
Respiratory agents NTA	2,903	3,692	4,296	4,655	3,660	—	—	—
CARDIOVASCULAR AGENTS	27,396	37,095	36,343	35,608	41,522	52	—	—
Antiadrenergic agents, centrally acting	3,616	5,125	4,810	4,751	6,197	71	—	30
Beta-adrenergic blocking agents	7,094	9,824	11,729	11,668	13,000	83	—	—
Calcium channel blocking agents	3,115	5,434	5,227	4,493	5,857	88	—	—
Diuretics	3,625	5,332	5,102	5,467	4,814	—	—	—
Cardiovascular agents NTA	14,930	18,881	17,338	17,879	22,359	—	—	—

(1) The classification of drugs used in DAWN is derived from the Multum *Lexicon*, © 2009, Multum Information Services, Inc. The classification was modified to meet DAWN's unique requirements (2009). The Multum Licensing Agreement governing use of the *Lexicon* can be found in Appendix A and on the Internet at http://dawninfo.samhsa.gov/drug_vocab.

(2) Estimates of ED visits are based on a representative sample of non-Federal, short-stay hospitals with 24-hour EDs in the United States.

(3) ED visits often involve multiple drugs. Such visits will appear multiple times in this table (e.g., a visit involving both methadone and tramadol will appear twice in this table). The sum of visits or rates by drug will be greater than the total, and the sum of percentages by drug will be greater than 100.

(4) This column denotes statistically significant ($p < 0.05$) increases or decreases between estimates for the periods shown.

NOTE: CNS = central nervous system. NOS = not otherwise specified. NTA = not tabulated above. An asterisk (*) indicates that an estimate with a relative standard error greater than 50%, or an estimate based on fewer than 30 visits, has been suppressed. A dash (—) indicates a blank cell.

SOURCE: Center for Behavioral Health Statistics and Quality, SAMHSA, Drug Abuse Warning Network, 2008.

Drugs for anxiety and insomnia (anxiolytics, sedatives, and hypnotics) increased 83 percent overall—almost 150,000 visits, with benzodiazepines accounting for almost 130,000 of the increase. Central nervous system stimulants (e.g., Adderal[®], Ritalin[®]) saw a 91 percent increase, the equivalent of almost 9,000 ED visits.

ED visits involving antipsychotics have gradually increased since 2004, for a net increase of 56 percent. Also, for the first time, long-term increases were seen for cardiovascular agents (52% increase). This may reflect the aging of the U.S. population.

DRUG-RELATED SUICIDE ATTEMPTS

ED visits involving drug-related suicide attempts, 2008

DAWN collects information on suicide attempts that involve drugs and require emergency medical care. These attempts are not limited to drug overdoses. Suicide attempts involving firearms, for example, are included as DAWN cases if drugs were involved at all at the time of the suicide attempt.¹⁰

DAWN estimates there were almost 200,000 (199,469) medical emergencies resulting in ED visits for drug-related suicide attempts in 2008 (Table 20). Nearly two thirds (64.0%) of ED visits for drug-related suicide attempts involved multiple drugs. Almost all (94.6%) involved a prescription drug or over-the-counter medication. Slightly less than three quarters (71.7%) involved central nervous system agents (primarily pain relievers and benzodiazepines), just under a third (29.4%) involved psychotherapeutic agents (e.g., antidepressants, antipsychotics), about a fifth (18.4%) involved illicit drugs, and almost a third (29.9%) of such visits involved alcohol.¹¹

After population size and the margin of error are taken into account, the rate of drug-related suicide attempt visits for females (76.6 visits per 100,000 population) was higher than that for males (53.9 per 100,000) (Table 21 and Figure 6). In respect to age, rates ranged from a low of 11.3 visits per 100,000 population for those aged 65 or older to 141.0 visits for those aged 18 to 20. In terms of race/ethnicity, 64.0 percent of the suicide attempts involved patients who were White. DAWN does not produce population-based rates for race/ethnicity categories because race/ethnicity information is often missing from ED records.

¹⁰ Excluded are suicide-related behaviors documented as something other than actual attempts (e.g., suicidal ideation, suicidal gesture, or suicidal thoughts).

¹¹ Percentages add to greater than 100 percent because visits often involve multiple drugs.

Table 20. ED visits involving drug-related suicide attempts, by selected drugs, 2008

Drug category and selected drugs (1)	ED visits (2,3)	Percent of ED visits (3)	RSE (%)	95% CI: Lower bound	95% CI: Upper bound
Total ED visits, suicide attempts	199,469	100.0	6.7	173,141	225,797
Visits involving a single drug	71,752	36.0	10.4	57,075	86,429
Visits involving multiple drugs	127,717	64.0	7.0	110,160	145,274
Visits involving illicit drugs	36,735	18.4	15.3	25,707	47,763
Visits involving alcohol	59,624	29.9	7.4	50,944	68,304
Visits involving pharmaceuticals	188,651	94.6	6.8	163,339	213,963
Alcohol	59,624	29.9	7.4	50,944	68,304
Alcohol in combination	59,218	29.7	7.5	50,468	67,969
Alcohol alone	406	0.2	45.8	41	770
Non-alcohol illicit	36,735	18.4	15.3	25,707	47,763
Cocaine	19,614	9.8	22.8	10,833	28,394
Heroin	4,249	2.1	23.9	2,256	6,241
Marijuana	17,285	8.7	14.5	12,374	22,195
Stimulants	2,788	1.4	27.8	1,266	4,309
Amphetamines	1,404	0.7	45.1	163	2,645
Methamphetamine	1,553	0.8	34.2	512	2,595
MDMA (Ecstasy)	745	0.4	37.0	205	1,286
GHB	*	*	*	*	*
Flunitrazepam (Rohypnol)	*	*	*	*	*
Ketamine	*	*	*	*	*
LSD	*	*	*	*	*
PCP	*	*	*	*	*
Miscellaneous hallucinogens	*	*	*	*	*
Inhalants	*	*	*	*	*
Combinations NTA	*	*	*	*	*
PSYCHOTHERAPEUTIC AGENTS	58,604	29.4	7.9	49,586	67,622
Antidepressants	40,985	20.5	8.1	34,478	47,491
Phenylpiperazine antidepressants	9,598	4.8	15.5	6,676	12,520
SSNRI antidepressants	5,808	2.9	19.0	3,644	7,972
Duloxetine	1,931	1.0	27.8	879	2,983
Venlafaxine	3,717	1.9	32.0	1,388	6,046
SSRI antidepressants	19,988	10.0	10.4	15,926	24,051
Citalopram	3,563	1.8	22.1	2,017	5,109
Fluoxetine	5,730	2.9	17.6	3,758	7,703
Paroxetine	2,013	1.0	34.6	647	3,378
Sertraline	4,197	2.1	16.5	2,837	5,556
Tetracyclic antidepressants	1,120	0.6	40.7	227	2,013
Tricyclic antidepressants	5,470	2.7	25.9	2,694	8,246
Miscellaneous antidepressants	4,630	2.3	15.3	3,243	6,017
Bupropion	4,137	2.1	16.8	2,774	5,501
Antipsychotics	25,451	12.8	12.4	19,257	31,645
Atypical antipsychotics	21,228	10.6	13.2	15,741	26,715
Olanzapine	1,961	1.0	30.5	788	3,133
Quetiapine	13,522	6.8	15.6	9,399	17,645
Risperidone	2,309	1.2	21.0	1,358	3,260
Phenothiazine antipsychotics	1,076	0.5	30.2	439	1,714

**Table 20. ED visits involving drug-related suicide attempts, by selected drugs, 2008
(continued)**

Drug category and selected drugs (1)	ED visits (2,3)	Percent of ED visits (3)	RSE (%)	95% CI: Lower bound	95% CI: Upper bound
Miscellaneous antipsychotic agents	4,250	2.1	20.8	2,514	5,985
Haloperidol	1,214	0.6	45.5	130	2,298
Lithium	2,948	1.5	21.8	1,686	4,211
CENTRAL NERVOUS SYSTEM AGENTS	142,931	71.7	6.5	124,639	161,222
Pain relievers	74,467	37.3	7.5	63,566	85,369
Opiates/opioids	30,067	15.1	9.7	24,325	35,810
Opiates/opioids, unspecified	3,605	1.8	35.9	1,070	6,140
Narcotic pain relievers	26,817	13.4	9.6	21,792	31,842
Codeine products	2,315	1.2	31.8	872	3,757
Hydrocodone products	11,676	5.9	13.7	8,549	14,804
Hydromorphone products	770	0.4	39.0	181	1,359
Methadone	2,008	1.0	31.7	759	3,258
Morphine products	1,161	0.6	31.6	442	1,879
Oxycodone products	8,760	4.4	16.4	5,936	11,584
Propoxyphene products	1,559	0.8	21.9	891	2,228
Nonsteroidal anti-inflammatory agents	18,657	9.4	11.6	14,427	22,887
Salicylates products	5,351	2.7	19.0	3,363	7,339
Misc. pain relievers products	29,388	14.7	9.1	24,160	34,616
Acetaminophen products	26,406	13.2	9.5	21,514	31,298
Tramadol products	3,057	1.5	27.1	1,435	4,679
Anorexiant	250	0.1	32.4	92	409
Anticonvulsants	14,486	7.3	10.2	11,580	17,393
Anxiolytics, sedatives, and hypnotics	78,990	39.6	7.1	68,044	89,936
Barbiturates	1,480	0.7	43.3	223	2,737
Benzodiazepines	55,823	28.0	7.2	47,974	63,672
Alprazolam	21,220	10.6	13.4	15,655	26,785
Clonazepam	14,571	7.3	8.9	12,037	17,106
Diazepam	5,313	2.7	17.7	3,473	7,153
Lorazepam	9,973	5.0	13.9	7,252	12,694
Temazepam	2,608	1.3	22.5	1,458	3,759
Misc. anxiolytics, sedatives, and hypnotics	28,253	14.2	8.5	23,564	32,942
Buspirone	1,653	0.8	42.6	274	3,033
Diphenhydramine	8,414	4.2	13.3	6,219	10,610
Doxylamine	2,315	1.2	35.0	725	3,905
Hydroxyzine	3,310	1.7	31.5	1,267	5,352
Zolpidem	9,533	4.8	15.1	6,704	12,363
CNS stimulants	3,221	1.6	20.0	1,959	4,484
Muscle relaxants	8,053	4.0	17.6	5,275	10,831
Skeletal muscle relaxants	7,722	3.9	17.8	5,023	10,421
Carisoprodol	3,452	1.7	33.1	1,215	5,688
Cyclobenzaprine	3,438	1.7	21.0	2,023	4,854
RESPIRATORY AGENTS	9,152	4.6	11.6	7,070	11,234
Antihistamines	2,979	1.5	22.0	1,694	4,263
Upper respiratory combinations	4,640	2.3	26.6	2,225	7,055

**Table 20. ED visits involving drug-related suicide attempts, by selected drugs, 2008
(continued)**

Drug category and selected drugs (1)	ED visits (2,3)	Percent of ED visits (3)	RSE (%)	95% CI: Lower bound	95% CI: Upper bound
CARDIOVASCULAR AGENTS	13,140	6.6	19.1	8,213	18,067
Antiadrenergic agents, centrally acting	1,715	0.9	24.0	907	2,523
Beta-adrenergic blocking agents	5,094	2.6	47.4	363	9,826
GASTROINTESTINAL AGENTS	3,606	1.8	18.4	2,307	4,904
HORMONES	2,168	1.1	32.4	793	3,543
METABOLIC AGENTS	3,173	1.6	17.6	2,077	4,270
Antidiabetic agents	2,749	1.4	20.4	1,649	3,848
NUTRITIONAL PRODUCTS	1,789	0.9	26.4	863	2,715
DRUG UNKNOWN	11,363	5.7	16.0	7,789	14,938

(1) The classification of drugs used in DAWN is derived from the Multum *Lexicon*, © 2009, Multum Information Services, Inc. The classification was modified to meet DAWN's unique requirements (2009). The Multum Licensing Agreement governing use of the *Lexicon* can be found in Appendix A and on the Internet at http://dawninfo.samhsa.gov/drug_vocab.

