

OFFICE OF APPLIED STUDIES

**Drug Abuse Warning Network, 2003:
Interim National Estimates of Drug-Related
Emergency Department Visits**

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
Substance Abuse and Mental Health Services Administration
<http://DAWNinfo.samhsa.gov/>

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HIGHLIGHTS

This is the first publication to use data from the new Drug Abuse Warning Network (DAWN). Virtually every feature of DAWN, except its name, changed in 2003. In this publication, we refer to “new DAWN” to emphasize for readers that it is very different.

DAWN data and estimates for 2003 are not comparable to those for any prior years. Therefore, no trends are presented. 2003 was a period of transition between “old” and “new” DAWN. The transition to the new sample of hospitals began in 2003, but is not yet complete. As a result, the estimates in this publication are based on data from 260 hospitals and apply only to the coterminous U.S. No estimates will be published for metropolitan areas for 2003.

Major features of new DAWN

Beginning in 2003, a DAWN case is any ED visit related to recent drug use.

New DAWN includes ED visits associated with substance abuse and drug misuse, both intentional and accidental. New DAWN also includes ED visits related to the use of drugs for legitimate therapeutic purposes. None of these, not even the substance abuse cases, are comparable to DAWN cases from prior years.

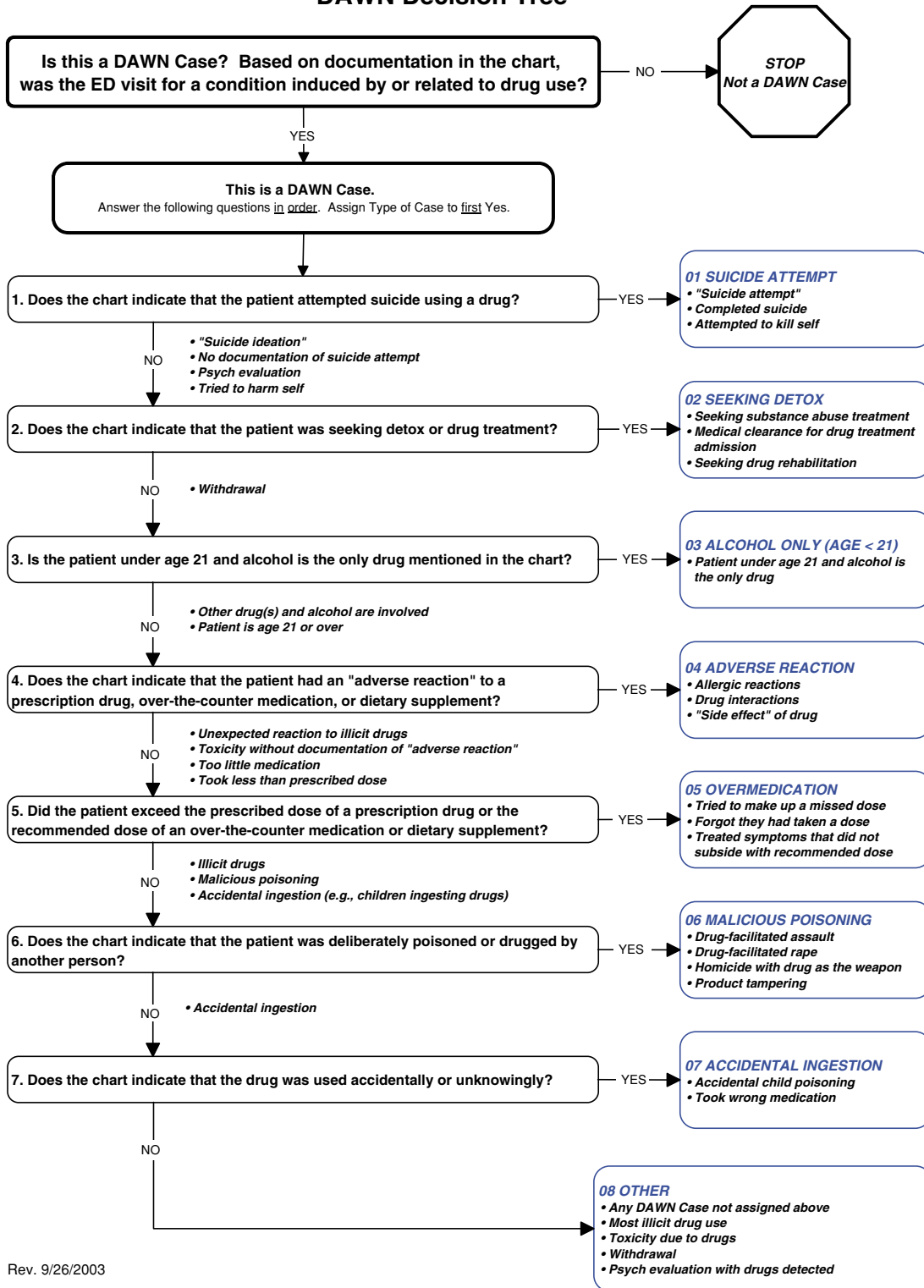
To be a DAWN case, a drug needs only to be implicated in the visit; the drug does not have to have caused the visit. Only recent drug use is included, the reason a patient used the drug is irrelevant, and the case criteria are broad enough to encompass all types of drug-related events, which include, but are not limited to, explicit drug abuse. This approach, which finds ED visits related to drug abuse only indirectly, recognizes that medical records (the source of DAWN data) frequently lack explicit documentation of substance abuse, and distinctions between use, misuse, and abuse of drugs are often subjective. This solves many problems inherent in the case criteria used by DAWN from 1972 to 2002.

To bring order to the heterogeneous mix of DAWN cases, each case is assigned to one of eight case types, hierarchically, as illustrated in the figure on the next page. The eight case types are:

- Suicide attempt;
- Seeking detoxification;
- Alcohol only in patients under age 21;
- Adverse reaction;
- Overmedication;
- Malicious poisoning (includes drug-facilitated sexual assault or product tampering);
- Accidental ingestion; and
- *Other*.

The final case type, which is called *other*, is designed to capture all of the drug-related ED visits that could not be classified in any of the prior seven case types. *Other* is the case type category designed to capture most drug abuse cases.

DAWN Decision Tree



Drug abuse in new DAWN

For analysis, we have defined three categories of ED visits related to drug misuse and abuse. These categories, designed to parallel the approach of the National Survey on Drug Use and Health (NSDUH), are based on:

- Use of illicit drugs;
- Use of alcohol, in combination with other drugs and alcohol alone in minors; and
- Non-medical use (“misuse”) of pharmaceuticals (prescription or over-the-counter [OTC]) (Table 1).

Table 1
Drug misuse and abuse in new DAWN

Nature of drug misuse/abuse	Defined by	Specifics
Use of illicit drugs	Drug	<ul style="list-style-type: none"> ■ Cocaine, heroin, marijuana, major stimulants (including amphetamines and methamphetamine), MDMA (Ecstasy), GHB, flunitrazepam (Rohypnol), ketamine, LSD, PCP, other hallucinogens, non-pharmaceutical inhalants, combinations of illicit drugs
Use of alcohol	Drug Case type	<ul style="list-style-type: none"> ■ Alcohol in combination with other drugs ■ Alcohol only in patients age less than 21
Non-medical use of pharmaceuticals and other substances	Combination of 3 case types	<ul style="list-style-type: none"> ■ <i>Overmedication</i> (cases of non-medical use, overuse, and misuse of prescription and OTC medications) ■ <i>Malicious poisoning</i> (cases in which the patient was administered a drug by another for a malicious purpose) ■ <i>Other</i> (cases that could not be assigned to another case type; includes documented drug abuse)

NOTE: Suicide attempt and seeking detox cases are analyzed separately, but may be combined selectively with non-medical use. Non-medical use excludes adverse reaction and accidental ingestion cases.

Total drug-related ED visits

For the third and fourth quarters of 2003, DAWN estimates 627,923 drug-related ED visits for the entire coterminous U.S. Considering the margin of error (i.e., taking sampling error into account and calculating a 95% confidence interval [CI]), this estimate may range from 535,619 to 720,227 drug-related ED visits out of more than 52 million total ED visits in the coterminous U.S. during the same period.

Overall, drug-related ED visits averaged 1.7 drugs per visit, including illicit drugs, alcohol, prescription and OTC pharmaceuticals, dietary supplements, and non-pharmaceutical inhalants.

Drug-related ED visits by case type

- The largest number of cases (over one-third) fell into case type *other*. This is expected, given the rules for assigning drug-related visits to case type.
- Adverse reactions accounted for a quarter of drug-related ED visits.
- Overmedication cases accounted for less than a fifth of drug-related ED visits (17%).
- Ten percent of drug-related ED visits were for patients seeking detox. These cases are classified separately because they tend to be concentrated in hospitals that require ED clearance for admission to their specialized detox units.
- Suicide attempts, narrowly defined to exclude suicide ideation and gestures, accounted for 6% of drug-related ED visits.
- Visits associated with underage consumption of alcohol alone (with no other drug involved) accounted for 4% of drug-related ED visits.
- Accidental ingestion of drugs accounted for 3% of drug-related ED visits.
- Malicious poisonings were the least frequent, 0.2% of drug-related ED visits.

Illicit drugs in ED visits

For Q3-Q4 2003, DAWN estimates 305,731 (CI: 230,228 to 381,234) drug-related ED visits involved a major substance of abuse. This means that nearly half of all drug-related ED visits involved alcohol or an illicit drug. For particular drugs, DAWN estimates that:

- Cocaine was involved in 125,921 (CI: 67,429 to 184,413) ED visits. In other words, approximately 1 in 5 drug-related ED visits (20%) involved cocaine.
- Marijuana was involved in 79,663 (CI: 39,067 to 120,259) ED visits. Thus, marijuana may be as common as cocaine in drug-related ED visits.
- Heroin was involved in 47,604 (CI: 31,369 to 63,839) drug-related ED visits or 8% of drug-related ED visits overall. Unspecified opiates, some of which may be heroin, occurred in 24,623 (CI: 12,510 to 36,736) visits, or 4% of all drug-related ED visits.
- Stimulants, including amphetamines and methamphetamine, were involved in 42,538 (CI: 20,860 to 64,216) ED visits or about 7% of drug-related ED visits overall.
- Other illicit drugs, such as PCP, Ecstasy, and GHB, were much less frequent than any of the above.

Alcohol and drug-related ED visits

For Q3-Q4 2003, DAWN estimates 141,343 (CI: 116,965 to 165,721) drug-related ED visits involved alcohol in combination with another drug or alcohol alone in a patient under the age of 21. Thus, nearly a quarter (23%) of all drug-related ED visits involved alcohol in one of these forms. Since DAWN does not account for ED visits involving alcohol alone in adults, the actual number of ED visits involving alcohol is higher. Alcohol is reported to DAWN when in combination with other drugs, regardless of the patient's age.

For Q3-Q4 2003, DAWN estimates:

- 118,724 (CI: 94,291 to 143,157) ED visits involved the use of alcohol in combination with another drug.
- 22,619 (CI: 16,452 to 28,652) ED visits were related to the use of alcohol by patients who were younger than age 21.
- The rate of alcohol-only ED visits for ages 18 to 20 (118 visits per 100,000 population) was three times that for patients age 12 to 17 (37 per 100,000). The rates for males and females were equivalent.

Considering all ED visits for patients between the ages of 12 and 20 that involved alcohol (that is, alcohol alone plus alcohol in combination with other drugs), DAWN estimates:

- 16,770 (CI: 12,037 to 21,503) alcohol-related ED visits for patients age 12-17, and
- 21,262 (CI: 16,386 to 26,138) alcohol-related ED visits for patients age 18-20.

Drug misuse and abuse in ED visits

When overmedication, malicious poisoning, and case type *other* are combined, DAWN estimates 332,046 (CI: 268,266 to 395,826) visits related to drug misuse or abuse in Q3-Q4 2003. More than half (54%) of these visits involved multiple drugs.

Alcohol or an illicit drug was involved in nearly two-thirds (65%) of these drug-related ED visits. The specific drugs most commonly associated with these ED visits included:

- Cocaine (in 28% of visits), alcohol (26%), and marijuana (20%), which were similar in frequency, when the margin of error is considered.
- Heroin and major stimulants (amphetamines/methamphetamine), which were each involved in 10% of visits.
- Non-medical use of benzodiazepines (anti-anxiety medications) and opiates/opioid analgesics (pain relievers), which each accounted for 17% of visits.

Males outnumbered females in cases classified as case type *other*. Females outnumbered males in overmedication and malicious poisoning cases. However, when the three case types are considered in combination, differences between males and females disappear.

Other types of drug-related ED visits

Suicide attempts

DAWN estimates 40,044 (CI: 33,607 to 46,481) drug-related ED visits associated with suicide attempts for Q3-Q4 2003. On average, these suicide attempts involved 2.2 drugs per case; about 39% involved only a single drug.

In suicide attempts for Q3-Q4 2003:

- About one-quarter (26%) involved alcohol.
- Central nervous system (CNS) agents, primarily analgesics (pain relievers), were involved in about half (56%) and included both prescription and OTC formulations.
- Psychotherapeutic agents, including benzodiazepines and antidepressants, were implicated in 45% of visits.
- Illicit drugs, such as cocaine (11% of visits) and marijuana (9% of visits), were relatively infrequent.

