

**Drug Abuse Warning Network, 2011:
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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- Attachment A. Glossary of DAWN Terms, 2011 Update
- Attachment B. Drug Abuse Warning Network Methodology Report, 2011 Update
- Attachment C. Guide to Drug Abuse Warning Network Trend Tables, 2011 Update

HIGHLIGHTS

This publication presents national estimates of drug-related visits to hospital emergency departments (EDs) for the calendar year 2011, based on data from the Drug Abuse Warning Network (DAWN). Also presented are comparisons of 2011 estimates with those for 2004, 2009, and 2010. DAWN is a public health surveillance system that monitors drug-related ED visits for the Nation and for selected metropolitan areas. The Substance Abuse and Mental Health Services Administration (SAMHSA), U.S. Department of Health and Human Services (HHS), 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.

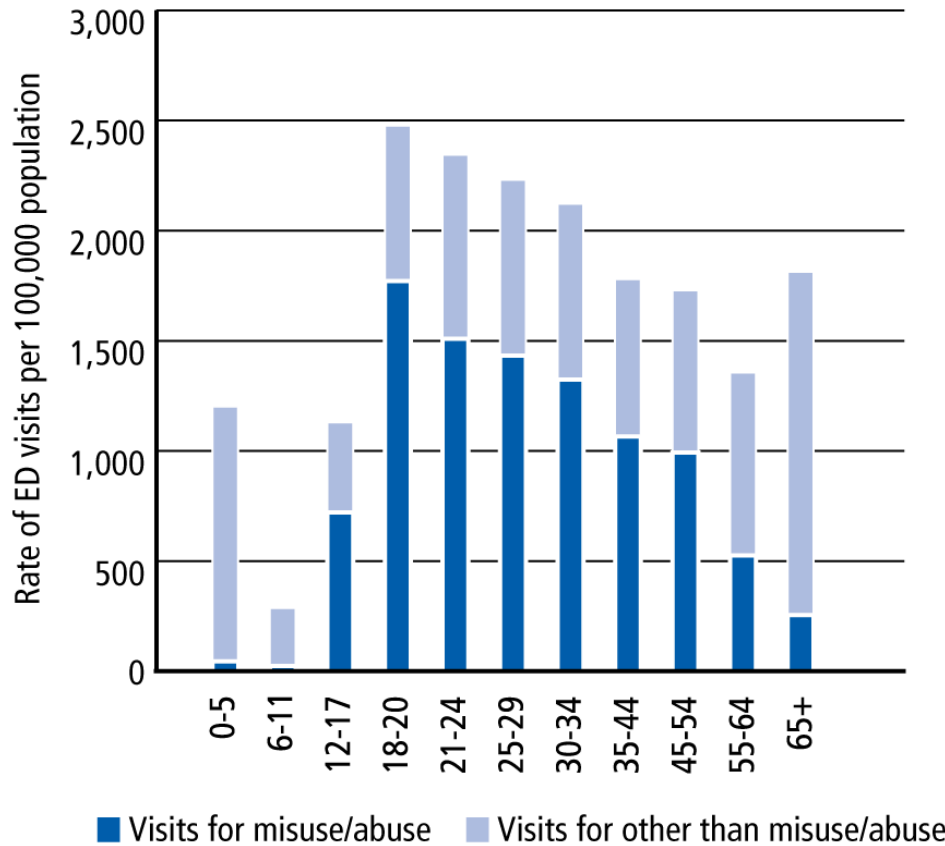
DAWN relies on a nationally representative sample of general, non-Federal hospitals operating 24-hour EDs, with oversampling of hospitals in selected metropolitan areas. In each participating hospital, ED medical records are reviewed retrospectively to find the ED visits that involved recent drug use. All types of drugs—illegal drugs, prescription drugs, over-the-counter pharmaceuticals (e.g., dietary supplements, cough medicine), and substances inhaled for their psychoactive effects—are included. Alcohol is considered an illicit drug when consumed by patients aged 20 or younger. For patients aged 21 or older, though, alcohol is reported only when it is used in conjunction with other drugs.

Marked findings of this report are (a) a 29 percent increase in the number of drug-related ED visits involving illicit drugs in the short term between 2009 and 2011; (b) simultaneous, short-term increases in the involvement of both illicit and licit stimulant-like drugs; and (c) some indications that the pace of increases in pharmaceutical involvement is slowing down.

All Drug-Related ED Visits

In 2011, over 125 million visits were made to EDs in general-purpose, non-Federal hospitals operating 24-hour EDs in the United States. DAWN estimates that over 5 million of these visits, or about 1,626 ED visits per 100,000 population, were related to drugs, a 100 percent increase since 2004. In 2011, drug-related visits range from a low of 288 visits per 100,000 population aged 6 to 11 to a high of 2,477 visits per 100,000 population aged 18 to 20 (Figure 1).

Figure 1. Rates of drug-related ED visits per 100,000 population, by age group, 2011



SOURCE: Center for Behavioral Health Statistics and Quality, SAMHSA, Drug Abuse Warning Network, 2011.

Overall Drug Misuse or Abuse

In 2011, DAWN estimates that about 2.5 million ED visits resulted from medical emergencies involving drug misuse or abuse, the equivalent of 790 ED visits per 100,000 population. For those aged 20 or younger, the rate is 500 visits; for those aged 21 or older, the rate is 903 visits.

Understanding that a visit may appear in more than one group, DAWN found that, out of all drug misuse or abuse ED visits,

- about 1.25 million ED visits, or 51 percent, involved illicit drugs;
- about 1.24 million, or 51 percent, involved nonmedical use of pharmaceuticals; and
- about 0.61 million, or 25 percent, involved drugs combined with alcohol.

In the long term, between 2004 and 2011, the annual overall number of ED visits attributable to drug misuse or abuse has risen steadily each year for a total increase of 52 percent, or about 844,000 visits. In the short term, between 2009 and 2011, ED visits involving overall misuse or abuse increased by 19 percent, or by about 400,000 visits over the 2 years. Almost half of the net increase in visits seen in the 8 years from 2004 to 2011 occurred in the last 2 years of the period, 2009 to 2011. Unlike the long-term trends, though, which are largely driven by rises in

pharmaceutical involvement, the short-term rise reflects the 38 percent increase seen in ED visits involving illicit drugs only, with no significant increases over the last 2 years for visits involving pharmaceuticals or alcohol alone or combinations of pharmaceuticals, alcohol, and illicit drugs.

Illicit Drugs

Of the approximately 2.5 million drug misuse or abuse ED visits that occurred during 2011, a total of 1,252,500, or just over half (51%), involved illicit drugs. That is the equivalent of 402 ED visits for each 100,000 persons in the U.S. population. The highest rates of involvement were found for cocaine and marijuana (162 and 146 ED visits per 100,000 population, respectively). Almost 40 percent of visits involving illicit drugs resulted in some form of follow-up, including admission to the hospital (24%), transfer to another health care facility (10%), or referral to a drug detox/dependency program (6%). The overall level of ED visits involving illicit drugs was stable in the long term, between 2004 and 2011. In the short term, between 2009 and 2011, though, visits involving illicit drugs have experienced a 29 percent increase.

Nonmedical Use of Pharmaceuticals

DAWN estimates that over 1.2 million ED visits involved nonmedical use of prescription medicines, over-the-counter drugs, or other types of pharmaceuticals in 2011. At 46 percent, pain relievers were the most common type of drugs involved in medical emergencies associated with nonmedical use of pharmaceuticals; narcotic pain relievers were involved in 29 percent. Some form of follow-up was observed for almost 40 percent of visits. Overall, medical emergencies related to nonmedical use of pharmaceuticals increased 132 percent in the period from 2004 to 2011, with opiate/opioid involvement rising 183 percent. In the short term, between 2009 and 2011, overall pharmaceutical involvement increased just 15 percent, and opiate/opioid involvement saw no significant increase. One category of drugs that has experienced both short- and long-term increases in involvement is central nervous system (CNS) stimulants (e.g., ADHD drugs). The short-term increase in involvement of CNS stimulants (85%) echoes a similar short-term rise observed for involvement of illicit stimulants (amphetamines/methamphetamine) (71%).

Drugs and Alcohol Taken Together

In 2011, about a quarter of all ED visits associated with drug misuse or abuse also involved alcohol. Among all visits involving alcohol, 58 percent involved illicit drugs and 56 percent involved pharmaceuticals. Among all visits involving illicit drugs, about 30 percent also involved alcohol; higher levels of alcohol involvement were found for visits involving ketamine (72%). Among all visits involving pharmaceuticals, 25 percent also involved alcohol. Alcohol was present in 38.6 percent of visits involving penicillin, 38 percent of visits involving CNS stimulants, and 31 percent of visits involving antidepressants. Just under half of the patients received follow-up care.

Underage Drinking

In 2011, of the nearly 440,000 drug abuse–related ED visits made by patients aged 20 or younger, more than 40 percent involved alcohol. The rate of medical emergencies involving alcohol was 287 visits per 100,000 population aged 12 to 17 and 858 per 100,000 population aged 18 to 20, almost a threefold difference. Visits involving drugs and alcohol have remained stable over the period from 2004 through 2011, with no short-term increases.

Drug-Related Suicide Attempts

DAWN estimated there were over 200,000 ED visits resulting from drug-related suicide attempts in 2011. Almost all involved a prescription drug or over-the-counter medication. Over 80 percent of patients attempting drug-related suicide had some form of follow-up after their ED visit. The number of drug-related suicide attempts has risen 41 percent from 2004 to 2011.

Seeking Detox Services

DAWN estimates that there were about a quarter million drug-related ED visits for patients seeking detox or substance abuse treatment services during 2011. Nearly 60 percent of ED patients classified as seeking detox obtained some follow-up based on their ED visit: about 30 percent were admitted to the hospital, 20 percent were referred to detox/treatment services, and 7 percent were transferred to another facility. While the overall number of ED visits by patients seeking detox for illicit drugs did not change significantly either in the long or short term, a short-term increase of 36 percent between 2009 and 2011 was observed for patients seeking detox from heroin; there were over 20,000 more visits in 2011 than in 2009.

Adverse Reactions to Pharmaceuticals

For 2011, DAWN estimates that over 2.3 million ED visits, or 738 visits per 100,000 population, involved adverse reactions to prescription medicines, over-the-counter drugs, or other types of therapeutic substances. Rates for women were higher than for men (887 and 584 visits per 100,000 population, respectively). For children aged 5 and under, the rate of ED visits for adverse reactions was 842 visits per 100,000 population. The rate dropped to a low of 248 visits for children aged 6 to 11 and then rose consistently to reach a high of 1,526 visits for patients aged 65 or older. About three quarters of patients were treated and released, and about a fifth of patients were admitted to the hospital. ED visits resulting from adverse reactions to pharmaceuticals increased 84 percent in the long term, rising from about 1.3 million visits in 2005 to about 2.3 million visits in 2011. The number of ED visits for adverse reactions to pharmaceuticals rose by about a quarter million visits (or more) per year between 2005 and 2008, leveling off at about 2.3 million visits per year over the period from 2009 to 2011.

Accidental Ingestion of Drugs

The preponderance of ED visits for accidental ingestion involved children aged 5 and under. In 2011, out of a total of 113,634 visits, over 77,000 involved children in this age range. The rate of

visits for accidental drug ingestion was about 25 times higher for children aged 5 and under than for adults: 318 visits per 100,000 children aged 5 and under compared with 13 visits per 100,000 population for the general adult population aged 21 or older. Pain relievers were the most common class of drugs involved in accidental ingestion among children aged 5 and under, appearing in 25 percent of visits. Medical emergencies related to accidental ingestions by patients aged 5 and under were stable from 2004 to 2011, though increases were observed for particular drug groups. With over 8,000 visits recorded in 2011, ED visits involving drugs to treat anxiety and insomnia rose 120 percent since 2004. With about 5,000 visits in 2011, visits involving narcotic pain relievers increased 225 percent over that period.

1. INTRODUCTION

This publication presents estimates of drug-related emergency department (ED) visits from the Drug Abuse Warning Network (DAWN) for 2011, with comparison of estimates for 2004, 2009, and 2010. DAWN is a public health surveillance system that monitors patients' medical records of ED visits for the Nation to identify those visits that are related to drug use, misuse, and abuse. 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 (HHS), 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. Survey findings, as well as comparisons to earlier years' data, are organized in eight sections, with each section focusing on a specific type of ED visit (as listed in Table 1). Additional details on DAWN terminology and methodology are provided as attachments to this document. Detailed tables of DAWN estimates, this document, its attachments, other reports using DAWN data, and other methodology reports are available at the DAWN Web site.¹ As they become available, DAWN data are accessible through SAMHSA's Data Archive (SAMHDA).²

Table 1. DAWN analytic groups

Analytic group	Description
All Visits	This group includes all visits that are reportable to DAWN without regard for the reason for the visit or the specific drugs involved. It includes visits involving all forms of drug misuse or abuse plus visits resulting from adverse reaction, accidental ingestion, suicide attempts, and visits where patients were seeking detoxification services. These estimates are useful for looking at overall levels of drug involvement in ED visits.
	Drug-related ED visits that involve drug misuse or abuse
All Misuse and Abuse	This analytic category includes ED visits that involve all forms of drug misuse or abuse, as defined by DAWN. This category is the combination of visits from the following four analytic groups: illicit drug visits, nonmedical use of pharmaceuticals, alcohol-related visits, and underage drinking. A visit may appear in more than one of those subgroups, but it will appear only once in this overall group. Suicide attempt visits and seeking detox visits will be included in this category if illicit drugs were involved.

¹ DAWN documents can be found on the DAWN Web site at <http://www.samhsa.gov/data/DAWN.aspx>.

² DAWN data can be found on the SAMHDA Web site at <http://www.icpsr.umich.edu/icpsrweb/SAMHDA/studies/31264?q=DAWN>.

Table 1. DAWN analytic groups (continued)

Analytic group	Description
Illicits (excluding alcohol)	This analytic category includes ED visits that involve the use of drugs that have limited or no therapeutic value and are generally illegal if taken without a prescription. These substances include cocaine, heroin, marijuana, synthetic cannabinoids, amphetamines, methamphetamine, MDMA (Ecstasy), GHB (gamma-Hydroxybutyric acid), flunitrazepam (Rohypnol®), ketamine, LSD, PCP, and hallucinogens. Visits involving the inhalation of substances for their psychoactive properties (e.g., sniffing model airplane glue) are included.
Nonmedical Use of Pharmaceuticals	This analytic category includes ED visits that involve nonmedical use of pharmaceuticals: patients who took a higher than prescribed or recommended dose of their own medication, patients who took a pharmaceutical prescribed for another person, malicious poisoning of the patient by another individual, and documented substance abuse involving pharmaceuticals.
All Alcohol	This analytic category includes ED visits involving alcohol. For adults aged 21 and older, the alcohol was found in combination with other drugs. For patients under the age of 21, the visit may involve alcohol alone or in combination with other drugs.
Underage Drinking	This analytic category includes ED visits that involve alcohol use (alone or with other drugs) for patients under the age of 21. Underage drinking is an important barometer of adolescent drinking patterns and a predictor of more serious substance abuse problems in young adults.
Suicide Attempts	This analytic category includes ED visits that involve drug-related suicide attempts. It includes visits for drug overdoses and for suicide attempts by other means (e.g., using a firearm) if drugs were involved or related to the suicide attempt. Inclusion in this analytic category has no restrictions on the type of drug used.
Seeking Detox	This analytic category includes nonemergency requests made through the ED for admission to detoxification unit, visits to obtain medical clearance before being incarcerated, and acute emergencies where an individual is experiencing withdrawal symptoms and requests detox. These estimates do not include patients who seek or enter the hospital's detox unit through other avenues.
Drug-related ED visits that do NOT involve drug misuse or abuse	
Adverse Reactions	This analytic category includes ED visits in which an adverse health consequence (e.g., side effects or an allergic reaction) resulted when taking prescription drugs, over-the-counter medications, or dietary supplements as prescribed or recommended.
Accidental Ingestions	This analytic category includes ED visits in which an individual accidentally or unknowingly used or was administered a prescription drug, over-the-counter medication, or dietary supplement. Drug-related accidental ingestions typically involve patients aged 5 and under.

1.1 Major Features of DAWN

1.1.1 What Is a DAWN Case?

A DAWN case is any ED visit involving recent drug use that is implicated in the ED visit. The reason a patient used a drug is not part of the criteria for considering a visit to be drug related. Therefore, DAWN includes ED visits resulting from accidental ingestions and adverse reactions as well as explicit drug abuse.

1.1.2 What Drugs Are Included in DAWN?

DAWN captures drugs that are explicitly named in the medical record as being involved in the ED visit. The relationship between the ED visit and the drug use need not be causal. That is, an implicated drug may or may not have directly caused the condition generating the ED visit; the ED staff simply named it as being involved. Conversely, DAWN does not report medications or pharmaceuticals that the ED medical records mention as having been taken by the patient but that are unrelated to the ED visit.

Within those guidelines, DAWN collects data on all types of drugs, including the following:

- illegal drugs, e.g., heroin, cocaine, marijuana, MDMA (Ecstasy), PCP, club drugs, ketamine;
- substances that have psychoactive effects when inhaled;
- narcotic pain relievers, e.g., OxyContin[®], Vicodin[®];
- prescription drugs for anxiety, depression, sleeplessness, and other behavior disorders, e.g., Xanax[®], Ritalin[®], Prozac[®];
- prescription drugs used in the treatment of other medical conditions, e.g., antibiotics, anti-coagulants, insulin, chemotherapy drugs;
- anesthetic gases;
- over-the-counter medications, e.g., acetaminophen, ibuprofen, multi-ingredient cough and cold remedies;
- dietary supplements, e.g., vitamins, herbal remedies, nutritional products;
- alcohol when used in combination with other drugs; and
- alcohol alone, in patients aged 20 or younger.

1.1.3 What Is Covered in This Publication?

This report provides detailed information on ED visits involving drug use, misuse, or abuse for the years 2004 through 2011. The types of ED visits (referred to as analytic groups) highlighted in this publication are listed in Table 1. The analytic groups are defined by the reason for the visit and the types of drugs involved. Because a visit may involve multiple types of drugs (e.g., an illicit drug, such as marijuana, and a pharmaceutical, such as hydrocodone), a single visit may appear in multiple analytic groups.

1.2 Hospital Participation in 2011

DAWN relies on a nationally representative sample of hospitals with oversampling of hospitals in selected metropolitan areas. The universe of hospitals eligible for DAWN includes non-Federal, short-stay, general medical and surgical facilities in the United States that operate 24-hour EDs. DAWN excludes specialty hospitals (e.g., pediatric hospitals), long-term care facilities, and Federal facilities (e.g., Veterans Health Administration hospitals). The American Hospital Association Annual Survey Database (ASDB) was used to identify the original frame members. Subsequent ASDB surveys are used annually to identify "births" of new hospitals that open and "deaths" of hospitals that close or merge with other hospitals.

For 2011, 5.2 million charts out of a universe of 12.2 million charts were reviewed to determine if a visit was drug related. Data on 229,211 drug-related ED visits submitted by 233 hospitals were used for estimation. The overall visit weighted response rate was 35.2 percent.

1.3 Estimates of ED Visits

This publication reports nationally representative estimates of drug-related ED visits for the United States. Estimates 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 hospital 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 ASDB survey.

Many of the tables in this report provide estimates of visits, by drug. DAWN is able to identify more than 3,300 individual drugs (which map to more than 19,000 individual brands and street names).³ The more commonly involved drugs and drug categories were selected for inclusion in the drug detail tables appearing in this report. Because (a) a single ED visit may involve multiple drugs, or (b) 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.

1.4 Rates of ED Visits per 100,000 Population

Standardized measures are helpful when comparing levels of drug-related ED visits for different age and sex groups. This publication reports rates of ED visits per 100,000 population by age groups and sex groups per year, e.g., visits per 100,000 population aged 12 to 17 or visits per 100,000 male population. Population estimates are based on counts provided by the U.S. Census

³ The classification of drugs used in DAWN is derived from the Multum *Lexicon*, © 2012 Lexi-Comp, Inc. and/or Cerner Multum, Inc. The classification was modified to meet DAWN's unique requirements (2011). The Multum Licensing Agreement governing use of the Lexicon can be found on the DAWN Web site at <http://www.samhsa.gov/data/dawn/MultumLicenseAgreement.pdf>.

Bureau.⁴ Population-based rates for race/ethnicity categories are not reported because race/ethnicity information is often missing from ED records; a dash (—) is displayed instead.

1.5 Sampling Error

Because DAWN relies on a sample of hospitals, each estimate produced from the DAWN ED data is subject to sampling variability, the variation in estimates that would be observed naturally if different samples were drawn from the same population using the same procedures. One measure of sampling variability of an estimate used in this publication is the relative standard error (RSE). The precision of an estimate is inversely related to its RSE. That is, the greater the RSE, the lower the precision. A second measure of sampling error used in this publication is the 95 percent confidence interval (CI). 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 CI 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. For example, in 2011, there were 2,462,948 ED visits associated with drug misuse or abuse with a CI of 2,112,868 to 2,813,028. The CI indicates with a high degree of confidence that the actual number was within this range.

1.6 Suppression

An asterisk (*) is displayed in the place of suppressed estimates and rates. Data may be suppressed to protect patient confidentiality or to ensure that published findings meet statistical standards of reliability for survey results. In all DAWN published materials, estimates are suppressed according to the following rules:

- *The RSE of the estimate is greater than 50 percent.* The RSE is a measure of the relative precision and is calculated by dividing the estimate's standard error by the estimate itself. When the RSE is greater than 50 percent, the lower bound of the 95 percent CI approaches or includes the value zero. A CI that includes zero means that the estimate is not statistically different from zero at this precision level.
- *The estimate is based on fewer than 30 ED visits.* Estimates based on a small number of cases are typically suppressed because the RSE is greater than 50 percent. Estimates that do meet RSE criteria for publication but are based on fewer than 30 ED visits (weighted or unweighted) are deemed too unreliable for publication. Such estimates are also suppressed to protect patient privacy.

Ratios (percentages or rates per 100,000 population) based on suppressed estimates are likewise suppressed.

⁴ Population counts were drawn from the set of United States Resident Population Estimates by Age, Sex, Race, and Hispanic Origin (Vintage 2011) issued by the U.S. Census Bureau.

1.7 Comparisons Across Years

In this publication, between-year changes are assessed by comparing estimates for 2011 with those for 2004, 2009, and 2010.⁵ This publication reports only those between-year changes that are statistically significant at the $p < 0.05$ level. The p -value is 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 0.01, it means that there is a 1 percent probability that the difference observed could be due to chance alone.

The redesign of DAWN in 2003 altered most of DAWN's core features. Changes were made to the design of the hospital sample, the protocol for selecting charts to review, the eligibility criteria for being a DAWN case, and the data items submitted on these cases. These changes 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).

1.8 Limitations of the Data

Readers are advised to consider the following limitations to the DAWN data when interpreting results:

- DAWN data collectors attempt to identify, with a high degree of specificity, the exact drugs involved in an ED visit, but extant medical records vary in specificity and detail. If extant medical records include only a general description of a drug (e.g., "benzodiazepines"), the drug is grouped in a general category (e.g., "benzodiazepines not otherwise specified").
- DAWN relies on the assessment made by ED medical staff to determine which drugs are related to the visit and records only those drugs indicated as being related.
- DAWN does not assess the medical reasons for the visit, and it cannot be assumed that a drug was the direct cause of the medical emergency. For example, a tranquilizer may have caused the patient to fall asleep while driving and then to have an accident.
- Use of illicit drugs is assumed to constitute drug abuse. The determination of nonmedical use of pharmaceuticals, though, must be supported by information provided by medical personnel in the ED records.
- In cases where multiple pharmaceuticals are involved, it is not necessary that both drugs are misused. The medical emergency might stem from the interaction between two pharmaceuticals, one of which was used nonmedically, and the other of which was taken as prescribed.
- While DAWN seeks to report only the drugs that are related to the ED visit, some unrelated drugs may be included due to insufficient information. For example, anecdotal evidence suggests that ED records may mention methadone but fail to indicate that the patient was

⁵ Due to data limitations in 2004, long-term comparisons for ED visits resulting from adverse reactions are made between 2005 and the current year.

enrolled in a methadone treatment program and that the methadone was unrelated to the medical emergency leading to the ED visit.