(2) Estimates of ED visits are based on a representative sample of non-Federal, short-stay hospitals with 24-hour EDs in the United States.

(3) ED visits often involve multiple drugs. Such visits will appear multiple times in this table (e.g., a visit involving both cocaine and marijuana will appear twice in this table). The sum of visits or rates by drug will be greater than the total, and the sum of percentages by drug will be greater than 100.

NOTE: CI = confidence interval. CNS = central nervous system. NTA = not tabulated above. RSE = relative standard error. An asterisk (*) indicates that an estimate with an RSE greater than 50% or an estimate based on fewer than 30 visits has been suppressed.

SOURCE: Center for Behavioral Health Statistics and Quality, SAMHSA, Drug Abuse Warning Network, 2008.

Table 21. ED visits involving drug-related suicide attempts, by patient demographics, 2008

Patient demographics	ED visits (1)	Percent of ED visits	Rate of ED visits per 100,000 population (2)
Total ED visits, suicide attempts	199,469	100.0	65.6
Gender	—	—	—
Male	80,841	40.5	53.9
Female	118,118	59.2	76.6
Unknown	*	*	—
Age	—	—	—
0–5 years	*	*	*
6–11 years	*	*	*
12–17 years	23,124	11.6	92.4
18–20 years	18,216	9.1	141.0
21–24 years	19,819	9.9	117.7
25–29 years	25,724	12.9	120.6
30–34 years	18,215	9.1	92.9
35–44 years	42,783	21.4	100.7
45–54 years	34,025	17.1	76.7
55–64 years	12,954	6.5	38.5
65 years and older	4,406	2.2	11.3
Unknown	*	*	—
Race/ethnicity	—	—	—
White	127,735	64.0	—
Black	*	*	—
Hispanic	21,376	10.7	—
Other or two or more race/ethnicities	3,364	1.7	—
Unknown	17,258	8.7	—

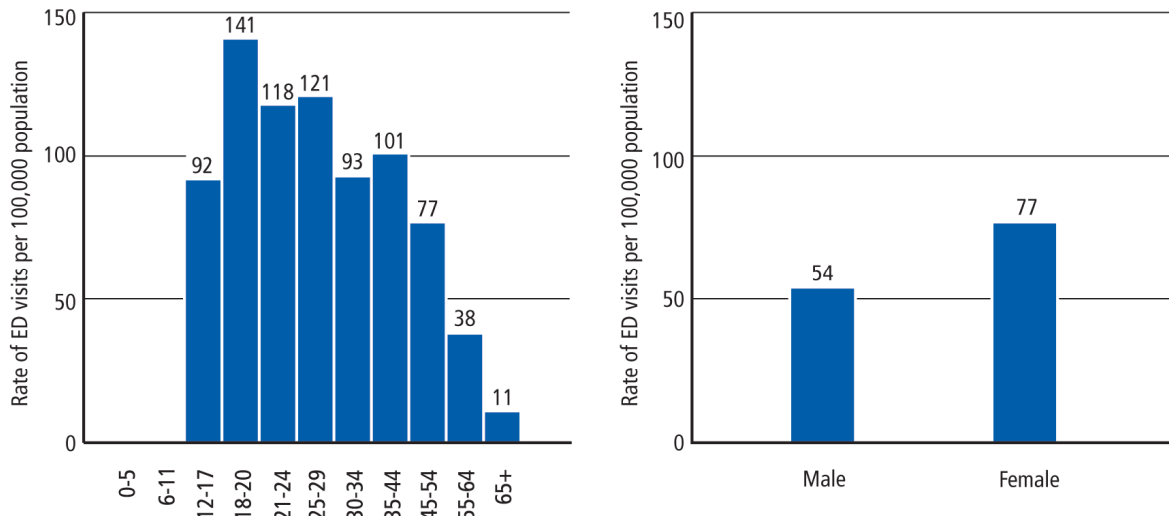
(1) Estimates of ED visits are based on a representative sample of non-Federal, short-stay hospitals with 24-hour EDs in the United States.

(2) All rates are ED visits per 100,000 population. Population estimates are drawn from the 2008 U.S. Census Bureau Postcensal Resident Population National Population Dataset as of July 1, 2008.

NOTE: An asterisk (*) indicates that an estimate with a relative standard error greater than 50%, or an estimate based on fewer than 30 visits, has been suppressed. A dash (—) indicates a blank cell. Rates are not provided for race and ethnicity subgroups because of data limitations.

SOURCE: Center for Behavioral Health Statistics and Quality, SAMHSA, Drug Abuse Warning Network, 2008.

Figure 6. Rates of ED visits per 100,000 population involving drug-related suicide attempts, by age and gender, 2008



SOURCE: Center for Behavioral Health Statistics and Quality, SAMHSA, Drug Abuse Warning Network, 2008.

About half (49.7%) of the patients attempting suicide were admitted for inpatient hospital care (Table 22), a fifth (19.7%) were admitted to an ICU/critical care unit, and somewhat smaller numbers were admitted to psychiatric units (15.0%) or other inpatient units (14.7%). A quarter (25.7%) were transferred to another health care facility, and only 14.8 percent were discharged home. Very few died in the ED. However, DAWN does not record deaths for patients who died before arriving at the ED or for patients who died after admission to inpatient units of the hospital.

Table 22. ED visits involving drug-related suicide attempts, by patient disposition, 2008

Patient disposition	ED visits (1)	Percent of ED visits	Rate of ED visits per 100,000 population (2)
Total ED visits, suicide attempts	199,469	100.0	65.6
Treated and released	39,321	19.7	12.9
Discharged home	29,551	14.8	9.7
Released to police/jail	4,104	2.1	1.3
Referred to detox/treatment	5,666	2.8	1.9
Admitted to this hospital	99,175	49.7	32.6
ICU/critical care	39,291	19.7	12.9
Surgery	421	0.2	0.1
Chemical dependency/detox	301	0.2	0.1
Psychiatric unit	29,853	15.0	9.8
Other inpatient unit	29,309	14.7	9.6
Other disposition	60,973	30.6	20.1
Transferred	51,244	25.7	16.9
Left against medical advice	880	0.4	0.3
Died	*	*	*
Other	*	*	*
Not documented	1,456	0.7	0.5

(1) Estimates of ED visits are based on a representative sample of non-Federal, short-stay hospitals with 24-hour EDs in the United States.

(2) All rates are ED visits per 100,000 population. Population estimates are drawn from the 2008 U.S. Census Bureau Postcensal Resident Population National Population Dataset as of July 1, 2008.

NOTE: An asterisk (*) indicates that an estimate with a relative standard error greater than 50%, or an estimate based on fewer than 30 visits, has been suppressed.

SOURCE: Center for Behavioral Health Statistics and Quality, SAMHSA, Drug Abuse Warning Network, 2008.

Trends in ED visits involving drug-related suicide attempts, 2004–2008

This section presents the trends in the estimates of drug-related ED visits involving suicide attempts for the period 2004 through 2008 (Tables 23 and 24). Differences between years are presented in terms of the percentage increase or decrease in visits in 2008 compared with the estimates for 2004 (long-term trends) and 2006 and 2007 (short-term trends). Only statistically significant changes are discussed and displayed in the tables.

In 2004 and 2005, the number of drug-related suicide attempts requiring immediate medical care resulted in 150,000 to 160,000 ED visits annually. There was an increase of over 40,000 visits, 30 percent, from 2005 to 2007. The level stabilized again between 2007 and 2008, by which time the total number of ED visits involving drug-related suicide attempts was just under 200,000 visits. The rise in visits between 2004 and 2008 appears to be associated with increased use of antipsychotics, hydrocodone, oxycodone, alprazolam, and zolpidem. The only noteworthy increase among visits involving illicit drugs was a short-term increase between 2007 and 2008 in visits involving marijuana (43%).

Specific types of drugs with increasing incidence between 2004 and 2008 are included in Table 23. A more complete list of drugs with information on short- and long-term trends is provided in Table 24.

Table 23. Drug categories and drugs with increasing involvement in drug-related suicide attempt ED visits, 2004–2008

Drug category and selected drugs (1)	Increase in visits, 2004 to 2008 (2)	Percent increase in visits, 2004 to 2008 (3)
Antipsychotics	7,644	43
Quetiapine	5,214	63
Central nervous system agents	32,834	30
Narcotic pain relievers	9,889	58
Hydrocodone products	4,642	66
Oxycodone products	3,420	64
Drugs for anxiety and insomnia	26,337	50
Benzodiazepines	18,829	51
Alprazolam	9,867	87
Other drugs for anxiety and insomnia	11,463	68
Zolpidem	5,178	119

(1) The classification of drugs used in DAWN is derived from the Multum *Lexicon*, © 2009, Multum Information Services, Inc. The classification was modified to meet DAWN's unique requirements (2009). The Multum Licensing Agreement governing use of the *Lexicon* can be found in Appendix A and on the Internet at http://dawninfo.samhsa.gov/drug_vocab.

(2) Estimates of ED visits are based on a representative sample of non-Federal, short-stay hospitals with 24-hour EDs in the United States.

(3) This column denotes statistically significant ($p < 0.05$) increases or decreases between estimates for the periods shown.

SOURCE: Center for Behavioral Health Statistics and Quality, SAMHSA, Drug Abuse Warning Network, 2008.