Seeking detox

DAWN estimates 61,506 (CI: 34,985 to 88,027) drug-related ED visits for patients seeking detoxification services during Q3-Q4 2003. However, as noted previously, these visits tend to be concentrated in hospitals with administrative policies that require medical clearance in the ED for admission to detox units.

On average, the seeking detox visits involved 2.1 drugs per visit; less than 40% involved only a single drug. Both illicit and prescription drugs were common in ED visits for patients seeking detox:

- Cocaine (in 47% of visits) and heroin (25% of visits) were followed in frequency by marijuana (14% of visits) and amphetamine or methamphetamine stimulants (9% of visits).
- Opioid pain relievers and benzodiazepines appeared to be more frequent than many of the illicit drugs. Opioids, such as hydrocodone and oxycodone, were implicated in 31% of seeking detox visits, and benzodiazepines in 19%.
- Alcohol in combination with another drug was implicated in about a third (33%) of seeking detox ED visits.

INTRODUCTION

The Drug Abuse Warning Network (DAWN) is a public health surveillance system that monitors drug-related emergency department (ED) visits for the Nation and for selected metropolitan areas. DAWN also collects data on drug-related deaths investigated by medical examiners and coroners in selected metropolitan areas and States. The Office of Applied Studies (OAS) of the Substance Abuse and Mental Health Services Administration (SAMHSA), U.S. Department of Health and Human Services, has been responsible for DAWN operations since 1992.

Major changes to DAWN were instituted at the beginning of 2003. These changes are the result of a re-design that altered virtually every feature of DAWN, except its name. In this publication, we sometimes refer to “new DAWN” to emphasize its differences.

Since this is the first publication from the new DAWN, it begins with a review of the design changes and explains their implications for understanding findings from new DAWN. These discussions of the various aspects of the new design, including how DAWN now defines drug abuse, are followed by the initial findings from data collected under this new design.

The findings in this publication are interim national estimates of drug-related ED visits, based on data for the third and fourth quarters (Q3-Q4, July-December) of 2003. The term “interim” is used because this is a period of transition between “old” and “new” DAWN. In this context, “interim” does not mean preliminary. These are final estimates. Trends are not presented here because data and estimates for 2003 are not comparable to those produced or published for any prior year.

Even so, estimates in this publication do not reflect all of the changes planned. For example, the transition to a new sample of hospitals began in 2003, but is not yet complete. When fully implemented, the new sample will represent hospitals in the entire U.S. The estimates in this publication are based on the sample of hospitals that applies only to the coterminous U.S. For metropolitan areas, no estimates, interim or otherwise, will be published for 2003.

The re-design of DAWN

The re-design of DAWN began in 1997. An expert panel convened by SAMHSA/OAS was asked the most fundamental of questions: Should DAWN continue? The experts responded that DAWN should continue, but required major improvements.

The rationale for fundamental change was straightforward. While the population of the U.S. and its health care system changed dramatically over three decades, the DAWN protocol had remained essentially static. A probability sample of hospitals had been introduced in DAWN in the 1980s to support the generation of national estimates. However, the other main features of DAWN, from the cases and data items collected to the choice of metropolitan areas, were historical artifacts that did not reflect the realities of today’s health care system or necessarily fulfill the needs of DAWN’s users. This led to misunderstandings about DAWN’s design and its data, misinterpretation and criticism of its findings, and unfounded assumptions about whom and what it represented.

SAMHSA/OAS initiated a two-year evaluation of design alternatives that resulted in a set of recommendations for a new design.¹ The recommendations addressed virtually every feature of DAWN. Many of these features were field tested during the evaluation.

Implementation of the new design began in 2003. There was no period of overlap between old and new DAWN. A side-by-side comparison of DAWN's features before and after the re-design is shown in Table 2 and is discussed next.

Major features of the new design

What is a DAWN case?

One of the most important features of the new DAWN is its expansive definition of a case:

A DAWN case is any ED visit related to recent drug use.

To be a DAWN case, the relationship between the ED visit and the drug need not be causal; the drug needs only to be implicated in the visit.

The case criteria are intended to be broad and inclusive and to have few exceptions. DAWN cases are found through a retrospective review of medical records.² Broad criteria take into account the fact that documentation in medical records varies in clarity and comprehensiveness across hospitals and among clinicians within hospitals. Broad criteria minimize the potential for judgments that could cause data to vary systematically and unexpectedly across reporters and hospitals. In addition, broad criteria are designed to capture a very diverse set of drug-related cases, which can be aggregated and disaggregated to serve a variety of analytical purposes and the interests of multiple audiences.

DAWN cases include ED visits associated with substance abuse, but also include drug misuse, intentional or accidental, as well as visits related to the use of drugs for legitimate therapeutic purposes.

DAWN cases also include:

- Alcohol only (age < 21). ED visits by minors that involve alcohol and no other drug.
- Withdrawal. Patients in active withdrawal.
- Drug seekers. Patients attempting to procure drugs, but only if there is evidence of recent drug use.

There are a few clearly delineated exceptions to the DAWN case criteria. An ED visit is *not* a DAWN case if:

- There is no evidence of recent drug use.
- The patient left the ED without being treated.
- The patient consumed a non-pharmaceutical substance but did not inhale it.
- The patient has a history of drug use but no recent use.
- Alcohol is the only substance involved and the patient is an adult (age 21 or over).

¹ Substance Abuse and Mental Health Services Administration, Office of Applied Studies. *Drug Abuse Warning Network: Development of a New Design (Methodology Report)*. DAWN Series M-4, DHHS Publication No. (SMA) 02-3754, Rockville, MD, 2002. This publication is available online at <http://DAWNinfo.samhsa.gov/>.

² This review is conducted by data collectors called "DAWN reporters."

- The only documentation of a drug is in toxicology test results.
- The only drugs listed (e.g., current medications) are not related to the visit.
- The patient is being treated for a consequence of undermedication, i.e., taking too little of a drug.

The case criteria adopted for new DAWN solve many problems inherent in the previous criteria. From 1972 to 2002, a DAWN case was defined as a visit related to drug abuse, and drug abuse was determined by the patient's intent. That is, an ED visit was a DAWN case if the patient's reason for taking the drug was dependence, suicide attempt or gesture, or to achieve psychic effects. DAWN cases could involve the use of an illegal drug, the non-medical use of a legal one, or the inhalation of a non-pharmaceutical substance. Visits were excluded, regardless of the drug involved, if the "intent to abuse" was absent.

Certainty with regard to a patient's intention is frequently not evident in medical records. Therefore, identification of drug abuse cases based on positive or explicit indicators in medical charts is often impossible and certainly varies systematically across EDs, among clinicians within EDs, and among patients. Financial incentives, whereby an insurer can legally deny payment for ED visits related to substance abuse, may be a factor to influence documentation practices. Further, the lack of clear and objective distinctions between use, misuse, and abuse also influence documentation in ways that are probably systematic but indiscernible. As a result, if the case criteria based on intent were strictly applied, cases involving use or misuse of a drug would be lost when the source record lacked explicit documentation of abuse as defined by DAWN. Thereby, ED visits of interest to DAWN users were excluded. If the criteria were applied improperly or inconsistently (a more likely scenario), the resulting data would be systematically flawed. Moreover, the resulting cases included a mix of acute and chronic conditions, based on drug use that occurred a few hours or years before the visit.

The new case criteria solve all of these problems. In new DAWN, only recent drug use is included; the reason a patient used a drug is irrelevant; and the criteria are broad enough to encompass all types of drug-related events, including, but not limited to, explicit drug abuse.

Table 2

Comparison of major features, new DAWN versus old DAWN

New DAWN (began 2003)	Old DAWN (ended 2002)
Cases reported to DAWN	
All types of drug-related ED visits	ED visits related to drug abuse only
Simple case criteria: <i>Any ED visit related to recent drug use</i>	Complex case criteria: ED visits related to drug abuse, defined as the use of an illicit drug or the non-medical use of a licit drug for one of the following purposes: <ul style="list-style-type: none"> ■ Suicide attempt or gesture ■ Dependence ■ To achieve psychic effects
Current or recent drug use	Drug abuse at any time: <ul style="list-style-type: none"> ■ Current or recent drug abuse ■ Past (history of) drug abuse
Patient's intent is not considered	Patient's intent to abuse a drug was key
8 case types assigned hierarchically: <ul style="list-style-type: none"> ■ Suicide attempt ■ Seeking detox ■ Alcohol only (age < 21) ■ Adverse reaction (to prescription or over-the-counter drugs) ■ Overmedication ■ Malicious poisoning ■ Accidental ingestion ■ Other (any case not categorized above) 	1 case type with 3 subcategories: <ul style="list-style-type: none"> ■ Suicide attempt or gesture ■ Seeking detox ■ Other drug abuse
Patients of any age	Patients age 6 to 97
Drugs reported to DAWN	
Only those drugs related to the ED visit	Any drug
All types of drugs: <ul style="list-style-type: none"> ■ Illicit drugs ■ Prescription and over-the-counter medications ■ Dietary supplements ■ Non-pharmaceutical inhalants 	Same
Maximum of 6 drugs, plus alcohol	Maximum of 4 drugs, plus alcohol
"Alcohol-in-combination" reportable for any case; "Alcohol only" for patients age < 21	"Alcohol-in-combination" only
Current medications unrelated to the visit are not reportable	Current medications reportable, even when unrelated to the visit
Other data items	
Whether each drug was confirmed by toxicology	No information about laboratory confirmation
Information about health: <ul style="list-style-type: none"> ■ Chief complaints ■ Diagnoses 	No information about health
Expanded categories for patient disposition: <ul style="list-style-type: none"> ■ 3 categories for treated and released ■ 5 categories for patients admitted to the hospital 	Limited categories for patient disposition: <ul style="list-style-type: none"> ■ 1 category for treated and released ■ 1 category for patients admitted to the hospital
No information about form or source	Included form and source of substance
6 categories for route of administration	7 categories for route of administration

Table 2 (continued)

Comparison of major features, new DAWN versus old DAWN

New DAWN (began 2003)	Old DAWN (ended 2002)
Other changes	
Case finding by retrospective review of medical charts for all patients treated in the ED	Mix of chart review and screening methods
Rigorous reporter training and quality assurance	Limited oversight
Performance feedback to hospitals and reporters	Limited feedback
Sample of hospitals	
Sample of hospitals to represent the complete U.S.	Sample of hospitals to represent the coterminous U.S.
Eligible hospitals: Short-term, general, non-Federal hospitals operating 24-hour EDs	Same
Metropolitan areas represented: <ul style="list-style-type: none"> ■ New boundary definitions based on 2000 Census ■ Oversampling in 22 areas ■ Expansion to additional areas planned 	Metropolitan areas represented: <ul style="list-style-type: none"> ■ Boundary definitions based on 1980 Census ■ Oversampling in 21 areas
National estimates based on: <ul style="list-style-type: none"> ■ Oversampling in designated metropolitan areas ■ "Supplementary sample" representing hospitals outside those areas 	National estimates based on: <ul style="list-style-type: none"> ■ Oversampling in designated metropolitan areas ■ "National panel" sample representing hospitals outside those areas

SOURCE: Office of Applied Studies, SAMHSA, Drug Abuse Warning Network, 2004.

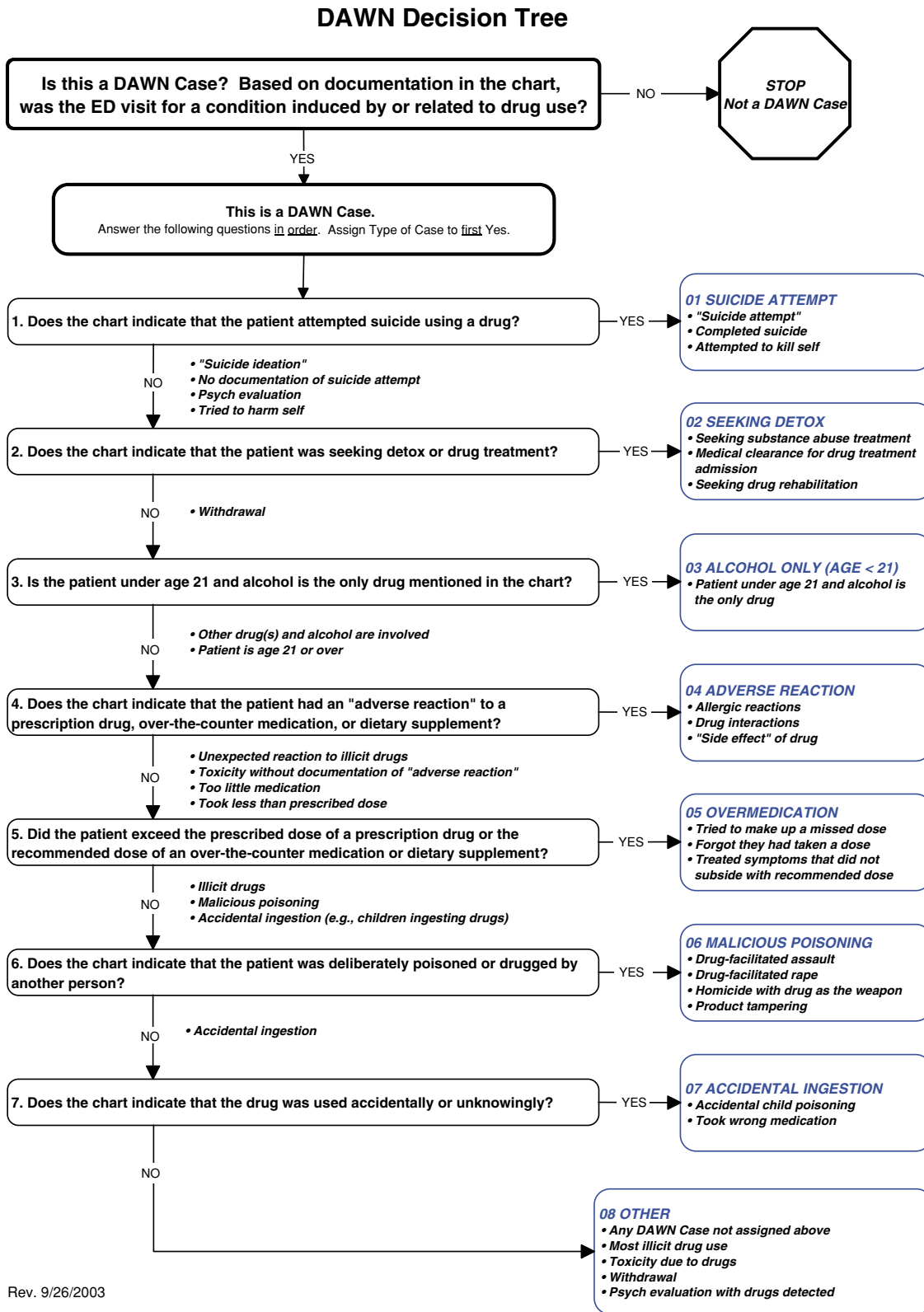
Types of cases in new DAWN

By design, the broad new case criteria yield a diverse set of cases in new DAWN. To bring order to this heterogeneous mix of DAWN cases, each case is assigned to one of eight case types, which may be analyzed separately or in purposeful combinations. The eight case types are:

- Suicide attempt;
- Seeking detoxification;
- Alcohol only in patients under age 21;
- Adverse reaction;
- Overmedication;
- Malicious poisoning (includes drug-facilitated sexual assault or product tampering);
- Accidental ingestion; and
- *Other.*

Each DAWN case is assigned hierarchically into one and only one case type, based on a series of questions and rules. To assign case type, DAWN reporters use a decision tree, a graphical depiction of the logic of the case type assignment rules (Figure 1). Cases are classified into the first case type that applies. Even if a case might fit into more than one type, it is assigned to the first one that applies. The case types were ordered with this in mind.

Figure 1
Type of case decision tree



The final category, the case type called *other*, is reserved for DAWN cases that do not meet any of the rules for classification into the first seven types. By design, most cases of drug abuse are classified as case type *other*. This approach, which never directly identifies drug abuse, comes from the recognition that:

- Medical records frequently lack explicit documentation of substance abuse, and
- Distinctions by clinicians between use, misuse, and abuse of drugs are often subjective.

This occurs for several reasons. First, there is no bright line to distinguish non-medical use, overuse, misuse, and abuse, so the distinctions are subjective. Second, if there is a low index of suspicion for drug abuse in some types of patients, ED physicians may be unlikely to label those types of patients as drug abusers. Third, in many States, insurers may legally deny payment for ED visits related to substance abuse. Thus, financial incentives may be a factor to influence documentation practices.

Obviously, DAWN now includes some ED visits that are unrelated to drug abuse. Therefore, a method for isolating a set of cases involving drug abuse is necessary. This method is described in the chapter entitled *Defining Drug Abuse in the New DAWN*.

What drugs are included in new DAWN?

DAWN includes all types of drugs.³ Drugs eligible for DAWN include:

- Illegal drugs, such as heroin, cocaine, marijuana, and Ecstasy;
- Prescription drugs, such as Prozac®, Vicodin®, OxyContin®, alprazolam, and methylphenidate;
- Over-the-counter (OTC) medications, including aspirin, acetaminophen, ibuprofen, and multi-ingredient cough and cold remedies;
- Dietary supplements, including vitamins, herbal remedies, and nutritional products;
- Psychoactive, non-pharmaceutical inhalants;
- Alcohol in combination with other drugs; and
- Alcohol alone, in patients age less than 21 years.

To be reportable, a non-pharmaceutical substance must be consumed by inhalation, sniffing, or snorting, and must have a psychoactive effect when inhaled. An ED visit involving inhalation of a non-pharmaceutical, psychoactive substance and no other drug qualifies as a DAWN case. Carbon monoxide is excluded from the inhalants.

Other improvements in new DAWN

Many other changes were implemented to improve the quality and reliability of DAWN data. These include:

- Case finding by a retrospective review of ED medical records for every patient treated in a participating ED;
- Conversion from paper to electronic reporting with automated prompts and data validation;
- Addition of data items on the health effects of drug use and additional detail on patient disposition;
- Elimination of incidental drug reporting;
- Emphasis on accurate, specific, and non-redundant drug reporting;

³ The classification of drugs used in DAWN is derived from the Multum *Lexicon*, Copyright 2004, Multum Information Services, Inc. The classification has been modified to meet DAWN's unique requirements (2004). The Multum Licensing Agreement governing use of the *Lexicon* is provided in Appendix A and can be found on the Internet at <http://www.multum.com>.

- Addition of data items to identify drugs confirmed by laboratory testing;
- Systematic training and certification of DAWN reporters; and
- In-house review and cleaning of DAWN case reports.

A discussion of these improvements is provided in Appendix B. The case report form showing all the DAWN data items is shown in Figure 2.

Figure 2
DAWN ED case form

Department of Health and Human Services Substance Abuse and Mental Health Services Administration

Drug Abuse Warning Network (DAWN)
Emergency Department Case Form

FOR SAMHSA USE ONLY FORM NUMBER _____ FORM APPROVED OMB. NO. 0930-0078 EXPIRES 12/31/2005

1. Facility ID **2. Cross-reference (for facility use only)**

PATIENT INFORMATION

3. Date of Visit
MONTH DAY YEAR **4. Time of Visit**
HOUR MINUTES
1 a.m.
2 p.m.
3 military

5. Age
 1 Less than 1 year
8 Not documented

6. Patient's Home ZIP Code

Otherwise, mark [x] one response:
1 No fixed address (e.g., homeless)
2 Institution (e.g., shelter/jail/hospital)
8 Not documented

7. Sex
1 Male
2 Female
8 Not documented

8. Race/Ethnicity
Mark [x] one or more:
White
Black or African American
Hispanic or Latino
Asian
American Indian or Alaska Native
Native Hawaiian or Other Pacific Islander
Not documented

9. Case Description Describe how the drug(s) was related to the ED visit. Copy verbatim from the patient's chart when possible.

10. Chief Complaint Mark [x] all that apply:
Overdose Seeking detox
Intoxication Accident/injury/assault
Seizures Abscess/cellulitis/skin/tissue
Altered mental status Chest pain
Psychiatric condition Respiratory problems
Withdrawal Digestive problems
Other (specify): _____

11. Substance(s) Involved Using available documentation, list all substances that caused or contributed to the ED visit. Record substances as specifically as possible (i.e., brand [trade] name preferred over generic name preferred over chemical name, etc.). Do not record the same substance by two different names.

Route of Administration
Circle one:
Mark [x] if confirmed by toxicology test

SAMHSA USE ONLY	Substance (record verbatim)	Route of Administration					
		Oral	Injected	Inhaled, sniffed, snorted	Smoked	Other	Not documented
1		1	2	3	4	5	8
2		1	2	3	4	5	8
3		1	2	3	4	5	8
4		1	2	3	4	5	8
5		1	2	3	4	5	8
6		1	2	3	4	5	8
7	C 2 0 0 0 2 9 Alcohol involved? 1 Yes 2 No 8 Not documented	1	2	3	4	5	8

12. Type of Case
Mark [x] the first category that applies:
01 Suicide attempt
02 Seeking detox
03 Alcohol only (age < 21)
04 Adverse reaction
05 Overmedication
06 Malicious poisoning
07 Accidental ingestion
08 Other

13. Diagnosis List up to 4 diagnoses noted in the patient's chart. Do not list ICD codes.
1 _____ 3 _____
2 _____ 4 _____

14. Disposition Mark [x] one:
Treated and released: Admitted to this hospital: Other disposition:
01 Discharged home 04 ICU/Critical care 09 Transferred
02 Released to police/jail 05 Surgery 10 Left against medical advice
03 Referred to detox/treatment 06 Chemical dependency/detox 11 Died
07 Psychiatric unit 96 Other
08 Other inpatient unit 98 Not documented

SMA 100-1 REV. 12/2002 SEE BURDEN STATEMENT ON BACK

Estimates in this publication

Estimates in this publication were derived by applying sampling weights to the data collected from the probability sample of hospitals. Only national estimates pertaining to the coterminous U.S. are provided.

The transition to the new sample of hospitals was not completed in 2003, so estimates in this publication are based on the existing sample from 1988. Hospitals eligible for the DAWN 1988 sample were non-Federal, short-stay, general, medical and surgical hospitals in the coterminous U.S. that operated 24-hour EDs. The sampling frame came from the American Hospital Association's (AHA) 1984 and 1985 Annual Surveys of Hospitals. (For a definition of sampling frame and other technical terms used in this publication, see Appendix C, Glossary of Terms.) The characteristics of this sample have been described in detail previously.⁴

The 1988 sample included an oversampling of hospitals in 21 metropolitan areas supplemented with a sample of hospitals from the remainder of the coterminous U.S., which includes other metropolitan areas and rural areas. The metropolitan area boundaries corresponded to the Office of Management and Budget (OMB) 1983 definitions of Metropolitan Statistical Areas (MSAs) and Primary Metropolitan Statistical Areas (PMSAs), which were based on the 1980 census, with a few exceptions. The size of the 1988 sample has changed over time as hospitals closed, merged with others, or become ineligible, while others have been added as part of annual sample maintenance efforts.

National estimates are the sum of the estimates from the 22 geographic units (21 metropolitan areas and the remainder of the coterminous U.S.). The weights are calculated for each quarter of data using a three-component model that considers:

- The base sampling weight, calculated as the reciprocal of the sampling probability;
- An adjustment for non-response, based either on complete non-participation or failure to provide data on all the reporting days in a given time period; and
- A post-stratification (benchmark) factor, applied within metropolitan areas, to adjust the total number of ED visits among participating sample hospitals to the total for the eligible population of hospitals as determined from the sampling frame.

The non-response adjustment to the sampling weights is designed to account for data that are missing, but not for data that are incomplete. Therefore, considering the many changes to DAWN, an intense level of scrutiny was given the data for this publication. For 2003, case eligibility and type of case assignment were subjected to 100% blind double review. All cases in which the first and second reviewers did not agree were sent to a third reviewer for adjudication. A final review focused explicitly on the possibility of incomplete data, that is, DAWN cases missed due to incomplete chart review or inappropriate application of the case criteria. As a result of this final step, all data for 37 hospitals (39 EDs) and an additional 69 hospital months (71 ED months) were deemed unusable and were deleted from the final data used for estimation.

⁴ Substance Abuse and Mental Health Services Administration, Office of Applied Studies. *Emergency Department Trends From the Drug Abuse Warning Network, Final Estimates 1995-2002*. DAWN Series D-24, DHHS Publication No. (SMA) 03-3780, Rockville, MD, 2003.

Hospital participation in 2003 (Table 3)

For quarters 3 and 4 of 2003, 260 out of 518 sampled hospitals submitted usable data. This 50% response rate varied from 22% in Los Angeles to 73% in Washington, DC. Response by hospitals covering the coterminous U.S. outside of the 21 metropolitan areas was 59%.

Hospitals participating in DAWN varied in size from about 300 total ED visits to more than 60,000 in the two quarters covered by this publication. In total, more than 5 million ED visits occurred in the 260 hospitals.

On average, a DAWN member hospital submitted 260 DAWN cases (about 43 per month) involving an average of 1.7 drugs per case. However, the number of cases varied widely, from 2 cases to more than 3,000 in a single hospital during Q3-Q4 2003. The proportion of ED visits that were drug-related also varied, from less than 1% to about 9%.

Table 3
ED sample information and response rates: Q3-Q4 2003

Metropolitan area	Total eligible hospitals ¹	Eligible hospitals in sample	Responding hospitals in sample	Response rate for sample hospitals	Response rate for visits (unweighted)
Total coterminous U.S.	4,558	518	260	50.2	50.9
Atlanta	32	18	12	66.7	75.1
Baltimore	21	21	12	57.1	52.0
Boston	44	24	13	54.2	46.7
Buffalo	10	10	7	70.0	75.0
Chicago	62	33	15	45.5	43.0
Dallas	30	18	7	38.9	48.1
Denver	14	14	4	28.6	40.4
Detroit	39	18	7	38.9	36.9
Los Angeles	73	37	8	21.6	28.5
Miami	22	18	6	33.3	50.7
Minneapolis	25	18	8	44.4	52.0
New Orleans	23	16	9	56.3	54.4
New York	78	34	13	38.2	39.0
Newark	24	16	8	50.0	41.3
Philadelphia	58	29	19	65.5	70.9
Phoenix	23	17	10	58.8	69.6
St. Louis	33	24	11	45.8	49.5
San Diego	17	17	9	52.9	63.4
San Francisco	18	18	9	50.0	38.5
Seattle	20	15	10	66.7	65.6
Washington, DC	28	15	11	73.3	78.6

¹ Short-term, general, non-Federal hospitals with 24-hour emergency departments, based on the American Hospital Association (AHA) Annual Survey.
SOURCE: Office of Applied Studies, SAMHSA, Drug Abuse Warning Network, 2003 (03/2004 update).