- Information on race and ethnicity is often poorly documented in extant ED records. In addition, some hospitals consider race/ethnicity to be private information and will not make it available to DAWN Field Reporters. Overall, about 15 percent of visits each year do not contain race/ethnicity information. DAWN does not produce rates (visits per 100,000 population) for race/ethnicity groups because these missing data will result in the understatement of visits by race/ethnicity category. This might affect racial/ethnic groups differentially and produce misleading findings.
- Although DAWN documents whether a drug was positively confirmed by toxicology testing, DAWN does not require that drugs reported for the ED visit be confirmed by laboratory testing. Toxicology tests are not used consistently across EDs, and some toxicology tests are not specific enough to identify particular drugs. Furthermore, a positive toxicology test is not necessarily evidence of recent drug involvement in an ED visit if it is a current medication or a drug that persists in the system long after it was used. For this reason, DAWN requires that the involvement of drugs be mentioned in the ED record, not just in the toxicology testing results, for the visit to be considered a DAWN case.
- Information on drug-related visits is based on a sample and is therefore subject to sampling variability. Standard error measurements are provided in many tables to reflect the sampling variability that occurs (a) by chance because only a sample rather than the entire universe is surveyed, and (b) due to nonresponse.
- As in any survey, a low response rate is of concern because it creates larger-than-expected sampling errors plus the opportunity for unpredictable biases. DAWN addresses these issues for the short term by always reporting standard errors based on the actual sample of respondents and for the long term by continuing its efforts to raise the hospital participation rate.

2. OVERALL DRUG MISUSE OR ABUSE

2.1 ED Visits Involving Overall Drug Misuse or Abuse, 2011

For 2011, DAWN estimates that there were over 5.1 million drug-related ED visits. Of these, 2.5 million ED visits were associated with drug misuse or abuse (Table 2). That is the equivalent of 790.4 ED visits for each 100,000 persons in the Nation; for those aged 20 or younger, the rate is 500.0 visits; for those aged 21 or older, the rate is 903.4 visits.

Table 2. ED visits involving drug misuse or abuse, by drug combinations, 2011

Drug combinations (1)	ED visits	Percent of ED visits	RSE (%)	95% CI: Lower bound	95% CI: Upper bound
Total ED visits, drug misuse or abuse (2)	2,462,948	100.0	7.30	2,112,868	2,813,028
Illicit drug(s) only	656,025	26.6	12.7	493,149	818,902
Alcohol only (age < 21) (3)	117,653	4.8	10.6	93,260	142,047
Pharmaceutical(s) only	835,275	33.9	6.4	730,440	940,110
Combinations	—	—	—	—	—
Illicit drug(s) with alcohol (4)	261,125	10.6	13.7	191,207	331,042
Illicit drug(s) with pharmaceutical(s)	247,342	10.0	17.3	163,707	330,976
Alcohol with pharmaceutical(s)	257,520	10.5	7.4	220,030	295,010
Illicit drug(s) with alcohol and pharmaceutical(s)	88,008	3.6	15.5	61,209	114,808

- (1) The classification of drugs used in DAWN is derived from the Multum *Lexicon*, © 2012 Lexi-Comp, Inc. and/or Cerner Multum, Inc. The classification was modified to meet DAWN's unique requirements (2011). The Multum Licensing Agreement governing use of the Lexicon can be found on the DAWN Web site at <http://www.samhsa.gov/data/dawn/MultumLicenseAgreement.pdf>.
- (2) Estimates of ED visits are based on a representative sample of general, non-Federal, short-stay hospitals in the United States with 24-hour EDs.
- (3) ED patients aged 21 or older for whom alcohol was the only drug associated with their ED visits are not considered DAWN cases.
- (4) 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, 2011.

Of the ED visits in 2011 that involved drug misuse or abuse, nearly two thirds (64.9%) were associated with a single drug type (illicit drugs, alcohol, or pharmaceuticals). Illicit drugs alone were involved in 26.6 percent of drug misuse or abuse visits, pharmaceuticals alone were involved in 33.9 percent, and alcohol with no other drug (aged 20 or younger only) was involved in 4.8 percent. The remaining visits (34.7%) involved some combination of illicit drugs, alcohol, and pharmaceuticals.

Understanding that a visit may appear in more than one group, DAWN found that out of all ED visits involving drug misuse or abuse,

- 1,252,500 ED visits, or 50.9 percent, involved illicit drugs;
- 1,244,872 ED visits, or 50.5 percent, involved nonmedical use of pharmaceuticals; and
- 606,653 ED visits, or 24.6 percent, involved drugs combined with alcohol.

2.2 Trends in ED Visits Involving Drug Misuse or Abuse, 2004–2011

This section presents the trends in the estimates of ED visits involving drug misuse or abuse for the period from 2004 through 2011 (Table 3). Differences between years are presented in terms of the percentage increase or decrease in visits in 2011 compared with the estimates for 2004 (long-term trends) and for 2009 and 2010 (short-term trends). Only statistically significant changes are discussed and displayed in the table.

In the long term, between 2004 and 2011, the annual overall number of ED visits attributable to drug misuse or abuse has risen steadily each year for a total increase of 52 percent, or about 844,000 visits. While visits involving illicit drugs alone or underage drinking have not risen, ED visits related to the use of pharmaceuticals with no other drug involvement rose substantially (148%), as did the use of pharmaceuticals with illicit drugs (137%), pharmaceuticals with alcohol (84%), and pharmaceuticals combined with both illicit drugs and alcohol (93%). These increases reflect almost 500,000 more ED visits related to pharmaceuticals alone in 2011 compared with 2004, over 142,000 more visits related to pharmaceuticals and illicit drugs, almost 120,000 more visits related to pharmaceuticals and alcohol, and over 42,000 more visits related to all three types of substances.

In the short term, between 2009 and 2011, ED visits involving overall drug misuse or abuse increased by 19 percent, or by about 200,000 visits per year for 2 years. Almost half of the net increase seen for ED visits involving misuse or abuse between 2004 and 2011 occurred in the last 2 years of the period. Unlike the long-term trends, though, which are largely driven by rises in pharmaceutical involvement, the short-term rise reflects the 38 percent increase seen in ED visits involving illicit drugs only, with no significant increases over the last 2 years for visits involving pharmaceuticals or alcohol alone or combinations of pharmaceuticals, alcohol, and illicit drugs.

Table 3. Trends in ED visits involving drug misuse or abuse, by drug combinations, 2004–2011

Drug combinations (1)	ED visits, 2004	ED visits, 2005	ED visits, 2006	ED visits, 2007	ED visits, 2008	ED visits, 2009	ED visits, 2010	ED visits, 2011	Percent change, 2004, 2011 (2)	Percent change, 2009, 2011 (2)	Percent change, 2010, 2011 (2)
Total ED visits, overall drug misuse or abuse (3)	1,619,056	1,616,404	1,742,942	1,883,280	1,999,877	2,070,452	2,301,050	2,462,948	52	19	—
Illicit drug(s) only	502,864	518,223	537,271	522,966	510,911	476,521	584,270	656,025	—	38	—
Alcohol only (age < 21) (4)	150,988	110,599	126,705	137,375	132,859	138,614	122,778	117,653	—	—	—
Pharmaceutical(s) only	336,753	443,980	485,911	581,809	663,540	729,607	778,923	835,275	148	—	—
Combinations	—	—	—	—	—	—	—	—	—	—	—
Illicit drug(s) with alcohol (5)	338,733	222,268	219,830	238,190	229,704	211,712	249,608	261,125	—	—	—
Illicit drug(s) with pharmaceutical(s)	104,525	127,004	142,234	143,841	168,515	206,061	250,283	247,342	137	—	—
Alcohol with pharmaceutical(s) (5)	139,675	139,807	171,459	189,244	208,896	227,839	227,073	257,520	84	—	—
Illicit drug(s) with alcohol and pharmaceutical(s) (5)	45,517	54,523	59,531	69,855	85,453	80,099	88,115	88,008	93	—	—

(1) The classification of drugs used in DAWN is derived from the Multum *Lexicon*, © 2012 Lexi-Comp, Inc. and/or Cerner Multum, Inc. The classification was modified to meet DAWN's unique requirements (2011). The Multum Licensing Agreement governing use of the Lexicon can be found on the DAWN Web site at <http://www.samhsa.gov/data/dawn/MultumLicenseAgreement.pdf>.

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

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

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

(5) When present with other drugs, alcohol is reportable for patients of all ages.

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

SOURCE: Center for Behavioral Health Statistics and Quality, SAMHSA, Drug Abuse Warning Network, 2011.

3. ILLICIT DRUGS

3.1 ED Visits Involving Illicit Drugs, 2011

For analysis, DAWN groups together ED visits that involve illicit drugs. These substances include cocaine, heroin, marijuana, synthetic cannabinoids, amphetamines/methamphetamine, MDMA (Ecstasy), GHB (gamma-Hydroxybutyric acid), flunitrazepam (Rohypnol®), ketamine, LSD, PCP, and hallucinogens. Visits involving the inhalation of nonmedical substances for their psychoactive properties (e.g., sniffing model airplane glue) are also included.⁶

Of the approximately 2.5 million drug misuse or abuse ED visits that occurred during 2011, a total of 1,252,500, or just over half (50.9%), involved illicit drugs (Table 4). A majority (56.3%) of illicit drug ED visits involved multiple drugs. Overall, 27.9 percent of visits involving illicit drugs also involved alcohol.

Cocaine and marijuana were the most commonly involved drugs, with 505,224 ED visits (40.3%) and 455,668 ED visits (36.4%), respectively. Cocaine and marijuana were followed by heroin, at 258,482 ED visits, or 20.6 percent, and then by amphetamines/methamphetamine, at 159,840 visits, or 12.8 percent.⁷

Other illicit drugs involved in ED visits occurred at levels under 5 percent and included the following:

- PCP, in 75,538 visits;
- synthetic cannabinoids, in 28,531 visits;
- MDMA (Ecstasy), in 22,498 visits;
- Combinations of illicit drugs (e.g., cocaine/heroin "speedball"), in 10,388 visits;
- inhalants, in 10,032 visits;
- hallucinogens (not elsewhere classified), in 8,043 visits;
- LSD, in 4,819 visits;
- GHB, in 2,406 visits; and
- ketamine, in 1,550 visits.

⁶ Drugs that DAWN considers to be illicit yet have legitimate medicinal uses include amphetamines; ketamine; and anesthetic gases, such as nitrous oxide ("laughing gas"). DAWN Field Reporters are careful to distinguish abuse from adverse reactions when classifying visits involving these drugs.

⁷ Heroin-related ED visits may be slightly underestimated. When drugs related to an ED visit are determined through toxicology tests, heroin metabolites are indistinguishable from other opiates unless a test specifically for the heroin metabolite is conducted. In the absence of this test, or if there is no evidence in the written record that heroin, specifically, was involved, the visit will be grouped with pharmaceuticals labeled "unspecified opiates" and not classified as heroin, an illicit drug. The number of drug misuse or abuse ED visits involving unspecified opiates is estimated at 157,981 visits, and about 53 percent of these (84,499 visits) were determined through toxicology testing. The portion that is attributable to heroin is unknown.

The estimates for visits involving flunitrazepam (e.g., Rohypnol) was suppressed due to low statistical precision.

Table 4. ED visits involving illicit drugs, 2011

Drugs (1)	ED visits	Percent of ED visits	RSE (%)	95% CI: Lower bound	95% CI: Upper bound
Total ED visits, illicit drugs (2,3)	1,252,500	100.0	11.3	976,169	1,528,831
Single drug	547,945	43.7	13.6	402,408	693,482
Multiple drugs	704,555	56.3	11.5	546,064	863,046
Alcohol present	349,133	27.9	13.4	257,249	441,017
Cocaine	505,224	40.3	18.3	324,262	686,185
Heroin	258,482	20.6	10.5	205,046	311,918
Cannabinoids	479,560	38.3	9.0	394,921	564,198
Marijuana	455,668	36.4	9.5	370,995	540,340
Synthetic cannabinoids	28,531	2.3	18.1	18,390	38,672
Amphetamines/methamphetamine	159,840	12.8	19.0	100,199	219,481
Amphetamines	70,831	5.7	22.5	39,631	102,031
Methamphetamine	102,961	8.2	23.1	56,391	149,530
MDMA (Ecstasy)	22,498	1.8	10.2	17,981	27,015
GHB	2,406	0.2	20.3	1,448	3,364
Flunitrazepam (Rohypnol)	*	*	*	*	*
Ketamine	1,550	0.1	36.1	453	2,647
LSD	4,819	0.4	23.2	2,628	7,009
PCP	75,538	6.0	37.0	20,702	130,374
Misc. hallucinogens	8,043	0.6	20.6	4,792	11,294
Inhalants	10,032	0.8	25.0	5,109	14,956
Combinations not tabulated above	10,388	0.8	26.1	5,069	15,707

(1) The classification of drugs used in DAWN is derived from the *Multum Lexicon*, © 2012 Lexi-Comp, Inc. and/or Cerner Multum, Inc. The classification was modified to meet DAWN's unique requirements (2011). The Multum Licensing Agreement governing use of the Lexicon can be found on the DAWN Web site at <http://www.samhsa.gov/data/dawn/MultumLicenseAgreement.pdf>.

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

(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 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 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, 2011.

Synthetic cannabinoids, also known as "Spice" or "K2," appeared for the first time at reportable levels in DAWN in 2010; they were involved in 11,406 ED visits (1.0%). In 2011, a total of 28,531 ED visits, or 2.3 percent, involved synthetic cannabinoids. While there appears to be a number of

different chemical compositions, synthetic cannabinoids are functionally similar to Δ 9-tetrahydrocannabinol (THC), the active ingredient in cannabis.⁸ Users report effects similar to those produced by marijuana, and regular users may experience withdrawal and addiction symptoms.⁹ According to the Monitoring the Future survey, almost one in nine, or 11.4 percent, of high school seniors reported using synthetic cannabinoids in 2011.^{10,11}

In 2011, there were 402.0 ED visits that involved illicit drugs for each 100,000 persons in the U.S. population (Table 5). The highest rates were found for cocaine involvement (162.1 ED visits per 100,000 population) and marijuana (146.2 visits) (Figure 2). These were followed by heroin (83.0 visits per 100,000 population), amphetamines/methamphetamine (51.3 visits), PCP (24.2 visits), synthetic cannabinoids (9.2 visits), and MDMA (Ecstasy) (7.2 visits). Lower-incidence drugs had rates below 4 visits per 100,000 population.

Table 6 presents estimates of the number of ED visits in 2011 involving illicit drugs, by sex, age, and race/ethnicity categories. To facilitate comparisons between demographic groups (e.g., comparing males to females), Table 7 and Figure 3 present the rates of ED visits per 100,000 population. For most illicit drugs, the rates were more than 50 percent higher for males than for females. Comparing visits by patient age, 21- to 24-year-olds had the highest rate of medical emergencies involving marijuana (446.9 visits per 100,000 population aged 21 to 24), heroin (266.1 visits), and amphetamines/methamphetamine (141.5 visits); 45- to 54-year-olds had the highest rate for cocaine (344.6 visits per 100,000 population aged 45 to 54).

Considering race/ethnicity, 50.7 percent of patients were White, 30.7 percent were Black, 10.9 percent were Hispanic, 1.5 percent were of other or multiple race/ethnic groups, and 6.3 percent were of unknown race/ethnicity. DAWN does not produce population-based rates for race/ethnicity categories because race/ethnicity information is often missing from ED records.

Overall, 39.4 percent of visits involving illicit drugs resulted in some form of follow-up, including admission to the hospital (24.0%), transfer to another health care facility (9.6%), or referral to a drug detox/dependency program (5.8%) (Table 8). Most other patients (52.5%) were treated and released to home, with the remainder (8.1%) experiencing other outcomes.

⁸ European Monitoring Centre for Drugs and Drug Addiction (EMCDDA). (2009). *Understanding the 'Spice' phenomenon* (EMCDDA Thematic Paper). Luxembourg: Office for Official Publications of the European Communities. Retrieved May 5, 2012, from <http://www.emcdda.europa.eu/publications/thematic-papers/spice>.

⁹ National Institute on Drug Abuse (NIDA). (2012, May). *DrugFacts: Spice (Synthetic marijuana)*. Retrieved May 5, 2012, from <http://www.drugabuse.gov/publications/infofacts/spice>.

¹⁰ Johnston, L. D., O'Malley, P. M., Bachman, J. G., & Schulenberg, J. E. (2011, December 14). Marijuana use continues to rise among U.S. teens, while alcohol use hits historic lows [Press release]. Ann Arbor, MI: University of Michigan News Service. Retrieved May 5, 2012, from <http://www.monitoringthefuture.org>.

¹¹ See *Glossary of DAWN Terms, 2011 Update*, for additional information on synthetic cannabinoids and their reporting by DAWN.

Table 5. Rates of ED visits per 100,000 population involving illicit drugs, 2011

Drugs (1)	Rate of ED visits per 100,000 population (2)	RSE (%)	95% CI: Lower bound	95% CI: Upper bound
Total ED visits, illicit drugs (3)	402.0	11.3	313.3	490.7
Cocaine	162.1	18.3	104.1	220.2
Heroin	83.0	10.5	65.8	100.1
Cannabinoids	153.9	9.0	126.7	181.1
Marijuana	146.2	9.5	119.1	173.4
Synthetic cannabinoids	9.2	18.1	5.9	12.4
Amphetamines/methamphetamine	51.3	19.0	32.2	70.4
Amphetamines	22.7	22.5	12.7	32.7
Methamphetamine	33.0	23.1	18.1	48.0
MDMA (Ecstasy)	7.2	10.2	5.8	8.7
GHB	0.8	20.3	0.5	1.1
Flunitrazepam (Rohypnol)	*	*	*	*
Ketamine	0.5	36.1	0.1	0.8
LSD	1.5	23.2	0.8	2.2
PCP	24.2	37.0	6.6	41.8
Misc. hallucinogens	2.6	20.6	1.5	3.6
Inhalants	3.2	25.0	1.6	4.8
Combinations not tabulated above	3.3	26.1	1.6	5.0

(1) The classification of drugs used in DAWN is derived from the Multum *Lexicon*, © 2012 Lexi-Comp, Inc. and/or Cerner Multum, Inc. The classification was modified to meet DAWN's unique requirements (2011). The Multum Licensing Agreement governing use of the Lexicon can be found on the DAWN Web site at <http://www.samhsa.gov/data/dawn/MultumLicenseAgreement.pdf>.

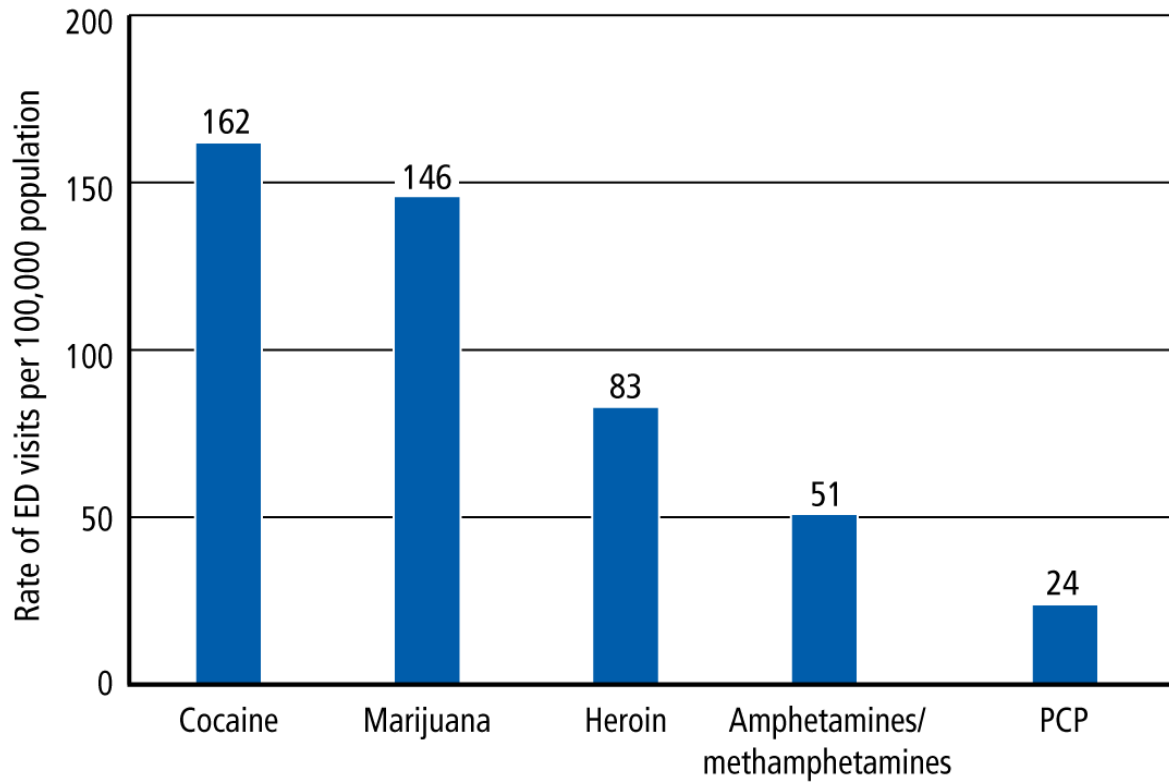
(2) All rates are ED visits per 100,000 population. Estimates of ED visits are based on a representative sample of general, non-Federal, short-stay hospitals in the United States with 24-hour EDs. Population estimates are drawn from the set of United States Resident Population Estimates by Age, Sex, Race, and Hispanic Origin (Vintage 2011) issued by the U.S. Census Bureau.

(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 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 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, 2011.

Figure 2. Rates of ED visits per 100,000 population involving illicit drugs, 2011



SOURCE: Center for Behavioral Health Statistics and Quality, SAMHSA, Drug Abuse Warning Network, 2011.

Table 6. ED visits involving illicit drugs, by patient demographics, 2011

Patient demographics	All illicit	Cocaine	Heroin	Marijuana	Amphetamines/ methamphet- amine	MDMA (Ecstasy)	GHB	LSD	PCP
Total ED visits, illicit drugs (1,2,3)	1,252,500	505,224	258,482	455,668	159,840	22,498	2,406	4,819	75,538
Sex	—	—	—	—	—	—	—	—	—
Male	810,055	325,396	167,016	298,016	99,755	15,612	1,408	4,045	51,906
Female	441,982	179,520	91,450	157,528	60,082	6,886	998	773	23,598
Unknown	*	*	*	*	*	*	*	*	*
Age	—	—	—	—	—	—	—	—	—
0–5 years	1,113	*	*	*	*	*	*	*	*
6–11 years	1,216	*	*	*	*	*	*	*	*
12–17 years	78,667	5,904	2,141	60,302	5,889	3,184	*	*	1,965
18–20 years	105,274	15,198	18,179	59,945	12,128	6,986	*	1,982	3,730
21–24 years	166,812	37,643	46,723	78,463	24,842	5,004	*	1,379	10,445
25–29 years	181,291	57,398	46,965	68,054	27,377	3,472	322	*	18,763
30–34 years	152,991	55,247	35,971	52,353	24,124	1,760	*	*	15,566
35–44 years	243,708	127,405	49,694	67,677	34,780	1,740	812	*	14,606
45–54 years	238,587	154,101	40,712	52,018	23,275	*	*	*	*
55–64 years	73,338	47,064	15,428	14,778	6,276	*	*	*	638
65 years and older	9,350	4,887	2,553	1,710	756	*	*	*	*
Unknown	*	*	*	*	*	*	*	*	*
Race/ethnicity	—	—	—	—	—	—	—	—	—
White	634,593	185,748	167,778	249,587	109,813	11,421	2,020	3,393	23,485
Black	384,317	236,089	36,095	122,081	13,231	4,352	*	*	43,599
Hispanic	136,888	49,810	31,031	49,593	25,483	3,089	*	*	3,677
Other/2+ race/ethnicities	18,318	5,086	3,290	7,314	3,556	*	*	*	*
Unknown	78,383	28,490	20,288	27,093	7,758	2,461	161	194	4,017

(1) The classification of drugs used in DAWN is derived from the Multum *Lexicon*, © 2012 Lexi-Comp, Inc. and/or Cerner Multum, Inc. The classification was modified to meet DAWN's unique requirements (2011). The Multum Licensing Agreement governing use of the Lexicon can be found on the DAWN Web site at <http://www.samhsa.gov/data/dawn/MultumLicenseAgreement.pdf>.

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

(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 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, 2011.