Table 24. Trends in ED visits for drug-related suicide attempts, by selected drugs, 2004–2008

Drug category and selected drugs (1)	ED visits, 2004 (2,3)	ED visits, 2005 (2,3)	ED visits, 2006 (2,3)	ED visits, 2007 (2,3)	ED visits, 2008 (2,3)	Percent change, 2004, 2008 (4)	Percent change, 2006, 2008 (4)	Percent change, 2007, 2008 (4)
Total ED visits, suicide attempts	161,586	151,568	182,805	197,053	199,469	—	—	—
Alcohol	48,726	47,891	54,820	57,319	59,624	—	—	—
Alcohol in combination	48,080	46,806	54,337	56,434	59,218	—	—	—
Alcohol alone	646	1,085	483	*	406	—	—	—
Non-alcohol illicit	34,763	33,784	42,148	37,319	36,735	—	—	—
Cocaine	19,520	19,628	26,510	26,462	19,614	—	—	—
Heroin	4,579	3,167	4,265	4,444	4,249	—	—	—
Marijuana	12,074	11,955	15,272	12,115	17,285	—	—	43
Stimulants	4,535	5,410	4,829	2,665	2,788	—	—	—
Amphetamines	1,560	1,646	2,228	878	1,404	—	—	—
Methamphetamine	3,136	3,853	2,877	1,795	1,553	—	-46	—
MDMA (Ecstasy)	*	529	1,239	481	745	—	—	—
GHB	*	*	*	*	*	—	—	—
Flunitrazepam (Rohypnol)	*	*	*	*	*	—	—	—
Ketamine	*	*	*	*	*	—	—	—
LSD	*	*	*	*	*	—	—	—
PCP	*	*	*	768	*	—	—	—
Miscellaneous hallucinogens	*	*	*	*	*	—	—	—
Inhalants	*	794	*	*	*	—	—	—
Combinations NTA	*	*	*	*	*	—	—	—

Table 24. Trends in ED visits for drug-related suicide attempts, by selected drugs, 2004–2008 (continued)

Drug category and selected drugs (1)	ED visits, 2004 (2,3)	ED visits, 2005 (2,3)	ED visits, 2006 (2,3)	ED visits, 2007 (2,3)	ED visits, 2008 (2,3)	Percent change, 2004, 2008 (4)	Percent change, 2006, 2008 (4)	Percent change, 2007, 2008 (4)
PSYCHOTHERAPEUTIC AGENTS	44,940	39,145	52,450	57,111	58,604	—	—	—
Antidepressants	33,366	27,086	36,677	38,870	40,985	—	—	—
Phenylpiperazine antidepressants	7,015	6,639	9,029	8,018	9,598	—	—	—
SSNRI antidepressants	3,193	2,941	4,392	6,404	5,808	—	—	—
Duloxetine	*	861	1,541	2,948	1,931	—	—	—
Venlafaxine	3,179	2,080	2,858	3,457	3,717	—	—	—
SSRI antidepressants	18,513	13,377	16,973	18,884	19,988	—	—	—
Citalopram	2,115	886	3,047	3,358	3,563	—	—	—
Fluoxetine	3,477	3,292	3,923	3,790	5,730	—	—	—
Paroxetine	4,509	2,927	2,054	2,071	2,013	-55	—	—
Sertraline	4,852	4,109	4,263	5,413	4,197	—	—	—
Tetracyclic antidepressants	1,749	811	2,200	1,303	1,120	—	—	—
Tricyclic antidepressants	3,555	3,008	4,681	4,152	5,470	—	—	—
Miscellaneous antidepressants	3,337	2,681	3,806	3,939	4,630	—	—	—
Bupropion	3,324	2,570	3,589	3,880	4,137	—	—	—
Antipsychotics	17,807	17,129	22,491	25,479	25,451	43	—	—
Atypical antipsychotics	15,016	14,300	19,429	20,250	21,228	—	—	—
Olanzapine	2,541	2,334	2,666	933	1,961	—	—	—
Quetiapine	8,308	8,649	10,756	14,051	13,522	63	—	—
Risperidone	3,255	2,036	2,536	2,367	2,309	—	—	—
Phenothiazine antipsychotics	956	680	1,574	*	1,076	—	—	—
Miscellaneous antipsychotic agents	2,821	2,354	2,568	3,842	4,250	—	—	—
Haloperidol	*	1,070	1,181	855	1,214	—	—	—
Lithium	1,832	1,281	1,298	2,751	2,948	—	127	—

Table 24. Trends in ED visits for drug-related suicide attempts, by selected drugs, 2004–2008 (continued)

Drug category and selected drugs (1)	ED visits, 2004 (2,3)	ED visits, 2005 (2,3)	ED visits, 2006 (2,3)	ED visits, 2007 (2,3)	ED visits, 2008 (2,3)	Percent change, 2004, 2008 (4)	Percent change, 2006, 2008 (4)	Percent change, 2007, 2008 (4)
CENTRAL NERVOUS SYSTEM AGENTS	110,097	103,698	129,735	143,384	142,931	30	—	—
Pain relievers	61,095	54,858	67,623	78,948	74,467	—	—	—
Opiates/opioids	18,939	20,359	27,185	31,476	30,067	59	—	—
Opiates/opioids, unspecified	2,363	2,819	3,129	1,893	3,605	—	—	—
Narcotic pain relievers	16,928	17,801	24,470	29,886	26,817	58	—	—
Codeine products	1,750	2,656	2,349	1,637	2,315	—	—	—
Hydrocodone products	7,034	7,035	8,998	13,238	11,676	66	—	—
Hydromorphone products	*	*	262	796	770	—	—	—
Methadone	1,287	1,596	1,772	3,192	2,008	—	—	—
Morphine products	714	1,210	*	1,690	1,161	—	—	—
Oxycodone products	5,340	4,229	7,842	9,351	8,760	64	—	—
Propoxyphene products	1,888	2,129	2,811	1,754	1,559	—	—	—
Nonsteroidal anti-inflammatory agents	19,114	14,117	15,956	18,810	18,657	—	—	—
Salicylates products	6,211	4,645	5,400	5,976	5,351	—	—	—
Misc. pain reliever products	22,864	22,692	27,371	32,968	29,388	—	—	—
Acetaminophen products	20,701	21,017	25,312	29,861	26,406	—	—	—
Tramadol products	1,742	1,515	1,719	2,816	3,057	—	—	—
Anorexiant	*	*	654	*	250	—	—	—
Anticonvulsants	10,957	9,389	12,580	11,803	14,486	—	—	—
Anxiolytics, sedatives, and hypnotics	52,653	52,022	68,177	72,637	78,990	50	—	—
Barbiturates	1,948	1,219	2,031	1,663	1,480	—	—	—
Benzodiazepines	36,995	35,676	50,431	53,509	55,823	51	—	—
Alprazolam	11,354	14,530	15,633	19,167	21,220	87	—	—
Clonazepam	9,402	9,064	14,173	14,455	14,571	—	—	—

Table 24. Trends in ED visits for drug-related suicide attempts, by selected drugs, 2004–2008 (continued)

Drug category and selected drugs (1)	ED visits, 2004 (2,3)	ED visits, 2005 (2,3)	ED visits, 2006 (2,3)	ED visits, 2007 (2,3)	ED visits, 2008 (2,3)	Percent change, 2004, 2008 (4)	Percent change, 2006, 2008 (4)	Percent change, 2007, 2008 (4)
Diazepam	4,630	3,968	5,909	6,912	5,313	—	—	—
Lorazepam	6,065	5,182	6,682	9,527	9,973	—	49	—
Temazepam	2,539	1,803	2,661	2,398	2,608	—	—	—
Misc. anxiolytics, sedatives, and hypnotics	16,790	17,522	21,527	23,349	28,253	68	—	—
Buspirone	268	*	516	950	1,653	—	—	—
Diphenhydramine	7,458	6,583	7,756	7,618	8,414	—	—	—
Doxylamine	454	1,325	1,090	1,098	2,315	410	—	—
Hydroxyzine	2,346	1,795	1,956	2,027	3,310	—	—	—
Zolpidem	4,355	4,972	6,674	7,403	9,533	119	—	—
CNS stimulants	1,654	1,782	1,949	2,208	3,221	—	—	—
Muscle relaxants	5,921	5,785	7,072	9,772	8,053	—	—	—
Skeletal muscle relaxants	5,867	5,677	6,698	9,587	7,722	—	—	—
Carisoprodol	1,864	2,038	3,811	4,301	3,452	—	—	—
Cyclobenzaprine	2,966	2,784	2,096	3,839	3,438	—	—	—
RESPIRATORY AGENTS	8,361	7,662	8,415	10,175	9,152	—	—	—
Antihistamines	2,059	1,650	1,627	3,813	2,979	—	—	—
Upper respiratory combinations	4,818	4,207	3,982	4,067	4,640	—	—	—
CARDIOVASCULAR AGENTS	7,667	5,814	7,965	7,873	13,140	—	—	—
Antiadrenergic agents, centrally acting	995	912	1,929	790	1,715	—	—	117
Beta-adrenergic blocking agents	2,105	1,916	1,999	2,501	5,094	—	—	—
GASTROINTESTINAL AGENTS	2,276	2,542	2,236	2,010	3,606	—	—	—
HORMONES	1,125	702	1,579	2,016	2,168	—	—	—

Table 24. Trends in ED visits for drug-related suicide attempts, by selected drugs, 2004–2008 (continued)

Drug category and selected drugs (1)	ED visits, 2004 (2,3)	ED visits, 2005 (2,3)	ED visits, 2006 (2,3)	ED visits, 2007 (2,3)	ED visits, 2008 (2,3)	Percent change, 2004, 2008 (4)	Percent change, 2006, 2008 (4)	Percent change, 2007, 2008 (4)
METABOLIC AGENTS	2,145	3,044	3,719	2,252	3,173	—	—	—
Antidiabetic agents	1,841	2,580	2,941	1,438	2,749	—	—	91
NUTRITIONAL PRODUCTS	1,333	1,105	1,065	2,077	1,789	—	—	—
DRUG UNKNOWN	4,015	6,725	6,704	9,322	11,363	183	69	—

(1) The classification of drugs used in DAWN is derived from the Multum *Lexicon*, © 2009, Multum Information Services, Inc. The classification was modified to meet DAWN's unique requirements (2009). The Multum Licensing Agreement governing use of the *Lexicon* can be found in Appendix A and on the Internet at http://dawninfo.samhsa.gov/drug_vocab.

(2) Estimates of ED visits are based on a representative sample of non-Federal, short-stay hospitals with 24-hour EDs in the United States.

(3) ED visits often involve multiple drugs. Such visits will appear multiple times in this table (e.g., a visit involving both cocaine and marijuana will appear twice in this table). The sum of visits or rates by drug will be greater than the total, and the sum of percentages by drug will be greater than 100.

(4) This column denotes statistically significant ($p < 0.05$) increases or decreases between estimates for the periods shown.

NOTE: CNS = central nervous system. NTA = not tabulated above. An asterisk (*) indicates that an estimate with a relative standard error greater than 50%, or an estimate based on fewer than 30 visits, has been suppressed. A dash (—) indicates a blank cell.

SOURCE: Center for Behavioral Health Statistics and Quality, SAMHSA, Drug Abuse Warning Network, 2008.

SEEKING DETOX SERVICES

ED visits involving seeking detox services, 2008

The category of visits referred to as “seeking detox” includes various situations such as nonemergency requests for admission for detoxification, visits to obtain medical clearance before entry to a detox program,¹² and acute emergencies in which an individual is in distress (i.e., displaying active withdrawal symptoms) and seeking detox. Because detox may be sought through other avenues (e.g., direct admission to a hospital, services provided through private clinics, entry into programs outside the community), the overall demand for detox services is most likely higher than suggested by DAWN estimates.