The margin of error

Since DAWN relies on a sample of hospitals, each estimate produced from the DAWN ED sample data is subject to sampling variability, the so-called “margin of error.” This is the variation in the estimate that would be observed naturally if different samples were drawn from the same population using the same procedures. The sampling variability of an estimate in this publication is measured by its relative standard error (RSE), which is the standard error of the estimate expressed as a percentage of the estimate. The precision of an estimate is related to its sampling variability as measured by the RSE; the greater the RSE, the lower the precision.

DAWN estimates with RSE values of 50% or higher are regarded as too imprecise for publication and are not shown. In the tables, 3 dots (“...”) are shown in the place of estimates that have an RSE of 50% or higher.

In this publication, “confidence intervals” (CIs) are included in most of the tables and are cited in the text along with the estimates. A CI, which is expressed as a range of values, does a better job of reflecting the true nature of the statistical estimates because it takes both the estimate and its margin of error into account. A 95% CI means that if repeated samples were drawn from the same population of hospitals using the same sampling and data collection procedures, the true population value would fall within the confidence interval 95% of the time.

For readers unfamiliar with these concepts, a more detailed discussion and examples are provided in Appendix D.

Estimates adjusted for population size

Standardized measures are needed to make valid comparisons of ED visits and drugs across age and gender categories that differ in population size. For age in particular, the size of the underlying population differs considerably across age groups; for example, the number of individuals age 18 to 20 in the U.S. is much lower than the number of individuals age 35 to 44.

To take the size of the underlying population into account, rates of ED visits or drugs per 100,000 population are generated using population data from the U.S. Bureau of the Census.⁵ An example is provided in Appendix D, and the population estimates used for this publication can be found in Appendix E.

Standardized rates are not calculated for race and ethnicity subgroups because the race and ethnicity categories available to DAWN are much less detailed than the race and ethnicity categories in the Census data. Appendix F describes the race and ethnicity data reported to DAWN.

⁵ Population counts from U.S. Census 2000 Summary File 1 (SF-1) (see <http://www.census.gov/Press-Release/www/2001/sumfile1.html>). Population estimates for 2003, as of July 1, 2003, from U.S. Census Bureau County Population Dataset CO-EST2003-ALLDATA (see <http://www.census.gov/popest/counties/files/CO-EST2003-alldata.csv>).

DEFINING DRUG ABUSE IN THE NEW DAWN

In 2003, DAWN cases began to include any ED visit related to recent drug use. Included are visits directly caused by the use, misuse, or abuse of a drug(s), as well as visits where the use, misuse, or abuse of a drug(s) contributed to the patient's condition but did not cause it. Included also are visits where a drug was merely implicated and visits where the drug's involvement as cause or contributor is not well defined.

While designating "drug abuse" cases in new DAWN is more challenging than before, the diversity of cases also provides new analytical opportunities and more flexibility than was possible before. This chapter will discuss the strategy used to define ED visits that are related to drug abuse and of interest to the substance abuse community.

Defining drug abuse

The model for DAWN's new analytic strategy comes from the National Survey on Drug Use and Health (NSDUH).⁶ The NSDUH focuses on three categories of drug use: use of illicit drugs, use of alcohol, and non-medical use of pharmaceuticals.⁷ In DAWN, three similar categories of drug use can be isolated based on two factors: the drugs involved in the ED visit and the case type.

The result is a set of three categories of ED visits used in this publication to present findings on drug misuse and abuse:

- Use of illicit drugs;
- Use of alcohol, in combination with other drugs or alcohol alone in patients under the age of 21; and
- Non-medical use ("misuse" or "abuse") of pharmaceuticals (prescription or OTC).

First, a category of ED visits related to the use of illicit drugs or inhalants, regardless of case type, can be created. For this publication, this includes ED visits involving the use of drugs previously termed "major substances of abuse":

- Cocaine
- Heroin
- Marijuana
- Major stimulants, including amphetamines and methamphetamine
- MDMA (Ecstasy)
- Gamma hydroxy butyrate (GHB)
- Flunitrazepam (Rohypnol)
- Ketamine
- Lysergic acid diethylamide (LSD)
- Phencyclidine (PCP)
- Other hallucinogens
- Non-pharmaceutical inhalants
- Combinations of the above

⁶ Substance Abuse and Mental Health Services Administration, Office of Applied Studies. *Results From the 2002 National Survey on Drug Use and Health: National Findings*. NHSDA Series H-22, DHHS Publication No. (SMA) 03-3836, Rockville, MD, 2003.

⁷ Substance Abuse and Mental Health Services Administration, Office of Applied Studies. *2004 National Survey on Drug Use and Health: CAI Specs for Programming English Version*. Contract No. 283-03-9028, Project No. 8726, Deliverable 2. Rockville, MD, December 2003.

Second, two categories of ED visits related to alcohol use can be developed:

- Alcohol in combination with other drugs, based on drugs reported, regardless of case type.
- Alcohol only in patients age less than 21. This category will be based solely on case type.⁸ Although alcohol is an illegal drug for minors, combining these cases with other cases involving illicit drugs tends to mask rather than highlight their importance for prevention and treatment efforts.

Third, a category for non-medical use of prescription and OTC drugs⁹ can be defined based on case type, specifically, by combining three case types:

- Overmedication. This category was designed to capture non-medical use, overuse, and misuse of prescription and OTC medications that are not documented as drug abuse in a medical chart.
- Malicious poisoning. This category was designed to capture cases of drug use in which the patient was administered a drug by another for a malicious purpose. Drug-facilitated sexual assault is one type of malicious poisoning, but other types of malicious poisonings such as product tampering would be classified in this category as well.
- Case type *other*. As discussed previously, this case type includes all cases that could not be assigned to any of the other seven types. By design, most cases of documented drug abuse will fall into this category, and most cases in this category will involve non-medical use of drugs and other substances.

Two remaining case types are analyzed separately, but may be combined selectively with the non-medical use category for particular applications or audiences. These include:

- Suicide attempt. Suicide attempts that involve prescription or OTC pharmaceuticals undoubtedly represent non-medical use of these drugs. Only documented suicide attempts (e.g., "attempted suicide," "tried to kill self") are classified in this category. Suicidal gestures, thoughts, or ideation, including attempts to "harm" self, are assigned to another case type.
- Seeking detox. These visits are classified separately because they often reflect administrative practices that vary across hospitals and may vary over time within the same hospital. Seeking detox visits tend to be concentrated in those facilities that provide substance abuse treatment services, and the largest numbers are found in facilities that require medical clearance for such treatment in their EDs.

⁸ Cases of underage drinking that were classified as suicide attempt or seeking detox will remain in those categories for analysis.

⁹ Unlike the NSDUH, DAWN includes medical as well as non-medical use of pharmaceuticals and includes pharmaceuticals sold over-the-counter as well as by prescription.

Exclusions from drug misuse and abuse

In this publication, our definition of non-medical use consistently excludes the two remaining case types:

- Adverse reaction. Adverse reactions represent the consequences of using a prescription or OTC pharmaceutical for therapeutic purposes and include visits related to adverse drug reactions, side effects, drug-drug interactions, and drug-alcohol interactions. Adverse reactions that involve a pharmaceutical and an illicit drug are exceptions that are excluded from this category.
- Accidental ingestion. This category includes cases involving the accidental use of a drug, for example, childhood drug poisonings and individuals who take the wrong medication or wrong dosage by mistake.

DRUG-RELATED ED VISITS IN Q3-Q4 2003

Total drug-related ED visits (Table 4)

Estimates for the entire universe of hospitals in the coterminous U.S. are produced by applying sampling weights to the data received from the sampled hospitals. Thus, 67,583 submitted cases are extrapolated to an estimate of 627,923 drug-related ED visits. Considering the margin of error, this estimate may range from 535,619 to 720,227 drug-related ED visits out of more than 52 million total ED visits estimated for the coterminous U.S.

Drug-related ED visits by case type (Figure 3)

The distribution of drug-related ED visits across the eight case types is illustrated in Figure 3. The pie chart on the top (A) illustrates the estimated mix of case types for the coterminous U.S. For comparison, the bottom pie (B) shows the mix of case types in unweighted data.

Estimates for the coterminous U.S. show the largest number of cases (over one-third) fell into the category *other*. Adverse reaction, which accounted for a quarter of drug-related ED visits, is second in frequency, followed by overmedication (17%). Ten percent of drug-related ED visits were for patients seeking detox. Suicide attempt, which was narrowly defined, accounted for 6% of drug-related visits. Visits associated with underage alcohol consumption and no other drug (alcohol only) accounted for 4% of drug-related ED visits, accidental ingestion 3%, and malicious poisoning 0.2%.

Table 4

Drug-related ED visits, by type of case: Q3-Q4 2003

Drug-related ED visits					
Type of case	Unweighted sample data	Weighted estimates ¹	Relative standard error (RSE)	95% Confidence interval	
				Lower bound	Upper bound
Suicide attempt	3,981	40,044	8.2	33,607	46,481
Seeking detox	9,421	61,506	22.0	34,985	88,027
Alcohol only (age < 21)	2,894	22,552	13.8	16,452	28,652
Adverse reaction	9,319	155,006	14.4	111,257	198,755
Overmedication	9,321	105,401	8.2	88,461	122,341
Malicious poisoning	166	1,300	25.0	663	1,937
Accidental ingestion	1,167	16,769	13.3	12,398	21,140
Other	31,314	225,345	14.4	161,743	288,947
Total drug-related visits	67,583	627,923	7.5	535,619	720,227
Total ED visits (all reasons)	5,268,743	52,336,352	0.0		

Drugs					
Type of case	Unweighted sample data	Weighted estimates ²	Relative standard error (RSE)	95% Confidence interval	
				Lower bound	Upper bound
Suicide attempt	8,218	86,856	9.5	70,684	103,028
Seeking detox	18,204	128,598	24.6	66,593	190,603
Alcohol only (age < 21)	2,894	22,552	13.8	16,452	28,652
Adverse reaction	11,479	185,109	14.2	133,590	236,628
Overmedication	16,353	194,184	8.3	162,595	225,773
Malicious poisoning	307	2,314	22.6	1,289	3,339
Accidental ingestion	1,436	20,873	13.4	15,391	26,355
Other	55,385	416,788	15.5	290,168	543,408
Drugs in all drug-related visits²	114,276	1,057,275	8.5	881,134	1,233,416

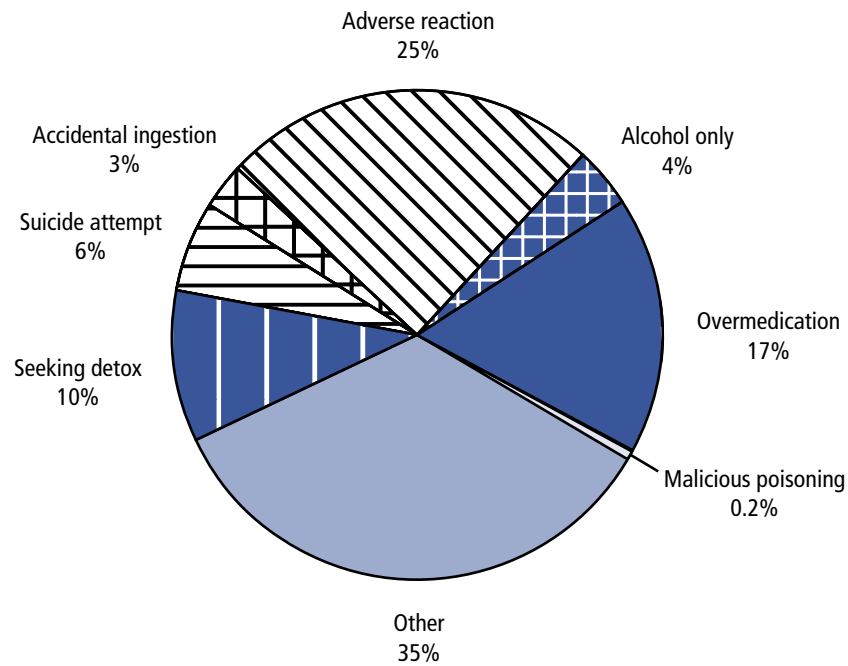
¹ These are estimates of ED visits based on a representative sample of non-Federal, short-stay hospitals with 24-hour EDs in the coterminous U.S.

² These are estimates of drugs. A single ED visit may involve multiple drugs.