Table 7. Rates of ED visits per 100,000 population involving illicit drugs, by patient demographics, 2011

Patient demographics	All illicit	Cocaine	Heroin	Marijuana	Amphetamines/ methamphet- amine	MDMA (Ecstasy)	GHB	LSD	PCP
Rates of ED visits, illicit drugs (1,2,3)	402.0	162.1	83.0	146.2	51.3	7.2	0.8	1.5	24.2
Sex	—	—	—	—	—	—	—	—	—
Male	528.4	212.3	109.0	194.4	65.1	10.2	0.9	2.6	33.9
Female	279.2	113.4	57.8	99.5	38.0	4.3	0.6	0.5	14.9
Age	—	—	—	—	—	—	—	—	—
0–5 years	4.6	*	*	*	*	*	*	*	*
6–11 years	4.9	*	*	*	*	*	*	*	*
12–17 years	313.3	23.5	8.5	240.2	23.5	12.7	*	*	7.8
18–20 years	779.4	112.5	134.6	443.8	89.8	51.7	*	14.7	27.6
21–24 years	950.1	214.4	266.1	446.9	141.5	28.5	*	7.9	59.5
25–29 years	851.9	269.7	220.7	319.8	128.7	16.3	1.5	*	88.2
30–34 years	745.9	269.4	175.4	255.2	117.6	8.6	*	*	75.9
35–44 years	599.9	313.6	122.3	166.6	85.6	4.3	2.0	*	35.9
45–54 years	533.5	344.6	91.0	116.3	52.0	*	*	*	*
55–64 years	192.7	123.7	40.5	38.8	16.5	*	*	*	1.7
65 years and older	22.6	11.8	6.2	4.1	1.8	*	*	*	*

(1) The classification of drugs used in DAWN is derived from the Multum *Lexicon*, © 2012 Lexi-Comp, Inc. and/or Cerner Multum, Inc. The classification was modified to meet DAWN's unique requirements (2011). The Multum Licensing Agreement governing use of the Lexicon can be found on the DAWN Web site at <http://www.samhsa.gov/data/dawn/MultumLicenseAgreement.pdf>.

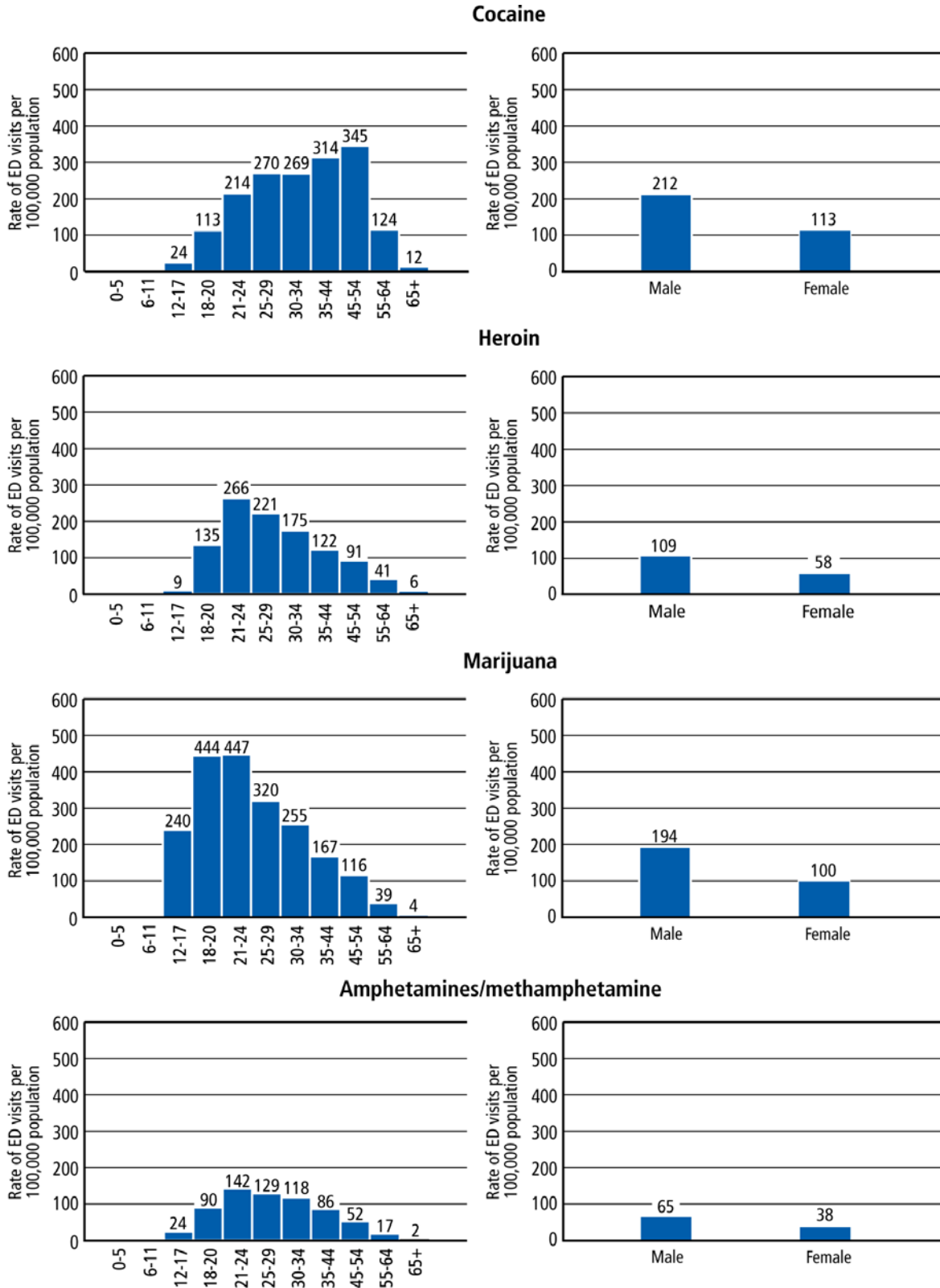
(2) All rates are ED visits per 100,000 population. Estimates of ED visits are based on a representative sample of general, non-Federal, short-stay hospitals in the United States with 24-hour EDs. Population estimates are drawn from the set of United States Resident Population Estimates by Age, Sex, Race, and Hispanic Origin (Vintage 2011) issued by the U.S. Census Bureau.

(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 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, 2011.

Figure 3. Rates of ED visits per 100,000 population involving illicit drugs, by selected drugs, age, and sex, 2011



SOURCE: Center for Behavioral Health Statistics and Quality, SAMHSA, Drug Abuse Warning Network, 2011.

Table 8. ED visits and rates involving illicit drugs, by patient disposition, 2011

Patient disposition	ED visits	Percent of ED visits	Rate of ED visits per 100,000 population (1)
Total ED visits, illicit drugs (2)	1,252,500	100.0	402.0
Treated and released	775,439	61.9	248.9
Discharged home	657,695	52.5	211.1
Released to police/jail	45,530	3.6	14.6
Referred to detox/treatment	72,214	5.8	23.2
Admitted to this hospital	300,342	24.0	96.4
ICU/critical care	29,780	2.4	9.6
Surgery	1,539	0.1	0.5
Chemical dependency/detox	24,517	2.0	7.9
Psychiatric unit	65,057	5.2	20.9
Other inpatient unit	179,449	14.3	57.6
Other disposition	176,718	14.1	56.7
Transferred	120,425	9.6	38.6
Left against medical advice	21,815	1.7	7.0
Died	1,502	0.1	0.5
Other	18,963	1.5	6.1
Not documented	*	*	*

(1) All rates are ED visits per 100,000 population. Population estimates are drawn from the set of United States Resident Population Estimates by Age, Sex, Race, and Hispanic Origin (Vintage 2011) issued by the U.S. Census Bureau.

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

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, 2011.

3.2 Trends in ED Visits Involving Illicit Drugs, 2004–2011

This section presents the trends in the estimates of ED visits involving illicit drugs for the period from 2004 through 2011 (Table 9). Differences between years are presented in terms of the percentage increase or decrease in visits in 2011 compared with the estimates for 2004 (long-term trends) and for 2009 and 2010 (short-term trends). Only statistically significant changes are discussed and displayed in the table.

Table 9. Trends in ED visits involving illicit drugs, by selected drugs, 2004–2011

Drugs (1)	ED visits, 2004	ED visits, 2005	ED visits, 2006	ED visits, 2007	ED visits, 2008	ED visits, 2009	ED visits, 2010	ED visits, 2011	Percent change, 2004, 2011 (2)	Percent change, 2009, 2011 (2)	Percent change, 2010, 2011 (2)
Total ED visits, illicit drugs (3,4)	991,640	922,018	958,866	974,852	994,583	974,392	1,172,276	1,252,500	—	29	—
Cocaine	475,425	483,865	548,608	553,535	482,188	422,902	488,101	505,224	—	—	—
Heroin	214,432	187,493	189,787	188,162	200,666	213,118	224,706	258,482	—	—	—
Cannabinoids	281,619	279,668	290,568	308,547	374,443	376,494	470,845	479,560	70	27	—
Marijuana	281,619	279,668	290,568	308,547	374,443	376,492	461,028	455,668	62	—	—
Synthetic cannabinoids	*	*	*	*	*	*	11,406	28,531	—	—	150
Amphetamines/ methamphetamine	162,435	137,806	107,586	85,043	91,945	93,564	138,632	159,840	—	71	—
Amphetamines	34,085	35,083	32,251	21,545	31,534	37,431	52,388	70,831	—	89	—
Methamphetamine	132,576	109,655	79,924	67,954	66,308	64,117	94,929	102,961	—	61	—
MDMA (Ecstasy)	10,227	11,287	16,784	12,751	17,888	22,847	21,836	22,498	120	—	—
GHB	1,789	1,036	1,084	2,210	1,441	1,758	1,787	2,406	—	—	—
Flunitrazepam (Rohypnol)	*	*	*	*	*	800	657	*	—	—	—
Ketamine	*	303	270	291	344	529	915	1,550	—	—	—
LSD	2,146	2,001	4,002	3,561	3,287	4,028	3,817	4,819	—	—	—
PCP	31,342	14,825	21,960	28,173	37,266	36,719	53,542	75,538	—	106	41
Misc. hallucinogens	3,153	3,194	3,900	4,899	6,193	6,620	6,107	8,043	155	—	—
Inhalants	9,525	5,167	5,650	7,996	7,115	6,137	11,401	10,032	—	—	—
Combinations not tabulated above	*	4,256	3,530	4,612	4,924	4,812	6,877	10,388	—	116	—

(1) The classification of drugs used in DAWN is derived from the Multum *Lexicon*, © 2012 Lexi-Comp, Inc. and/or Cerner Multum, Inc. The classification was modified to meet DAWN's unique requirements (2011). The Multum Licensing Agreement governing use of the Lexicon can be found on the DAWN Web site at <http://www.samhsa.gov/data/dawn/MultumLicenseAgreement.pdf>.

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

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

(4) 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 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, 2011.

The overall level of ED visits involving illicit drugs was stable between 2004 and 2011, though several specific illicit drug categories experienced increased involvement over the 8 years. With 455,668 visits in 2011, marijuana experienced a 62 percent increase between 2004 and 2011. MDMA (Ecstasy) involvement more than doubled, reaching over 20,000 visits in 2011. The category of miscellaneous hallucinogens also more than doubled, with about 8,000 visits in 2011.

In the short term, between 2009 and 2011, illicit drugs overall as well as individual drugs have experienced significant increases. Contributing to the overall 29 percent 2-year increase in illicit drug involvement are rises in the involvement of synthetic cannabinoids, amphetamines, methamphetamine, PCP, and various combinations of these drugs. Synthetic cannabinoids first appeared in DAWN records in 2009, though at levels too small to be reported. By 2010, ED visits involving synthetic cannabinoids rose to a reportable level for the nation: 11,406 visits. By 2011, the number reached 28,531 visits, a 150 percent 1-year increase. Amphetamines involvement saw an 89 percent increase, and methamphetamine involvement had a 61 percent increase between 2009 and 2011 for a total of about 160,000 visits in 2011. PCP rose 106 percent over the 2 years, going from about 36,000 visits in 2009 to about 50,000 in 2010 and about 75,000 visits in 2011. Combination illicit drugs (e.g., cocaine/heroin combinations called "speedballs," marijuana mixed with PCP ["angel dust"]) increased 116 percent since 2009, reaching over 10,000 visits in 2011.

4. ALCOHOL

4.1 ED Visits Involving Drugs and Alcohol Taken Together, 2011

According to the National Institute on Alcohol Abuse and Alcoholism (NIAAA), more than 150 medications have harmful additive or interactive effects when combined with alcohol. The harmful effects of combining drugs with alcohol are heightened by drugs that depress the central nervous system, such as heroin, opiate pain relievers, benzodiazepines (anti-anxiety drugs), antihistamines, and antidepressants. These drug-alcohol interactions may result in increased risk of illness, injury, and even death. Medications for certain disorders—including diabetes, high blood pressure, and heart disease—also can have harmful interactions with alcohol.¹²

In 2011, over 600,000 ED visits involved drugs combined with alcohol (Table 10). This represents nearly a quarter of all ED visits associated with drug misuse or abuse.

Table 10. ED visits involving alcohol, 2011

Alcohol use category (1)	ED visits (2)	Percent of all drug misuse/abuse visits	RSE (%)	95% CI: Lower bound	95% CI: Upper bound
Alcohol present with drugs (3)	606,653	24.6	9.9	489,228	724,078

- (1) The classification of drugs used in DAWN is derived from the Multum *Lexicon*, © 2012 Lexi-Comp, Inc. and/or Cerner Multum, Inc. The classification was modified to meet DAWN's unique requirements (2011). The Multum Licensing Agreement governing use of the Lexicon can be found on the DAWN Web site at <http://www.samhsa.gov/data/dawn/MultumLicenseAgreement.pdf>.
- (2) Estimates of ED visits are based on a representative sample of general, non-Federal, short-stay hospitals in the United States with 24-hour EDs.
- (3) For patients of all ages, DAWN records whether alcohol is present in addition to other drugs.

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

SOURCE: Center for Behavioral Health Statistics and Quality, SAMHSA, Drug Abuse Warning Network, 2011.

Illicit drugs were involved in over half (57.6%) of ED visits involving alcohol-drug combinations, with cocaine and marijuana representing the greater proportions of such visits (28.6% and 25.0%, respectively) (Table 11). Pharmaceuticals were also involved in over half (57.0%) of such visits. Anxiolytics, sedatives, and hypnotics (drugs to treat insomnia and anxiety) were involved in 24.6 percent of visits, with the largest part of that category being benzodiazepines (20.4%). Pain relievers were involved in a similar number of visits (21.8%), with narcotic pain relievers accounting for over half of that number (12.6%). Psychotherapeutic agents (antidepressants and antipsychotics) were involved in 7.7 percent of visits involving alcohol-drug combinations.

¹² National Institute on Alcohol Abuse and Alcoholism (NIAAA). (2008, July). *Alcohol and other drugs*. Retrieved June 22, 2012, from <http://pubs.niaaa.nih.gov/publications/AA76/AA76.htm>.

Table 11. ED visits involving drugs and alcohol taken together, 2011

Drugs reported with alcohol (1)	ED visits	Percent of ED visits	Rate of ED visits per 100,000 population (2)
Total ED visits, drugs with alcohol (3,4)	606,653	100.0	194.7
Illicit drugs	349,133	57.6	112.0
Cocaine	173,799	28.6	55.8
Heroin	48,036	7.9	15.4
Cannabinoids	154,495	25.5	49.6
Marijuana	151,591	25.0	48.7
Synthetic cannabinoids	3,806	0.6	1.2
Amphetamines/methamphetamine	25,820	4.3	8.3
Pharmaceuticals	345,528	57.0	110.9
<i>Anxiolytics, sedatives, and hypnotics</i>	148,958	24.6	47.8
Benzodiazepines	123,572	20.4	39.7
Alprazolam	46,713	7.7	15.0
Clonazepam	25,322	4.2	8.1
Lorazepam	15,539	2.6	5.0
<i>Central nervous system stimulants (e.g., ADHD drugs)</i>	17,118	2.8	5.5
<i>Pain relievers</i>	131,991	21.8	42.4
Acetaminophen products	15,082	2.5	4.8
Opiates/opioids	103,730	17.1	33.3
Narcotic pain relievers	76,734	12.6	24.6
Hydrocodone products	25,712	4.2	8.3
Oxycodone products	31,534	5.2	10.1
<i>Psychotherapeutic agents</i>	46,949	7.7	15.1
Antidepressants	33,854	5.6	10.9
Antipsychotics	19,409	3.2	6.2

(1) The classification of drugs used in DAWN is derived from the Multum *Lexicon*, © 2012 Lexi-Comp, Inc. and/or Cerner Multum, Inc. The classification was modified to meet DAWN's unique requirements (2011). The Multum Licensing Agreement governing use of the Lexicon can be found on the DAWN Web site at <http://www.samhsa.gov/data/dawn/MultumLicenseAgreement.pdf>.

(2) All rates are ED visits per 100,000 population. Population estimates are drawn from the set of United States Resident Population Estimates by Age, Sex, Race, and Hispanic Origin (Vintage 2011) issued by the U.S. Census Bureau.

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

(4) All visits in this table involve alcohol and another drug. Some involve multiple drugs. Such visits will appear multiple times in this table (e.g., a visit involving alcohol, marijuana, and hydrocodone will appear twice in this table). The sum of visits by drug will be greater than the total, and the sum of percentages by drug will be greater than 100.

SOURCE: Center for Behavioral Health Statistics and Quality, SAMHSA, Drug Abuse Warning Network, 2011.

Looking at alcohol involvement from the perspective of all visits involving drug misuse or abuse, DAWN found that about 30 percent of visits involving illicit drugs also involved alcohol (Table 12). Among illicit drugs, higher levels of alcohol involvement were found for visits involving ketamine (71.5%). Among visits involving pharmaceuticals, about 25 percent also involved alcohol. Alcohol was present in 38.6 percent of visits involving penicillin, 37.9 percent of visits involving central nervous system (CNS) stimulants (e.g., ADHD drugs), and 31.2 percent of visits involving antidepressants.

There were 194.7 visits per 100,000 population that involved drugs in combination with alcohol (Table 13). The rate of drug-related ED visits involving alcohol was higher for males (249.5 visits per 100,000 males) than for females (141.5 visits; Figure 4). By age, the highest rate of alcohol involvement was found for those aged 21 to 24 (393.9 visits per 100,000 population aged 21 to 24), though alcohol involvement was consistently near or above 300 visits per 100,000 population for all the age groups between 21 and 54.

Considering race/ethnicity, 58.7 percent of patients were White, 22.3 percent were Black, 10.9 percent were Hispanic, 1.3 percent were of other or multiple race/ethnic groups, and 6.8 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.

Just under half (45.4%) of patients seen for alcohol-related ED visits received follow-up care: 27.2 percent were admitted to the hospital, 12.0 percent were transferred to another facility, and the balance (6.3%) was referred to detox/treatment (Table 14). The remaining patients were treated and released to home (48.4%) or had other outcomes (6.2%).

Table 12. ED visits involving alcohol, by drug, 2011

Drugs category and selected drugs (1)	All ED visits involving drug	Percent also involving alcohol
Total ED visits, drug misuse or abuse (2,3)	2,462,948	29.4
Illicit drugs	1,252,500	27.9
Cocaine	505,224	34.4
Heroin	258,482	18.6
Marijuana	455,668	33.3
Amphetamines/methamphetamine	159,840	16.2
MDMA (Ecstasy)	22,498	39.6
GHB	2,406	35.8
Ketamine	1,550	71.5
LSD	4,819	34.2
Misc. hallucinogens	8,043	33.3
Inhalants	10,032	23.4
Pharmaceuticals	1,428,145	24.2
Anticonvulsants	53,142	28.3
Antidepressants	108,388	31.2
Antihistamines	9,553	24.6
Antipsychotics	76,197	25.5
Anxiolytics, sedatives, and hypnotics	501,207	29.7
Benzodiazepines	425,616	29.0
Central nervous system stimulants (e.g., ADHD drugs)	45,158	37.9
Muscle relaxants	52,830	18.0
Pain relievers	662,400	19.9
Aspirin products	13,594	24.2
Narcotic pain relievers	420,040	18.3
Nonsteroidal anti-inflammatories (NSAIDs)	42,065	25.0
Penicillins	4,296	38.6
Respiratory agents	46,819	27.8

(1) The classification of drugs used in DAWN is derived from the Multum *Lexicon*, © 2012 Lexi-Comp, Inc. and/or Cerner Multum, Inc. The classification was modified to meet DAWN's unique requirements (2011). The Multum Licensing Agreement governing use of the Lexicon can be found on the DAWN Web site at <http://www.samhsa.gov/data/dawn/MultumLicenseAgreement.pdf>.

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

(3) All visits in this table involve alcohol and another drug. Some involve multiple drugs. Such visits will appear multiple times in this table (e.g., a visit involving alcohol, marijuana, and antidepressants will appear twice in this table). The sum of visits by drug will be greater than the total, and the sum of percentages by drug will be greater than 100.

SOURCE: Center for Behavioral Health Statistics and Quality, SAMHSA, Drug Abuse Warning Network, 2011.

Table 13. ED visits involving drugs and alcohol taken together, by patient demographics, 2011

Patient demographics	ED visits	Percent of ED visits	Rate of ED visits per 100,000 population (1)
Total ED visits, drugs and alcohol (2)	606,653	100.0	194.7
Sex	—	—	—
Male	382,438	63.0	249.5
Female	223,987	36.9	141.5
Unknown	*	*	*
Age	—	—	—
0–5 years	*	*	*
6–11 years	*	*	*
12–17 years	31,752	5.2	126.5
18–20 years	38,897	6.4	288.0
21–24 years	69,159	11.4	393.9
25–29 years	74,941	12.4	352.2
30–34 years	75,332	12.4	367.3
35–44 years	122,706	20.2	302.0
45–54 years	133,771	22.1	299.1
55–64 years	50,388	8.3	132.4
65 years and older	9,190	1.5	22.2
Unknown	*	*	*
Race/ethnicity	—	—	—
White	356,004	58.7	—
Black	135,296	22.3	—
Hispanic	66,174	10.9	—
Other or two or more race/ethnicities	8,042	1.3	—
Unknown	41,137	6.8	—

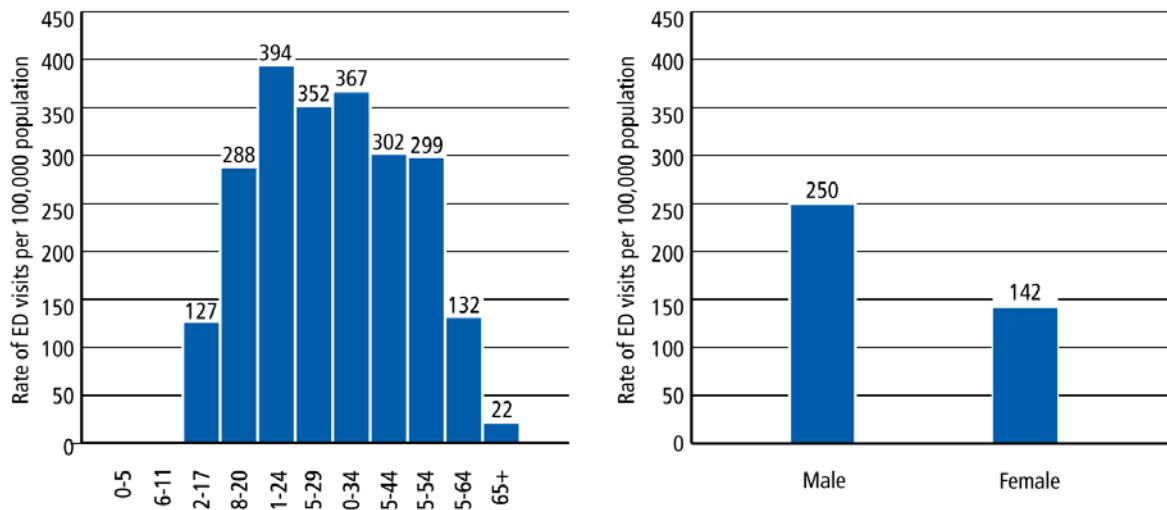
(1) All rates are ED visits per 100,000 population. Population estimates are drawn from the set of United States Resident Population Estimates by Age, Sex, Race, and Hispanic Origin (Vintage 2011) issued by the U.S. Census Bureau.

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

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, 2011.

Figure 4. Rates of ED visits per 100,000 population involving drugs and alcohol, by age and sex, 2011



SOURCE: Center for Behavioral Health Statistics and Quality, SAMHSA, Drug Abuse Warning Network, 2011.

Table 14. ED visits involving drugs and alcohol taken together, by patient disposition, 2011

Patient disposition	ED visits	Percent of ED visits	Rate of ED visits per 100,000 population (1)
Total ED visits, drugs with alcohol (2)	606,653	100.0	194.7
Treated and released	346,469	57.1	111.2
Discharged home	293,612	48.4	94.2
Released to police/jail	14,834	2.4	4.8
Referred to detox/treatment	38,022	6.3	12.2
Admitted to this hospital	165,043	27.2	53.0
ICU/critical care	30,925	5.1	9.9
Surgery	374	0.1	0.1
Chemical dependency/detox	13,538	2.2	4.3
Psychiatric unit	36,611	6.0	11.7
Other inpatient unit	83,595	13.8	26.8
Other disposition	95,142	15.7	30.5
Transferred	72,601	12.0	23.3
Left against medical advice	8,288	1.4	2.7
Died	*	*	*
Other	7,840	1.3	2.5
Not documented	*	*	*

(1) All rates are ED visits per 100,000 population. Population estimates are drawn from the set of United States Resident Population Estimates by Age, Sex, Race, and Hispanic Origin (Vintage 2011) issued by the U.S. Census Bureau.