DAWN estimates that there were 177,879 drug-related ED visits for patients seeking detox or substance abuse treatment services during 2008 (Table 25). Among the illicit drugs, cocaine was observed in 38.7 percent of visits, heroin in 29.2 percent, marijuana in 18.5 percent, and stimulants in 7.0 percent. Among pain relievers, narcotic pain relievers were observed in 32.9 percent of visits, including oxycodone in 19.3 percent, hydrocodone in 12.1 percent, and methadone in 5.6 percent. Benzodiazepines were observed in 23.4 percent of visits. More than one third (36.6%) of ED visits by persons seeking detox involved alcohol.¹³ Visits for almost three quarters (73.0%) of patients seeking detox involved multiple drugs.

When population size and the margin of error are taken into account, the rate of seeking detox visits for males (74.6 per 100,000 population) was higher than that for females (42.8 per 100,000 population) (Table 26, Figure 7). Rates of seeking detox visits were over 100 visits per 100,000 population for those aged 18 to 44, peaking at 163.7 for those aged 25 to 29.

In terms of race/ethnicity, the majority (67.5%) of seeking detox visits involved patients who were White. DAWN does not produce population-based rates for race/ethnicity categories because race/ethnicity information is often missing in ED records.

About half (47.1%) of the ED patients classified as seeking detox were treated and released (Table 27). There was evidence that just under half (20.9%) of those treated and released were referred to detox or treatment services. Another 20.3 percent were admitted to the chemical dependency/detox unit of the hospital, and 17.5 percent were admitted to other units within the hospital. Less than 10 percent (7.5%) were transferred to another facility. In total, 66.1 percent of patients had some form of follow-up.

¹² Some detox programs, in the hospital or the community, require medical clearance before a person can be admitted to a program. Medical clearance establishes whether a person has any special medical needs (e.g., person is diabetic and needs insulin) or is not suitable to mingle with other patients in the program (e.g., person has an infectious disease or is mentally unstable).

¹³ The role of alcohol may be underrepresented here because, for patients aged 21 and older, DAWN captures alcohol use only when it is combined with the use of other drugs.

Table 25. ED visits involving seeking detox services, by selected drugs, 2008

Drug category and selected drugs (1)	ED visits (2,3)	Percent of ED visits (3)	RSE (%)	95% CI: Lower bound	95% CI: Upper bound
Total ED visits, seeking detox	177,879	100.0	18.6	112,962	242,796
Visits involving a single drug	47,944	27.0	11.4	37,186	58,702
Visits involving multiple drugs	129,935	73.0	23.2	70,941	188,928
Alcohol	65,166	36.6	14.7	46,445	83,887
Alcohol in combination	64,802	36.4	14.8	46,046	83,559
Alcohol alone	363	0.2	38.0	93	634
Non-alcohol illicit	124,371	69.9	16.3	84,669	164,073
Cocaine	68,824	38.7	17.2	45,569	92,079
Heroin	51,932	29.2	13.5	38,238	65,626
Marijuana	32,887	18.5	25.8	16,242	49,532
Stimulants	12,418	7.0	43.8	1,758	23,077
Amphetamines	2,658	1.5	48.5	132	5,184
Methamphetamine	9,908	5.6	42.8	1,595	18,222
MDMA (Ecstasy)	775	0.4	23.6	416	1,133
GHB	*	*	*	*	*
Flunitrazepam (Rohypnol)	*	*	*	*	*
Ketamine	*	*	*	*	*
LSD	71	<0.1	22.5	40	102
PCP	1,478	0.8	41.6	274	2,681
Miscellaneous hallucinogens	*	*	*	*	*
Inhalants	*	*	*	*	*
Combinations NTA	85	<0.1	38.6	21	149
PSYCHOTHERAPEUTIC AGENTS	3,671	2.1	32.7	1,317	6,024
Antidepressants	1,894	1.1	24.1	1,000	2,787
Antipsychotics	*	*	*	*	*
CENTRAL NERVOUS SYSTEM AGENTS	86,040	48.4	29.8	35,768	136,313
Pain relievers	69,602	39.1	34.2	22,981	116,224
Opiates/opioids	65,630	36.9	33.5	22,489	108,771
Opiates/opioids, unspecified	8,123	4.6	30.2	3,313	12,933
Narcotic pain relievers	58,488	32.9	33.7	19,846	97,130
Codeine products	768	0.4	34.9	242	1,293
Fentanyl products	1,126	0.6	27.6	517	1,735
Hydrocodone products	21,595	12.1	47.1	1,648	41,543
Hydromorphone products	1,447	0.8	27.0	681	2,213
Methadone	10,022	5.6	23.4	5,421	14,623
Morphine products	5,066	2.8	31.7	1,917	8,215
Oxycodone products	34,301	19.3	39.5	7,778	60,825

Table 25. ED visits involving seeking detox services, by selected drugs, 2008 (continued)

Drug category and selected drugs (1)	ED visits (2,3)	Percent of ED visits (3)	RSE (%)	95% CI: Lower bound	95% CI: Upper bound
Anxiolytics, sedatives, and hypnotics	42,178	23.7	34.9	13,345	71,012
Barbiturates	551	0.3	33.5	189	913
Benzodiazepines	41,576	23.4	35.5	12,666	70,486
Alprazolam	*	*	*	*	*
Clonazepam	5,683	3.2	32.2	2,101	9,265
Diazepam	*	*	*	*	*
Lorazepam	2,847	1.6	27.9	1,292	4,403
Temazepam	*	*	*	*	*
CNS stimulants	*	*	*	*	*
Muscle relaxants	1,381	0.8	25.3	697	2,065
RESPIRATORY AGENTS	348	0.2	38.0	88	607
CARDIOVASCULAR AGENTS	227	0.1	46.8	19	435
DRUG UNKNOWN	10,515	5.9	46.3	979	20,051

(1) The classification of drugs used in DAWN is derived from the Multum *Lexicon*, © 2009, Multum Information Services, Inc. The classification was modified to meet DAWN's unique requirements (2009). The Multum Licensing Agreement governing use of the *Lexicon* can be found in Appendix A and on the Internet at http://dawninfo.samhsa.gov/drug_vocab.

(2) Estimates of ED visits are based on a representative sample of non-Federal, short-stay hospitals with 24-hour EDs in the United States.

(3) ED visits often involve multiple drugs. Such visits will appear multiple times in this table (e.g., a visit involving both cocaine and marijuana will appear twice in this table). The sum of visits or rates by drug will be greater than the total, and the sum of percentages by drug will be greater than 100.

NOTE: CI = confidence interval. CNS = central nervous system. NTA = not tabulated above. RSE = relative standard error. An asterisk (*) indicates that an estimate with an RSE greater than 50% or an estimate based on fewer than 30 visits has been suppressed.

SOURCE: Center for Behavioral Health Statistics and Quality, SAMHSA, Drug Abuse Warning Network, 2008.

Table 26. ED visits involving seeking detox services, by patient demographics, 2008

Patient demographics	ED visits (1)	Percent of ED visits	Rate of ED visits per 100,000 population (2)
Total ED visits, seeking detox	177,879	100.0	58.5
Gender	—	—	—
Male	111,870	62.9	74.6
Female	65,978	37.1	42.8
Unknown	*	*	—
Age	—	—	—
0–5 years	*	*	*
6–11 years	*	*	*
12–17 years	1,575	0.9	6.3
18–20 years	15,785	8.9	122.2
21–24 years	21,283	12.0	126.4
25–29 years	34,918	19.6	163.7
30–34 years	22,045	12.4	112.5
35–44 years	43,982	24.7	103.5
45–54 years	28,873	16.2	65.1
55–64 years	8,351	4.7	24.8
65 years and older	1,040	0.6	2.7
Unknown	*	*	—
Race/ethnicity	—	—	—
White	120,031	67.5	—
Black	29,261	16.4	—
Hispanic	10,164	5.7	—
Other or two or more race/ethnicities	708	0.4	—
Unknown	17,715	10.0	—

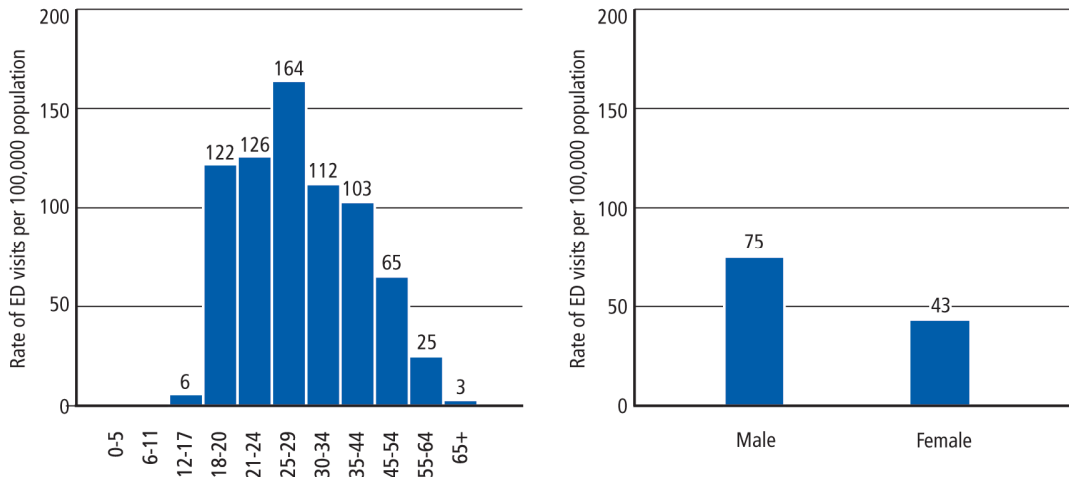
(1) Estimates of ED visits are based on a representative sample of non-Federal, short-stay hospitals with 24-hour EDs in the United States.

(2) All rates are ED visits per 100,000 population. Population estimates are drawn from the 2008 U.S. Census Bureau Postcensal Resident Population National Population Dataset as of July 1, 2008.

NOTE: An asterisk (*) indicates that an estimate with a relative standard error greater than 50%, or an estimate based on fewer than 30 visits, has been suppressed. A dash (—) indicates a blank cell. Rates are not provided for race and ethnicity subgroups because of data limitations.

SOURCE: Center for Behavioral Health Statistics and Quality, SAMHSA, Drug Abuse Warning Network, 2008.

Figure 7. Rates of ED visits per 100,000 population involving seeking detox services, by age and gender, 2008



SOURCE: Center for Behavioral Health Statistics and Quality, SAMHSA, Drug Abuse Warning Network, 2008.

Table 27. ED visits involving seeking detox services, by patient disposition, 2008

Patient disposition	ED visits (1)	Percent of ED visits	Rate of ED visits per 100,000 population (2)
Total ED visits, seeking detox	177,879	100.0	58.5
Treated and released	83,864	47.1	27.6
Discharged home	46,458	26.1	15.3
Released to police/jail	*	*	*
Referred to detox/treatment	37,111	20.9	12.2
Admitted to this hospital	67,218	37.8	22.1
ICU/critical care	807	0.5	0.3
Surgery	*	*	*
Chemical dependency/detox	36,026	20.3	11.8
Psychiatric unit	*	*	*
Other inpatient unit	*	*	*
Other disposition	26,797	15.1	8.8
Transferred	13,276	7.5	4.4
Left against medical advice	4,434	2.5	1.5
Died	*	*	*
Other	*	*	*
Not documented	*	*	*

(1) Estimates of ED visits are based on a representative sample of non-Federal, short-stay hospitals with 24-hour EDs in the United States.