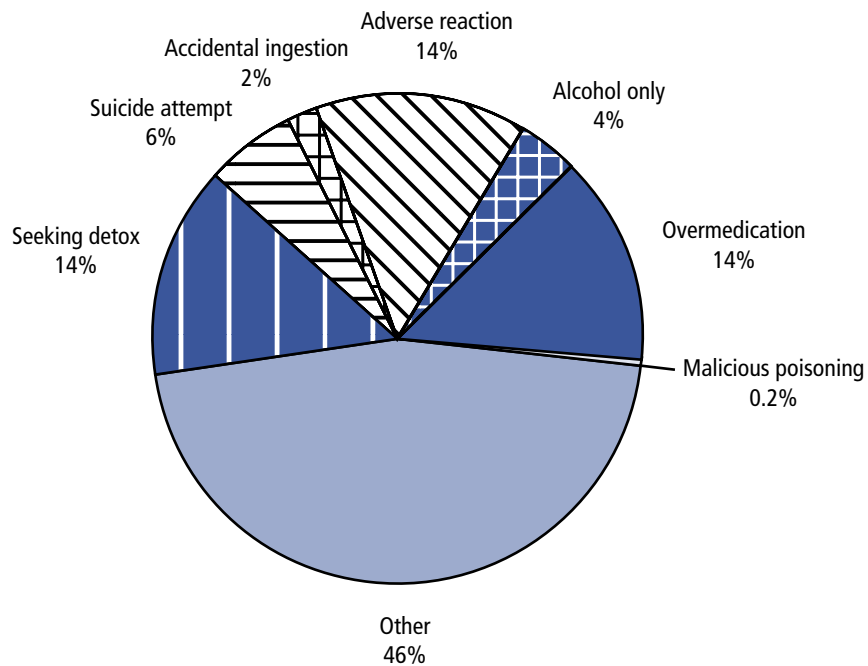
SOURCE: Office of Applied Studies, SAMHSA, Drug Abuse Warning Network, 2003 (03/2004 update).

Figure 3
Drug-related ED visits, by type of case: Q3-Q4 2003

A. Estimates for the coterminous U.S.



B. Unweighted sample data



SOURCE: Office of Applied Studies, SAMHSA, Drug Abuse Warning Network, 2003 (03/2004 update).

ILLCIT DRUGS IN ED VISITS

The first method for assessing drug abuse in new DAWN focuses on illicit drugs, regardless of case type.

For Q3-Q4 2003, DAWN estimates 305,731 (CI: 230,228 to 381,234) drug-related ED visits that involved a major substance of abuse (Table 5). This means that nearly half of all the drug-related ED visits during this period involved alcohol or an illicit drug.

DAWN estimates that cocaine was involved in 125,921 (CI: 67,429 to 184,413) ED visits. In other words, approximately 1 in 5 drug-related ED visits (20%) involved cocaine.

Marijuana was involved in 79,663 (CI: 39,067 to 120,259) ED visits. Thus, marijuana may be as common as cocaine in drug-related ED visits.

Heroin was involved in 47,604 (CI: 31,369 to 63,839) drug-related ED visits or 8% of drug-related ED visits overall. This could, however, be an underestimate. Heroin is an opiate, and some drug screens test for opiates only as a class. Among the drug reports to DAWN, nearly 9 out of 10 (87%) reports of "opiates" come from toxicology findings, so some unknown quantity of these may have been heroin. The number of unspecified opiates in drug-related ED visits is estimated at 24,623 (CI: 12,510 to 36,736) visits, or 4% of all drug-related ED visits.

Stimulants, including amphetamines and methamphetamine, were involved in from 42,538 (CI: 20,860 to 64,216) ED visits, about 7% of drug-related ED visits overall. Amphetamines and methamphetamine are combined for this analysis because about three-quarters of amphetamine reports are derived from toxicology findings. Since some drug screens test for amphetamines only as a class, an amphetamine-positive result could indicate amphetamine or methamphetamine.

Other illicit drugs appeared at much lower frequencies. For Q3-Q4 2003, DAWN estimates:

- MDMA (Ecstasy) in 2,221 (CI: 923 to 3,519) ED visits;
- GHB in 990 (CI: 535 to 1,445) ED visits;
- Ketamine in 73 (CI: 24 to 122) ED visits;
- LSD in 656 (CI: 352 to 960) ED visits;
- PCP in 4,581 (CI: 2,139 to 7,023) ED visits;
- Miscellaneous hallucinogens in 684 (CI: 304 to 1,064) ED visits; and
- Non-pharmaceutical inhalants in 1,681 (CI: 999 to 2,363) ED visits.

By design, DAWN excludes illicit drugs from all case types except suicide attempt, seeking detox, malicious poisoning, and *other*. Also by design, most illicit drug use will be classified in case type *other*, with most of the remainder in suicide attempts and seeking detox cases (Table 6). For example:

- Cocaine was found in 11% of visits related to suicide attempt and nearly half (47%) of seeking detox visits.
- Heroin was infrequent (1%) in visits related to suicide attempt, but was present in a quarter of seeking detox visits.
- Marijuana was found in 9% of visits related to suicide attempts and 14% of seeking detox visits. Marijuana was also involved in 16% of malicious poisoning visits.

Table 5**Illicit drugs and alcohol in drug-related ED visits: Q3-Q4 2003**

Drug category and selected drugs ¹	Estimated visits ^{2,3,4}	Relative standard error (RSE)	95% Confidence interval		
			Lower bound	-	Upper bound
Total drug-related ED visits	627,923	7.5	535,619	-	720,227
Major substances of abuse (includes alcohol)					
Alcohol	305,731	12.6	230,228	-	381,234
Alcohol-in-combination	141,343	8.8	116,965	-	165,721
Alcohol alone	118,724	10.5	94,291	-	143,157
Alcohol alone	22,619	13.8	16,502	-	28,736
Cocaine	125,921	23.7	67,429	-	184,413
Heroin	47,604	17.4	31,369	-	63,839
Marijuana	79,663	26.0	39,067	-	120,259
Stimulants	42,538	26.0	20,860	-	64,216
Amphetamines	18,129	18.0	11,734	-	24,524
Methamphetamine	25,039	36.6	7,078	-	43,000
MDMA (Ecstasy)	2,221	29.8	923	-	3,519
GHB	990	23.4	535	-	1,445
Flunitrazepam (Rohypnol)	...	86.8	...	-	...
Ketamine	73	34.3	24	-	122
LSD	656	23.6	352	-	960
PCP	4,581	27.2	2,139	-	7,023
Miscellaneous hallucinogens	684	28.3	304	-	1,064
Inhalants	1,681	20.7	999	-	2,363
Combinations not tabulated above (NTA)	1,346	35.4	413	-	2,279

¹ This classification of drugs is derived from the Multum *Lexicon*, Copyright 2004, Multum Information Services, Inc. The classification has been modified to meet DAWN's unique requirements (2004). The Multum Licensing Agreement governing use of the *Lexicon* is provided in Appendix A and can be found on the Internet at <http://www.multum.com>.

² These are estimates of ED visits based on a representative sample of non-Federal, short-stay hospitals with 24-hour EDs in the coterminous U.S.

³ Estimates are all expressed in visits. For example, 125,921 visits involved cocaine, and 47,604 visits involved heroin. Visits cannot be summed across drugs because drug-related ED visits often involve multiple drugs (e.g., visits involving both cocaine and heroin would be double counted).

⁴ Three dots (...) indicate that an estimate with an RSE greater than 50% has been suppressed.

SOURCE: Office of Applied Studies, SAMHSA, Drug Abuse Warning Network, 2003 (03/2004 update).

Table 6
Illicit drugs, by type of case: Q3-Q4 2003

Drug category and selected drugs ¹	All case types	Type of case							
		Suicide attempt	Seeking detox	Alcohol only (age < 21)	Adverse reaction	Over-medication	Malicious poisoning	Accidental ingestion	Other
Drug-related ED visits^{2,3,4}									
Total drug-related ED visits	627,923	40,044	61,506	22,552	155,006	105,401	1,300	16,769	225,345
Cocaine	125,921	4,544	29,035				...	...	91,818
Heroin	47,604	495	15,428				14		31,667
Marijuana	79,663	3,603	8,705				202	...	67,131
Stimulants	42,538	1,692	5,794		...	1,167	194	...	32,374
Amphetamines	18,129	1,141	1,056		...	1,149	77	...	14,056
Methamphetamine	25,039	...	4,755		...	...	...	...	18,921
MDMA (Ecstasy)	2,221	35	...				23		1,886
GHB	990	...	7				...		856
Flunitrazepam (Rohypnol)	...						...		...
Ketamine	73	...	...						63
LSD	656	...	183				2	...	326
PCP	4,581	187	453				24		3,917
Miscellaneous hallucinogens	684		43				...	...	637
Inhalants	1,681	12	392		...			640	626
Combinations NTA	1,346	...	24						1,213
Percent of visits									
Cocaine	20%	11%	47%						41%
Heroin	8%	1%	25%				1%		14%
Marijuana	13%	9%	14%				16%		30%
Stimulants	7%	4%	9%			1%	15%		14%
Amphetamines	3%	3%	2%			1%	6%		6%
Methamphetamine	4%		8%						8%
MDMA (Ecstasy)	0%	0%					2%		1%
GHB	0%		0%						0%
Flunitrazepam (Rohypnol)									
Ketamine	0%								0%
LSD	0%		0%				0%		0%
PCP	1%	0%	1%				2%		2%
Miscellaneous hallucinogens	0%		0%						0%
Inhalants	0%	0%	1%					4%	0%
Combinations NTA	0%		0%						1%

Table 6 (continued)

Illicit drugs, by type of case: Q3-Q4 2003

Drug category and selected drugs ¹	All case types	Type of case							
		Suicide attempt	Seeking detox	Alcohol only (age < 21)	Adverse reaction	Over-medication	Malicious poisoning	Accidental ingestion	Other
ED visits per 100,000 population^{2,3,4}									
Total drug-related ED visits	217	14	21	8	54	36	0	6	78
Cocaine	44	2	10				...	...	32
Heroin	16	0	5				0		11
Marijuana	28	1	3				0	...	23
Stimulants	15	1	2		...	0	0	...	11
Amphetamines	6	0	0		...	0	0	...	5
Methamphetamine	9	...	2		...	...	...	...	7
MDMA (Ecstasy)	1	0	...				0		1
GHB	0	...	0				...		0
Flunitrazepam (Rohypnol)	...						...		...
Ketamine	0	...	...						0
LSD	0	...	0				0	...	0
PCP	2	0	0				0		1
Miscellaneous hallucinogens	0		0				...	...	0
Inhalants	1	0	0		...			0	0
Combinations NTA	0	...	0						0

¹ This classification of drugs is derived from the Multum *Lexicon*, Copyright 2004, Multum Information Services, Inc. The classification has been modified to meet DAWN's unique requirements (2004). The Multum Licensing Agreement governing use of the *Lexicon* is provided in Appendix A and can be found on the Internet at <http://www.multum.com>.

² These are estimates of ED visits based on a representative sample of non-Federal, short-stay hospitals with 24-hour EDs in the coterminous U.S.

³ Estimates are all expressed in visits. For example, 125,921 visits involved cocaine, and 47,604 visits involved heroin. Visits cannot be summed across drugs because drug-related ED visits often involve multiple drugs (e.g., visits involving both cocaine and heroin would be double counted).

⁴ Three dots (...) indicate that an estimate with an RSE greater than 50% has been suppressed.

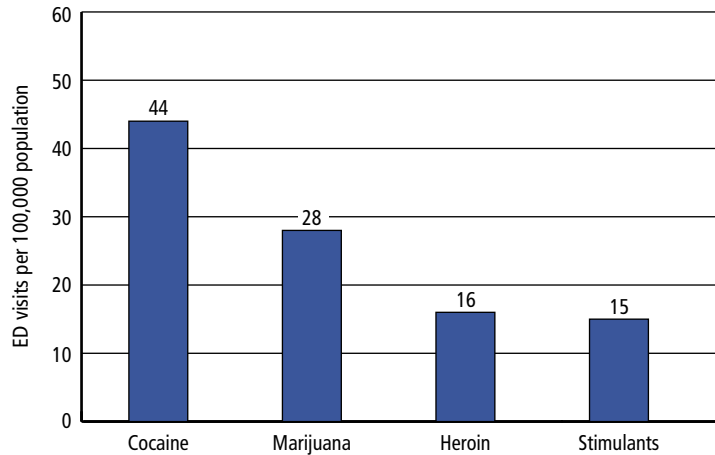
SOURCE: Office of Applied Studies, SAMHSA, Drug Abuse Warning Network, 2003 (03/2004 update).

When considered in relation to population, ED visits associated with illicit drugs are relatively low, but vary across the major drugs (Figure 4):

- 44 visits per 100,000 population for cocaine;
- 28 visits per 100,000 population for marijuana;
- 16 visits per 100,000 population for heroin; and
- 15 visits per 100,000 population for stimulants.

The rates of ED visits involving cocaine, marijuana, heroin, and stimulants did not differ between males and females after taking population size and the margin of error into account. The rates for patients ages 21 to 54 tended to be similar as well, with lower rates for younger and older patients (Table 7 and Figure 5). Marijuana was the exception, with the highest rates for patients age 18 to 24.

Figure 4
Illicit drugs in ED visits: Q3-Q4 2003



SOURCE: Office of Applied Studies, SAMHSA, Drug Abuse Warning Network, 2003 (03/2004 update).