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

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, 2011.

4.2 Underage Drinking

The use of alcohol by those under the age of 21 can have many immediate adverse consequences as well as lead to dangerous patterns of alcohol abuse in adulthood. Intervention at an early age is critical to preventing these patterns from developing. Intervention during an ED visit may be an efficient way to identify those youth at higher risk.

In 2011, of the nearly 440,000 drug abuse–related ED visits made by patients aged 20 or younger, almost half (188,706 visits, or 43.2%) involved alcohol (Table 15).

Table 15. ED visits involving underage drinking, 2011

Alcohol use category (1)	ED visits (2)	Percent of drug misuse/abuse visits made by patients < 21	RSE (%)	95% CI: Lower bound	95% CI: Upper bound
Underage drinking (3)	188,706	43.2	9.6	153,216	224,196

(1) The classification of drugs used in DAWN is derived from the Multum *Lexicon*, © 2012 Lexi-Comp, Inc. and/or Cerner Multum, Inc. The classification was modified to meet DAWN's unique requirements (2011). The Multum Licensing Agreement governing use of the Lexicon can be found on the DAWN Web site at <http://www.samhsa.gov/data/dawn/MultumLicenseAgreement.pdf>.

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

(3) Underage drinking includes ED visits for patients aged 20 or younger that involve alcohol with or without concurrent use of other drugs.

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

SOURCE: Center for Behavioral Health Statistics and Quality, SAMHSA, Drug Abuse Warning Network, 2011.

Of these ED visits involving underage drinking, 71,991 visits were made by patients aged 12 to 17, and 115,841 visits were made by patients aged 18 to 20 (Table 16). Considering rates, though, the difference is more striking. The rate of medical emergencies involving use of alcohol was 286.7 visits per 100,000 population aged 12 to 17 and 857.6 per 100,000 population aged 18 to 20, almost a threefold difference. For those aged 18 to 20, about two thirds of these visits involved just alcohol, with the remainder involving alcohol taken with other drugs (Figure 5). The visits were more evenly split between alcohol alone and alcohol in combination with drugs for those aged 12 to 17.

Table 16. ED visits involving alcohol, by patients aged 12 to 17 and 18 to 20, 2011

Alcohol use category (1)	ED visits (2)	Rate of ED visits per 100,000 population (3)	RSE (%)	95% CI: Lower bound	95% CI: Upper bound
Alcohol abuse, patients aged 12 to 17	71,991	286.7	9.7	58,327	85,655
Alcohol with drugs	31,752	126.5	14.4	22,808	40,696
Alcohol alone	40,239	160.3	10.0	32,339	48,139
Alcohol abuse, patients aged 18 to 20	115,841	857.6	11.5	89,722	141,960
Alcohol with drugs	38,897	288.0	13.7	28,480	49,314
Alcohol alone	76,945	569.7	13.0	57,347	96,542

(1) The classification of drugs used in DAWN is derived from the Multum *Lexicon*, © 2012 Lexi-Comp, Inc. and/or Cerner Multum, Inc. The classification was modified to meet DAWN's unique requirements (2011). The Multum Licensing Agreement governing use of the Lexicon can be found on the DAWN Web site at <http://www.samhsa.gov/data/dawn/MultumLicenseAgreement.pdf>.

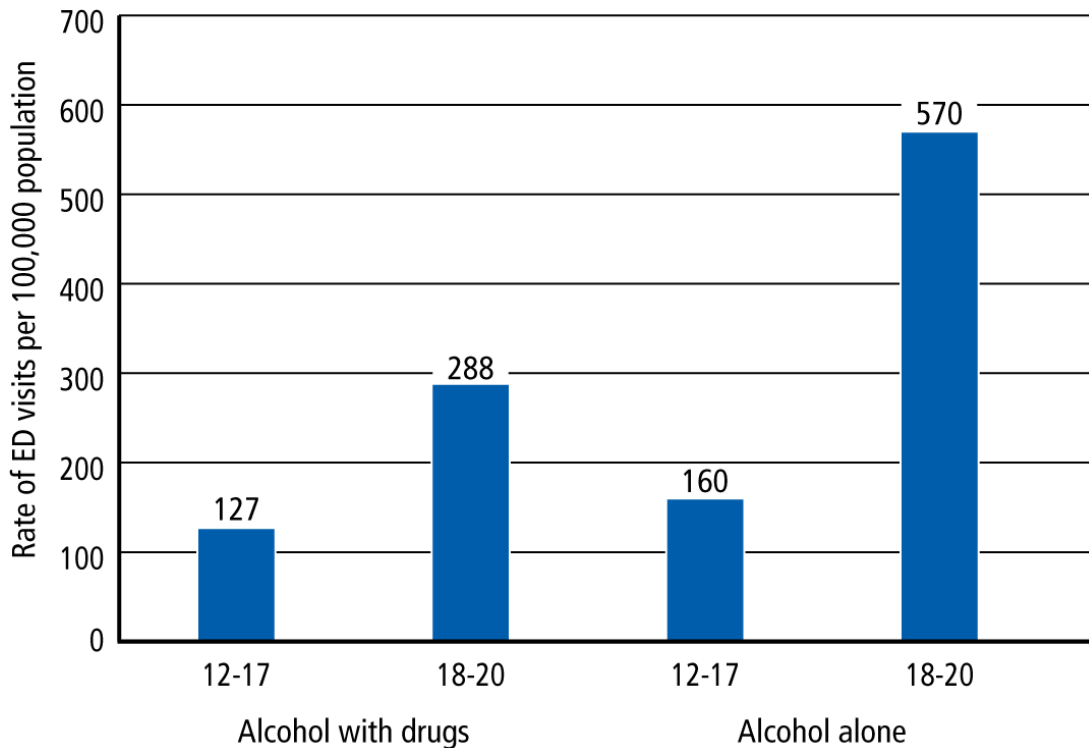
(2) Estimates of ED visits are based on a representative sample of general, non-Federal, short-stay hospitals in the United States with 24-hour EDs.

(3) All rates are ED visits per 100,000 population. Population estimates are drawn from the set of United States Resident Population Estimates by Age, Sex, Race, and Hispanic Origin (Vintage 2011) issued by the U.S. Census Bureau.

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

SOURCE: Center for Behavioral Health Statistics and Quality, SAMHSA, Drug Abuse Warning Network, 2011.

Figure 5. Rates of ED visits per 100,000 population involving alcohol, by patients aged 12 to 17 and 18 to 20, 2011



SOURCE: Center for Behavioral Health Statistics and Quality, SAMHSA, Drug Abuse Warning Network, 2011.

4.3 Trends in ED Visits Involving Alcohol, 2004–2011

This section presents the trends in the estimates of ED visits involving alcohol for the period from 2004 through 2011 (Table 17). Differences between years are presented in terms of the percentage increase or decrease in visits in 2011 compared with the estimates for 2004 (long-term trends) and for 2009 and 2010 (short-term trends). Only statistically significant changes are discussed and displayed in the table.

Involvement of alcohol in drug-related medical emergencies has remained stable over the period from 2004 through 2011. Underage drinking has, likewise, remained constant for youth aged 12 to 17 and young adults aged 18 to 20.

Table 17. Trends in ED visits involving alcohol, 2004–2011

Alcohol use category (1,2)	ED visits, 2004	ED visits, 2005	ED visits, 2006	ED visits, 2007	ED visits, 2008	ED visits, 2009	ED visits, 2010	ED visits, 2011	Percent change, 2004, 2011 (3)	Percent change, 2009, 2011 (3)	Percent change, 2010, 2011 (3)
Alcohol with drugs (all ages) (4)	523,926	416,599	450,820	497,288	524,052	519,650	564,796	606,653	—	—	—
Underage drinking (5)	204,910	158,393	183,260	196,208	190,015	199,429	189,060	188,706	—	—	—
Patients aged 12 to 17	67,589	62,459	76,760	82,364	74,991	76,918	73,716	71,991	—	—	—
Patients aged 18 to 20	135,313	95,166	105,675	112,563	113,993	120,853	114,722	115,841	—	—	—

(1) The classification of drugs used in DAWN is derived from the Multum *Lexicon*, © 2012 Lexi-Comp, Inc. and/or Cerner Multum, Inc. The classification was modified to meet DAWN's unique requirements (2011). The Multum Licensing Agreement governing use of the Lexicon can be found on the DAWN Web site at <http://www.samhsa.gov/data/dawn/MultumLicenseAgreement.pdf>.

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

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

(4) For patients of all ages, DAWN always records whether alcohol is involved in a drug-related visit. ED visits involving alcohol and no other drugs are reportable to DAWN only if the patient is aged 20 or younger. DAWN estimates do not represent visits involving just alcohol for adults aged 21 or older.

(5) Underage drinking includes ED visits for patients aged 20 or younger that involve alcohol with or without concurrent use of other drugs.

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

SOURCE: Center for Behavioral Health Statistics and Quality, SAMHSA, Drug Abuse Warning Network, 2011.

5. NONMEDICAL USE OF PHARMACEUTICALS

5.1 ED Visits Involving Nonmedical Use of Pharmaceuticals, 2011

There is growing concern in the public health community about the misuse or abuse of pharmaceuticals. When taken as directed for legitimate medical purposes, pharmaceuticals are usually safe and effective. However, when misused, pharmaceuticals can be just as dangerous and debilitating as illegal drugs.¹³ As documented by the 2011 National Survey of Drug Use and Health (NSDUH), misuse of pharmaceuticals appears to be widespread. NSDUH estimated that over 14 million persons aged 12 or older used prescription-type pain relievers, tranquilizers, stimulants, or sedatives nonmedically in 2011.¹⁴ Of the estimated 3.1 million persons aged 12 or older in 2011 who misused or abused drugs for the first time within the past 12 months, more than one in five initiated with nonmedical use of psychotherapeutics (22.0%, including 14.0% with pain relievers, 4.2% with tranquilizers, 2.6% with stimulants, and 1.2% with sedatives). Initiation rates for nonmedical pain reliever use continued to be second only to marijuana rates. NSDUH also reported that about 700,000 persons received treatment in the past year for use of pain relievers, exceeding the number for cocaine (511,000 persons), heroin (430,000 persons), or tranquilizers (300,000 persons).

DAWN defines nonmedical use to include misuse or abuse of any therapeutic substance. While use of any illicit drug is assumed to constitute drug abuse, nonmedical use of pharmaceuticals must be substantiated in the patient's ED medical records. Evidence supporting nonmedical use includes the following:

- taking more than the prescribed dose of a prescription drug;
- taking more than the recommended dose of an over-the-counter pharmaceutical or supplement;
- taking a drug prescribed for another individual;
- taking a drug obtained illegally or without a legitimate prescription;
- deliberate poisoning with a pharmaceutical by another person; and
- any use of a prescription drug, an over-the-counter pharmaceutical, or a dietary supplement that ED medical staff document in the patient's medical record as misuse or abuse.

¹³ Office of National Drug Control Policy (ONDCP). (2011). *A response to the epidemic of prescription drug abuse*. Retrieved May 5, 2012, from <http://www.whitehouse.gov/ondcp/ondcp-fact-sheets/response-to-the-epidemic-of-prescription-drug-abuse>.

¹⁴ Substance Abuse and Mental Health Services Administration (SAMHSA). *Results from the 2011 National Survey of Drug Use and Health: Summary of national findings*, NSDUH Series H-44, HHS Publication No. (SMA) 12-4713. Rockville, MD. Retrieved December 27, 2012, from <http://www.samhsa.gov/data/NSDUH/2k11Results/NSDUHresults2011.htm>.

Nonmedical use of pharmaceuticals may involve a single pharmaceutical, multiple pharmaceuticals, or pharmaceuticals in combination with illicit drugs or alcohol. Pharmaceuticals that the patient may have taken recently but that are not related to the reason for the ED visit are not included in the DAWN data.¹⁵

For 2011, DAWN estimates that 1,244,872 ED visits involved nonmedical use of prescription medicines, over-the-counter drugs, or other types of pharmaceuticals (Table 18). This represents about a quarter (24.6%) of all drug-related ED visits and about half (50.5%) of ED visits for drug abuse or misuse. Over half (53.0%) of medical emergencies seen in the ED resulting from nonmedical use of pharmaceuticals involved multiple drugs.¹⁶ About one in five (17.6%) of ED visits involving nonmedical use of pharmaceuticals also involved alcohol.

At 46.1 percent, pain relievers were the most common type of drugs involved in medical emergencies associated with nonmedical use of pharmaceuticals; narcotic pain relievers were involved in 29.4 percent. Specific narcotic pain relievers seen more commonly were oxycodone, hydrocodone, and methadone at 12.1, 6.6, and 5.4 percent, respectively.¹⁷ Non-narcotic pain relievers—such as acetaminophen, nonsteroidal anti-inflammatories (e.g., ibuprofen, naproxen), and aspirin—were seen at levels below 4 percent.

Anxiolytics, sedatives, and hypnotics (drugs to treat anxiety and insomnia) were found in 33.9 percent of visits related to nonmedical use of pharmaceuticals. Benzodiazepines were involved in 28.7 percent of ED visits, with alprazolam (e.g., Xanax) indicated in about a third (9.9%) of such visits.

Among other major categories of drugs, psychotherapeutic agents (antidepressants and antipsychotics) were involved in 10.9 percent of ED visits related to nonmedical use of pharmaceuticals. Central nervous system (CNS) stimulants (e.g., ADHD drugs), respiratory agents, cardiovascular agents, muscle relaxants, and anticonvulsants each were involved in about 3 to 4 percent of ED visits. Other types of drugs were found in under 2 percent of visits.

¹⁵ 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.

¹⁶ Multiple drugs may not all be taken for the same reason; a patient may misuse one type of prescription medication while taking another medication as prescribed. To be counted as a DAWN case involving multiple drugs, though, both drugs must be involved as a reason for the ED visit (e.g., the drugs' interaction caused or worsened the medical emergency).

¹⁷ 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 18. ED visits involving nonmedical use of pharmaceuticals, by selected drugs, 2011

Drug category and selected drugs (1)	ED visits	Percent of ED visits	RSE (%)	95% CI: Lower bound	95% CI: Upper bound
Total ED visits, nonmedical use (2,3)	1,244,872	100.0	7.2	1,068,306	1,421,438
Single drug	585,367	47.0	6.4	512,368	658,366
Multiple drugs	659,505	53.0	9.9	532,058	786,953
Alcohol present	219,485	17.6	10.3	174,981	263,989
Pharmaceuticals	1,244,872	100.0	7.2	1,068,306	1,421,438
<i>Anorexiant</i> s	1,042	0.1	32.8	372	1,711
<i>Anticonvulsant</i> s	44,235	3.6	10.7	34,924	53,547
<i>Anti-Parkinson agent</i> s	6,200	0.5	29.4	2,629	9,772
<i>Anxiolytics, sedatives, and hypnotics</i>	421,940	33.9	11.9	323,813	520,067
Barbiturates	18,282	1.5	14.1	13,224	23,341
Benzodiazepines	357,836	28.7	14.3	257,887	457,784
Alprazolam	123,744	9.9	15.1	87,050	160,439
Clonazepam	61,219	4.9	6.7	53,121	69,317
Diazepam	24,118	1.9	8.8	19,951	28,285
Lorazepam	42,874	3.4	8.8	35,510	50,238
Diphenhydramine	19,012	1.5	19.7	11,664	26,359
Hydroxyzine	4,978	0.4	20.2	3,003	6,954
Zolpidem	30,149	2.4	8.0	25,402	34,896
<i>Cardiovascular agents</i>	47,699	3.8	9.0	39,256	56,143
ACE inhibitors	6,980	0.6	14.0	5,070	8,890
Alpha agonists, central	9,080	0.7	22.8	5,022	13,139
Beta blockers	14,585	1.2	10.7	11,528	17,642
Calcium channel blocking agents	7,043	0.6	18.3	4,523	9,563
Diuretics	7,829	0.6	17.4	5,157	10,501
<i>Central nervous system stimulants</i>	40,648	3.3	12.3	30,835	50,461
Amphetamine-dextroamphetamine	17,272	1.4	14.8	12,277	22,268
Caffeine	1,848	0.1	40.9	368	3,329
Methylphenidate	4,918	0.4	25.4	2,469	7,366
<i>Gastrointestinal agents</i>	13,060	1.0	15.1	9,192	16,929
<i>Hormones</i>	12,539	1.0	16.6	8,454	16,625
<i>Metabolic agents</i>	27,794	2.2	11.3	21,623	33,965
<i>Muscle relaxants</i>	46,269	3.7	11.5	35,826	56,711
Carisoprodol	25,528	2.1	16.9	17,085	33,970
Cyclobenzaprine	11,551	0.9	15.2	8,121	14,981
<i>Nutritional products</i>	11,090	0.9	14.1	8,036	14,144
<i>Pain relievers</i>	573,497	46.1	9.5	466,963	680,031
Acetaminophen products	39,783	3.2	6.2	34,925	44,642
Aspirin products	11,074	0.9	17.1	7,365	14,783
Nonsteroidal anti-inflammatories	33,034	2.7	6.5	28,847	37,220
Ibuprofen	22,663	1.8	9.0	18,671	26,655
Naproxen	7,223	0.6	24.4	3,771	10,675

**Table 18. ED visits involving nonmedical use of pharmaceuticals, by selected drugs, 2011
(continued)**

Drug category and selected drugs (1)	ED visits	Percent of ED visits	RSE (%)	95% CI: Lower bound	95% CI: Upper bound
Opiates/opioids	488,004	39.2	10.7	386,007	590,001
Narcotic pain relievers	366,181	29.4	9.2	300,358	432,004
Buprenorphine products	21,483	1.7	21.1	12,600	30,366
Codeine products	9,927	0.8	19.5	6,141	13,712
Fentanyl products	20,034	1.6	19.7	12,294	27,774
Hydrocodone products	82,480	6.6	9.3	67,502	97,457
Hydromorphone products	18,224	1.5	17.2	12,081	24,366
Methadone	66,870	5.4	11.0	52,487	81,253
Morphine products	34,593	2.8	10.5	27,498	41,689
Oxycodone products	151,218	12.1	16.5	102,455	199,981
Propoxyphene products	1,655	0.1	36.9	459	2,851
Opiates/opioids, unspecified	138,130	11.1	20.3	83,228	193,031
Tramadol products	20,000	1.6	18.6	12,693	27,307
<i>Psychotherapeutic agents</i>	135,455	10.9	7.2	116,470	154,441
Antidepressants	88,965	7.1	7.0	76,681	101,249
SSRI antidepressants	41,257	3.3	6.9	35,700	46,814
Tricyclic antidepressants	15,307	1.2	22.2	8,634	21,980
Antipsychotics	61,951	5.0	11.4	48,094	75,809
<i>Respiratory agents</i>	41,377	3.3	9.9	33,361	49,393
Antihistamines	8,441	0.7	17.8	5,496	11,386
Bronchodilators	3,762	0.3	23.3	2,045	5,479
Expectorants	5,336	0.4	24.4	2,787	7,886
Upper respiratory products	17,726	1.4	13.3	13,094	22,359

(1) The classification of drugs used in DAWN is derived from the Multum *Lexicon*, © 2012 Lexi-Comp, Inc. and/or Cerner Multum, Inc. The classification was modified to meet DAWN's unique requirements (2011). The Multum Licensing Agreement governing use of the Lexicon can be found on the DAWN Web site at <http://www.samhsa.gov/data/dawn/MultumLicenseAgreement.pdf>.

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

(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 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.

SOURCE: Center for Behavioral Health Statistics and Quality, SAMHSA, Drug Abuse Warning Network, 2011.

When population size and sampling error are taken into account, visits for nonmedical use of pharmaceuticals did not differ between males and females (399.0 and 399.7 visits per 100,000 population, respectively; Table 19, Figure 6). The rate of ED visits for patients in age categories between 21 and 29 were over 700 visits per 100,000 population, with lower levels observed for younger and older patients.

Table 19. ED visits and rates involving nonmedical use of pharmaceuticals, by patient demographics, 2011

Patient demographics	ED visits	Percent of ED visits	Rate of ED visits per 100,000 population (1)
Total ED visits, nonmedical use (2)	1,244,872	100.0	399.5
Sex	—	—	—
Male	611,680	49.1	399.0
Female	632,788	50.8	399.7
Unknown	*	*	*
Age	—	—	—
0–5 years	9,808	0.8	40.4
6–11 years	4,351	0.3	17.7
12–17 years	75,487	6.1	300.6
18–20 years	76,896	6.2	569.3
21–24 years	128,918	10.4	734.3
25–29 years	156,230	12.5	734.2
30–34 years	140,254	11.3	683.8
35–44 years	215,897	17.3	531.4
45–54 years	216,641	17.4	484.5
55–64 years	125,370	10.1	329.4
65 years and older	94,322	7.6	227.9
Unknown	*	*	*
Race/ethnicity	—	—	—
White	897,976	72.1	—
Black	146,190	11.7	—
Hispanic	104,211	8.4	—
Other or two or more race/ethnicities	20,680	1.7	—
Unknown	75,815	6.1	—

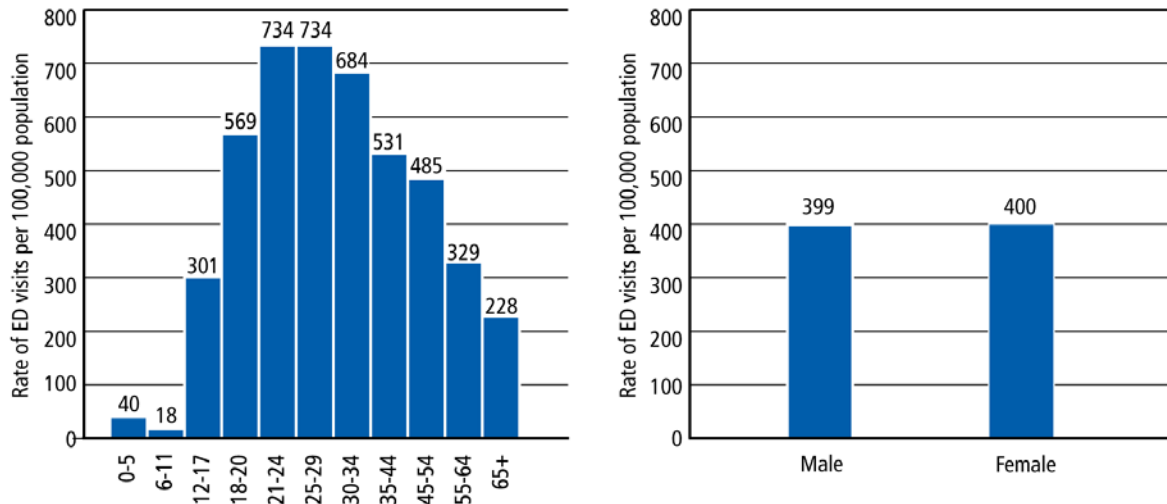
(1) All rates are ED visits per 100,000 population. Population estimates are drawn from the set of United States Resident Population Estimates by Age, Sex, Race, and Hispanic Origin (Vintage 2011) issued by the U.S. Census Bureau.

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

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, 2011.

Figure 6. Rates of ED visits per 100,000 population involving nonmedical use of pharmaceuticals, by age and sex, 2011



SOURCE: Center for Behavioral Health Statistics and Quality, SAMHSA, Drug Abuse Warning Network, 2011.

In terms of race/ethnicity, 72.1 percent of visits related to nonmedical use of pharmaceuticals involved patients who were White, 11.7 percent who were Black, and 8.4 percent who were Hispanic. DAWN does not produce population-based rates for race/ethnicity categories because race/ethnicity information is often missing from ED records.

Some form of follow-up was observed for 38.0 percent of patients whose visits involved nonmedical use of pharmaceuticals (Table 20). Follow-up included admission to the hospital (25.8%), transfer to another facility (9.6%), and referral to detox/treatment (2.6%). Of the remainder, 56.2 percent of patients were treated and released to home, and 5.7 percent had other outcomes. This distribution of outcomes is similar to that found for patients whose ED visits involved illicit drugs (see Table 8).

Table 20. ED visits and rates involving nonmedical use of pharmaceuticals, by patient disposition, 2011

Patient disposition	ED visits	Percent of ED visits	Rate of ED visits per 100,000 population (1)
Total ED visits, nonmedical use (2)	1,244,872	100.0	399.5
Treated and released	754,866	60.6	242.3
Discharged home	700,018	56.2	224.7
Released to police/jail	22,175	1.8	7.1
Referred to detox/treatment	32,673	2.6	10.5
Admitted to this hospital	320,980	25.8	103.0
ICU/critical care	73,894	5.9	23.7
Surgery	443	0.0	0.1
Chemical dependency/detox	2,107	0.2	0.7
Psychiatric unit	42,544	3.4	13.7
Other inpatient unit	201,992	16.2	64.8
Other disposition	169,026	13.6	54.2
Transferred	119,830	9.6	38.5
Left against medical advice	21,717	1.7	7.0
Died	2,160	0.2	0.7
Other	14,081	1.1	4.5
Not documented	*	*	*

(1) All rates are ED visits per 100,000 population. Population estimates are drawn from the set of United States Resident Population Estimates by Age, Sex, Race, and Hispanic Origin (Vintage 2011) issued by the U.S. Census Bureau.