(2) All rates are ED visits per 100,000 population. Population estimates are drawn from the 2008 U.S. Census Bureau Postcensal Resident Population National Population Dataset as of July 1, 2008.

NOTE: An asterisk (*) indicates that an estimate with a relative standard error greater than 50%, or an estimate based on fewer than 30 visits, has been suppressed.

SOURCE: Center for Behavioral Health Statistics and Quality, SAMHSA, Drug Abuse Warning Network, 2008.

Trends in ED visits involving seeking detox services, 2004–2008

This section presents the trends in the estimates of ED visits involving seeking detox services for the period 2004 through 2008 (Table 28). Differences between years are presented in terms of the percentage increase or decrease in visits in 2008 compared with the estimates for 2004 (long-term trends) and 2006 and 2007 (short-term trends). Only statistically significant changes are discussed and displayed in the table.

The number of patients seeking detox services through the ED was relatively stable from 2004 through 2008. In the short term, between 2006 and 2008, increases were seen in the involvement of heroin (51%) and methadone (89%). These increases merely offset declines seen in the immediately preceding year (2005), and the level of ED visits in 2008 is similar to that seen in 2004. From 2004 to 2008, there were large percentage increases in the involvement of morphine, clonazepam, and lorazepam, although the actual number of visits associated with these drugs remains small.

Table 28. Trends in ED visits involving seeking detox services, by selected drugs, 2004–2008

Drug category and selected drugs (1)	ED visits, 2004 (2,3)	ED visits, 2005 (2,3)	ED visits, 2006 (2,3)	ED visits, 2007 (2,3)	ED visits, 2008 (2,3)	Percent change, 2004, 2008 (4)	Percent change, 2006, 2008 (4)	Percent change, 2007, 2008 (4)
Total ED visits, seeking detox	141,867	126,226	118,355	139,908	177,879	—	—	—
Alcohol	53,662	47,494	47,102	57,157	65,166	—	—	—
Alcohol in combination	51,831	47,154	46,769	56,574	64,802	—	—	—
Alcohol alone	*	*	*	*	363	—	—	—
Non-alcohol illicit	110,792	101,244	92,385	106,660	124,371	—	—	—
Cocaine	62,989	56,061	57,738	65,124	68,824	—	—	—
Heroin	47,035	40,895	34,462	42,242	51,932	—	51	—
Marijuana	25,965	22,486	22,104	25,970	32,887	—	—	—
Stimulants	11,760	15,402	8,128	7,161	12,418	—	—	—
Amphetamines	*	*	2,034	979	2,658	—	—	—
Methamphetamine	*	*	6,211	6,287	9,908	—	—	—
MDMA (Ecstasy)	882	511	483	654	775	—	—	—
GHB	*	*	*	*	*	—	—	—
Flunitrazepam (Rohypnol)	*	*	*	*	*	—	—	—
Ketamine	*	*	*	*	*	—	—	—
LSD	*	*	*	*	71	—	—	—
PCP	827	729	989	*	1,478	—	—	—
Miscellaneous hallucinogens	*	*	*	*	*	—	—	—
Inhalants	*	*	*	*	*	—	—	—
Combinations NTA	*	191	*	216	85	—	—	—
PSYCHOTHERAPEUTIC AGENTS	1,419	1,380	1,364	1,654	3,671	—	—	—
Antidepressants	1,024	1,195	1,141	1,314	1,894	—	—	—
Antipsychotics	459	259	457	536	*	—	—	—

Table 28. Trends in ED visits involving seeking detox services, by selected drugs, 2004–2008 (continued)

Drug category and selected drugs (1)	ED visits, 2004 (2,3)	ED visits, 2005 (2,3)	ED visits, 2006 (2,3)	ED visits, 2007 (2,3)	ED visits, 2008 (2,3)	Percent change, 2004, 2008 (4)	Percent change, 2006, 2008 (4)	Percent change, 2007, 2008 (4)
CENTRAL NERVOUS SYSTEM AGENTS	44,905	41,265	40,704	52,829	86,040	—	—	—
Pain relievers	34,730	30,114	31,690	42,776	69,602	—	—	—
Opiates/opioids	33,296	29,330	30,786	41,241	65,630	—	—	—
Opiates/opioids, unspecified	4,507	4,246	4,467	4,746	8,123	—	—	—
Narcotic pain relievers	29,894	25,550	26,880	37,040	58,488	—	—	—
Codeine products	650	347	426	*	768	—	—	—
Fentanyl products	704	1,265	1,054	1,359	1,126	—	—	—
Hydrocodone products	8,114	8,929	8,092	10,425	21,595	—	—	—
Hydromorphone products	962	617	*	*	1,447	—	—	—
Methadone	8,109	4,172	5,294	6,886	10,022	—	89	—
Morphine products	1,638	2,399	3,002	3,341	5,066	209	—	—
Oxycodone products	15,917	14,028	14,721	18,880	34,301	—	—	—
Anxiolytics, sedatives, and hypnotics	15,748	16,533	16,799	20,365	42,178	—	—	—
Barbiturates	852	684	530	722	551	—	—	—
Benzodiazepines	14,717	15,734	15,801	19,301	41,576	—	—	—
Alprazolam	6,061	6,253	7,063	9,138	*	—	—	—
Clonazepam	1,510	1,805	2,119	2,635	5,683	276	—	—
Diazepam	2,975	2,058	1,431	3,172	*	—	—	—
Lorazepam	1,012	987	1,479	1,980	2,847	181	—	—
Temazepam	*	*	*	*	*	—	—	—
CNS stimulants	*	829	589	1,049	*	—	—	—
Muscle relaxants	1,356	1,204	1,214	1,701	1,381	—	—	—

Table 28. Trends in ED visits involving seeking detox services, by selected drugs, 2004–2008 (continued)

Drug category and selected drugs (1)	ED visits, 2004 (2,3)	ED visits, 2005 (2,3)	ED visits, 2006 (2,3)	ED visits, 2007 (2,3)	ED visits, 2008 (2,3)	Percent change, 2004, 2008 (4)	Percent change, 2006, 2008 (4)	Percent change, 2007, 2008 (4)
RESPIRATORY AGENTS	*	*	*	*	348	—	—	—
CARDIOVASCULAR AGENTS	*	285	302	632	227	—	—	—
DRUG UNKNOWN	3,203	2,944	3,175	6,368	10,515	—	—	—

(1) The classification of drugs used in DAWN is derived from the Multum *Lexicon*, © 2009, Multum Information Services, Inc. The classification was modified to meet DAWN's unique requirements (2009). The Multum Licensing Agreement governing use of the *Lexicon* can be found in Appendix A and on the Internet at http://dawninfo.samhsa.gov/drug_vocab.

(2) Estimates of ED visits are based on a representative sample of non-Federal, short-stay hospitals with 24-hour EDs in the United States.

(3) ED visits often involve multiple drugs. Such visits will appear multiple times in this table (e.g., a visit involving both cocaine and marijuana will appear twice in this table). The sum of visits or rates by drug will be greater than the total, and the sum of percentages by drug will be greater than 100.

(4) This column denotes statistically significant ($p < 0.05$) increases or decreases between estimates for the periods shown.

NOTE: CNS = central nervous system. NTA = not tabulated above. An asterisk (*) indicates that an estimate with a relative standard error greater than 50%, or an estimate based on fewer than 30 visits, has been suppressed. A dash (—) indicates a blank cell.

SOURCE: Center for Behavioral Health Statistics and Quality, SAMHSA, Drug Abuse Warning Network, 2008.

APPENDIX A

MULTUM LEXICON END-USER LICENSE AGREEMENT

Every effort has been made to ensure that the information provided by Lexi-Comp, Inc. (“Lexi-Comp”) is accurate, up-to-date, and complete, but no guarantee is made to that effect. In addition, the drug information contained herein may be time sensitive. Lexi-Comp information has been compiled for use by healthcare practitioners and end-users in the United States. Lexi-Comp does not warrant that uses outside of the United States are appropriate.

Lexi-Comp’s drug information does not endorse drugs, diagnose patients or recommend therapy. Lexi-Comp’s drug information is an informational resource designed to assist licensed healthcare practitioners in caring for their patients and/or to serve end-users viewing this Lexi-Comp Product as a supplement to, and not a substitute for, the expertise, skill, knowledge and judgment of healthcare practitioners. Healthcare practitioners should use their professional judgment in using the information provided. The absence of a warning for a given drug or drug combination in no way should be construed to indicate that the drug or drug combination is safe, effective or appropriate for any given patient. Lexi-Comp and its affiliates do not assume any responsibility for any aspect of healthcare administered with the aid of information Lexi-Comp and its affiliates provides.

The information contained herein is not intended to cover all possible uses, directions, precautions, warnings, drug interactions, allergic reactions, or adverse effects. If you have questions about the drugs you are taking, check with your doctor, nurse or pharmacist.

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APPENDIX B

GLOSSARY OF DAWN TERMS, 2008 UPDATE

This glossary defines terms used in data collection activities, analyses, and publications associated with the emergency department (ED) component of the Drug Abuse Warning Network (DAWN).

Accidental ingestion: This category of drug-related ED visits includes those involving the accidental use of a drug, for example, childhood drug poisonings and individuals who take the wrong medication by mistake.

Adverse reaction: This category of drug-related ED visits represents the consequences of using a prescription or over-the-counter pharmaceutical for therapeutic purposes and includes visits related to adverse drug reactions, side effects, drug-drug interactions, and drug-alcohol interactions. Adverse reactions that involve a pharmaceutical with an illicit drug are excluded from this category.

Alcohol use: Alcohol is reportable for all patients when present in combination with one or more other reportable substances. For patients under the age of 21, alcohol is also reportable if it is used alone with no other substance or reportable drug. (See **Drug misuse or abuse** and **Underage drinking**.)

Case description: A description of how the drug or drugs were related to the patient's ED visit. The case description, in conjunction with other documentation in the ED medical record, is used to determine whether the ED visit is reportable to DAWN. It is copied verbatim from the patient's chart when possible.

Case type: See **Type of case**.

Case type other: See **Drug misuse or abuse**.

Confidence interval (CI): An interval estimate, that is, a range of values around a point estimate that takes sampling error into account. The accepted standard of confidence is 95 percent. Technically, a 95 percent CI means that, if repeated samples were drawn from the same population of hospitals using the same sampling and data collection procedures, the true population value would fall within the confidence interval 95 percent of the time. Practically, a 95 percent CI summarizes both the estimate and its margin of error in a straightforward way with a reasonable degree of confidence.

Diagnosis: The condition(s) for which the patient was treated as determined by the clinician after study.

Disposition: The location or facility to which an ED patient was referred, transferred, or released.