Table 7
Illicit drugs, by patient characteristics: Q3-Q4 2003

Patient characteristics	Selected drugs ¹							
	Cocaine	Heroin	Marijuana	Stimulants	MDMA (Ecstasy)	GHB	LSD	PCP
Drug-related ED visits^{2,3,4}								
Total drug-related ED visits	125,921	47,604	79,663	42,538	2,221	990	656	4,581
Gender								
Male	78,293	30,205	53,162	25,389	1,523	513	616	3,377
Female	47,483	17,330	26,340	17,142	698	477	39	1,202
Unknown	145	68	...	...				...
Age								
0-5 years	...	7	7	...				
6-11 years	...		15	...	1			6
12-17 years	...	411	12,202	3,739	...	...	71	...
18-20 years	7,274	2,714	11,923	4,917	688	274	57	...
21-24 years	11,892	6,200	10,230	6,096	...	65	...	934
25-29 years	14,765	7,724	8,806	5,833	...	133	...	573
30-34 years	17,922	6,216	10,017	6,818	...	60	184	901
35-44 years	46,175	14,921	17,215	10,062	77	277	...	516
45-54 years	21,030	8,151	8,128	3,617	11	5	9	...
55-64 years	2,729	1,131	957	552				...
65 years and older	452	104	...	23				...
Unknown	112	25	11	8	10	...		...
Race/ethnicity								
White	62,581	25,209	47,175	31,098	927	847	562	1,442
Black	40,184	10,194	17,644	1,193	564	9	18	2,331
Hispanic	11,264	4,515	7,574	3,364	...	...	...	554
Race/ethnicity NTA	2,005	428	1,180	756	...	...	26	31
Unknown	9,887	7,258	6,092	6,127	185	...	32	223

Table 7 (continued)

Illicit drugs, by patient characteristics: Q3-Q4 2003

Patient characteristics	Selected drugs ¹							
	Cocaine	Heroin	Marijuana	Stimulants	MDMA (Ecstasy)	GHB	LSD	PCP
ED visits per 100,000 population^{2,3,4}								
Total drug-related ED visits	44	16	28	15	1	0	0	2
Gender								
Male	56	21	38	18	1	0	0	2
Female	32	12	18	12	0	0	0	1
Age								
0-5 years	...	0	0	...				
6-11 years	...		0	...	0			0
12-17 years	...	2	48	15	...	...	0	...
18-20 years	66	25	109	45	6	3	1	...
21-24 years	81	42	69	41	...	0	...	6
25-29 years	74	39	44	29	...	1	...	3
30-34 years	85	29	47	32	...	0	1	4
35-44 years	99	32	37	22	0	1	...	1
45-54 years	54	21	21	9	0	0	0	...
55-64 years	11	4	4	2				...
65 years and older	1	0	...	0				...

¹ This classification of drugs is derived from the Multum *Lexicon*, Copyright 2004, Multum Information Services, Inc. The classification has been modified to meet DAWN's unique requirements (2004). The Multum Licensing Agreement governing use of the *Lexicon* is provided in Appendix A and can be found on the Internet at <http://www.multum.com>.

² These are estimates of ED visits based on a representative sample of non-Federal, short-stay hospitals with 24-hour EDs in the coterminous U.S.

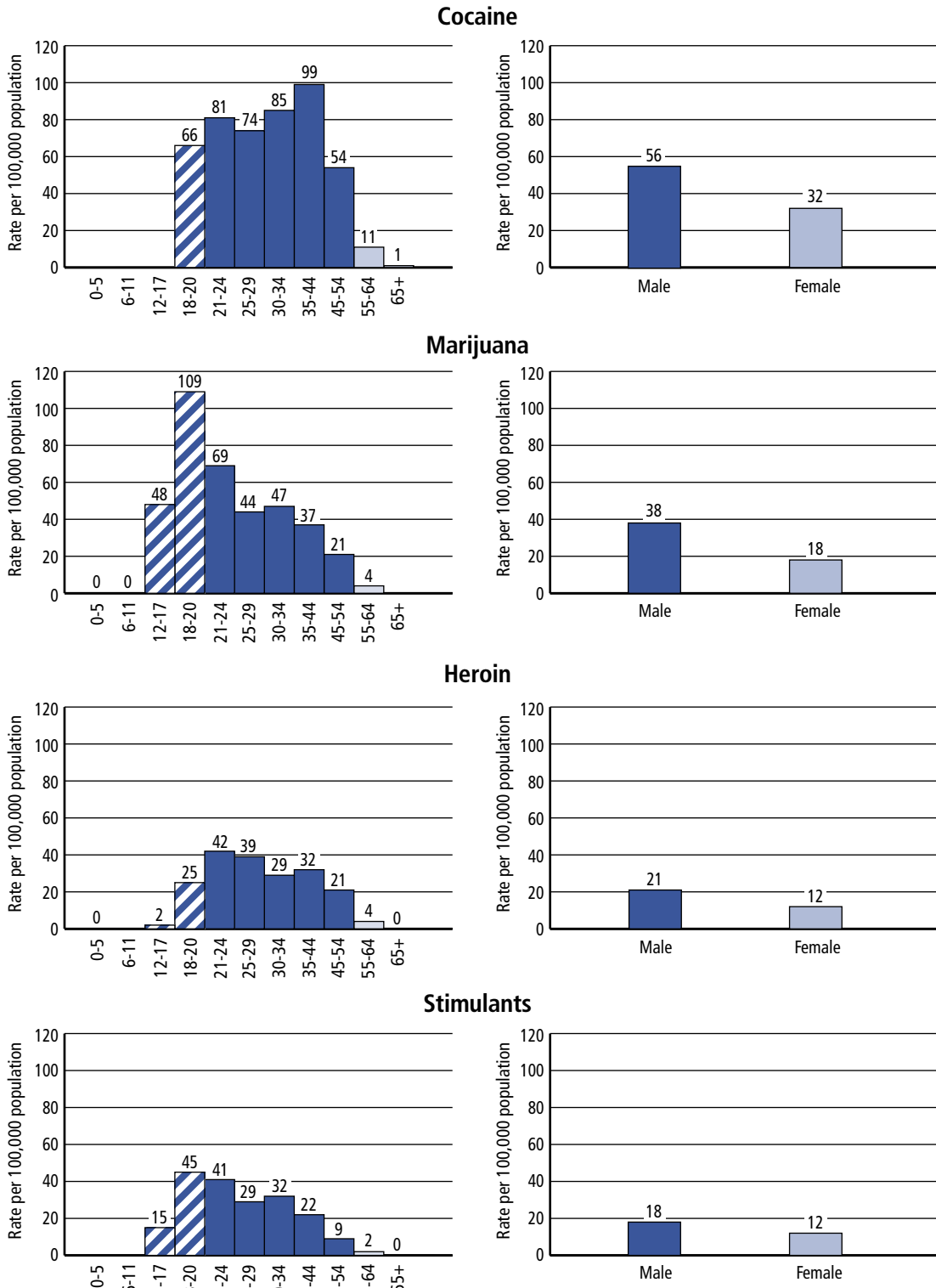
³ Estimates are all expressed in visits.

⁴ Three dots (...) indicate that an estimate with an RSE greater than 50% has been suppressed.

SOURCE: Office of Applied Studies, SAMHSA, Drug Abuse Warning Network, 2003 (03/2004 update).

Figure 5

Illicit drugs, ED visit rates by age and gender: Q3-Q4 2003



SOURCE: Office of Applied Studies, SAMHSA, Drug Abuse Warning Network, 2003 (03/2004 update).

ALCOHOL AND DRUG-RELATED ED VISITS

The second method for assessing drug misuse and abuse in new DAWN focuses on alcohol:

- Alcohol used in combination with other drugs, and
- Alcohol alone, in patients under the age of 21.

For Q3-Q4 2003, DAWN estimates 141,343 (CI: 116,965 to 165,721) ED visits involved alcohol in combination with another drug or alcohol alone in a patient under the age of 21. Thus, nearly a quarter (23%) of all drug-related ED visits involved alcohol in one of these forms (Table 8).

Table 8
Alcohol in drug-related ED visits: Q3-Q4 2003

Drug category and selected drugs ¹	Estimated visits ^{2,3}	Relative standard error (RSE)	95% Confidence interval		
			Lower bound	-	Upper bound
Total drug-related ED visits	627,923	7.5	535,619	-	720,227
Alcohol	141,343	8.8	116,965	-	165,721
Alcohol-in-combination	118,724	10.5	94,291	-	143,157
Alcohol alone	22,619	13.8	16,502	-	28,736

¹ This classification of drugs is derived from the Multum *Lexicon*, Copyright 2004, Multum Information Services, Inc. The classification has been modified to meet DAWN's unique requirements (2004). The Multum Licensing Agreement governing use of the *Lexicon* is provided in Appendix A and can be found on the Internet at <http://www.multum.com>.

² These are estimates of ED visits based on a representative sample of non-Federal, short-stay hospitals with 24-hour EDs in the coterminous U.S.

³ Estimates are all expressed in visits.

SOURCE: Office of Applied Studies, SAMHSA, Drug Abuse Warning Network, 2003 (03/2004 update).

Alcohol in combination with other drugs (Tables 8-11, Figure 6)

DAWN estimates 118,724 (CI: 94,291 to 143,157) ED visits related to use of alcohol in combination with another drug in Q3-Q4 2003. Alcohol is reported to DAWN in combination with other drugs, regardless of the patient's age. These are the only alcohol reports received for patients age 21 and older.

Nearly 9 out of 10 (87%) ED visits implicating alcohol with another drug were for adult patients.

Alcohol in combination appeared in substantial numbers in most case types:

- In 26% of ED visits related to suicide attempts;
- In 33% of seeking detox visits;
- In 22% of overmedication visits;
- In 59% of malicious poisoning visits; and
- In 28% of visits categorized as case type *other*.

Alcohol appeared rarely in adverse reactions (1% of visits).

Table 9

Alcohol, by type of case: Q3-Q4 2003

Drug category and selected drugs ¹	All case types	Type of case							
		Suicide attempt	Seeking detox	Alcohol only (age < 21)	Adverse reaction	Over-medication	Malicious poisoning	Accidental ingestion	Other
Drug-related ED visits^{2,3,4}									
Total drug-related ED visits	627,923	40,044	61,506	22,552	155,006	105,401	1,300	16,769	225,345
Alcohol	141,343	10,447	20,124	22,552	1,686	22,871	765	...	62,771
Alcohol-in-combination	118,724	10,429	20,075		1,686	22,871	765	...	62,771
Alcohol alone	22,619	18	49	22,552					
Percent of visits									
Alcohol	23%	26%	33%	100%	1%	22%	59%		28%
Alcohol-in-combination	19%	26%	33%		1%	22%	59%		28%
Alcohol alone	4%	0%	0%	100%					

¹ This classification of drugs is derived from the Multum *Lexicon*, Copyright 2004, Multum Information Services, Inc. The classification has been modified to meet DAWN's unique requirements (2004). The Multum Licensing Agreement governing use of the *Lexicon* is provided in Appendix A and can be found on the Internet at <http://www.multum.com>.

² These are estimates of ED visits based on a representative sample of non-Federal, short-stay hospitals with 24-hour EDs in the coterminous U.S.

³ Estimates are all expressed in visits.

⁴ Three dots (...) indicate that an estimate with an RSE greater than 50% has been suppressed.

SOURCE: Office of Applied Studies, SAMHSA, Drug Abuse Warning Network, 2003 (03/2004 update).

Alcohol was most frequently combined with:

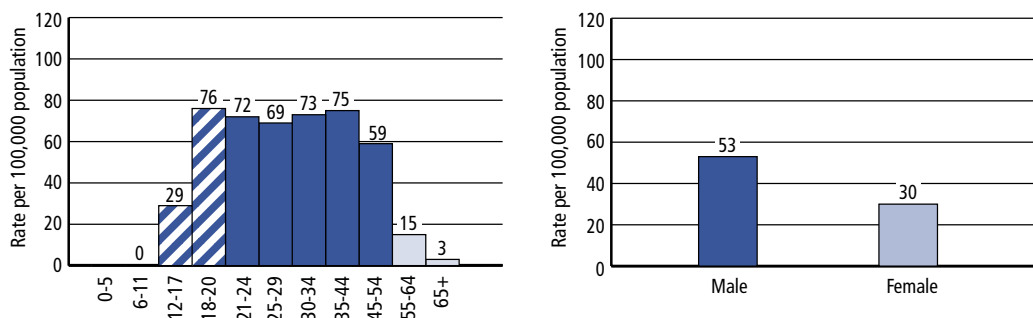
- Cocaine alone (24,049 visits),
- Marijuana alone (10,310 visits),
- Cocaine and marijuana (5,754 visits), and
- Heroin alone (5,160 visits).

Considering cases involving misuse or abuse of drugs—overmedication, malicious poisoning, and case type *other*—as a group, DAWN estimates 86,407 (CI: 68,455 to 104,359) ED visits involving alcohol in combination with other drugs in Q3-Q4 2003. Males accounted for 62% of the visits involving alcohol and other drugs, but taking population size into account, males and females had similar rates of such visits. There was little variation in rates across the age groups from ages 18 to 54. However, rates of such visits were lower for older and younger patients.

In terms of race and ethnicity, 61% of the visits with alcohol in combination involved patients who were white, 17% black, and 10% Hispanic.

Figure 6

Alcohol with other drugs, ED visit rates by age and gender: Q3-Q4 2003



SOURCE: Office of Applied Studies, SAMHSA, Drug Abuse Warning Network, 2003 (03/2004 update).

Table 10

Drugs reported most frequently with alcohol, by type of case: Q3-Q4 2003

Drugs reported with alcohol ¹	All case types	Type of case							
		Suicide attempt	Seeking detox	Alcohol only (age < 21)	Adverse reaction	Over-medication	Malicious poisoning	Accidental ingestion	Other
Drug-related ED visits^{2,3}									
Cocaine only	24,049	349	6,351				187		17,162
No other drug	22,619	18	49	22,552					
Marijuana only	10,310	132	777				5		9,396
Cocaine and marijuana only	5,754	52	1,286						4,416
Heroin only	5,160	32	1,554						3,573
Alprazolam only	2,675	417	164		12	1,490		5	587
Cocaine and heroin only	2,534	14	1,167						1,353
Acetaminophen only	1,820	733	140			907			40
Methamphetamine only	1,806	5	318				8		1,476
Atenolol only	1,610					1,610			

¹ This classification of drugs is derived from the Multum *Lexicon*, Copyright 2004, Multum Information Services, Inc. The classification has been modified to meet DAWN's unique requirements (2004). The Multum Licensing Agreement governing use of the *Lexicon* is provided in Appendix A and can be found on the Internet at <http://www.multum.com>.