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

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, 2011.

5.2 Trends in ED Visits Involving Nonmedical Use of Pharmaceuticals, 2004–2011

This section presents the trends in the estimates of ED visits involving nonmedical use of pharmaceuticals for the period from 2004 through 2011 (Table 21). Differences between years are presented in terms of the percentage increase or decrease in visits in 2011 compared with the estimates for 2004 (long-term trends) and for 2009 and 2010 (short-term trends). Only statistically significant changes are discussed and displayed in the table.

Table 21. Trends in ED visits involving nonmedical use of pharmaceuticals, by selected drugs, 2004–2011

Drug category and selected drugs (1)	ED visits, 2004	ED visits, 2005	ED visits, 2006	ED visits, 2007	ED visits, 2008	ED visits, 2009	ED visits, 2010	ED visits, 2011	Percent change, 2004, 2011 (2)	Percent change, 2009, 2011 (2)	Percent change, 2010, 2011 (2)
Total ED visits, nonmedical use (3,4)	535,447	668,211	740,457	855,334	970,657	1,078,714	1,172,403	1,244,872	132	15	—
Pharmaceuticals	535,447	668,211	740,457	855,334	970,657	1,078,714	1,172,403	1,244,872	132	15	—
<i>Anorexiant</i>	*	1,757	1,170	851	1,660	1,698	2,144	1,042	—	—	—
<i>Anticonvulsants</i>	28,655	27,645	31,169	35,403	37,445	42,073	43,934	44,235	—	—	—
<i>Anti-Parkinson agents</i>	2,472	1,692	3,816	3,764	3,802	4,775	3,532	6,200	—	—	—
<i>Anxiolytics, sedatives, and hypnotics</i>	177,409	227,489	233,886	259,988	325,105	363,270	399,061	421,940	138	—	—
Barbiturates	11,721	14,693	10,991	9,877	9,603	11,824	11,586	18,282	—	55	58
Benzodiazepines	143,549	189,704	195,625	218,640	271,692	312,931	345,691	357,836	149	—	—
Alprazolam	46,528	57,419	65,236	80,313	104,762	112,552	124,902	123,744	166	—	—
Clonazepam	28,178	30,648	33,557	40,920	48,385	57,633	62,811	61,219	117	—	—
Diazepam	15,619	18,433	19,936	19,674	26,518	25,150	26,860	24,118	—	—	—
Lorazepam	17,674	23,210	23,720	26,213	36,602	36,582	36,675	42,874	143	—	—
Diphenhydramine	10,457	10,298	12,302	12,540	13,531	13,321	14,082	19,012	82	—	—
Hydroxyzine	2,363	2,179	2,679	2,447	5,647	3,690	5,902	4,978	—	—	—
Zolpidem	12,792	14,730	17,257	18,464	28,262	29,127	31,994	30,149	136	—	—
<i>Cardiovascular agents</i>	27,397	36,804	36,250	35,494	41,430	45,857	43,602	47,699	74	—	—
ACE inhibitors	3,542	6,361	5,064	6,860	8,146	8,075	7,813	6,980	97	—	—
Alpha agonists, central	3,616	5,125	4,810	4,751	6,197	5,258	5,742	9,080	151	—	—
Beta blockers	7,094	9,824	11,729	11,668	13,000	16,204	16,925	14,585	106	—	—
Calcium channel blocking agents	3,115	5,435	5,227	4,493	5,857	6,428	6,894	7,043	—	—	—
Diuretics	3,626	5,332	5,102	5,465	4,812	7,555	7,965	7,829	—	—	—
<i>Central nervous system stimulants</i>	9,979	11,519	14,276	18,794	18,879	21,997	28,491	40,648	307	85	43
Amphetamine-dextroamphetamine	2,303	2,669	5,027	6,372	6,500	8,656	11,327	17,272	650	100	52
Caffeine	2,736	4,567	4,508	2,165	1,876	2,074	2,712	1,848	—	—	—
Methylphenidate	2,446	2,519	2,192	4,782	3,173	4,953	4,089	4,918	—	—	—

Table 21. Trends in ED visits involving nonmedical use of pharmaceuticals, by selected drugs, 2004–2011 (continued)

Drug category and selected drugs (1)	ED visits, 2004	ED visits, 2005	ED visits, 2006	ED visits, 2007	ED visits, 2008	ED visits, 2009	ED visits, 2010	ED visits, 2011	Percent change, 2004, 2011 (2)	Percent change, 2009, 2011 (2)	Percent change, 2010, 2011 (2)
<i>Gastrointestinal agents</i>	9,351	7,301	10,549	11,056	13,281	14,828	13,549	13,060	—	—	—
<i>Hormones</i>	5,203	6,897	7,868	8,036	7,846	10,424	9,373	12,539	141	—	—
<i>Metabolic agents</i>	11,343	21,014	23,416	27,097	25,422	31,204	34,507	27,794	145	—	—
<i>Muscle relaxants</i>	25,934	33,695	38,918	40,769	54,151	50,878	53,708	46,269	78	—	—
Carisoprodol	14,736	20,082	24,505	27,128	34,155	29,980	29,864	25,528	—	—	—
Cyclobenzaprine	6,183	7,629	7,142	6,197	12,748	11,178	12,411	11,551	87	—	—
<i>Nutritional products</i>	4,921	5,569	4,861	6,765	6,133	7,784	11,532	11,090	125	—	—
<i>Pain relievers</i>	241,584	294,258	323,665	363,720	458,451	516,409	567,524	573,497	137	—	—
Acetaminophen products	39,167	43,558	44,314	43,872	49,986	52,995	47,176	39,783	—	-25	—
Aspirin products	9,580	12,123	10,399	9,726	13,007	13,930	12,979	11,074	—	—	—
Nonsteroidal anti-inflammatories	27,362	28,837	27,693	30,822	30,345	35,571	33,975	33,034	—	—	—
Ibuprofen	22,127	22,268	20,541	20,892	23,539	27,339	25,392	22,663	—	-17	—
Naproxen	4,715	5,190	6,682	7,208	4,528	6,236	6,223	7,223	—	—	—
Opiates/opioids	172,738	217,600	247,669	286,618	366,823	416,814	474,133	488,004	183	—	—
Narcotic pain relievers	144,655	168,379	201,280	237,239	305,892	342,983	359,921	366,181	153	—	—
Buprenorphine products	*	*	4,440	7,136	12,544	14,266	15,778	21,483	—	51	—
Codeine products	7,176	6,181	6,928	5,648	8,235	7,962	7,928	9,927	—	—	—
Fentanyl products	9,823	11,211	16,012	15,947	20,179	20,945	21,196	20,034	104	—	—
Hydrocodone products	39,846	47,194	57,550	65,734	89,052	86,258	95,972	82,480	107	—	-14
Hydromorphone products	3,385	4,714	6,780	9,497	12,142	14,337	17,666	18,224	438	—	—
Methadone	36,806	42,684	45,130	53,950	63,629	63,031	65,945	66,870	82	—	—
Morphine products	14,090	15,762	20,416	29,591	28,818	31,731	29,605	34,593	146	—	—
Oxycodone products	41,701	52,943	64,891	76,684	105,526	148,974	146,355	151,218	263	—	—
Propoxyphene products	6,744	7,648	6,220	7,401	13,364	9,526	8,832	1,655	-75	-83	-81
Opiates/opioids, unspecified	31,864	52,673	50,978	52,997	66,585	84,144	124,249	138,130	334	64	—
Tramadol products	4,849	5,918	6,048	8,039	11,850	15,349	16,251	20,000	312	—	—

Table 21. Trends in ED visits involving nonmedical use of pharmaceuticals, by selected drugs, 2004–2011 (continued)

Drug category and selected drugs (1)	ED visits, 2004	ED visits, 2005	ED visits, 2006	ED visits, 2007	ED visits, 2008	ED visits, 2009	ED visits, 2010	ED visits, 2011	Percent change, 2004, 2011 (2)	Percent change, 2009, 2011 (2)	Percent change, 2010, 2011 (2)
<i>Psychotherapeutic agents</i>	91,268	101,451	112,856	119,787	124,331	132,483	131,698	135,455	—	—	—
Antidepressants	66,917	67,051	79,682	82,009	80,881	89,075	88,919	88,965	—	—	—
SSRI antidepressants	32,285	30,374	35,370	37,446	39,780	39,814	38,366	41,257	—	—	—
Tricyclic antidepressants	12,412	14,515	16,564	16,600	13,246	18,303	15,240	15,307	—	—	—
Antipsychotics	35,198	44,396	44,733	52,752	55,005	58,018	57,199	61,951	76	—	—
<i>Respiratory agents</i>	22,310	28,332	28,967	31,225	31,508	36,424	34,629	41,377	85	—	—
Antihistamines	5,761	4,429	4,130	5,096	8,282	9,439	8,617	8,441	—	—	—
Bronchodilators	2,294	3,043	2,920	3,043	3,046	3,123	4,386	3,762	—	—	—
Expectorants	832	1,966	2,125	2,293	2,089	4,172	3,035	5,336	541	—	76
Upper respiratory products	10,333	15,850	15,127	16,791	14,910	15,627	14,998	17,726	—	—	—

(1) The classification of drugs used in DAWN is derived from the Multum *Lexicon*, © 2012 Lexi-Comp, Inc. and/or Cerner Multum, Inc. The classification was modified to meet DAWN's unique requirements (2011). The Multum Licensing Agreement governing use of the Lexicon can be found on the DAWN Web site at <http://www.samhsa.gov/data/dawn/MultumLicenseAgreement.pdf>.

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

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

(4) 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 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, 2011.

Large increases in the number of ED visits involving nonmedical use of pharmaceuticals were observed between 2004 and 2011. It is likely that there are multiple causes contributing to these increases. Some portion may be associated with the greater number of prescriptions being written, making prescription drugs more accessible and able to be diverted. Also, as more people are taking prescription medications as part of their regular health care, there is more risk that drugs taken as prescribed will interact with other drugs that are being used nonmedically. It is beyond the scope of this report to explore the causes behind the growing numbers of ED visits involving misuse or abuse of pharmaceuticals, and further research is needed.

Medical emergencies related to nonmedical use of pharmaceuticals increased 132 percent in the period from 2004 to 2011, rising from about a half million visits to about 1.25 million visits. Contributing heavily to this rise was a 183 percent increase in the involvement of drugs classified as opiates/opioids. There were over 315,000 more visits involving opiates/opioids in 2011 than in 2004. Narcotic pain relievers increased 153 percent, or over 220,000 visits, beyond the 2004 level of about 145,000 visits. Among specific opiate drugs, oxycodone had the largest impact, with a 263 percent increase and over 100,000 more visits in 2011 than in 2004. Drugs experiencing large relative increases but having smaller impact included tramadol (e.g., Ultram[®]), a narcotic-like opiate agonist used for moderate to severe pain, and hydromorphone (e.g., Dilaudid[®]), a morphine derivative. Visits involving tramadol increased 312 percent, reaching 20,000 visits in 2010. Hydromorphone involvement rose 438 percent, reaching almost 20,000 visits in 2011. For about a quarter of visits designated as involving opiates/opioids, the type of opiate involved was not reported in the ED records. The category "Opiates/opioids unspecified" rose 334 percent, with over 100,000 more visits in 2011 than in 2004.

Between 2004 and 2011, the number of visits involving drugs for anxiety and insomnia increased 138 percent overall—a jump of more than 244,000 visits over the 2004 level of about 180,000 visits. Benzodiazepines (e.g., alprazolam, clonazepam, diazepam, lorazepam) increased 149 percent and were involved in about 215,000 more visits in 2011 than in 2004. Visits involving zolpidem (e.g., Ambien[®]), a sleeping aid with benzodiazepine-like properties, increased 136 percent, reaching over 30,000 visits in 2011.

Trends in the short term are quite different from those observed in the long term. Overall, visits involving nonmedical use of pharmaceuticals increased just 15 percent over the 2 years between 2009 and 2011, about half the annual rate of increase seen in earlier years. There was no increase in overall opioid/opiates involvement in the short term. Among specific drugs, there were no measureable increases in visits involving the narcotic pain relievers codeine, fentanyl, hydromorphone, methadone, morphine, or oxycodone; propoxyphene involvement dropped from a

high of over 13,000 visits in 2008 to under 2,000 visits in 2011 (88%);¹⁸ and hydrocodone involvement dropped 14 percent, or over 13,000 visits in the 1 year between 2010 and 2011. The most notable exception was for the category "Opiates/opioids unspecified," which increased 64 percent, or over 50,000 visits, between 2009 and 2011. The other exception is buprenorphine products, whose involvement increased by a little over 7,000 visits between 2009 and 2011 (51%). This trend likely reflects the increased availability of buprenorphine after the U.S. Food and Drug Administration approved its use for treatment of opioid dependence in 2002 and also the increasing number of physicians who subsequently became certified to prescribe it.¹⁹ In 2005, approximately 100,000 patients had received a buprenorphine prescription. By 2010, more than 800,000 patients had received a prescription—an eightfold increase.²⁰

With one exception, there have been no short-term increases in the involvement of drugs for anxiety and insomnia between 2009 and 2011. The exception is barbiturates, whose involvement increased by a little under 7,000 visits between 2010 and 2011.

One category of drugs that has experienced both short- and long-term increases in involvement is CNS stimulants (e.g., ADHD drugs). With over 40,000 visits in 2011, visits with CNS stimulant involvement increased 307 percent in the long term and 85 percent in the short term. Among specific CNS stimulants, the ADHD drug amphetamine-dextroamphetamine (e.g., Adderall®) saw a 650 percent increase in the long term and 100 percent increase in the short term, for a total of over 17,000 visits in 2011. This growth in involvement of CNS stimulants echoes the previously noted short-term rise in illicit stimulants, where amphetamines/methamphetamine saw a 71% increase and a rise of over 66,000 visits between 2009 and 2011.

¹⁸ In November 2010, the U.S. Food and Drug Administration (FDA) issued a recommendation against continued prescribing and use of the pain reliever propoxyphene because new data showed that the drug may cause serious toxicity to the heart, even when used at therapeutic doses. FDA requested that companies voluntarily withdraw propoxyphene from the U.S. market. Propoxyphene is an opioid pain reliever used to treat mild-to-moderate pain. It is sold under various names as a single-ingredient product (e.g., Darvon®) and as part of a combination product with acetaminophen (e.g., Darvocet®).

¹⁹ Substance Abuse and Mental Health Services Administration (SAMHSA), Center for Behavioral Health Statistics and Quality (CBHSQ). (2013, January 29). *The DAWN Report: Emergency department visits involving buprenorphine*. Rockville, MD. Retrieved March 21, 2013, from <http://www.samhsa.gov/data/2k13/DAWN106/sr106-buprenorphine.pdf>.

²⁰ Ibid.

6. DRUG-RELATED SUICIDE ATTEMPTS

6.1 ED Visits Involving Drug-Related Suicide Attempts, 2011

According to the National Vital Statistics System, there were 38,285 suicide deaths in 2011 in the United States.²¹ Suicide was the second leading cause of death for adults aged 15 to 24 and the fourth leading cause for those aged 5 to 14 and 25 to 44.²² Substance abuse is strongly associated with suicide attempts. Evidence suggests that one third of those who died by suicide were positive for alcohol at the time of death and that nearly one in five had evidence of opiates in their system.²³ Highlighting the relevance of drugs to the overall problem of life-threatening suicide attempts, the National Center for Injury Prevention and Control estimated that, overall, there were about 420,000 ED visits per year for the past 5 years resulting from self-harm; for the same range of years, DAWN estimated there were about 210,000 ED visits for suicide attempts involving drugs per year, or about half the total number of all visits for self-harm.²⁴

DAWN data provide a unique window to study life-threatening suicide attempts that involve drugs in respect to the types of drugs involved, the characteristics of the patients, and the follow-up treatments provided. DAWN reports on suicide attempts involving all types of illicit drugs and prescription drugs as well as over-the-counter products and attempts involving alcohol alone for patients aged 20 or younger. DAWN cases are not limited to drug overdoses. Suicide attempts involving firearms, for example, are included as DAWN cases if drugs are noted as being involved at the time of the suicide attempt.²⁵

DAWN estimated there were 228,366 ED visits resulting from drug-related suicide attempts in 2011 (Table 22). Almost all (94.7%) involved a prescription drug or over-the-counter medication, about two thirds (64.4%) involved multiple drugs, and over one quarter (29.0%) involved alcohol.

Less than a fifth (14.8%) involved illicit drugs. Marijuana and cocaine were the more commonly involved illicit drugs, appearing in 6.8 and 6.3 percent of visits, respectively.

²¹ Hoyert, D. L., & Xu, J. Q. (2012, October 10). Deaths: Preliminary data for 2011. *National Vital Statistics Reports*, 61(6), 4. Hyattsville, MD: National Center for Health Statistics. Retrieved December 28, 2012, from http://www.cdc.gov/nchs/data/nvsr/nvsr61/nvsr61_06.pdf.

²² Ibid, 29–30.

²³ Centers for Disease Control and Prevention (CDC), National Center for Injury Prevention and Control (NCIPC). (2010, Summer). *Suicide: Facts at a glance*. Retrieved May 5, 2012, from <http://www.cdc.gov/ViolencePrevention/pdf/Suicide-DataSheet-a.pdf>.

²⁴ Centers for Disease Control and Prevention (CDC), National Center for Injury Prevention and Control (NCIPC). *WISQARS nonfatal injury query system, 2007–2011*. Retrieved January 4, 2013, from <http://webappa.cdc.gov/sasweb/ncipc/nfirates2001.html>.

²⁵ Excluded are suicide-related behaviors documented as something other than actual attempts (e.g., suicidal ideation, suicidal gestures, or suicidal thoughts).

Table 22. ED visits involving drug-related suicide attempts, by selected drugs, 2011

Drug category and selected drugs (1)	ED visits	Percent of ED visits	RSE (%)	95% CI: Lower bound	95% CI: Upper bound
Total ED visits, suicide attempts (2,3)	228,366	100.0	6.8	197,745	258,986
Single drug	81,280	35.6	7.3	69,660	92,899
Multiple drugs	147,086	64.4	8.3	123,136	171,037
Alcohol present	66,186	29.0	10.3	52,760	79,612
Illicit drugs	33,826	14.8	15.5	23,564	44,089
Cocaine	14,442	6.3	18.9	9,080	19,803
Heroin	6,794	3.0	18.4	4,347	9,240
Marijuana	15,615	6.8	18.6	9,937	21,293
Amphetamines/methamphetamine	4,837	2.1	34.0	1,618	8,056
Pharmaceuticals	216,149	94.7	6.9	187,004	245,293
<i>Anticonvulsants</i>	15,419	6.8	9.4	12,585	18,252
<i>Antidepressants</i>	44,669	19.6	9.6	36,223	53,115
SSRI antidepressants	22,402	9.8	10.5	17,796	27,008
Citalopram	7,411	3.2	18.6	4,715	10,108
Fluoxetine	5,148	2.3	23.1	2,819	7,477
Paroxetine	1,074	0.5	30.3	437	1,710
Sertraline	5,644	2.5	27.2	2,637	8,652
Trazodone	10,919	4.8	15.1	7,683	14,155
<i>Antipsychotics</i>	29,345	12.9	14.1	21,243	37,448
Atypical antipsychotics	25,120	11.0	14.7	17,898	32,343
Quetiapine	16,413	7.2	15.8	11,341	21,484
Risperidone	2,867	1.3	20.4	1,718	4,016
Lithium	2,383	1.0	36.5	677	4,090
<i>Anxiolytics, sedatives, hypnotics</i>	93,271	40.8	7.2	80,034	106,508
Barbiturates	1,805	0.8	39.6	405	3,205
Benzodiazepines	66,807	29.3	8.1	56,252	77,362
Alprazolam	25,252	11.1	10.7	19,932	30,572
Clonazepam	21,793	9.5	13.7	15,923	27,662
Diazepam	6,004	2.6	20.7	3,563	8,444
Lorazepam	12,044	5.3	17.3	7,960	16,128
Diphenhydramine	9,301	4.1	14.9	6,587	12,014
Hydroxyzine	4,481	2.0	18.4	2,861	6,102
Zolpidem	14,764	6.5	16.3	10,044	19,484
<i>Cardiovascular agents</i>	14,759	6.5	14.5	10,561	18,958
ACE inhibitors	4,209	1.9	22.3	2,416	6,165
Alpha agonists, central	1,139	0.5	39.2	264	2,014
Beta blockers	5,345	2.3	16.4	3,624	7,065
<i>Central nervous system stimulants (e.g., ADHD drugs)</i>	4,715	2.1	19.0	2,959	6,471
<i>Gastrointestinal agents</i>	4,881	2.1	22.2	2,758	7,005
<i>Hormones</i>	2,524	1.1	22.2	1,426	3,622
<i>Metabolic agents</i>	4,399	1.9	18.5	2,804	5,993
Antidiabetic agents	3,263	1.4	27.1	1,530	4,996

**Table 22. ED visits involving drug-related suicide attempts, by selected drugs, 2011
(continued)**

Drug category and selected drugs (1)	ED visits	Percent of ED visits	RSE (%)	95% CI: Lower bound	95% CI: Upper bound
<i>Muscle relaxants</i>	10,892	4.8	16.3	7,419	14,365
Carisoprodol	2,325	1.0	29.0	1,004	3,645
Cyclobenzaprine	5,676	2.5	19.2	3,538	7,815
<i>Pain relievers</i>	86,667	38.0	9.0	71,307	102,028
Acetaminophen products	29,822	13.1	14.1	21,584	38,060
Aspirin products	5,681	2.5	16.4	3,855	7,506
Narcotic pain relievers	31,697	13.9	10.9	24,943	38,451
Codeine products	2,495	1.1	27.8	1,137	3,852
Hydrocodone products	12,190	5.3	18.2	7,838	16,543
Methadone	2,060	0.9	36.4	589	3,530
Morphine products	2,043	0.9	23.6	1,099	2,988
Oxycodone products	13,806	6.0	15.1	9,719	17,893
Nonsteroidal anti-inflammatories (NSAIDs)	22,377	9.8	15.9	15,422	29,333
Tramadol products	5,692	2.5	25.9	2,804	8,580
<i>Respiratory agents</i>	12,204	5.3	9.6	9,907	14,501
Antihistamines	4,011	1.8	15.9	2,764	5,258
Upper respiratory products	6,142	2.7	18.1	3,962	8,322

(1) The classification of drugs used in DAWN is derived from the Multum *Lexicon*, © 2012 Lexi-Comp, Inc. and/or Cerner Multum, Inc. The classification was modified to meet DAWN's unique requirements (2011). The Multum Licensing Agreement governing use of the Lexicon can be found on the DAWN Web site at <http://www.samhsa.gov/data/dawn/MultumLicenseAgreement.pdf>.

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

(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 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.

SOURCE: Center for Behavioral Health Statistics and Quality, SAMHSA, Drug Abuse Warning Network, 2011.

Pharmaceuticals were much more common than illicit drugs in suicide attempts:

- Pain relievers were found to be involved in 38.0 percent of drug-related suicide attempts. Narcotic pain relievers were involved in over a third of that number (13.9%), and acetaminophen products were involved in just under a third (13.1%).
- Benzodiazepines (anti-anxiety drugs) were found to be involved in 29.3 percent of drug-related suicide attempts. Alprazolam (e.g., Xanax) and clonazepam (e.g., Klonopin®) each accounted for about a third (11.1% and 9.5%, respectively).
- Antidepressants appeared in 19.6 percent of visits. About half (9.8%) of those visits involved an SSRI antidepressant such as citalopram (e.g., Celexa®), sertraline (e.g., Zoloft®), or fluoxetine (e.g., Prozac). Trazodone (e.g., Desyrel®), a SARI antidepressant, was involved in about a quarter (4.8%).

- Antipsychotics, as a whole, appeared in 12.9 percent of visits. At 11.0 percent, the newer types of atypical antipsychotics accounted for most of those visits. Quetiapine (e.g., Seroquel®) was the most common atypical antipsychotic (7.2%).

After population size and sampling error are taken into account, the rate of drug-related suicide-attempt visits for females (84.7 visits per 100,000 population) was higher than that for males (61.5 visits) (Table 23, Figure 7). Suggesting the vulnerability of youth, rates ranged from a low of 12.0 visits per 100,000 population for those aged 65 or older to a high of 150.6 visits for those aged 18 to 20.

Considering race/ethnicity, 67.7 percent of the suicide attempts involved patients who were White, 13.9 percent who were Black, 8.9 percent who were Hispanic, 2.1 percent who were of other or multiple race/ethnic groups, and 7.3 percent who 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.