Treated and released includes three categories:

- *Discharged home*—“Home” is used as a broad category to mean the patient’s residence. Home is generally used for persons who live locally; however, for students at nearby universities, home means their university; for travelers who get sick on the road, it may mean their hotel or wherever they are staying; and so on.
- Released to police/jail.
- *Referred to detox/treatment*—The chart indicates that the patient was referred to a substance abuse treatment or detox program, facility, or provider.

Admitted to this hospital includes five categories of inpatient units:

- ICU/critical care,
- Surgery,
- Chemical dependency/detox,
- Psychiatric unit, and
- *Other inpatient unit*—The inpatient unit was not specified or does not match one of the preceding units.

Other disposition includes five categories:

- *Transferred*—The patient was transferred to another health care facility.
- *Left against medical advice*—The patient left the treatment setting without a physician’s approval.
- *Died*—The patient died after arriving in the ED but before being discharged, admitted, or transferred.
- *Other*—The discharge status is documented in the chart but does not fit into any of the preceding categories.
- *Not documented*—The discharge status was not documented in the medical chart.

Drug: A substance that is (a) used as a medication or in the preparation of medication; (b) an illicit substance that causes addiction, habituation, or a marked change in consciousness; or (c) both. Substances reportable to DAWN include alcohol, illicit drugs (e.g., club drugs, cocaine, heroin, marijuana, stimulants), nonpharmaceutical inhalants, prescription drugs (e.g., ADHD drugs, antibiotics, antidepressants, antipsychotics, anticoagulants, beta blockers, birth control pills, hormone replacement, insulin, muscle relaxants, pain relievers, sleeping aids), drugs used in treatment of medical conditions (e.g., respiratory therapy, chemo therapy, radiation therapy), vaccines, dietary supplements, vitamins, and other over-the-counter pharmaceutical products. DAWN publications use the term “drug” to refer to any of these substances. Multiple substances can be reported for each DAWN case. Therefore, the total number of drugs exceeds the total number of DAWN cases reported.

Drug category: A generic grouping of related pharmaceuticals or other substances reported to DAWN, based on the classification system developed by Multum Information Services, a subsidiary

of the Cerner Corporation, and modified for use with DAWN. (More information on the Multum system is available at <http://www.multum.com/>.) In general, the Multum categories reflect the therapeutic uses for prescription and over-the-counter pharmaceuticals.

Additional clarification is provided for the following drug categories, as these are unique to DAWN:

- Alcohol alone—DAWN treats alcohol as an illicit drug for minors. Therefore, DAWN collects data on ED visits involving alcohol and no other drugs if the patient is under the age of 21.
- Alcohol-in-combination—DAWN records if alcohol was involved in all drug-related ED visits for patients of all ages.

Drug misuse or abuse: A group of ED visits defined broadly to include all visits associated with illicit drugs, alcohol use in combination with other drugs, alcohol use alone among those younger than 21 years, and nonmedical use of pharmaceuticals. (See also **Alcohol use, Illicit drug use, Nonmedical use of pharmaceuticals, and Underage drinking.**)

Drug-related ED visit: This category includes any ED visit related to recent drug use. To be a DAWN case, a drug needs only to be implicated in the visit; the drug does not have to have caused the visit. (See also **Single-drug case.**) One patient may make repeated visits to an ED or to several EDs, thus producing a number of visits. The number of unique patients involved in the reported drug-related ED visits cannot be estimated, because no direct patient identifiers are collected by DAWN.

There are some circumstances in which ED visits are not reviewed for DAWN. These include persons who left before being seen by a physician, visits for suture removal, and direct admission to the hospital through the ED for women in labor.

Estimate: A statistical estimate is the value of a parameter (such as the number of drug-related ED visits) for the universe that is derived by applying sampling weights to data from a sample. Estimates of drug-related ED visits are calculated by applying weights and adjustments to the data provided by the sampled hospitals participating in DAWN. The sampling weights reflect the probability of selection; separate adjustment factors account for nonresponse, data quality, and the known total of ED visits delivered by the universe of eligible hospitals as identified by the American Hospital Association (AHA) for the relevant time period.

GHB: Gamma hydroxybutyrate, a hallucinogen and depressant frequently combined with alcohol and other beverages. Also used by bodybuilders to aid in fat reduction and muscle building. For further information, see <http://www.drugabuse.gov/infofacts/infofactsindex.html>.

Hospital emergency department (ED): To be eligible for DAWN, hospitals must be non-Federal, short-stay, general medical and surgical facilities that operate one or more EDs 24 hours a day, 7 days a week. They must be located in the United States. Specialty hospitals, hospital units of institutions, long-term care facilities, pediatric hospitals, hospitals operating part-time EDs, and

hospitals operated by the Veterans Health Administration and the Indian Health Service are excluded. The universe of EDs is identified from the American Hospital Association's Annual Survey Database. Participation in DAWN is limited to hospitals that meet the eligibility criteria for DAWN. (See also **Universe**.)

Illicit drug use: This category of drug-related ED visits includes all visits related to the use of illicit or illegal drugs. Illicit drugs include

- cocaine,
- heroin,
- marijuana,
- stimulants (amphetamines and methamphetamine),
- MDMA,
- GHB,
- flunitrazepam (Rohypnol),
- ketamine,
- LSD,
- PCP,
- other hallucinogens,
- nonpharmaceutical inhalants,
- combinations of illicit drugs, and
- alcohol when used by patients under the age of 21.

Additional clarification is provided for the following drug categories:

- *Stimulants*—This drug category includes amphetamines and methamphetamine and excludes central nervous system stimulants, such as caffeine or methylphenidate. Amphetamines and methamphetamine are combined for analysis because medical records and toxicology tests often generically refer to either drug as “amphetamines.”
- *Amphetamines*—This class of substances has been moved from the category of central nervous system stimulants to illicit drug use because it is considered a major substance of abuse. For purposes of classification, amphetamines includes compounds derived from or related to the drug amphetamine. Although some designer drugs fall into the class of amphetamines, they are reported individually as major substances of abuse (e.g., methamphetamine).
- *Inhalants*—This category includes (1) anesthetic gases and (2) any nonpharmaceutical substance that has psychoactive effects when inhaled, sniffed, or snorted. Excluded from the inhalant category are carbon monoxide and nonpharmaceutical inhalants if the exposure was accidental (e.g., inhaling paint fumes while painting a closet).
- Anesthetic gases are presumed to have been inhaled. Included in this category are, for example, nitrous oxide, ether, and chloroform. The route of administration for psychoactive nonpharmaceuticals is not assumed and must be documented in ED records specifically as inhalation. Psychoactive nonpharmaceuticals that, when inhaled, are included in this category fall into three main categories: volatile solvents, nitrites, and

chlorofluorohydrocarbons. Examples of substances in each of these three categories include the following:

- **Volatile solvents**—This category of inhalants includes adhesives (model airplane glue, rubber cement, household glue), aerosols (spray paint, hairspray, air freshener, deodorant, fabric protector), solvents and gases (nail polish remover, paint thinner, correction fluid and thinner, toxic markers, pure toluene, lighter fluid, gasoline, carburetor cleaner, octane booster), cleaning agents (dry cleaning fluid, spot remover, degreaser), food products (vegetable cooking spray; dessert topping spray such as whipped cream or “whippets”), and gases (butane, propane, helium).
- **Nitrites**—This category of inhalants includes amyl nitrites (“poppers,” “snappers”) and butyl nitrites (“rush,” “locker room,” “bolt,” “climax,” video head cleaner).
- **Chlorofluorohydrocarbons**—Freons are an example of this category of inhalants.
- **Combinations not tabulated above (NTA)**—This category includes combinations composed of two or more major substances of abuse that are mixed and taken together. For example, “speedball,” which usually refers to the combination of heroin and cocaine taken at once, would be classified as a “Combination NTA,” whereas heroin and cocaine used separately would be classified separately in the categories heroin and cocaine. Combinations consisting of a major substance of abuse and another substance are classified in the category of the major substance (e.g., heroin with scopolamine is classified as heroin).

LSD: d-lysergic acid diethylamide, a hallucinogen usually taken orally. For further information, see <http://www.drugabuse.gov/infofacts/infofactsindex.html>.

Malicious poisoning: See **Nonmedical use of pharmaceuticals**.

MDMA: Methylenedioxymethamphetamine, a hallucinogen with stimulant effects, usually taken orally. For further information, see <http://www.drugabuse.gov/infofacts/infofactsindex.html>.

Metropolitan area: An area comprising a relatively large core city or cities and the adjacent geographic areas. Conceptually, these areas are integrated economic and social units with a large population center. Unless otherwise noted, metropolitan area analyses prepared by DAWN use the boundaries established by the Office of Management and Budget (OMB), as updated in 2003.

Nonmedical use of pharmaceuticals: Nonmedical use of pharmaceuticals includes taking more than the prescribed dose of a prescription pharmaceutical or more than the recommended dose of an over-the-counter pharmaceutical or supplement; taking a pharmaceutical prescribed for another individual; deliberate poisoning with a pharmaceutical by another person; and documented misuse or abuse of a prescription drug, an over-the-counter pharmaceutical, or a dietary supplement. Nonmedical use of pharmaceuticals may involve pharmaceuticals alone or pharmaceuticals in combination with illicit drugs or alcohol. Nonmedical use of pharmaceuticals includes prescription and over-the-counter pharmaceuticals in ED visits that are of the following types of cases:

- *overmedication*—nonmedical use, overuse, and misuse of prescription and over-the-counter medications that are not documented as drug abuse in the medical chart;
- *malicious poisoning*—drug use in which the patient was administered a drug by another person for a malicious purpose (drug-facilitated sexual assault is one type of malicious poisoning, but other types of malicious poisonings, such as product tampering, would be classified in this category as well); and
- *case type other*—all drug-related ED visits that could not be assigned to any of the other seven types (by design, most cases of documented drug abuse will fall into this category).

(See also **Drug misuse or abuse** and **Type of case**.)

Not otherwise specified (NOS): This is the catchall category for substances that are not specifically named but are qualified as a DAWN case. Terms are classified into an NOS category only when assignment to a more specific category is not possible based on the information in the source documentation (ED patient charts).

Not tabulated above (NTA): This designation is used when drugs or drug categories are not explicitly listed in a table. Low-incidence drugs (or drug categories) falling under a broader drug classification may be summarized into a single row under that classification and labeled as NTA.

Overmedication: See **Nonmedical use of pharmaceuticals**.

Oversampling: Without oversampling, one would expect a sample to resemble the population from which it was drawn. Oversampling implies the deliberate selection of a much higher proportion of certain types of sampling units than would normally be obtained in a simple, random sample. The deliberate selection of certain types of sample units is done to improve the precision of estimates of the properties of these types of sampling units. This is a form of stratified sampling. (See also **Sampling**, **Sample frame**, and **Sampling unit**.)

p-value: A measure of the probability (p) that the difference between two estimates could have occurred by chance, if the estimates being compared were really the same. The larger the p -value, the more likely the difference could have occurred by chance. For example, if the difference between two DAWN estimates has a p -value of 0.05, it means that there is no more than a 5 percent probability that the difference observed could be due to chance alone.