² These are estimates of ED visits based on a representative sample of non-Federal, short-stay hospitals with 24-hour EDs in the coterminous U.S.

³ Estimates are all expressed in visits.

SOURCE: Office of Applied Studies, SAMHSA, Drug Abuse Warning Network, 2003 (03/2004 update).

Table 11
Alcohol, by patient characteristics: Q3-Q4 2003

Patient characteristics	All case types ^{1,2,3,4}			Overmedication, malicious poisoning, and case type <i>other</i> ^{1,2,3,4}
	All alcohol	Alcohol-in-combination	Alcohol alone	Alcohol-in-combination
Total drug-related ED visits	141,343	118,724	22,619	86,407
Gender				
Male	86,478	74,681	11,797	53,533
Female	54,724	43,919	10,805	32,791
Unknown	142	124	18	83
Age				
0-5 years	38	...	23	11
6-11 years	...	9	...	7
12-17 years	16,770	7,259	9,511	6,173
18-20 years	21,262	8,308	12,954	6,544
21-24 years	10,609	10,609		8,312
25-29 years	13,729	13,729		9,682
30-34 years	15,426	15,426		10,088
35-44 years	35,242	35,242		24,554
45-54 years	23,270	23,270		17,527
55-64 years	3,724	3,724		2,826
65 years and older	1,054	1,054		617
Unknown	78	78		...
Race/ethnicity				
White	87,335	73,174	14,161	52,712
Black	21,957	20,211	1,746	15,094
Hispanic	14,496	11,607	2,890	8,835
Race/ethnicity NTA	2,601	1,982	619	1,615
Unknown	14,954	11,750	3,203	8,151

¹ This classification of drugs is derived from the Multum *Lexicon*, Copyright 2004, Multum Information Services, Inc. The classification has been modified to meet DAWN's unique requirements (2004). The Multum Licensing Agreement governing use of the *Lexicon* is provided in Appendix A and can be found on the Internet at <http://www.multum.com>.

² These are estimates of ED visits based on a representative sample of non-Federal, short-stay hospitals with 24-hour EDs in the coterminous U.S.

³ Estimates are all expressed in visits.

⁴ Three dots (...) indicate that an estimate with an RSE greater than 50% has been suppressed.

SOURCE: Office of Applied Studies, SAMHSA, Drug Abuse Warning Network, 2003 (03/2004 update).

Alcohol only in patients under the age of 21 (Tables 8-9 and 12, Figure 7)

DAWN estimates 22,552 (CI: 16,452 to 28,652) ED visits related to use of alcohol by patients who were younger than age 21 in Q3-Q4 2003 (Table 4). These numbers rise very little (to 22,619 [CI: 16,502 to 28,736] visits) if the few instances of underage alcohol use in suicide attempts and seeking detox cases are also included (Tables 8-9).

The most frequent chief complaint was intoxication (83% of visits), followed by accident/injury/assault (15%), altered mental status (13%), and digestive problems (5%), which include nausea and vomiting.

Alcohol was specifically indicated in a diagnosis in about 2 out of 3 (68%) alcohol-only visits, with toxic effects (e.g., "intoxication") in slightly fewer (62%). Injuries were diagnosed in 16% of alcohol-only visits, and accidents, involving falls or motor vehicles, were indicated by diagnosis in 4%. This is not inconsistent with the incidence of chief complaints of accident/injury/assault. It is important to remember that external sources of injury may be documented in parts of the medical record other than chief complaint and diagnoses.

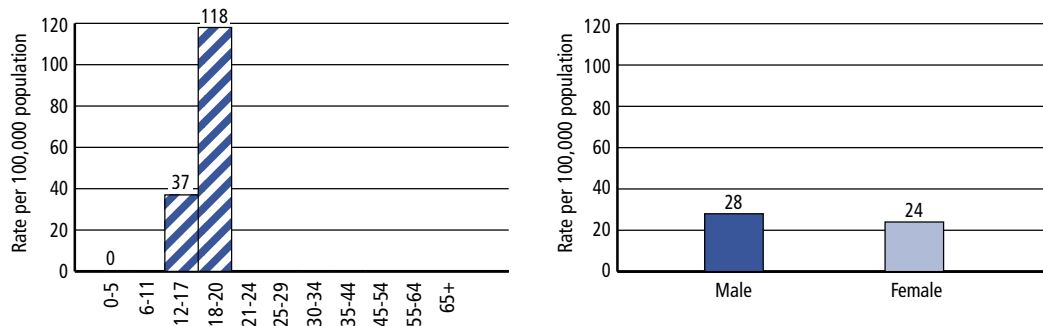
Nearly 9 out of 10 (87%) of such visits resulted in patients being treated and released, usually to home; another 9% were admitted to inpatient units.

Taking population size into account, the rate of alcohol-only ED visits for ages 18 to 20 (118 visits per 100,000 population) was three times that for patients age 12 to 17 (37 per 100,000). The rates for males and females were equivalent.

In terms of race and ethnicity, 63% of the alcohol-only visits involved patients who were white, 13% Hispanic, and 8% black.

Figure 7

Alcohol only (age < 21), ED visit rates by age and gender: Q3-Q4 2003



SOURCE: Office of Applied Studies, SAMHSA, Drug Abuse Warning Network, 2003 (03/2004 update).

Table 12

Alcohol only (age < 21), by patient and visit characteristics: Q3-Q4 2003

Patient/visit characteristics	Estimated visits ^{1,2}	Patient/visit characteristics	Estimated visits ^{1,2}
Total drug-related ED visits	22,552		
Gender		Number of drugs involved	
Male	11,758	Single drug	22,552
Female	10,777	Multiple drugs	
Unknown	18	Alcohol involved	22,552
Age		Disposition	
0-5 years	23	Treated and released	19,596
6-11 years	...	Discharged home	17,621
12-17 years	9,485	Released to police/jail	1,148
18-20 years	12,912	Referred to detox/treatment	...
21-24 years		Admitted to this hospital	2,109
25-29 years		ICU/critical care	...
30-34 years		Surgery	...
35-44 years		Chemical dependency/detox	42
45-54 years		Psychiatric unit	202
55-64 years		Other inpatient unit	901
65 years and older		Other disposition	...
Unknown		Transferred	...
Race/ethnicity		Left against medical advice	43
White	14,120	Died	
Black	1,734	Other	31
Hispanic	2,887	Not documented	123
Race/ethnicity NTA	618		
Unknown	3,193		
Chief complaint(s)³		Selected diagnoses³	
Overdose	214	Drug-related diagnoses	
Intoxication	18,697	Abuse	1,710
Seizures	45	Alcohol	15,260
Altered mental status	2,980	Toxic effects	14,012
Psychiatric condition	659	Other conditions	
Withdrawal	8	Altered mental status	817
Seeking detox	...	Injuries	3,683
Accident/injury/assault	3,387	Psychiatric conditions	1,118
Abscess/cellulitis/skin/tissue	...	Depression	534
Chest pain	38	Suicide (other than attempt)	271
Respiratory problems	110	Miscellaneous	
Digestive problems	1,059	Accidents	998
Other	1,606	Fall	69
		Motor vehicle	929

¹ These are estimates of ED visits based on a representative sample of non-Federal, short-stay hospitals with 24-hour EDs in the coterminous U.S.

² Three dots (...) indicate that an estimate with an RSE greater than 50% has been suppressed.

³ Components do not sum to total because multiple complaints or multiple diagnoses may be reported for a single visit.

SOURCE: Office of Applied Studies, SAMHSA, Drug Abuse Warning Network, 2003 (03/2004 update).

Any alcohol in patients under the age of 21 (Table 13)

Alcohol use by minors also occurs in combination with other drugs. Considering alcohol only and alcohol in combination with other drugs, DAWN estimates:

- 16,770 (CI: 12,037 to 21,503) drug-related ED visits for patients age 12-17, and
- 21,262 (CI: 16,386 to 26,138) drug-related ED visits for patients age 18-20.

Table 13

Alcohol in drug-related ED visits in patients under age 21: Q3-Q4 2003

Drug category and selected drugs ¹	Estimated visits ^{2,3}	Relative standard error (RSE)	95% Confidence interval		
			Lower bound	-	Upper bound
Patients age 12-17					
Alcohol	16,770	14.4	12,037	-	21,503
Alcohol-in-combination	7,259	20.1	4,399	-	10,119
Alcohol alone	9,511	17.2	6,305	-	12,717
Patients age 18-20					
Alcohol	21,262	11.7	16,386	-	26,138
Alcohol-in-combination	8,308	15.1	5,849	-	10,767
Alcohol alone	12,954	16.9	8,663	-	17,245

¹ This classification of drugs is derived from the Multum *Lexicon*, Copyright 2004, Multum Information Services, Inc. The classification has been modified to meet DAWN's unique requirements (2004). The Multum Licensing Agreement governing use of the *Lexicon* is provided in Appendix A and can be found on the Internet at <http://www.multum.com>.

² These are estimates of ED visits based on a representative sample of non-Federal, short-stay hospitals with 24-hour EDs in the coterminous U.S.

³ Estimates are all expressed in visits.

SOURCE: Office of Applied Studies, SAMHSA, Drug Abuse Warning Network, 2003 (03/2004 update).

DRUG MISUSE AND ABUSE IN ED VISITS

The third method for assessing drug misuse and abuse in new DAWN focuses on particular types of drug-related ED visits: overmedication, malicious poisoning, and case type *other*.

Overmedication (Tables 14-15, Figure 8)

Overmedication is defined as a patient taking more than the prescribed or recommended dose of a prescription or OTC pharmaceutical. DAWN estimates 105,401 (CI: 88,461 to 122,341) drug-related ED visits for Q3-Q4 2003 involved overmedication.

The drugs most frequently involved in overmedication ED visits were:

- Psychotherapeutic agents (52% of visits), including antidepressants, antipsychotics, and drugs classified as anxiolytics, sedatives, and hypnotics, particularly the benzodiazepines; and
- Central nervous system (CNS) agents (52% of visits), including both prescription and OTC analgesics (pain relievers), anticonvulsants, and muscle relaxants.

On average, the ED visits related to overmedication involved 1.8 drugs per case; about half (52%) involved multiple drugs. About one-fifth (22%) involved alcohol in combination with other drugs.

The chief complaints associated with overmedication included overdose (84% of visits), altered mental status (19%), and psychiatric conditions (15%). More than one complaint may be recorded for a single visit.

The most frequently occurring diagnoses for overmedication cases were overdose (in 57% of visits), depression or another psychiatric condition (24%), and other suicide (11%). Diagnoses classified as other suicide include suicidal gestures, thoughts, or ideation; suicide attempts are classified separately. Visits related to overmedication frequently had diagnoses indicating drug involvement (53%) or alcohol (6%).

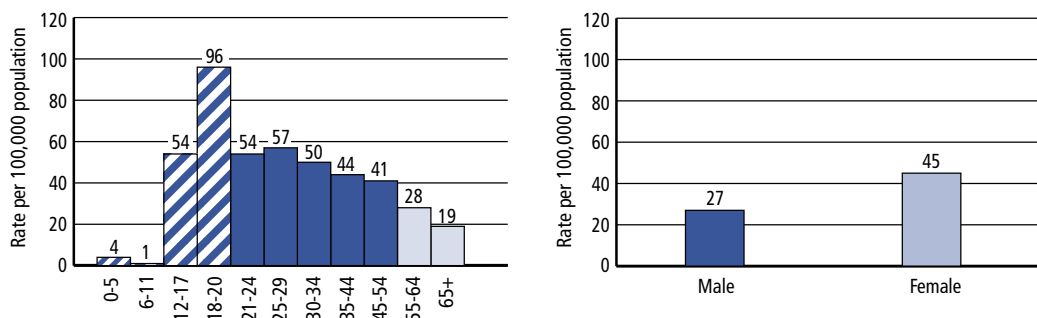
About 4 out of 10 (42%) of such visits were treated and released, but another 4 out of 10 (42%) resulted in admission to inpatient hospital units, with 18% being admitted to critical care. About 14% were transferred to another health care facility.

Overmedication cases more frequently involved females than males, with 45 visits per 100,000 population for females and 27 per 100,000 population for males. Among the age groups, the highest rate (96 per 100,000) was for patients age 18 to 20. Patients age 12 to 17 and patients age 21 to 54 had similar rates (from 41 to 57 visits per 100,000). Visit rates were lower for patients in the oldest (55 and over) age categories and lowest for patients 11 and younger.

In terms of race/ethnicity, 72% of overmedication visits involved patients who were white.

Figure 8

Overmedication, ED visit rates by age and gender: Q3-Q4 2003



SOURCE: Office of Applied Studies, SAMHSA, Drug Abuse Warning Network, 2003 (03/2004 update).