Overall, 81.7 percent of patients attempting drug-related suicide had some form of follow-up (Table 24).

- About half (49.3%) were admitted for inpatient hospital care:
 - 18.3 percent were admitted to an intensive or critical care unit (ICU),
 - 9.0 percent went to a psychiatric unit, and
 - 22.0 percent went to other units including combination psychiatric/detox units;
- a quarter (25.4%) were transferred to another health care facility; and
- under 10 percent were referred to detox/treatment.

The remaining 18.3 percent of patients were either treated and discharged to home (14.7%) or had other outcomes.

The level of follow-up for drug-related suicides is approximately double that found for visits involving illicit drugs or nonmedical use of pharmaceuticals.

DAWN only records death as the outcome if the patient died in the ED after admission. DAWN does not record deaths for patients who died prior to admission to the ED or after admission to inpatient units of the hospital or transfer to another facility. Therefore, death as an ED disposition is rarely observed by DAWN.

Table 23. ED visits involving drug-related suicide attempts, by patient demographics, 2011

Patient demographics	ED visits	Percent of ED visits	Rate of ED visits per 100,000 population (1)
Total ED visits, suicide attempts (2)	228,366	100.0	73.3
Sex	—	—	—
Male	94,305	41.3	61.5
Female	134,046	58.7	84.7
Unknown	*	*	*
Age	—	—	—
0–5 years	*	*	*
6–11 years	*	*	*
12–17 years	23,005	10.1	91.6
18–20 years	20,341	8.9	150.6
21–24 years	24,605	10.8	140.1
25–29 years	30,122	13.2	141.6
30–34 years	25,687	11.2	125.2
35–44 years	40,784	17.9	100.4
45–54 years	42,027	18.4	94.0
55–64 years	16,748	7.3	44.0
65 years and older	4,953	2.2	12.0
Unknown	*	*	*
Race/ethnicity	—	—	—
White	154,620	67.7	—
Black	31,800	13.9	—
Hispanic	20,423	8.9	—
Other or two or more race/ethnicities	4,803	2.1	—
Unknown	16,720	7.3	—

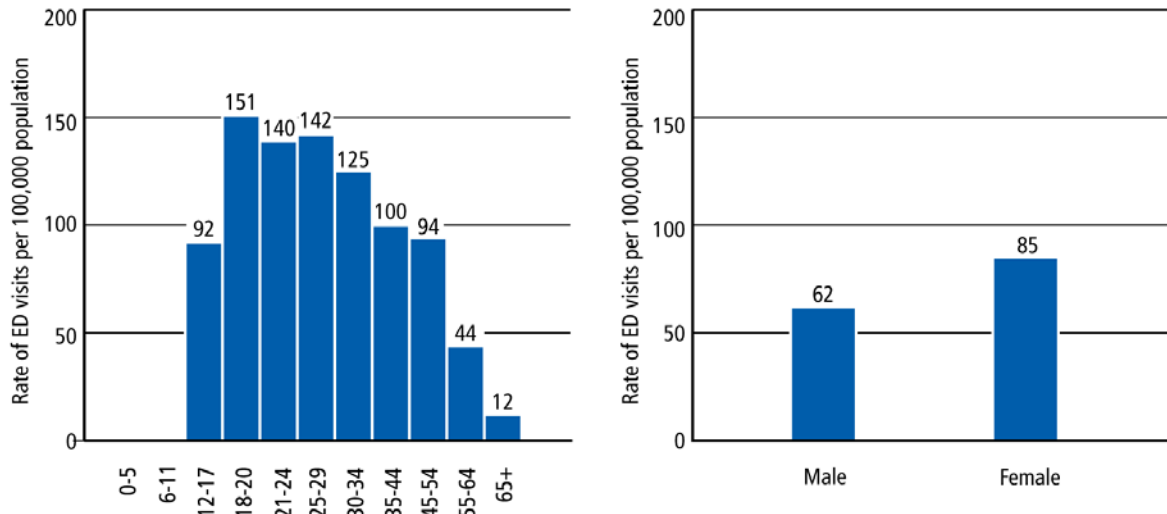
(1) All rates are ED visits per 100,000 population. Population estimates are drawn from the set of United States Resident Population Estimates by Age, Sex, Race, and Hispanic Origin (Vintage 2011) issued by the U.S. Census Bureau.

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

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, 2011.

Figure 7. Rates of ED visits per 100,000 population involving drug-related suicide attempts, by age and sex, 2011



SOURCE: Center for Behavioral Health Statistics and Quality, SAMHSA, Drug Abuse Warning Network, 2011.

Table 24. ED visits involving drug-related suicide attempts, by patient disposition, 2011

Patient disposition	ED visits	Percent of ED visits	Rate of ED visits per 100,000 population (1)
Total ED visits, suicide attempts (2)	228,366	100.0	73.3
Treated and released	52,469	23.0	16.8
Discharged home	33,625	14.7	10.8
Released to police/jail	2,772	1.2	0.9
Referred to detox/treatment	*	*	*
Admitted to this hospital	112,655	49.3	36.2
ICU/critical care	41,725	18.3	13.4
Surgery	*	*	*
Chemical dependency/detox	*	*	*
Psychiatric unit	20,464	9.0	6.6
Other inpatient unit	50,309	22.0	16.1
Other disposition	63,241	27.7	20.3
Transferred	57,938	25.4	18.6
Left against medical advice	*	*	*
Died	*	*	*
Other	2,465	1.1	0.8
Not documented	1,260	0.6	0.4

(1) All rates are ED visits per 100,000 population. Population estimates are drawn from the set of United States Resident Population Estimates by Age, Sex, Race, and Hispanic Origin (Vintage 2011) issued by the U.S. Census Bureau.

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

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, 2011.

6.2 Trends in ED Visits Involving Drug-Related Suicide Attempts, 2004–2011

This section presents the trends in the estimates of drug-related ED visits involving suicide attempts for the period from 2004 through 2011. Differences between years are presented in terms of the percentage increase or decrease in visits in 2011 compared with the estimates for 2004 (long-term trends) and for 2009 and 2010 (short-term trends). Only statistically significant changes are discussed and displayed in the tables.

With about 230,000 visits in 2011, the number of drug-related suicide attempts has risen 41 percent from 2004 to 2011 (Table 25).

- With over 90,000 visits in 2011, involvement of anxiolytics (drugs to treat anxiety and insomnia) rose 77 percent in the long term. Visits for alprazolam (e.g., Xanax), clonazepam (e.g., Klonopin), and lorazepam (e.g., Ativan[®]) doubled; visits for zolpidem (e.g., Ambien) tripled. With one small exception, though, no anxiolytics have risen in the short term. The exception is hydroxyzine (e.g., Vistaril[®], Atarax[®]), which rose both in the long term (91%) and the short term (65%) to account for about 4,500 visits in 2011.
- With over 85,000 visits in 2011, pain relievers overall have shown no-long or short-term changes in involvement. With over 30,000 visits in 2011, narcotic pain relievers in general have increased involvement 87 percent in the long term; in specific, oxycodone has increased involvement 158 percent. Tramadol experienced both long-term (227%) and short-term (147%) increases in involvement for a total of about 5,500 visits in 2011.
- With over 40,000 visits in 2011, involvement of antidepressants overall has not increased in the long term from 2004 to 2011, though there was a short-term uptick of 24 percent between 2009 and 2011. This was in part due to a 95 percent increase between 2009 and 2011 in the involvement in citalopram (e.g., Celexa).
- With about 30,000 visits in 2011, involvement of antipsychotics increased 65 percent in the long term. Contributing to that rise was Quetiapine (e.g., Seroquel), which rose 98 percent in the long term and 34 percent in the short term, reaching about 16,000 visits in 2011. Quetiapine was consistently involved in about half of all visits involving antipsychotics each year.
- With over 10,000 visits in 2011, muscle relaxants increased involvement 84 percent in the long term. Cyclobenzaprine (e.g., Flexeril[®]) accounted for over half of those visits. No measurable short-term changes were observed.
- With over 5,000 visits in 2011, central nervous system (CNS) stimulants (e.g., ADHD drugs) increased involvement 184 percent in the long term. No measurable short-term changes were observed.

Table 25. Trends in ED visits for drug-related suicide attempts, by selected drugs, 2004–2011

Drug category and selected drugs (1)	ED visits, 2004	ED visits, 2005	ED visits, 2006	ED visits, 2007	ED visits, 2008	ED visits, 2009	ED visits, 2010	ED visits, 2011	Percent change, 2004, 2011 (2)	Percent change, 2009, 2011 (2)	Percent change, 2010, 2011 (2)
Total ED visits, suicide attempts (3,4)	161,586	151,568	182,805	197,053	199,469	198,403	212,736	228,366	41	—	—
Illicit drugs	34,767	33,787	42,169	37,355	36,735	35,685	37,382	33,826	—	—	—
Cocaine	19,520	19,628	26,510	26,462	19,614	17,969	15,721	14,442	—	—	—
Heroin	4,579	3,167	4,265	4,444	4,249	5,019	6,017	6,794	—	—	—
Marijuana	12,074	11,955	15,272	12,115	17,285	14,176	17,219	15,615	—	—	—
Amphetamines/methamphetamine	4,535	5,411	4,829	2,665	2,788	3,429	3,573	4,837	—	—	—
Pharmaceuticals	145,496	138,447	169,040	185,270	188,644	186,883	201,519	216,149	49	—	—
<i>Anticonvulsants</i>	10,957	9,391	12,580	11,803	14,486	13,299	14,318	15,419	—	—	—
<i>Antidepressants</i>	33,366	27,086	36,677	38,870	40,985	36,154	42,276	44,669	—	24	—
SSRI antidepressants	18,513	13,377	16,973	18,884	19,988	17,548	22,365	22,402	—	—	—
Citalopram	2,115	886	3,047	3,358	3,563	3,810	5,114	7,411	250	95	—
Fluoxetine	3,477	3,292	3,923	3,790	5,730	5,307	4,680	5,148	—	—	—
Paroxetine	4,509	2,927	2,054	2,071	2,013	1,777	2,563	1,074	-76	—	-58
Sertraline	4,852	4,109	4,263	5,413	4,197	4,526	5,890	5,644	—	—	—
Trazodone	6,995	6,635	9,021	8,014	9,594	8,298	10,870	10,919	—	—	—
<i>Antipsychotics</i>	17,807	17,129	22,491	25,479	25,451	23,910	28,618	29,345	65	—	—
Atypical antipsychotics	15,016	14,300	19,429	20,250	21,228	20,499	23,507	25,120	67	—	—
Quetiapine	8,308	8,649	10,756	14,051	13,522	12,219	13,776	16,413	98	34	—
Risperidone	3,255	2,036	2,536	2,367	2,309	2,014	3,464	2,867	—	—	—
Lithium	1,832	1,281	1,298	2,751	2,948	2,663	3,830	2,383	—	—	—
<i>Anxiolytics, sedatives, and hypnotics</i>	52,657	52,022	68,181	72,639	78,995	77,623	80,750	93,271	77	—	—
Barbiturates	1,948	1,219	2,031	1,663	1,480	1,605	452	1,805	—	—	—
Benzodiazepines	36,995	35,676	50,431	53,509	55,823	56,851	60,318	66,807	81	—	—
Alprazolam	11,354	14,530	15,633	19,167	21,220	23,250	22,473	25,252	122	—	—
Clonazepam	9,402	9,064	14,173	14,455	14,571	16,060	20,033	21,793	132	—	—
Diazepam	4,630	3,968	5,909	6,912	5,313	6,120	6,236	6,004	—	—	—
Lorazepam	6,065	5,182	6,682	9,527	9,973	9,897	10,605	12,044	99	—	—
Diphenhydramine	7,461	6,583	7,760	7,620	8,414	8,384	7,195	9,301	—	—	—
Hydroxyzine	2,346	1,795	1,956	2,027	3,310	2,843	2,714	4,481	91	—	65
Zolpidem	4,355	4,972	6,674	7,405	9,533	10,815	11,092	14,764	239	—	—
<i>Cardiovascular agents</i>	7,667	5,814	7,952	7,850	12,592	10,413	14,227	14,759	93	42	—
ACE inhibitors	1,325	1,045	1,048	1,654	2,822	2,261	3,847	4,290	224	—	—
Alpha agonists, central	995	912	1,929	790	1,715	1,204	2,317	1,139	—	—	—
Beta blockers	2,105	1,916	1,999	2,501	5,094	3,829	3,571	5,345	154	—	—

Table 25. Trends in ED visits for drug-related suicide attempts, by selected drugs, 2004–2011 (continued)

Drug category and selected drugs (1)	ED visits, 2004	ED visits, 2005	ED visits, 2006	ED visits, 2007	ED visits, 2008	ED visits, 2009	ED visits, 2010	ED visits, 2011	Percent change, 2004, 2011 (2)	Percent change, 2009, 2011 (2)	Percent change, 2010, 2011 (2)
<i>Central nervous system stimulants (e.g., ADHD drugs)</i>	1,659	2,086	1,959	2,288	3,270	3,446	4,407	4,715	184	—	—
<i>Gastrointestinal agents</i>	2,276	2,542	2,236	2,010	3,612	3,040	3,643	4,881	—	—	—
<i>Hormones</i>	1,124	533	1,573	2,016	2,161	2,024	2,359	2,524	—	—	—
<i>Metabolic agents</i>	2,145	3,048	3,720	2,252	3,181	4,918	5,312	4,399	105	—	—
Antidiabetic agents	1,841	2,580	2,941	1,438	2,749	3,602	3,505	3,263	—	—	—
<i>Muscle relaxants</i>	5,921	5,785	7,072	9,772	8,053	8,350	11,210	10,892	84	—	—
Carisoprodol	1,864	2,038	3,811	4,301	3,452	2,516	4,158	2,325	—	—	—
Cyclobenzaprine	2,966	2,784	2,096	3,839	3,438	3,955	4,621	5,676	91	—	—
<i>Pain relievers</i>	61,099	54,860	67,625	78,950	74,598	75,547	78,830	86,667	—	—	—
Acetaminophen products	20,703	21,019	25,312	29,864	26,406	24,072	28,747	29,822	—	—	—
Aspirin products	6,211	4,645	5,403	5,980	5,480	6,892	4,861	5,681	—	—	—
Narcotic pain relievers	16,930	17,803	24,470	29,886	26,817	29,595	32,987	31,697	87	—	—
Codeine products	1,752	2,656	2,349	1,637	2,315	1,512	2,433	2,495	—	—	—
Hydrocodone products	7,034	7,035	8,998	13,238	11,676	13,701	12,863	12,190	—	—	—
Methadone	1,287	1,596	1,772	3,192	2,008	2,474	1,651	2,060	—	—	—
Morphine products	714	1,210	*	1,690	1,161	1,423	2,343	2,043	—	—	—
Oxycodone products	5,342	4,229	7,842	9,351	8,760	10,945	13,199	13,806	158	—	—
Nonsteroidal anti-inflammatories (NSAIDs)	19,116	14,117	15,956	18,810	18,658	19,127	18,603	22,377	—	—	—
Tramadol	1,742	1,515	1,719	2,816	3,057	2,305	2,669	5,692	227	147	113
<i>Respiratory agents</i>	8,363	7,747	8,426	10,205	9,166	7,943	10,636	12,204	—	54	—
Antihistamines	2,059	1,650	1,627	3,813	2,979	2,475	3,369	4,011	—	—	—
Upper respiratory products	4,820	4,289	3,982	4,078	4,642	3,167	4,249	6,142	—	—	—

(1) The classification of drugs used in DAWN is derived from the *Multum Lexicon*, © 2012 Lexi-Comp, Inc. and/or Cerner Multum, Inc. The classification was modified to meet DAWN's unique requirements (2011). The Multum Licensing Agreement governing use of the Lexicon can be found on the DAWN Web site at <http://www.samhsa.gov/data/dawn/MultumLicenseAgreement.pdf>.

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

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

(4) 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 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, 2011.

7. SEEKING DETOX SERVICES

7.1 ED Visits Involving Seeking Detox Services, 2011

The DAWN category of visits referred to as "seeking detox" includes nonemergency requests for admission for detoxification and visits to obtain medical clearance before entry to a detox program as well as acute emergencies in which an individual is experiencing withdrawal symptoms and seeking detox.²⁶ 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 250,596 drug-related ED visits for patients seeking detox or substance abuse treatment services during 2011 (Table 26). Visits for almost three quarters (66.4%) of patients seeking detox involved multiple drugs. On average, 27.9 percent of visits associated with seeking detox involved alcohol.²⁷ Approximately 60 percent of visits involved illicit drugs and 60 percent involved pharmaceuticals. Cocaine was observed in 24.2 percent of visits, heroin in 31.5 percent, marijuana in 14.5 percent, and amphetamines/methamphetamine in 6.6 percent. Other illicit drugs were seen at lower levels. Among pharmaceuticals, narcotic pain relievers were observed in 37.6 percent of visits, including oxycodone at 17.1 percent. Benzodiazepines (anti-anxiety drugs) were observed in 21.8 percent of visits, with alprazolam (e.g., Xanax) at 12.0 percent accounting for about half.

When population size and sampling error are taken into account, the rate of seeking detox visits for males (98.8 per 100,000 population) was higher than that for females (62.6 per 100,000 population) (Table 27, Figure 8). Rates of seeking detox visits were over 100 visits per 100,000 population for those aged 18 to 44, peaking at 257.4 for those aged 21 to 24.

In terms of race/ethnicity, the majority (77.2%) of seeking detox visits involved patients who were White, 12.6 percent who were Black, and 4.7 percent who were Hispanic. DAWN does not produce population-based rates for race/ethnicity categories because race/ethnicity information is often missing in ED records.

Nearly 60 percent (57.4%) of ED patients classified as seeking detox obtained some follow-up based on their ED visit: 30.4 percent were admitted to the hospital, 20.1 percent were referred to detox/treatment services, and 6.9 percent were transferred to another facility (Table 28). The remaining patients were treated and discharged home (38.5%) or had other outcomes (4.1%).

²⁶ 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).

²⁷ 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 26. ED visits involving seeking detox services, by selected drugs, 2011

Drug category and selected drugs (1)	ED visits	Percent of ED visits	RSE (%)	95% CI: Lower bound	95% CI: Upper bound
Total ED visits, seeking detox (2,3)	250,596	100.0	29.3	106,830	394,363
Single drug	84,250	33.6	29.0	36,351	132,149
Multiple drugs	166,346	66.4	29.7	69,405	263,287
Alcohol involved	69,850	27.9	15.9	48,115	91,584
Illicit drugs	147,297	58.8	18.7	93,246	201,348
Cocaine	60,609	24.2	19.7	37,150	84,069
Heroin	78,931	31.5	18.1	50,999	106,862
Marijuana	36,277	14.5	18.5	23,120	49,434
Amphetamines/methamphetamine	16,566	6.6	34.9	5,241	27,892
PCP	4,582	1.8	30.5	1,839	7,326
Pharmaceuticals	158,905	63.4	40.9	31,445	286,365
<i>Antidepressants</i>	966	0.4	43.6	140	1,793
<i>Anxiolytics, sedatives, and hypnotics</i>	56,393	22.5	36.9	15,618	97,169
Benzodiazepines	54,532	21.8	37.3	14,715	94,348
Alprazolam	30,172	12.0	41.7	5,513	54,832
<i>Central nervous system stimulants (e.g., ADHD drugs)</i>	2,272	0.9	47.6	151	4,394
<i>Muscle relaxants</i>	2,988	1.2	41.5	557	5,419
<i>Pain relievers</i>	121,000	48.3	47.7	7,796	234,205
Opiates/opioids	117,571	46.9	48.2	6,389	228,753
Narcotic pain relievers	94,118	37.6	46.7	7,954	180,282
Buprenorphine products	7,364	2.9	29.1	3,161	11,568
Morphine products	5,970	2.4	43.5	877	11,064
Oxycodone products	42,808	17.1	33.2	14,937	70,679
<i>Respiratory agents</i>	1,864	0.7	35.5	568	3,160

(1) The classification of drugs used in DAWN is derived from the Multum *Lexicon*, © 2012 Lexi-Comp, Inc. and/or Cerner Multum, Inc. The classification was modified to meet DAWN's unique requirements (2011). The Multum Licensing Agreement governing use of the Lexicon can be found on the DAWN Web site at <http://www.samhsa.gov/data/dawn/MultumLicenseAgreement.pdf>.

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

(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 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.

SOURCE: Center for Behavioral Health Statistics and Quality, SAMHSA, Drug Abuse Warning Network, 2011.

Table 27. ED visits involving seeking detox services, by patient demographics, 2011

Patient demographics	ED visits	Percent of ED visits	Rate of ED visits per 100,000 population (1)
Total ED visits, seeking detox (2)	250,596	100.0	80.4
Sex	—	—	—
Male	151,487	60.5	98.8
Female	99,105	39.5	62.6
Unknown	*	*	*
Age	—	—	—
0–5 years	*	*	*
6–11 years	*	*	*
12–17 years	*	*	*
18–20 years	17,917	7.1	132.6
21–24 years	45,195	18.0	257.4
25–29 years	46,179	18.4	217.0
30–34 years	40,794	16.3	198.9
35–44 years	43,343	17.3	106.7
45–54 years	39,708	15.8	88.8
55–64 years	12,303	4.9	32.3
65 years and older	2,228	0.9	5.4
Unknown	*	*	*
Race/ethnicity	—	—	—
White	193,495	77.2	—
Black	31,468	12.6	—
Hispanic	11,672	4.7	—
Other or two or more race/ethnicities	1,555	0.6	—
Unknown	12,406	5.0	—

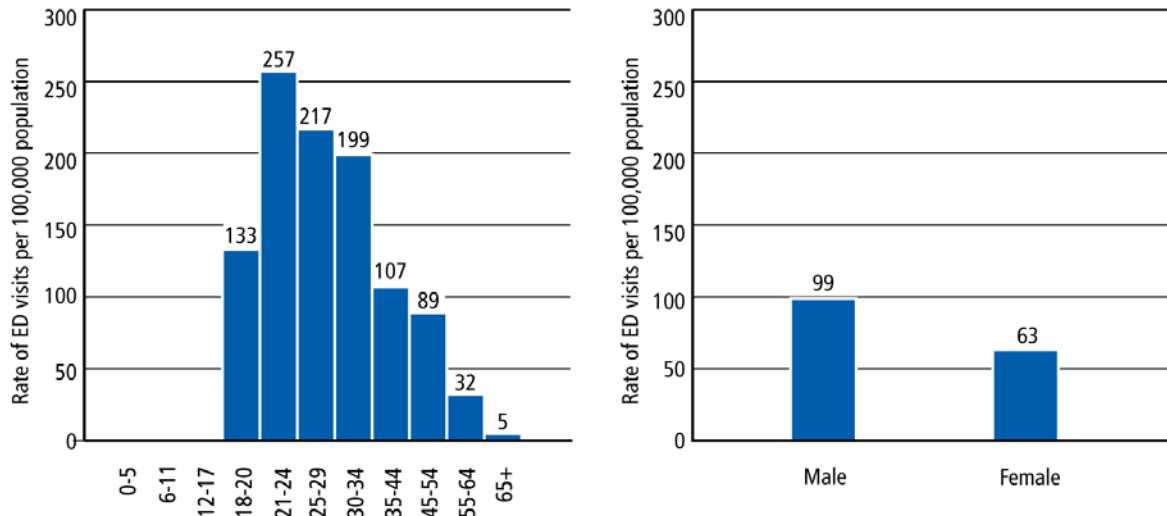
(1) All rates are ED visits per 100,000 population. Population estimates are drawn from the set of United States Resident Population Estimates by Age, Sex, Race, and Hispanic Origin (Vintage 2011) issued by the U.S. Census Bureau.

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

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, 2011.

Figure 8. Rates of ED visits per 100,000 population involving seeking detox services, by age and sex, 2011



SOURCE: Center for Behavioral Health Statistics and Quality, SAMHSA, Drug Abuse Warning Network, 2011.

Table 28. ED visits involving seeking detox services, by patient disposition, 2011

Patient disposition	ED visits	Percent of ED visits	Rate of ED visits per 100,000 population (1)
Total ED visits, seeking detox (2)	250,596	100.0	80.4
Treated and released	147,148	58.7	47.2
Discharged home	96,465	38.5	31.0
Released to police/jail	275	0.1	0.1
Referred to detox/treatment	50,408	20.1	16.2
Admitted to this hospital	76,136	30.4	24.4
ICU/critical care	1,408	0.6	0.5
Surgery	*	*	*
Chemical dependency/detox	34,541	13.8	11.1
Psychiatric unit	14,452	5.8	4.6
Other inpatient unit	*	*	*
Other disposition	27,311	10.9	8.8
Transferred	17,263	6.9	5.5
Left against medical advice	3,925	1.6	1.3
Died	*	*	*
Other	3,120	1.2	1.0
Not documented	*	*	*

(1) All rates are ED visits per 100,000 population. Population estimates are drawn from the set of United States Resident Population Estimates by Age, Sex, Race, and Hispanic Origin (Vintage 2011) issued by the U.S. Census Bureau.