PCP: Phencyclidine, a hallucinogenic white crystalline powder that is readily soluble in water or alcohol or may be snorted or smoked. For further information, see <http://www.drugabuse.gov/infofacts/infofactsindex.html>.

Population: See **Universe**.

Precision: The extent to which an estimate agrees with its mean value in repeated sampling. The precision of an estimate is measured inversely by its standard error (SE) or relative standard error (RSE). In DAWN publications, estimates with RSEs greater than 50 percent are regarded as too

imprecise to be published. ED table cells where such estimates would have appeared contain the asterisk symbol (*). (See also **Relative standard error**.)

Race/ethnicity: Race/ethnicity data in DAWN are collected retrospectively from the medical record. Patients are never interviewed to obtain DAWN data. DAWN follows OMB protocol for collection of race/ethnicity when self-identification of race/ethnicity by the individual is not possible. This approach involves a single question listing six race/ethnicity groups (plus not documented) and allows for multiple responses.¹⁴ For reporting, DAWN collapses the reported race/ethnicity information into four mutually exclusive categories, plus an unknown category, as follows:

- *White*—A person having origins in any of the original peoples of Europe, the Middle East, or North Africa. Those who are identified as White and Hispanic are classified as Hispanic.
- *Black*—A person having origins in any of the Black racial groups of Africa. Those who are identified as Black or African American and Hispanic are classified as Hispanic.
- *Hispanic*—A person of Cuban, Mexican, Puerto Rican, South or Central American, or other Spanish culture or origin, regardless of race. Those who are identified as Hispanic are classified as Hispanic, regardless of any other race/ethnicity designations.
- *Race/ethnicity not tabulated above*—A person who is an American Indian, Alaska Native, Asian, Native Hawaiian, or Other Pacific Islander, or a person of two or more race/ethnicities.
- *Unknown*—Race/ethnicity is unknown.

Race/ethnicity is missing from ED patient records about 10 to 20 percent of the time, although this varies widely by hospital. Detail about multiple races/ethnicities may be lacking as well. Rates of ED visits per 100,000 are not calculated for race/ethnicity categories because of these data limitations.

Rate: A measure of the incidence of drug-related ED visits per 100,000 population. A rate can be calculated for the total population or for any subset defined by characteristics such as age and gender.

Relative standard error (RSE): A measure of an estimate's relative precision. The RSE of an estimate is equal to the estimate's standard error (SE) divided by the estimate itself. For example, an estimate of 2,000 cocaine visits with an SE of 200 visits has an RSE of 0.1 and is multiplied by 100 to change it to a percentage. This resulting RSE percent value is 10 percent. The larger the RSE, the less precise the estimate. Estimates with an RSE of 50 percent or greater are not published by DAWN. (See also **Precision**.)

Sample frame: A list of units from which the ED sample is drawn. All members of the sampling frame have a known probability of being selected. A sampling frame is constructed such that there is no duplication and each unit is identifiable. Ideally, the sampling frame and the universe are the

¹⁴ See Office of Management and Budget, Revisions to the standards for the classification of Federal data on race and ethnicity, 62 Fed. Reg. 58,782 (October 30, 1997).

same. The sampling frame for the DAWN hospital ED sample is derived from the American Hospital Association's Annual Survey Database.

Sampling: Sampling is the process of selecting a proper subset of elements from the full population so that the subset can be used to make inference to the population as a whole. A probability sample is one in which each element has a known and positive chance (probability) of selection. A simple random sample is one in which each member has the same chance of selection. In DAWN, a sample of hospitals is selected to make inference to all hospitals; DAWN uses simple random sampling within strata.

Sampling unit: A member of a sample selected from a sampling frame. For the DAWN sample, the units are hospitals, and data are collected for drug-related ED visits at the responding hospitals selected for the sample.

Sampling weights: Numeric coefficients used to derive population estimates from a sample by adjusting for deviations from the original sample design due to unequal probability sampling, variable nonresponse, and other potential sources of bias.

Seeking detox: This category of drug-related ED visits reflects patients seeking substance abuse treatment, drug rehabilitation, or medical clearance for admission to a drug treatment or detoxification unit. They are classified separately because they often reflect administrative practices that vary across hospitals and may vary over time within the same hospital. Seeking detox visits tend to be concentrated in those facilities that operate specialized inpatient units providing substance abuse treatment or detoxification services, and the largest numbers are found in facilities that require medical clearance for entry into such treatment to be granted in their EDs.

Single-drug case: An ED visit in which only one drug was involved. DAWN collects single-drug ED visits involving alcohol alone only if the patient was younger than 21 years of age.

Statistically significant: A difference between two estimates is said to be statistically significant if the value of the statistic used to test the difference is larger or smaller than would be expected by chance alone. For DAWN ED estimates, a difference is considered statistically significant if the *p*-value is less than 0.05. (See also ***p*-value**.)

Strata (plural), stratum (singular): Subgroups of a universe within which separate ED samples are drawn. Stratification is used to increase the precision of estimates for a given sample size, or, conversely, to reduce the sample size required to achieve the desired level of precision. The DAWN ED sample is stratified into metropolitan area cells plus an additional cell for the remainder of the United States. To ensure thorough coverage within metropolitan areas, the universe of hospitals in each is allocated into substrata identified by (1) two types of hospital ownership (public, private) and (2) up to four size categories (measured in terms of the number of ED visits annually). This allocation creates up to eight substrata in each metropolitan area stratum. Hospitals in the stratum that covers the rest of the United States are stratified first by Census region, type of

ownership, and size (also measured in terms of ED visits). A systematic sample is selected from each of the geographic strata.

Suicide attempt: This type of drug-related ED visit captures suicide attempts (e.g., attempted suicide, tried to kill self) that are documented in the medical record and in which a drug was involved. Suicidal gestures, thoughts, or ideation, including attempts to harm oneself, are not included in this category.

Type of case: A classification used to define similar DAWN cases for analysis. Each case must be assigned a type and may not be assigned more than one type. Cases are classified into one of the following eight categories: suicide attempt, seeking detox, alcohol only (age younger than 21), adverse reaction, overmedication, malicious poisoning, accidental ingestion, and other. The case is coded into the first group that meets the inclusion criteria for that group; for example, a patient 34 years of age with hives who took aspirin and no other drug would be classified into the adverse reaction group since it did not qualify as a suicide attempt, seeking detox, or alcohol only (age younger than 21) case.

Underage drinking: DAWN records if alcohol was involved in all drug-related ED visits for patients of all ages. DAWN treats alcohol as an illicit drug for minors. Therefore, DAWN also collects data on ED visits involving alcohol and no other drugs if the patient is under the age of 21. Underage drinking includes all visits by patients under 21 that involve alcohol, regardless of whether other drugs are involved.

Universe: The entire set of units for which generalizations are drawn. The universe for the DAWN ED sample is all non-Federal, short-stay, general medical and surgical hospitals in the United States that operate one or more EDs 24 hours a day, 7 days a week. Specialty hospitals, hospital units of institutions, long-term care facilities, pediatric hospitals, hospitals operating part-time EDs, and hospitals operated by the Veterans Health Administration and the Indian Health Service are excluded. The universe of EDs is identified from the American Hospital Association's Annual Survey Database.

APPENDIX C

2008 DAWN METHODOLOGY

DAWN relies on a longitudinal probability sample of hospitals located throughout the United States, including Alaska and Hawaii. To be eligible for selection into the DAWN sample, a hospital must be a non-Federal, short-stay, general surgical and medical hospital located in the United States, with at least one 24-hour ED. This current approach was first implemented in the 2004 data collection year.

DAWN uses the data from the visits classified as DAWN cases in the selected hospitals to calculate various estimates of drug-related ED visits for the Nation as a whole, as well as for specific metropolitan areas. To calculate these estimates and measure their precision requires the application of sampling and weighting methodologies to the DAWN survey.

This appendix documents the participation of sampled hospitals in 2008 and other related survey methodology topics. Additional detail on the general data collection methods is available in the *ED Reference Guide*.¹⁵

2008 hospital participation

For 2008, 231 hospitals submitted data on 351,697 drug-related ED visits that were used for estimation (Tables C1 and C2). The overall weighted response rate was 32.9 percent. For the 13 oversampled metropolitan areas and divisions, individual response rates ranged from 26.8 percent in the Houston-Baytown-Sugar Land, TX, Metropolitan Statistical Area to 83.1 percent in the Detroit-Warren-Livonia, MI, Metropolitan Statistical Area.

2008 charts reviewed for drug-related ED visits

DAWN cases are found through a retrospective review of medical records in participating hospitals. Across all participating hospitals in 2008, 9,818,812 charts were reviewed to find the drug-related ED visits that met the DAWN case criteria. On the basis of the review of charts, 383,977 drug-related visits¹⁶ were found and submitted to the DAWN database, a case rate of 3.9 percent. On average, a DAWN member hospital submitted 1,167 DAWN cases. However, the number of submitted cases varied widely across hospitals, from 0 cases to 6,832 cases (median 896) in a single hospital during 2008.

¹⁵ The *ED Reference Guide* is available for download from the DAWN Web site, <https://dawninfo.samhsa.gov/collect/>. The link for the document is

https://dawninfo.samhsa.gov/files/collect_2009-2011/ed_reference_guide_2009-2011.pdf.

¹⁶ For 2008, more hospitals participated in DAWN than were used in estimation. Therefore, the number of drug-related ED visits from all participating hospitals exceeded the number used for estimation.

Table C1. Sample characteristics for 2008 DAWN data collection year

Geographic area	Total eligible hospitals (1)	Eligible hospitals in sample (1)	Responding hospitals in sample	Response rate for sampled hospitals (%)	Design weight response rate (%)	Visits weighted response rate (%)
Total United States (2, 3)	4,592	557	231	41.5	27.5	32.9
Boston-Cambridge-Quincy, MA-NH, MSA	43	29	19	65.5	65.5	69.4
Chicago-Naperville-Joliet, IL-IN-WI, MSA	88	72	30	41.7	42.2	38.1
Denver-Aurora, CO, MSA	16	15	11	73.3	73.3	76.7
Detroit-Warren-Livonia, MI, MSA	35	25	18	72.0	73.8	83.1
Houston-Baytown-Sugar Land, TX, MSA	55	42	13	31.0	34.1	26.8
Miami-Fort Lauderdale-Miami Beach, FL, MSA—Dade County Division	21	16	9	56.3	51.7	56.1
Miami-Fort Lauderdale-Miami Beach, FL, MSA—Fort Lauderdale Division	29	21	9	42.9	41.0	49.9
Minneapolis-St. Paul-Bloomington, MN-WI, MSA	26	26	11	42.3	42.3	53.9
New York-Newark-Edison, NY-NJ-PA, MSA—Five Boroughs Division	48	37	23	62.2	58.8	68.5
Phoenix-Mesa-Scottsdale, AZ, MSA	28	26	14	53.8	53.8	55.6
San Diego-Carlsbad-San Marcos, CA, MSA	16	16	7	43.8	43.8	48.7
San Francisco-Oakland-Fremont, CA, MSA—San Francisco Division	18	18	8	44.4	44.4	48.0
Seattle-Tacoma-Bellevue, WA, MSA	22	22	12	54.5	54.5	64.5

(1) Non-Federal, short-stay hospitals with 24-hour EDs in the United States, based on the American Hospital Association Annual Survey, are eligible for DAWN.