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

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, 2011.

7.2 Trends in ED Visits Involving Seeking Detox Services, 2004–2011

This section presents the trends in the estimates of ED visits involving seeking detox services for the period from 2004 through 2011 (Table 29). Differences between years are presented in terms of the percentage increase or decrease in visits in 2011 compared with the estimates for 2004 (long-term trends) and for 2009 and 2010 (short-term trends). Only statistically significant changes are discussed and displayed in the table.

While ED visits by patients seeking detox for illicit drugs did not change significantly either in the long or short term, a short-term increase of 36 percent between 2009 and 2011 was observed for heroin, with over 20,000 more visits in 2011 than in 2009. Pharmaceutical involvement in ED visits seeking detox has also been stable, with the exception of a 1-year spike in oxycodone. Between 2009 and 2010, involvement of oxycodone rose 47 percent but then dropped 36 percent between 2010 and 2011, returning to its 2009 level.²⁸

²⁸ Substance Abuse and Mental Health Services Administration (SAMHSA). (2012). *Drug Abuse Warning Network, 2010: National estimates of drug-related emergency department visits*. HHS Publication No. (SMA) 12-4733, DAWN Series D-38. Rockville, MD.

Table 29. Trends in ED visits involving seeking detox services, by selected drugs, 2004–2011

Drug category and selected drugs (1)	ED visits, 2004	ED visits, 2005	ED visits, 2006	ED visits, 2007	ED visits, 2008	ED visits, 2009	ED visits, 2010	ED visits, 2011	Percent change, 2004, 2011 (2)	Percent change, 2009, 2011 (2)	Percent change, 2010, 2011 (2)
Total ED visits, seeking detox (3,4)	141,867	126,226	118,355	139,908	177,879	205,407	232,542	250,596	—	—	—
Illicit drugs	110,798	101,250	92,387	106,662	124,375	131,163	141,837	147,297	—	—	—
Cocaine	62,989	56,061	57,738	65,124	68,824	60,076	64,211	60,609	—	—	—
Heroin	47,035	40,895	34,464	42,242	51,932	58,233	62,078	78,931	—	36	—
Marijuana	25,965	22,486	22,104	25,970	32,887	37,513	43,040	36,277	—	—	—
Amphetamines/methamphetamine	11,760	15,402	8,128	7,161	12,418	11,085	13,633	16,566	—	—	—
PCP	827	729	989	*	1,478	1,134	1,309	4,582	454	304	250
Pharmaceuticals	48,646	44,727	44,457	59,660	94,949	123,080	150,505	158,905	—	—	—
<i>Antidepressants</i>	1,024	1,195	1,141	1,314	1,894	1,769	1,410	966	—	—	—
<i>Anxiolytics, sedatives, and hypnotics</i>	15,748	16,533	16,799	20,365	42,178	49,768	55,482	56,393	—	—	—
Benzodiazepines	14,717	15,734	15,801	19,301	41,576	48,769	53,830	54,532	—	—	—
Alprazolam	6,061	6,253	7,063	9,138	*	27,647	28,396	30,172	—	—	—
<i>Central nervous system stimulants (e.g., ADHD drugs)</i>	*	829	589	1,049	*	1,994	1,288	2,272	—	—	—
<i>Muscle relaxants</i>	1,356	1,204	1,214	1,701	1,381	2,332	2,192	2,988	—	—	—
<i>Pain relievers</i>	34,730	30,114	31,797	42,785	69,604	90,381	121,456	121,000	—	—	—
Opiates/opioids	33,296	29,330	30,893	41,250	65,632	87,670	118,527	117,571	—	—	—
Narcotic pain relievers	29,894	25,550	26,987	37,049	58,491	78,426	105,684	94,118	—	—	—
Buprenorphine products	*	*	*	*	*	4,858	7,372	7,364	—	—	—
Morphine products	1,638	2,399	3,002	3,341	5,066	3,597	6,134	5,970	—	—	—
Oxycodone products	15,917	14,028	14,831	18,905	34,306	45,591	67,079	42,808	—	—	-36
<i>Respiratory agents</i>	*	*	*	*	348	*	1,215	1,864	—	—	—

(1) The classification of drugs used in DAWN is derived from the Multum *Lexicon*, © 2012 Lexi-Comp, Inc. and/or Cerner Multum, Inc. The classification was modified to meet DAWN's unique requirements (2011). The Multum Licensing Agreement governing use of the Lexicon can be found on the DAWN Web site at <http://www.samhsa.gov/data/dawn/MultumLicenseAgreement.pdf>.

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

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

(4) 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 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, 2011.

8. ADVERSE REACTIONS TO PHARMACEUTICALS

8.1 ED Visits Involving Adverse Reactions to Pharmaceuticals, 2011

Adverse reactions to pharmaceuticals are a growing problem in the United States. It is likely that there are multiple causes contributing to increases in adverse reactions. Some portion may be associated with the greater number of prescriptions being written and more people taking prescription drugs as part of their medical care. Additionally, people of all ages are increasingly being prescribed multiple drugs simultaneously, which, in turn, increases the possibility for unintended interactions. This is particularly common among older populations who are placed on long-term medication for chronic conditions, and the number of older persons in the nation is growing.²⁹ While it is beyond the scope of this report to assess the precise impact of these different causes, DAWN data provide insight concerning the number and characteristics of medical emergencies resulting from the recent use of prescription drugs, over-the-counter pharmaceuticals, or other therapeutic substances used as prescribed or indicated. Included in DAWN are ED visits related to side effects, drug-drug interactions, and drug-alcohol interactions. Visits involving illicit drug abuse or documented misuse of pharmaceuticals are excluded from this grouping.³⁰

As with all ED visits that DAWN considers to be drug related, the involvement of a drug must be documented in the ED records. If the relationship between a drug and an adverse reaction is not recognized, a visit will not be considered drug related and will not be captured by DAWN. Also, adverse reactions that are identified in different medical settings (e.g., during a visit to the doctor's office or while a patient is already hospitalized) will not be captured by DAWN. Therefore, the total number of people experiencing adverse drug reactions is greater than reported by DAWN.

For 2011, DAWN estimates that 2,301,059 ED visits (Table 30), or 738.5 visits per 100,000 population (Table 31), involved adverse reactions to prescription medicines, over-the-counter drugs, or other types of pharmaceuticals. This represents just under half (45.4%) of all drug-related ED visits. About one in five (17.6%) involved multiple drugs. Alcohol was a contributing factor in just 1.3 percent of adverse reaction visits.

²⁹ Substance Abuse and Mental Health Services Administration (SAMHSA), Center for Behavioral Health Statistics and Quality (CBHSQ). (2011). *The DAWN Report: Emergency department visits involving adverse reactions to medications among older adults*. Rockville, MD. Retrieved March 22, 2013, from http://www.samhsa.gov/data/2k10/TDR013AdverseReactionsOlderAdults/AdverseReactionsOlderAdults_HTML.pdf.

³⁰ While adverse reactions are typically limited to pharmaceuticals, a small number involve drugs classified as illicit by DAWN for which there are legitimate medicinal uses (e.g., nitrous oxide when used by a dentist for sedation; cocaine when used as a topical anesthetic for eye surgery).

Table 30. ED visits involving adverse reaction to pharmaceuticals, 2011

Drug category and selected drugs (1)	ED visits	Percent of ED visits	RSE (%)	95% CI: Lower bound	95% CI: Upper bound
Total ED visits, adverse reaction (2,3)	2,301,059	100.0	6.2	2,021,724	2,580,394
Single drug	1,895,436	82.4	6.2	1,665,903	2,124,968
Multiple drugs	405,623	17.6	10.0	326,273	484,973
Alcohol present	30,635	1.3	12.3	23,247	38,022
Pharmaceuticals	2,300,827	100.0	6.2	2,021,473	2,580,180
<i>Anticoagulants</i>	130,567	5.7	8.6	108,470	152,665
<i>Anticonvulsants</i>	88,301	3.8	9.0	72,718	103,884
<i>Antidepressants</i>	102,471	4.5	9.3	83,858	121,085
<i>Antidiabetic agents</i>	126,030	5.5	11.5	97,526	154,534
<i>Anti-infectives</i>	517,750	22.5	7.1	445,752	589,749
Cephalosporins	58,116	2.5	9.5	47,291	68,941
Macrolide derivatives	41,034	1.8	9.1	33,723	48,346
Penicillins	139,289	6.1	8.4	116,296	162,282
Quinolones	64,032	2.8	9.7	51,859	76,204
Sulfonamides	90,294	3.9	6.9	78,078	102,510
<i>Antineoplastics (chemotherapy drugs)</i>	135,319	5.9	18.8	85,429	185,208
<i>Antipsychotics</i>	79,219	3.4	7.7	67,208	91,229
<i>Anxiolytics, sedatives, and hypnotics</i>	99,135	4.3	9.7	80,363	117,907
Benzodiazepines	57,559	2.5	13.1	42,726	72,393
Zolpidem	15,570	0.7	15.9	10,717	20,423
<i>Cardiovascular agents</i>	214,868	9.3	11.5	166,281	263,454
ACE inhibitors	65,959	2.9	12.6	49,717	82,201
Beta blockers	45,597	2.0	12.2	34,684	56,509
Calcium channel blocking agents	31,479	1.4	21.4	18,246	44,713
Diuretics	36,548	1.6	8.9	30,167	42,930
<i>Gastrointestinal agents</i>	79,683	3.5	14.1	57,610	101,757
Laxatives	27,354	1.2	17.2	18,136	36,573
<i>Herbal and nutraceutical products (alternative medicines)</i>	16,656	0.7	13.8	12,149	21,163
<i>Hormones</i>	129,909	5.6	8.8	107,383	152,435
Adrenal cortical steroids	51,674	2.2	13.2	38,327	65,021
Sex hormones	37,403	1.6	13.6	27,416	47,390
<i>Immunologic agents</i>	98,307	4.3	10.9	77,386	119,228
Viral vaccines	33,204	1.4	13.9	24,178	42,230
<i>Muscle relaxants</i>	27,355	1.2	12.0	20,925	33,784
<i>Nutritional products</i>	79,638	3.5	9.2	65,307	93,968
<i>Pain relievers</i>	362,192	15.7	8.1	304,501	419,884
Acetaminophen products	20,543	0.9	14.7	14,631	26,456
Aspirin products	34,432	1.5	13.5	25,327	43,537
Narcotic pain relievers	190,252	8.3	9.2	155,780	224,724
Hydrocodone products	74,631	3.2	9.7	60,389	88,872
Oxycodone products	65,012	2.8	14.2	46,970	83,054
Nonsteroidal anti-inflammatories (NSAIDs)	75,322	3.3	10.4	59,976	90,668
Tramadol products	27,421	1.2	13.2	20,328	34,514

Table 30. ED visits involving adverse reaction to pharmaceuticals, 2011 (continued)

Drug category and selected drugs (1)	ED visits	Percent of ED visits	RSE (%)	95% CI: Lower bound	95% CI: Upper bound
<i>Radiologic agents</i>	20,773	0.9	14.5	14,872	26,673
<i>Respiratory agents</i>	85,947	3.7	8.5	71,693	100,201
<i>Topical agents</i>	70,360	3.1	9.2	57,623	83,097

(1) The classification of drugs used in DAWN is derived from the Multum *Lexicon*, © 2012 Lexi-Comp, Inc. and/or Cerner Multum, Inc. The classification was modified to meet DAWN's unique requirements (2011). The Multum Licensing Agreement governing use of the Lexicon can be found on the DAWN Web site at <http://www.samhsa.gov/data/dawn/MultumLicenseAgreement.pdf>.

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

(3) ED visits often involve multiple drugs. Such visits will appear multiple times in this table (e.g., a visit involving both penicillin and tramadol will appear twice in this table). The sum of visits 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.

SOURCE: Center for Behavioral Health Statistics and Quality, SAMHSA, Drug Abuse Warning Network, 2011.

With reference to the specific types of drugs involved, adverse reactions show a very different pattern from nonmedical use of pharmaceuticals in that visits involve a much wider array of drugs. Not surprisingly, given their widespread use, anti-infectives (e.g., antibiotics) were found to be involved in 22.5 percent of adverse reaction visits. Of these, penicillins were involved in 6.1 percent of adverse reaction visits, followed by sulfonamides (e.g., sulfa drugs) in 3.9 percent, quinolones (e.g., Cipro[®]) in 2.8 percent, cephalosporins (e.g., Keflex[®]) in 2.5 percent, and macrolides (e.g., Zithromax[®]) in 1.8 percent.

Pain relievers were found to be involved in 15.7 percent of visits. Among these, 8.3 percent involved narcotic pain relievers, 3.3 percent involved nonsteroidal anti-inflammatories (NSAIDs), 1.5 percent involved aspirin products, and under 1.0 percent involved acetaminophen products.

Cardiovascular agents were found to be involved in 9.3 percent of visits. Among these, angiotensin-converting enzyme (ACE) inhibitors (e.g., Prinivil[®], Zestril[®]) were involved in 2.9 percent and beta blockers (e.g., Lopressor[®], Toprol XL[®]) in 2.0 percent.

Appearing in between 5 and 6 percent of visits each were anticoagulants (e.g., Coumadin[®]), antidiabetic agents (e.g., insulin), and antineoplastics (chemotherapy drugs).

Appearing in between 3 and 5 percent of visits each were antidepressants, antipsychotics, and anxiolytics (drugs used to treat insomnia and anxiety).

When population size and sampling error were taken into account, women had notably more visits than men (887.3 and 584.2 visits per 100,000 population, respectively; Table 31, Figure 9). For children aged 5 and under, the rate of ED visits for adverse reactions was 842.4 visits per 100,000

population. The rate dropped to a low of 248.2 visits for children aged 6 to 11 and then rose consistently to reach a high of 1,525.8 visits for patients aged 65 or older.

In terms of race/ethnicity, 65.6 percent of visits related to adverse reaction to pharmaceuticals involved patients who were White, 13.7 percent who were Black, and 10.9 percent who were Hispanic. DAWN does not produce population-based rates for race/ethnicity categories because race/ethnicity information is often missing from ED records.

About three quarters (76.6%) of patients were treated and released (Table 32). About a fifth (20.6%) of patients were admitted to the hospital, and the remainder (2.8%) had other outcomes.

Table 31. ED visits and rates involving adverse reaction to pharmaceuticals, by patient demographics, 2011

Patient demographics	ED visits	Percent of ED visits	Rate of ED visits per 100,000 population (1)
Total ED visits, adverse reaction (2)	2,301,059	100.0	738.5
Sex	—	—	—
Male	895,584	38.9	584.2
Female	1,404,571	61.0	887.3
Unknown	*	*	—
Age	—	—	—
0–5 years	204,279	8.9	842.4
6–11 years	60,990	2.7	248.2
12–17 years	80,946	3.5	322.4
18–20 years	74,304	3.2	550.1
21–24 years	112,676	4.9	641.7
25–29 years	138,190	6.0	649.4
30–34 years	133,077	5.8	648.8
35–44 years	260,261	11.3	640.6
45–54 years	300,744	13.1	672.5
55–64 years	303,592	13.2	797.6
65 years and older	631,611	27.4	1,525.8
Unknown	*	*	—
Race/ethnicity	—	—	—
White	1,509,366	65.6	—
Black	314,937	13.7	—
Hispanic	250,439	10.9	—
Other or two or more race/ethnicities	51,755	2.2	—
Unknown	174,563	7.6	—

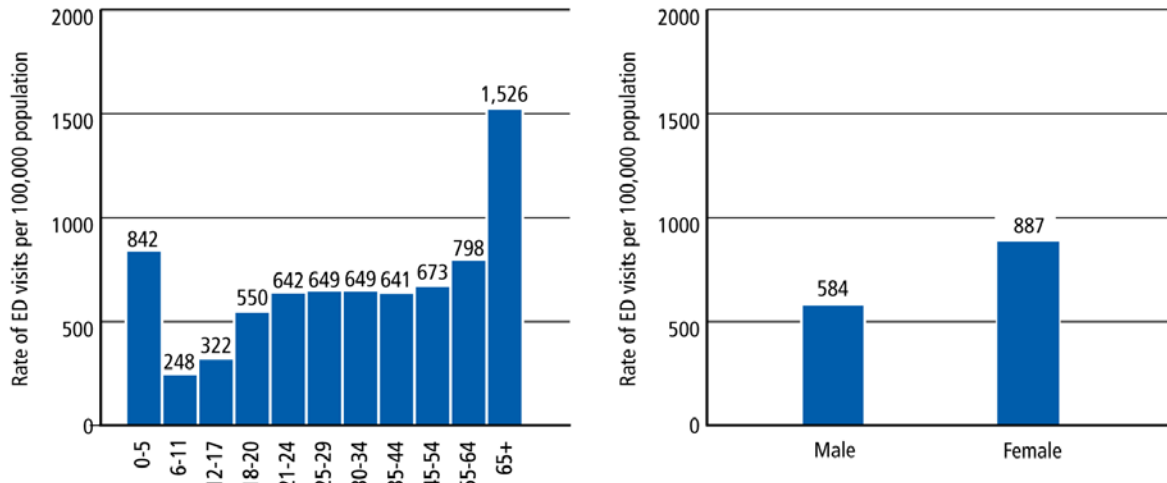
(1) All rates are ED visits per 100,000 population. Population estimates are drawn from the set of United States Resident Population Estimates by Age, Sex, Race, and Hispanic Origin (Vintage 2011) issued by the U.S. Census Bureau.

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

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, 2011.

Figure 9. Rates of ED visits per 100,000 population involving adverse reaction to pharmaceuticals, by age and sex, 2011



SOURCE: Center for Behavioral Health Statistics and Quality, SAMHSA, Drug Abuse Warning Network, 2011.

Table 32. ED visits and rates involving adverse reaction to pharmaceuticals, by patient disposition, 2011

Patient disposition	ED visits	Percent of ED visits	Rate of ED visits per 100,000 population (1)
Total ED visits, adverse reaction (2)	2,301,059	100.0	738.5
Treated and released	1,762,091	76.6	565.5
Discharged home	1,754,690	76.3	563.1
Released to police/jail	4,436	0.2	1.4
Referred to detox/treatment	*	*	*
Admitted to this hospital	474,999	20.6	152.4
ICU/critical care	38,980	1.7	12.5
Surgery	*	*	*
Chemical dependency/detox	*	*	*
Psychiatric unit	6,828	0.3	2.2
Other inpatient unit	425,531	18.5	136.6
Other disposition	63,968	2.8	20.5
Transferred	29,092	1.3	9.3
Left against medical advice	12,150	0.5	3.9
Died	*	*	*
Other	10,687	0.5	3.4
Not documented	*	*	*

(1) All rates are ED visits per 100,000 population. Population estimates are drawn from the set of United States Resident Population Estimates by Age, Sex, Race, and Hispanic Origin (Vintage 2011) issued by the U.S. Census Bureau.

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

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, 2011.

8.2 Trends in ED Visits Involving Adverse Reaction to Pharmaceuticals, 2005–2011

This section presents the trends in the estimates of ED visits involving adverse reactions for the period from 2005 through 2011 (Table 33). Differences between years are presented in terms of the percentage increase or decrease in visits in 2011 compared with the estimates for 2005 (long-term trends) and for 2009 and 2010 (short-term trends).³¹ Only statistically significant changes are discussed and displayed in the table.

ED visits resulting from adverse reactions to pharmaceuticals increased 84 percent in the period from 2005 to 2011, rising from about 1.3 million visits to about 2.3 million visits. The number of ED visits for adverse reactions to pharmaceuticals rose by about a quarter million visits, or more, per year between 2005 and 2008, leveling off at about 2.3 million visits per year over the period from 2009 to 2011. Accordingly, most drugs, though not all, have seen some increase in involvement in the long term between 2005 and 2011 but, unless noted otherwise, no short-term increases. The following remarks are ordered by number of visits in 2011.

- Anti-infectives (e.g., antibiotics) saw a 69 percent increase in the long term for a total of over 500,000 ED visits in 2011. There have been no short-term increases in any major type of anti-infective, and one type, macrolides, experienced a decline of 16 percent over the period from 2009 to 2011.
- Pain relievers, as a general category, saw a 62 percent increase since 2005 for a total of over 350,000 ED visits in 2011. Narcotic pain relievers in general rose 63 percent, with hydrocodone products rising 77 percent, and oxycodone products rising 128 percent.
- Involvement of cardiovascular agents rose 85 percent for a total of over 200,000 visits in 2011. Visits involving beta blockers declined 24 percent in the 1 year between 2010 and 2011.
- With over 135,000 visits in 2011, antineoplastics (chemotherapy drugs) saw a 179 percent increase in the long term, increasing consistently each year over the period from 2005 to 2011.
- Anticoagulant involvement overall has not risen in the long term, with about 130,000 visits in 2011. A short-term decline of 33 percent was observed between 2009 and 2011.
- Hormone-based drugs (e.g., anti-inflammatory drugs, contraceptives, thyroid hormones) experienced a 160 percent increase for a total of about 130,000 ED visits in 2011. Involvement of hormone-based drugs has increased consistently each year over the period from 2005 to 2011.
- With over 125,000 visits in 2011, visits involving antidiabetic drugs (e.g., insulin, biguanides, sulfonylureas) are not measurably different in 2011 than in 2005.
- Antidepressants saw a 119 percent increase for a total of about 100,000 ED visits in 2011.

³¹ Due to data limitations in 2004, long-term trends for adverse reaction visits are assessed for the period from 2005 through 2011 and not from 2004 through 2011.

- Anxiolytics (drugs to treat insomnia and anxiety) saw a 102 percent increase overall between 2005 and 2011. Beginning in 2008, involvement stabilized at about 100,000 visits per year. A measureable decline of 22 percent was observed for zolpidem (e.g., Ambien) between 2009 and 2011.
- Immunological drugs (e.g., bacterial and viral vaccines) saw a 153 percent increase for a total of nearly 100,000 ED visits in 2011.
- Anticonvulsants saw a 99 percent increase for a total of just under 90,000 ED visits in 2011.
- Nutritional products—including minerals and electrolytes products, oral nutritional supplements, and vitamins—saw a 196 percent increase for a total of about 80,000 ED visits in 2011.
- Antipsychotics saw a 96 percent increase for a total of about 80,000 ED visits in 2011.

Table 33. Trends in ED visits involving adverse reaction to pharmaceuticals, by selected drugs, 2005–2011

Drug category and selected drugs (1)	ED visits, 2005	ED visits, 2006	ED visits, 2007	ED visits, 2008	ED visits, 2009	ED visits, 2010	ED visits, 2011	Percent change, 2005, 2011 (2,3)	Percent change, 2009, 2011 (2)	Percent change, 2010, 2011 (2)
Total ED visits, adverse reaction to pharmaceuticals (4,5)	1,250,377	1,526,010	1,908,928	2,157,128	2,287,271	2,329,221	2,301,059	84	—	—
<i>Anticoagulants</i>	108,180	125,687	167,929	189,577	194,696	157,911	130,567	—	-33	-17
<i>Anticonvulsants</i>	44,281	59,924	73,256	83,018	86,835	81,954	88,301	99	—	—
<i>Antidepressants</i>	46,702	65,458	76,222	84,604	91,396	102,397	102,471	119	—	—
<i>Antidiabetic agents</i>	77,625	115,513	166,006	136,971	140,067	145,534	126,030	—	—	—
<i>Anti-infectives</i>	306,110	367,088	426,442	487,757	477,221	506,358	517,750	69	—	—
Cephalosporins	38,442	44,794	48,713	53,648	52,408	54,007	58,116	—	—	—
Macrolide derivatives	39,981	42,982	42,478	47,074	48,960	50,656	41,034	—	-16	-19
Penicillins	97,308	104,693	122,912	134,340	128,283	136,714	139,289	—	—	—
Quinolones	46,791	59,683	65,308	76,114	67,151	69,521	64,032	—	—	—
Sulfonamides	36,879	47,657	59,681	75,391	75,905	85,907	90,294	145	—	—
<i>Antineoplastics (chemotherapy drugs)</i>	48,569	51,273	70,618	94,810	105,199	124,591	135,319	179	—	—
<i>Antipsychotics</i>	40,330	55,941	65,818	75,531	79,002	84,842	79,219	96	—	—
<i>Anxiolytics, sedatives, and hypnotics</i>	49,044	57,467	79,269	100,702	104,404	102,401	99,135	102	—	—
Benzodiazepines	25,520	33,482	48,129	61,880	63,494	59,055	57,559	126	—	—
Zolpidem	6,111	6,680	12,417	16,188	19,951	19,487	15,570	155	-22	—
<i>Cardiovascular agents</i>	116,037	169,629	207,270	237,663	247,063	241,637	214,868	85	—	—
ACE inhibitors	27,100	38,781	53,707	69,041	72,219	69,196	65,959	143	—	—
Beta blockers	24,669	40,653	56,551	54,778	58,179	59,842	45,597	85	-22	-24
Calcium channel blocking agents	12,742	18,200	22,935	22,926	30,354	27,233	31,479	147	—	—
Diuretics	19,023	33,779	42,425	46,008	44,745	44,809	36,548	92	—	—
<i>Gastrointestinal agents</i>	36,238	50,487	62,307	72,801	82,951	81,295	79,683	120	—	—
<i>Herbal and nutraceutical products (alternative medicines)</i>	6,360	6,286	9,803	11,919	12,149	14,961	16,656	162	—	—

Table 33. Trends in ED visits involving adverse reaction to pharmaceuticals, by selected drugs, 2005–2011 (continued)

Drug category and selected drugs (1)	ED visits, 2005	ED visits, 2006	ED visits, 2007	ED visits, 2008	ED visits, 2009	ED visits, 2010	ED visits, 2011	Percent change, 2005, 2011 (2,3)	Percent change, 2009, 2011 (2)	Percent change, 2010, 2011 (2)
<i>Hormones</i>	49,979	70,790	89,729	104,174	114,714	123,718	129,909	160	—	—
Adrenal cortical steroids	29,506	37,292	44,431	44,756	49,403	52,753	51,674	75	—	—
Sex hormones	10,697	15,218	22,386	28,216	31,821	35,423	37,403	250	—	—
<i>Immunologic agents</i>	38,786	52,280	66,492	86,235	104,473	100,818	98,307	153	—	—
Viral vaccines	13,372	18,817	21,559	29,329	52,874	38,266	33,204	148	-37	—
<i>Muscle relaxants</i>	12,173	15,454	22,285	26,556	27,551	28,265	27,355	125	—	—
<i>Nutritional products</i>	26,885	38,349	44,519	63,607	67,182	77,056	79,638	196	—	—
<i>Pain relievers</i>	223,725	266,602	321,246	363,947	387,197	379,260	362,192	62	—	—
Acetaminophen products	15,498	17,033	20,485	17,469	22,997	26,178	20,543	—	—	—
Aspirin products	24,435	36,450	40,851	47,722	42,983	38,997	34,432	—	—	—
Narcotic pain relievers	116,677	139,021	174,720	198,891	218,366	207,322	190,252	63	—	—
Hydrocodone products	42,260	52,307	62,948	80,270	79,877	83,518	74,631	77	—	—
Oxycodone products	28,511	36,404	54,433	54,868	65,146	57,223	65,012	128	—	—
Nonsteroidal anti-inflammatories (NSAIDs)	55,755	61,262	72,250	70,867	70,035	79,248	75,322	—	—	—
Tramadol products	10,091	12,746	16,946	23,756	25,884	25,887	27,421	172	—	—
<i>Radiologic agents</i>	12,604	14,479	17,896	18,798	20,434	16,425	20,773	65	—	—
<i>Respiratory agents</i>	61,702	68,812	82,958	90,751	96,462	82,801	85,947	—	—	—
<i>Topical agents</i>	30,703	37,117	44,843	44,761	51,728	61,263	70,360	129	36	—

(1) The classification of drugs used in DAWN is derived from the Multum *Lexicon*, © 2012 Lexi-Comp, Inc. and/or Cerner Multum, Inc. The classification was modified to meet DAWN's unique requirements (2011). The Multum Licensing Agreement governing use of the Lexicon can be found on the DAWN Web site at <http://www.samhsa.gov/data/dawn/MultumLicenseAgreement.pdf>.

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

(3) Due to data limitations in 2004, long-term trends for adverse reaction visits are assessed for the period from 2005 through 2011, not from 2004 through 2011.

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

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

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

SOURCE: Center for Behavioral Health Statistics and Quality, SAMHSA, Drug Abuse Warning Network, 2011.

9. ACCIDENTAL INGESTION OF DRUGS

9.1 ED Visits Involving Accidental Ingestion of Drugs, 2011

To be classified by DAWN as an accidental ingestion ED visit, a drug must have been taken unintentionally or without it being known which drug was actually taken. The drug may be taken by the patient or given to the patient by someone else (e.g., a parent giving medication to a child).³²

This chapter focuses on the characteristics of accidental ingestion ED visits for children aged 5 and under as the preponderance of ED visits for accidental ingestion involve children in this age range. In 2011, DAWN found 77,074 ED visits out of a total of 113,624 involved children aged 5 and under. The rate of these ED visits was about 25 times higher for children aged 5 and under than for adults: 317.8 visits per 100,000 children aged 5 and under compared with 12.9 visits per 100,000 for the general adult population aged 21 or older (Figure 10). As soon as infants learn to crawl and especially once they learn to walk, their mobility, curiosity, and tendency to put things in their mouths make many substances in the home a potential danger.³³ Pharmaceutical products belonging to other household members present a particularly critical danger to children because, due to their physiology and smaller size, children's unintended ingestions of even small amounts can lead to medical emergencies requiring care in an ED.³⁴ This combination of propensity, accessibility, and susceptibility is evidenced in calls to poison control centers, where over half (51.0%) of human exposure calls involve children aged 5 and under and where 14 of the top 25 substances involved in pediatric exposure are drugs and therapeutic substances.³⁵

Drugs recognized as being particularly dangerous when accidentally ingested by children include pain medications, such as narcotic pain relievers (e.g., oxycodone, hydrocodone); cardiac medications, such as calcium channel blockers ("heart pills") and blood pressure medicines (e.g., clonidine); aspirin products; antidepressants (e.g., Elavil[®], Wellbutrin[®], Zyban[®]); antidiabetic medications; camphor-containing salves (when ingested); eye drops (e.g., Clear Eyes[®]); and nasal sprays (e.g., Afrin[®]).³⁶

³² A visit is not considered as resulting from accidental ingestion if a patient took too much of his or her own medications because he or she forgot having taken a dose earlier.

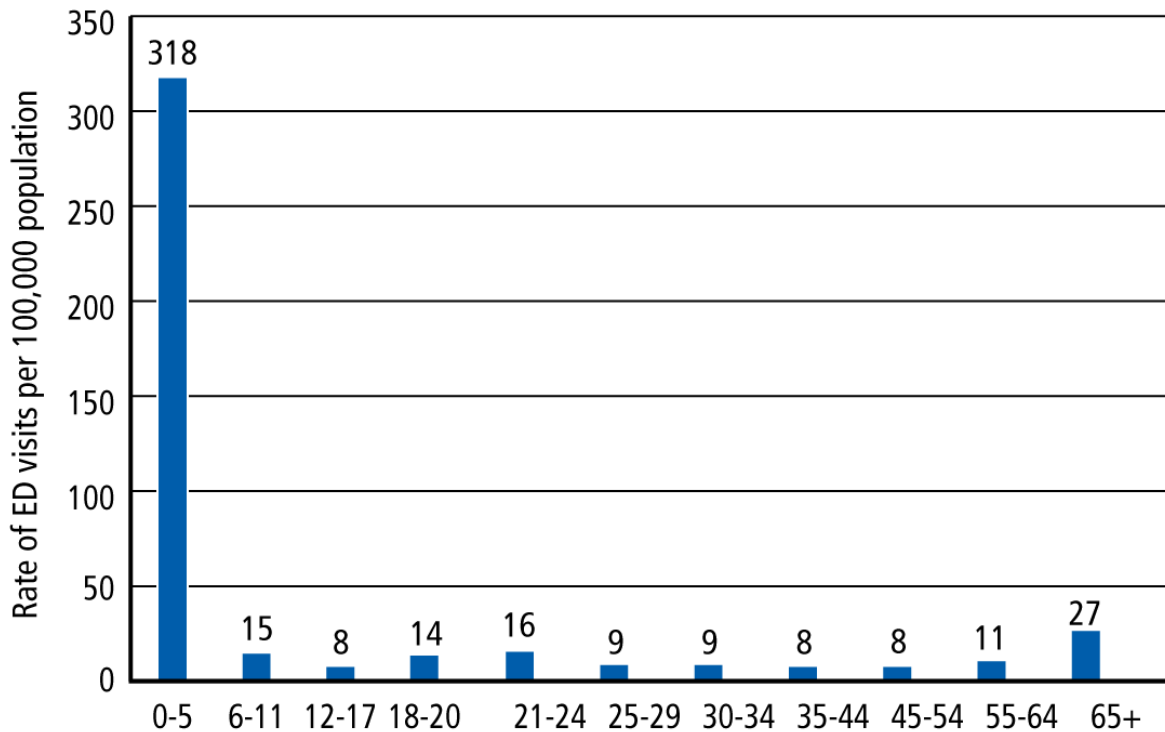
³³ Ma, D. (2009). Keep curious kids safe by poison proofing your home. *AAP News*, 30(11), 2. Retrieved May 5, 2012, from <http://aapnews.aapublications.org/content/30/11>.

³⁴ Centers for Disease Control and Prevention (CDC). (2006). Nonfatal, unintentional medication exposures among children—United States, 2001–2003. *Morbidity and Mortality Weekly Report*, 55(1), 1–5. Retrieved May 5, 2012, from <http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5501a1.htm>.

³⁵ Bronstein, A. C., Spyker, D. A., Cantilena, L. R., Jr., Green, J. L., Rumack, B. H., & Dart, R. C. (2011). 2010 Annual report of the American Association of Poison Control Centers' National Poison Data System (NPDS): 28th annual report. *Clinical Toxicology*, 49, 910–941. Retrieved December 18, 2012, from <http://www.poisson.org/stats/2010%20NPDS%20Annual%20Report.pdf>.

³⁶ Eldridge, D. L., Mutter, K. W., & Holstege, C. P. (2010). An evidence-based review of single pills and swallows that can kill a child. *Pediatric Emergency Medicine Practice*, 7(3).

Figure 10. Rates of ED visits per 100,000 population involving accidental ingestion of pharmaceuticals, by age, 2011



SOURCE: Center for Behavioral Health Statistics and Quality, SAMHSA, Drug Abuse Warning Network, 2011.

Considering only these particularly dangerous drugs, DAWN found the following:

- Pain relievers were the most common class of drugs involved in accidental ingestion among children aged 5 and under, with 24.6 percent of visits (Table 34). Among pain relievers, acetaminophen products were involved in 9.0 percent of accidental ingestion visits, narcotic pain relievers in 6.7 percent, nonsteroidal anti-inflammatories (e.g., ibuprofen and naproxen products) in 6.3 percent, and aspirin products in 2.1 percent.
- Cardiovascular agents were involved in 12.2 percent of visits. Of these, angiotensin-converting enzyme (ACE) inhibitors, beta blockers, blood pressure drugs, and calcium channel blocking agents each accounted for between 1 and 4 percent of visits.
- Antidepressants were involved in 5.6 percent of visits, and antipsychotics were involved in 3.1 percent.
- Antidiabetic medications were found in 2.4 percent of visits.
- Counts of accidental ingestion of eye drops, nasal sprays, and camphor-containing salves were not observed at reportable levels.

Table 34. ED visits involving accidental ingestion of drugs by patients aged 5 and under, 2011

Drug category and selected drugs (1)	ED visits	Percent of ED visits	RSE (%)	95% CI: Lower bound	95% CI: Upper bound
Total ED visits, accidental ingestion (2,3)	77,074	100.0	11.8	59,237	94,912
Pharmaceuticals	76,638	99.4	11.9	58,807	94,469
<i>Anticonvulsants</i>	2,571	3.3	22.6	1,433	3,710
<i>Antidepressants</i>	4,291	5.6	25.6	2,134	6,448
<i>Antidiabetic agents</i>	1,813	2.4	39.1	423	3,202
<i>Antihyperlipidemic agents</i>	1,175	1.5	48.7	53	2,296
<i>Anti-infectives</i>	2,612	3.4	38.6	637	4,588
<i>Antipsychotics</i>	2,413	3.1	35.9	715	4,111
<i>Anxiolytics, sedatives, and hypnotics</i>	8,479	11.0	20.2	5,117	11,841
Benzodiazepines	2,556	3.3	24.2	1,342	3,771
Diphenhydramine	4,311	5.6	28.0	1,947	6,676
<i>Cardiovascular agents</i>	9,398	12.2	24.5	4,887	13,909
ACE inhibitors	1,771	2.3	41.4	336	3,206
Beta blockers	1,934	2.5	30.6	774	3,093
Blood pressure drugs	1,234	1.6	42.2	213	2,254
Calcium channel blocking agents	2,884	3.7	48.1	166	5,602
<i>Central nervous system stimulants (e.g., ADHD drugs)</i>	3,952	5.1	30.8	1,564	6,340
Amphetamine-dextroamphetamine	2,179	2.8	45.1	253	4,105
<i>Gastrointestinal agents</i>	4,180	5.4	28.3	1,865	6,496
<i>Hormones</i>	2,145	2.8	17.2	1,422	2,868
<i>Nutritional products</i>	1,638	2.1	31.0	644	2,632
<i>Pain relievers</i>	18,971	24.6	12.7	14,231	23,710
Acetaminophen products	6,935	9.0	22.1	3,926	9,944
Aspirin products	1,592	2.1	36.4	457	2,727
Narcotic pain relievers	5,187	6.7	29.4	2,199	8,175
Nonsteroidalantiinflammatories (NSAIDs)	4,876	6.3	22.8	2,702	7,051
<i>Respiratory agents</i>	5,980	7.8	19.5	3,697	8,262
<i>Topical agents</i>	7,604	9.9	19.0	4,776	10,432

(1) The classification of drugs used in DAWN is derived from the Multum *Lexicon*, © 2012 Lexi-Comp, Inc. and/or Cerner Multum, Inc. The classification was modified to meet DAWN's unique requirements (2011). The Multum Licensing Agreement governing use of the Lexicon can be found on the DAWN Web site at <http://www.samhsa.gov/data/dawn/MultumLicenseAgreement.pdf>.

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

(3) ED visits often involve multiple drugs. Such visits will appear multiple times in this table (e.g., a visit involving both aspirin and antihistamines will appear twice in this table). The sum of visits 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.

SOURCE: Center for Behavioral Health Statistics and Quality, SAMHSA, Drug Abuse Warning Network, 2011.

Other drugs found at measureable levels included the following:

- Anxiolytics, sedatives, and hypnotics (drugs to treat insomnia and anxiety) were found in 11.0 percent of visits, with about half involving the anti-allergy drug diphenhydramine (e.g., Benadryl®) and about a third involving some type of benzodiazepine (e.g., alprazolam, clonazepam).
- Topical agents were found in 9.9 percent of visits; these include anesthetics (e.g., benzocaine) that are found in gels for teething pain (e.g., Orajel®), antihistamines (e.g., calamine lotion), and anti-infectives (e.g., hydrogen peroxide).
- Respiratory agents—e.g., antihistamines, bronchodilators, and a broad range of combination products used to treat upper respiratory conditions—were found in 7.8 percent of visits.
- CNS stimulants (e.g., ADHD drugs) were involved in about 5 percent of visits.
- Other types of drugs involved in under 5 percent of visits included anti-infectives (e.g., penicillins); anticonvulsants; hormone-containing drugs; and nutritional products (e.g., vitamins).

A negligible number of visits involved alcohol or illicit drugs.

Overall, there were 317.8 ED visits per 100,000 persons aged 0 to 5 resulting from accidental ingestion of drugs or other therapeutic substances (Table 35). The Consumer Product Safety Commission's National Electronic Injury Surveillance System (NEISS) reported a similar rate of 336.1 drug poisoning injuries treated in an ED per 100,000 population aged 0 to 4.³⁷

Among children aged 0 to 5, a preponderance (67.5%) of visits involved children aged 1 or 2, and the rates for children aged 1 and 2 were each over 600 visits per 100,000 persons of that age. No differences were found by sex. In terms of race/ethnicity, 60.1 percent of visits involved patients who were White, 10.8 percent who were Black, and 18.4 percent who were Hispanic. DAWN does not produce population-based rates for race/ethnicity categories because race/ethnicity information is often missing from ED records.

The large majority (87.6%) of patients aged 5 and under were treated and discharged home (Table 36). The balance received more extensive follow-up care, e.g., admission to the hospital (7.4%), transfer to another facility (3.6%).

³⁷ U.S. Consumer Product Safety Commission (CPSC). (n.d.). *NEISS 2011 data highlights*. Retrieved March 21, 2013, from <http://www.cpsc.gov/en/Research--Statistics/NEISS-Injury-Data/>.

Table 35. ED visits and rates involving accidental ingestion of drugs by patients aged 5 and under, by patient demographics, 2011

Patient demographics	ED visits	Percent of ED visits	Rate of ED visits per 100,000 population (1)
Total ED visits, accidental ingestion (2)	77,074	100.0	317.8
Sex	—	—	—
Male	40,988	53.2	330.8
Female	36,085	46.8	304.2
Unknown	*	*	—
Age	—	—	—
0 year	6,276	8.1	157.0
1 year	25,018	32.5	630.3
2 year	27,001	35.0	679.8
3 year	12,143	15.8	296.0
4 year	4,000	5.2	97.0
5 year	2,636	3.4	64.5
Race/ethnicity	—	—	—
White	46,325	60.1	—
Black	8,307	10.8	—
Hispanic	14,166	18.4	—
Other or two or more race/ethnicities	1,460	1.9	—
Unknown	6,818	8.8	—

(1) All rates are ED visits per 100,000 population. Population estimates are drawn from the set of United States Resident Population Estimates by Age, Sex, Race, and Hispanic Origin (Vintage 2011) issued by the U.S. Census Bureau.

(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.

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, 2011.

Table 36. ED visits and rates involving accidental ingestion of drugs by patients aged 5 and under, by patient disposition, 2011

Patient disposition	ED visits	Percent of ED visits	Rate of ED visits per 100,000 population (1)
Total ED visits, accidental ingestion (2)	77,074	100	317.8
Treated and released	67,529	87.6	278.5
Discharged home	67,529	87.6	278.5
Released to police/jail	*	*	*
Referred to detox/treatment	*	*	*
Admitted to this hospital	5,736	7.4	23.7
ICU/critical care	1,246	1.6	5.1
Surgery	*	*	*
Chemical dependency/detox	*	*	*
Psychiatric unit	*	*	*
Other inpatient unit	4,491	5.8	18.5
Other disposition	3,809	4.9	15.7
Transferred	2,766	3.6	11.4
Left against medical advice	*	*	*
Died	*	*	*
Other	*	*	*
Not documented	*	*	—

(1) All rates are ED visits per 100,000 population. Population estimates are drawn from the set of United States Resident Population Estimates by Age, Sex, Race, and Hispanic Origin (Vintage 2011) issued by the U.S. Census Bureau.

(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.

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, 2011.

9.2 Trends in ED Visits Involving Accidental Ingestion of Drugs by Patients Aged 5 and Under, 2004–2011

This section presents the trends in the estimates of ED visits involving accidental ingestion of drugs by patients aged 5 and under for the period from 2004 through 2011 (Table 37). Differences between years are presented in terms of the percentage increase or decrease in visits in 2011 compared with the estimates for 2004 (long-term trends) and for 2009 and 2010 (short-term trends). Only statistically significant changes are discussed and displayed in the table.

Medical emergencies related to accidental ingestions by patients aged 5 and under were stable from 2004 to 2011, though increases were observed for particular drug groups. With over 8,000 visits recorded in 2011, drugs to treat anxiety and insomnia rose 120 percent since 2004. With about 5,000 visits in 2011, narcotic pain relievers rose 225 percent over that period. Topical agents rose 219 percent, reaching over 7,000 visits in 2011. Hormone-containing drugs increased in the long term by 280 percent, reaching over 2,000 visits in 2011.

No increases were observed in the short term, and two drugs groups, benzodiazepines and respiratory agents, saw declines (35% and 30%, respectively) in the 1 year between 2010 and 2011. The decrease in benzodiazepine involvement appears to part of general decline that began in 2008. The decrease in respiratory agents merely offsets a 1-year spike that occurred between 2009 and 2010, returning visits to their 2009 level.

Table 37. Trends in ED visits involving accidental ingestion of drugs by patients aged 5 and under, by selected drugs, 2004–2011

Drug category and selected drugs (1)	ED visits, 2004	ED visits, 2005	ED visits, 2006	ED visits, 2007	ED visits, 2008	ED visits, 2009	ED visits, 2010	ED visits, 2011	Percent change, 2004, 2011 (2)	Percent change, 2009, 2011 (2)	Percent change, 2010, 2011 (2)
Total ED visits, accidental ingestion (3,4)	50,503	44,663	57,422	65,408	69,121	62,696	73,115	77,074	—	—	—
Pharmaceuticals	50,098	44,477	57,285	64,779	68,431	61,894	72,795	76,638	—	—	—
<i>Anticonvulsants</i>	2,447	1,764	832	861	1,944	1,877	2,931	2,571	—	—	—
<i>Antidepressants</i>	2,845	3,838	5,351	3,227	4,287	3,646	4,709	4,291	—	—	—
<i>Antidiabetic agents</i>	*	2,060	1,414	2,343	2,705	785	1,850	1,813	—	—	—
<i>Antihyperlipidemic agents</i>	*	932	808	*	444	1,456	889	1,175	—	—	—
<i>Anti-infectives</i>	1,242	930	1,564	1,725	1,925	1,283	1,347	2,612	—	—	—
<i>Antipsychotics</i>	1,667	1,441	1,230	1,667	2,034	1,690	3,875	2,413	—	—	—
<i>Anxiolytics, sedatives, and hypnotics</i>	3,854	3,045	5,706	6,260	8,039	7,065	7,269	8,479	120	—	—
Benzodiazepines	1,870	1,424	3,041	3,361	5,325	3,688	3,932	2,556	—	—	-35
Diphenhydramine	1,513	880	1,900	2,478	1,806	2,121	2,304	4,311	—	—	—
<i>Cardiovascular agents</i>	7,300	7,287	9,327	11,193	10,646	9,087	9,226	9,398	—	—	—
ACE inhibitors	834	1,057	886	1,245	3,028	1,629	1,461	1,771	—	—	—
Beta blockers	2,267	2,448	2,741	2,986	3,299	2,375	3,252	1,934	—	—	—
Blood pressure drugs	884	1,264	2,427	2,009	1,661	792	1,702	1,234	—	—	—
Calcium channel blocking agents	1,108	876	524	1,637	1,049	1,656	736	2,884	—	—	—
<i>Central nervous system stimulants (e.g., ADHD drugs)</i>	1,919	900	2,457	3,730	1,869	1,628	2,360	3,952	—	—	—
<i>Gastrointestinal agents</i>	2,423	2,105	2,349	2,950	3,300	2,261	3,186	4,180	—	—	—
<i>Hormones</i>	564	1,662	1,443	1,519	2,814	1,497	1,497	2,145	280	—	—

Table 37. Trends in ED visits involving accidental ingestion of drugs by patients aged 5 and under, by selected drugs, 2004–2011 (continued)

Drug category and selected drugs (1)	ED visits, 2004	ED visits, 2005	ED visits, 2006	ED visits, 2007	ED visits, 2008	ED visits, 2009	ED visits, 2010	ED visits, 2011	Percent change, 2004, 2011 (2)	Percent change, 2009, 2011 (2)	Percent change, 2010, 2011 (2)
<i>Nutritional products</i>	2,660	2,187	2,177	4,835	2,333	2,888	3,335	1,638	—	—	—
<i>Pain relievers</i>	12,048	9,631	14,451	13,606	14,579	17,797	20,441	18,971	—	—	—
Acetaminophen products	6,198	4,760	5,915	5,523	7,010	8,348	7,709	6,935	—	—	—
Aspirin products	722	589	1,251	1,753	528	604	1,923	1,592	—	—	—
Narcotic pain relievers	1,596	1,866	2,798	2,434	2,679	4,755	5,113	5,187	225	—	—
Nonsteroidal anti-inflammatory (NSAIDs)	2,635	2,108	4,681	3,795	4,581	3,896	4,373	4,876	—	—	—
<i>Respiratory agents</i>	7,167	5,290	5,539	10,032	7,302	5,378	8,600	5,980	—	—	-30
<i>Topical agents</i>	2,383	2,328	3,320	3,565	6,110	5,662	3,895	7,604	219	—	—

(1) The classification of drugs used in DAWN is derived from the Multum *Lexicon*, © 2012 Lexi-Comp, Inc. and/or Cerner Multum, Inc. The classification was modified to meet DAWN's unique requirements (2011). The Multum Licensing Agreement governing use of the Lexicon can be found on the DAWN Web site at <http://www.samhsa.gov/data/dawn/MultumLicenseAgreement.pdf>.

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

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

(4) ED visits often involve multiple drugs. Such visits will appear multiple times in this table (e.g., a visit involving both aspirin and antihistamines will appear twice in this table). The sum of visits 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, 2011.

Attachment A
Glossary of DAWN Terms,
2011 Update

Attachment B

Drug Abuse Warning Network

Methodology Report,

2011 Update

Attachment C
Guide to Drug Abuse Warning
Network Trend Tables,
2011 Update