(2) The total number of eligible hospitals includes the sampled and participating hospitals from metropolitan areas shown in this table plus hospitals in the remainder of the United States. Components shown here do not sum to the total.

(3) Metropolitan Statistical Areas (MSAs) and Metropolitan Divisions follow the standard definitions issued by the Office of Management and Budget in June 2003 (available at <http://www.whitehouse.gov/omb/bulletins/b03-04.html>), with one exception: for New York, geographic coverage is limited to the subarea comprising the five Boroughs of New York City.

NOTE: MSA = Metropolitan Statistical Area.

SOURCE: Center for Behavioral Health Statistics and Quality, SAMHSA, Drug Abuse Warning Network, 2008.

Table C2. Drug-related ED visits and drugs, by type of case, 2008

Type of visit	Unweighted sample data	Weighted estimates	RSE (%)	95% CI: Lower bound	95% CI: Upper bound
Drug-related ED visits (1)	—	—	—	—	—
Suicide attempt	16,271	199,469	6.7	173,141	225,797
Seeking detox	24,526	177,879	18.6	112,962	242,796
Alcohol only (age < 21)	12,468	132,073	9.6	107,100	157,047
Adverse reaction	138,108	2,157,128	7.9	1,822,484	2,491,772
Overmedication	28,734	396,444	9.9	319,602	473,286
Malicious poisoning	928	7,609	17.4	5,013	10,204
Accidental ingestion	5,860	100,342	7.7	85,152	115,531
Other	124,802	1,212,552	10.2	971,170	1,453,934
Total drug-related ED visits	351,697	4,383,494	6.2	3,847,852	4,919,137
Total drug misuse or abuse visits	197,016	1,999,861	7.8	1,692,919	2,306,802
Total ED visits (all reasons)	11,128,842	118,359,742	0.0	—	—
Drugs (2)	—	—	—	—	—
Suicide attempt	35,086	452,198	6.8	391,906	512,491
Seeking detox	52,655	401,000	22.5	224,326	577,673
Alcohol only (age < 21)	12,468	132,073	9.6	107,100	157,047
Adverse reaction	183,318	2,947,354	9.6	2,393,979	3,500,729
Overmedication	51,617	733,310	11.6	566,026	900,595
Malicious poisoning	1,708	14,527	18.8	9,175	19,878
Accidental ingestion	7,639	130,997	7.7	111,236	150,758
Other	213,956	2,146,567	10.4	1,709,977	2,583,158
Drugs in all drug-related ED visits	558,447	6,958,026	8.2	5,838,755	8,077,297
Drugs in all misuse or abuse ED visits	350,724	3,667,298	9.2	3,004,768	4,329,829

(1) Estimates of ED visits are based on a representative sample of non-Federal, short-stay hospitals with 24-hour EDs in the United States.

(2) These are estimates of drugs involved in ED visits. Because a single ED visit may involve multiple drugs, the number of drugs is greater than the number of visits.

NOTE: CI = confidence interval. RSE = relative standard error. A dash (—) indicates a blank cell.

SOURCE: Center for Behavioral Health Statistics and Quality, SAMHSA, Drug Abuse Warning Network, 2008.

DAWN data in this publication

Seven types of ED visits related to drug misuse or abuse were defined in this publication:

- All ED visits resulting from medical emergencies involving drug misuse or abuse (1,999,861 visits);
- ED visits involving illicit drugs (993,379 visits);
- ED visits involving use of alcohol in combination with other drugs (524,050 visits);
- ED visits involving underage drinking (132,842 visits);
- ED visits involving nonmedical use of pharmaceuticals (971,914 visits);
- ED visits resulting from drug-related suicide attempts (199,469 visits); and
- ED visits for the purpose of seeking detox services (177,879 visits).

These categories are defined by drug and type of case as shown in Table C3. Note that the categories are not mutually exclusive.

Population estimates used to generate rates (visits per 100,000 population) for 2008 are provided in Table C4. Standardized rates were not calculated for race and ethnicity subgroups, because the race/ethnicity categories available to DAWN are much less detailed and contain considerably more missing data than the race and ethnicity categories in the census data. Appendix D describes the race and ethnicity data reported for DAWN.

Table C3. DAWN analytic groups

Analytic category	Drugs included	Types of cases included
All	All	All
Adverse reaction	All drugs	Adverse reaction only
Accidental ingestion	All drugs	Accidental ingestion only
All misuse/abuse	All	This analytic group is the union of the following four analytic groups. See the definition provided for each of these four groups for detail on the exact drugs and types of cases included in this overall category.
Illicit drugs	<ul style="list-style-type: none"> • Cocaine • Heroin • Marijuana • Stimulants (amphetamines and methamphetamine) • MDMA • GHB • Flunitrazepam (Rohypnol) • Ketamine • LSD • PCP • Other hallucinogens • Nonpharmaceutical inhalants • Combinations of illicit drugs 	All types of cases except accidental ingestion and adverse reaction
Alcohol	<ul style="list-style-type: none"> • Alcohol (with or without other drugs) 	All types of cases except accidental ingestion and adverse reaction; patient may be of any age
Underage drinking	<ul style="list-style-type: none"> • Alcohol (with or without other drugs) 	All types of cases except accidental ingestion and adverse reaction; patient must be under the age of 21
Nonmedical use of pharmaceuticals	<ul style="list-style-type: none"> • Prescription drugs (e.g., ADHD drugs, antibiotics, antidepressants, antipsychotics, anticoagulants, beta blockers, birth control pills, hormone replacement, insulin, muscle relaxants, pain relievers, sleeping aids) • Dietary supplements • Vitamins • Other over-the-counter pharmaceutical products 	Combination of three types of cases (1): <ul style="list-style-type: none"> • Overmedication (cases of nonmedical use, overuse, or misuse lacking explicit documentation of drug abuse), • Malicious poisoning (cases in which the patient was administered a drug by another for a malicious purpose), and • Type of case “Other” (cases that could not be assigned to another type of case; includes documented drug abuse).
Drug-related suicide attempts (2)	All drugs	Suicide attempts only
Visits for the purpose of seeking detox services (2)	All drugs	Seeking detox only

(1) Nonmedical use of pharmaceuticals explicitly excludes ED visits for adverse reactions and accidental ingestions.

(2) Suicide attempts and seeking detox visits are only considered to be drug misuse or abuse if they involve an illicit drug or alcohol for a minor.

Table C4. U.S. population by age and gender, 2008

Age	Total United States (1)	Males	Females
Total	304,059,724	149,924,604	154,135,120
0–5 years	25,082,312	12,833,236	12,249,076
6–11 years	23,831,109	12,183,090	11,648,019
12–17 years	25,028,427	12,817,191	12,211,236
18–20 years	12,915,055	6,628,081	6,286,974
21–24 years	16,842,164	8,680,535	8,161,629
25–29 years	21,333,743	10,940,956	10,392,787
30–34 years	19,597,822	9,959,083	9,638,739
35–44 years	42,501,130	21,314,357	21,186,773
45–54 years	44,372,065	21,852,633	22,519,432
55–65 years	33,686,181	16,250,639	17,435,542
65 years and older	38,869,716	16,464,803	22,404,913

(1) Population estimates for 2008 are as of 7/29/2009 from the U.S. Census Bureau Postcensal Resident Population National Population Dataset, National estimates by demographic characteristics—single year of age, sex, race, and Hispanic Origin, Monthly Population Estimates. Link: <http://www.census.gov/popest/datasets.html>. File: NC-EST2008-ALLDATA-R-File18.csv.

APPENDIX D

RACE AND ETHNICITY IN 2008 DAWN

In October 1997, the Office of Management and Budget (OMB) issued a revised standard protocol for race and ethnicity categories used in Federal data collection systems.¹⁷ The new protocol permitted separate reporting of race and Hispanic ethnicity, and it incorporated the ability to capture more than one race for an individual, several modifications in nomenclature (e.g., “Black” was changed to “Black or African American”), division of certain categories (“Asian or Pacific Islander” was split into two categories, “Asian” and “Native Hawaiian or Other Pacific Islander”), and elimination of the “other” category. The OMB protocol also permitted a combined format, whereby race and Hispanic ethnicity would be recorded in a single data item, which could still record multiple responses for race, Hispanic ethnicity, or both. The single data item for race and ethnicity is shown in the Drug Abuse Warning Network (DAWN) emergency department (ED) case form.

DAWN collects data retrospectively from medical records. There is no mechanism to obtain data that is missing from the ED records, and patients are never interviewed. Race/ethnicity is missing entirely in about 10 to 20 percent of DAWN case records. When present, detail concerning the race/ethnicity categories of Asian, American Indian or Alaska Native, Native Hawaiian or Pacific Islander, two race/ethnicities, and three race/ethnicities are often not documented.¹⁸

For reference, estimates of drug-related ED visits by DAWN’s detailed race/ethnicity groups are presented in Table D1. Considering the limitations in the collection of race/ethnicity, this and other DAWN publications report race/ethnicity aggregated into four groups: non-Hispanic White, non-Hispanic Black, Hispanic, and race/ethnicity not tabulated above. All cases reported to DAWN as Hispanic or Latino ethnicity are tabulated as Hispanic race/ethnicity, regardless of race.

¹⁷ Revisions to the standards for the classification of Federal data on race and ethnicity, 62 Fed. Reg. 58,782 (October 30, 1997).

¹⁸ If two races are reported and the second is reported as unknown, the episode is coded for the known race.

Table D1. Drug-related ED visits, by detailed race/ethnicity, 2008

Race/ethnicity	ED visits (1)
Total drug-related ED visits	4,383,494
One race/ethnicity	4,296,110
White	2,781,229
Black or African American	681,238
Hispanic	284,645
Asian	6,264
American Indian or Alaska Native	41,907
Native Hawaiian or Other Pacific Islander	*
Race unknown	493,434
Two races/ethnicities	*
White + Black or African American	*
White + Hispanic	*
White + Asian	*
White + American Indian or Alaska Native	*
Black or African American + Hispanic	1,768
Black or African American + Asian	*
Black or African American + American Indian/Alaska Native	*
Hispanic + Asian	*
Hispanic + American Indian or Alaska Native	*
Asian + American Indian or Alaska Native	*
Three races/ethnicities	*
White + Black or African American + Hispanic	*
White + Hispanic + Asian	*
White + Asian + Native Hawaiian or Other Pacific Islander	*

(1) Estimates of ED visits are based on a representative sample of non-Federal, short-stay hospitals with 24-hour EDs in the United States.

NOTE: An asterisk (*) indicates that an estimate with a relative standard error greater than 50%, or an estimate based on fewer than 30 visits, has been suppressed.

SOURCE: Center for Behavioral Health Statistics and Quality, SAMHSA, Drug Abuse Warning Network, 2008.