Table 14

Overmedication: Q3-Q4 2003

Drug category and selected drugs ¹	Estimated visits ^{2,3}	Relative standard error (RSE)	95% Confidence interval	
			Lower bound	Upper bound
Total drug-related ED visits	105,401	8.2	88,461	122,341
Psychotherapeutic agents	54,420	10.2	43,540	65,300
Antidepressants	19,534	10.2	15,630	23,438
Antipsychotics	8,888	14.5	6,362	11,414
Anxiolytics, sedatives, and hypnotics	34,420	12.0	26,325	42,515
Benzodiazepines	26,193	11.4	20,340	32,046
CNS agents	54,557	8.7	45,255	63,859
Analgesics	43,692	10.1	35,043	52,341
Opiates/opioids	20,830	10.9	16,381	25,279
Nonsteroidal anti-inflammatory agents	7,894	14.5	5,650	10,138
Salicylates/combinations	5,223	31.4	2,009	8,437
Miscellaneous analgesics/combinations	15,902	17.9	10,324	21,480
Anticonvulsants	6,569	13.3	4,856	8,282
Muscle relaxants	8,016	14.6	5,723	10,309

¹ This classification of drugs is derived from the Multum *Lexicon*, Copyright 2004, Multum Information Services, Inc. The classification has been modified to meet DAWN's unique requirements (2004). The Multum Licensing Agreement governing use of the *Lexicon* is provided in Appendix A and can be found on the Internet at <http://www.multum.com>.

² These are estimates of ED visits based on a representative sample of non-Federal, short-stay hospitals with 24-hour EDs in the coterminous U.S.

³ Estimates are all expressed in visits.

SOURCE: Office of Applied Studies, SAMHSA, Drug Abuse Warning Network, 2003 (03/2004 update).

Table 15**Overmedication, by patient and visit characteristics: Q3-Q4 2003**

Patient/visit characteristics	Estimated visits ^{1,2}	Patient/visit characteristics	Estimated visits ^{1,2}
Total drug-related ED visits	105,401		
Gender		Number of drugs involved	
Male	38,035	Single drug	50,769
Female	67,182	Multiple drugs	54,632
Unknown	...	Alcohol involved	22,871
Age		Disposition	
0-5 years	905	Treated and released	44,028
6-11 years	308	Discharged home	39,734
12-17 years	13,681	Released to police/jail	1,378
18-20 years	10,457	Referred to detox/treatment	2,916
21-24 years	7,987	Admitted to this hospital	44,488
25-29 years	11,396	ICU/critical care	19,367
30-34 years	10,522	Surgery	10
35-44 years	20,568	Chemical dependency/detox	675
45-54 years	15,969	Psychiatric unit	8,575
55-64 years	6,967	Other inpatient unit	15,861
65 years and older	6,626	Other disposition	16,884
Unknown	14	Transferred	14,248
Race/ethnicity		Left against medical advice	1,303
White	76,338	Died	...
Black	8,541	Other	307
Hispanic	7,763	Not documented	852
Race/ethnicity NTA	2,250		
Unknown	10,509		
Chief complaint(s)³		Selected diagnoses³	
Overdose	88,708	Drug-related diagnoses	
Intoxication	5,659	Abuse	5,783
Seizures	487	Drug or alcohol	57,907
Altered mental status	20,132	Alcohol	6,812
Psychiatric condition	15,351	Drug	56,249
Withdrawal	...	Overdose	60,394
Seeking detox	25	Overmedication	2,466
Accident/injury/assault	1,367	Toxic effects	8,391
Abscess/cellulitis/skin/tissue	961	Body system (includes infections)	10,426
Chest pain	1,722	Other conditions	
Respiratory problems	3,216	Altered mental status	4,174
Digestive problems	3,527	Pain	2,864
Other	9,684	Psychiatric conditions	24,974
		Depression	19,604
		Suicide (other than attempt)	11,885

¹ These are estimates of ED visits based on a representative sample of non-Federal, short-stay hospitals with 24-hour EDs in the coterminous U.S.

² Three dots (...) indicate that an estimate with an RSE greater than 50% has been suppressed.

³ Components do not sum to total because multiple complaints or multiple diagnoses may be reported for a single visit.

SOURCE: Office of Applied Studies, SAMHSA, Drug Abuse Warning Network, 2003 (03/2004 update).

Malicious poisoning (Tables 16-17, Figure 9)

DAWN estimates 1,300 (CI: 663 to 1,937) drug-related ED visits related to malicious poisoning for Q3-Q4 2003. Multiple drugs were involved in 63% of ED visits related to malicious poisoning, and 59% involved alcohol. Malicious poisoning means the patient was deliberately poisoned or drugged by another person. These cases may include drug-facilitated assault, drug-facilitated sexual assault, homicide when the weapon was a drug, and product tampering.

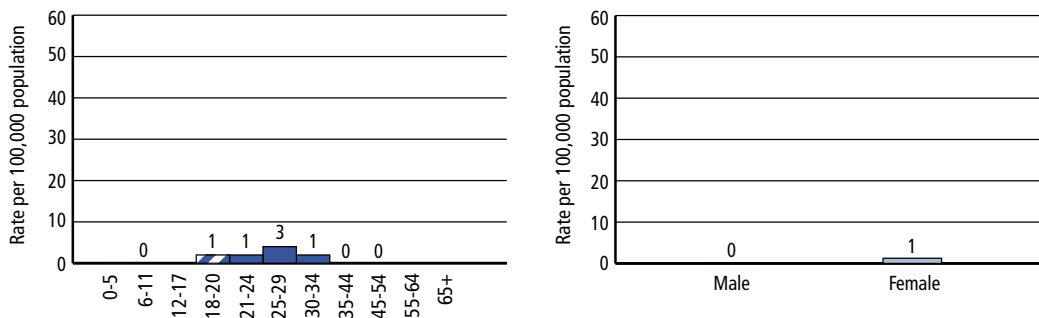
Alcohol was the most frequently occurring substance (59%) in ED visits related to malicious poisoning. Other drugs involved in these visits included marijuana (in 16% of visits), stimulants (15%), and opiate/opioid analgesics (14%). It is important to note, however, that the standard errors for the individual drug categories are quite high (usually more than 40%), and the estimates of ED visits are quite small.

Altered mental status was the most frequent chief complaint. However, other chief complaints (those that did not fit into pre-assigned categories) occurred in nearly half (47%) of visits associated with malicious poisonings.

The most frequently occurring diagnoses for malicious poisoning cases were altered mental status (11%), other infections (8%), or toxic effects (8%). DAWN estimates 7% of malicious poisoning cases had a diagnosis of assault, sexual assault, or sexual abuse. More than one-quarter (29%) of malicious poisoning visits had diagnoses indicating the involvement of a drug or alcohol.

Although the rates of malicious poisoning ED visits were very low across the board, the typical case appeared to be female, white, and age 25 to 29. The vast majority (87%) of patients were treated and released.

Figure 9
Malicious poisoning, ED visit rates by age and gender: Q3-Q4 2003



SOURCE: Office of Applied Studies, SAMHSA, Drug Abuse Warning Network, 2003 (03/2004 update).

Table 16
Malicious poisoning: Q3-Q4 2003

Drug category and selected drugs ¹	Estimated visits ^{2,3,4}	Relative standard error (RSE)	95% Confidence interval		
			Lower bound	-	Upper bound
Total drug-related ED visits	1,300	25.0	663	-	1,937
Major substances of abuse					
Alcohol	765	27.8	348	-	1,182
Alcohol-in-combination	765	27.8	348	-	1,182
Alcohol alone					
Cocaine	...	56.0	...	-	...
Heroin	14	48.7	0	-	28
Marijuana	202	45.9	20	-	384
Stimulants	194	47.9	12	-	376
MDMA (Ecstasy)	23	24.5	11	-	35
GHB	...	74.2	...	-	...
Flunitrazepam (Rohypnol)	...	51.7	...	-	...
PCP	24	40.6	4	-	44
Other substances					
Opiates/opioid analgesics	183	48.4	9	-	357

¹ This classification of drugs is derived from the Multum *Lexicon*, Copyright 2004, Multum Information Services, Inc. The classification has been modified to meet DAWN's unique requirements (2004). The Multum Licensing Agreement governing use of the *Lexicon* is provided in Appendix A and can be found on the Internet at <http://www.multum.com>.

² These are estimates of ED visits based on a representative sample of non-Federal, short-stay hospitals with 24-hour EDs in the coterminous U.S.

³ Estimates are all expressed in visits. Visits cannot be summed across drugs because drug-related ED visits often involve multiple drugs.

⁴ Three dots (...) indicate that an estimate with an RSE greater than 50% has been suppressed.

SOURCE: Office of Applied Studies, SAMHSA, Drug Abuse Warning Network, 2003 (03/2004 update).

Table 17

Malicious poisoning, by patient and visit characteristics: Q3-Q4 2003

Patient/visit characteristics	Estimated visits ^{1,2}	Patient/visit characteristics	Estimated visits ^{1,2}
Total drug-related ED visits	1,300		
Gender		Number of drugs involved	
Male	311	Single drug	...
Female	989	Multiple drugs	822
Unknown		Alcohol involved	765
Age		Disposition	
0-5 years	...	Treated and released	1,130
6-11 years	6	Discharged home	1,115
12-17 years	...	Released to police/jail	9
18-20 years	57	Referred to detox/treatment	...
21-24 years	91	Admitted to this hospital	28
25-29 years	571	ICU/critical care	12
30-34 years	195	Surgery	...
35-44 years	184	Chemical dependency/detox	...
45-54 years	24	Psychiatric unit	9
55-64 years	...	Other inpatient unit	...
65 years and older	...	Other disposition	...
Unknown	...	Transferred	...
Race/ethnicity		Left against medical advice	17
White	1,089	Died	...
Black	102	Other	...
Hispanic	35	Not documented	6
Race/ethnicity NTA	...		
Unknown	72		
Chief complaint(s)³		Selected diagnoses³	
Overdose	...	Drug-related diagnoses	
Intoxication	252	Drug or alcohol	385
Seizures		Alcohol	67
Altered mental status	454	Drug	363
Psychiatric condition	11	Illicits	215
Withdrawal		Other unspecified drug	160
Seeking detox		Toxic effects	109
Accident/injury/assault	...	Other conditions	
Abscess/cellulitis/skin/tissue	...	Altered mental status	147
Chest pain	35	Miscellaneous	
Respiratory problems	19	Assault	90
Digestive problems	77	Assault	11
Other	614	Sexual assault/abuse	81

¹ These are estimates of ED visits based on a representative sample of non-Federal, short-stay hospitals with 24-hour EDs in the coterminous U.S.

² Three dots (...) indicate that an estimate with an RSE greater than 50% has been suppressed.

³ Components do not sum to total because multiple complaints or multiple diagnoses may be reported for a single visit.

SOURCE: Office of Applied Studies, SAMHSA, Drug Abuse Warning Network, 2003 (03/2004 update).

Case type *other* (Tables 18-19, Figure 10)

DAWN estimates 225,345 (CI: 161,743 to 288,947) drug-related ED visits for Q3-Q4 2003 could not be classified into any of the seven case types discussed previously. On average, these visits involved 1.8 drugs per case; 46% involved a single drug and 54% multiple drugs. Alcohol was involved in 28% of other drug-related visits.

Drugs involved in these visits included alcohol, major substances of abuse, and pharmaceuticals taken, in general, for non-medical purposes. The most frequent drugs were:

- Cocaine, in 41% of visits;
- Marijuana, in 30%;
- Alcohol, in 28%;
- Heroin, in 14%;
- Major stimulants, including amphetamines and methamphetamine, in 14%;
- Benzodiazepines, in 13%; and
- Opiates/opioid analgesics (pain relievers), in 16%.

Common chief complaints included psychiatric conditions (in 23% of visits), altered mental status (21%), overdose (19%), and intoxication (10%). More than half (58%) of patients were treated and released, but nearly a third (32%) were admitted to inpatient units for additional care.

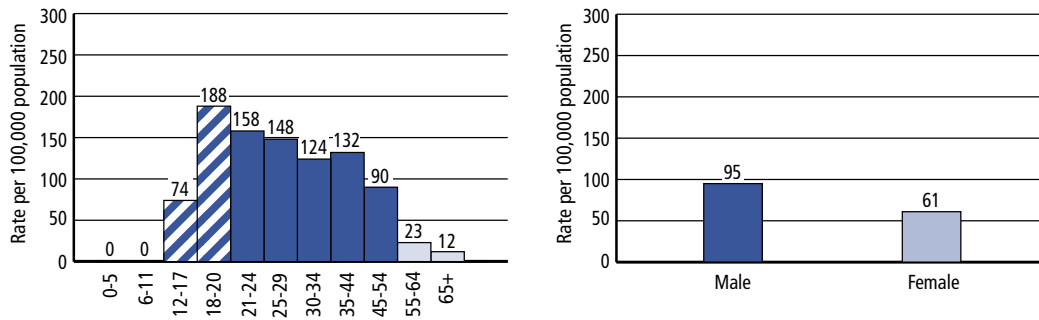
The most frequently occurring diagnoses for ED visits in the *other* category were drug abuse (32%), depression or another psychiatric condition (23%), and overdose (11%). More than half (62%) of these drug-related ED visits had diagnoses indicating the involvement of a drug, either illicit drugs (25%), a non-illicit or unspecified drug (38%), or alcohol (9%).

Drug-related ED visits in the case type *other* category more often involved males than females. The rates were 95 visits per 100,000 population for males and 61 per 100,000 for females. By age, the highest rates (from 124 to 188 visits per 100,000 population) occurred in ages 18 to 44. The rates for younger patients age 12 to 17 and older patients age 45 to 54 were similar (74 and 90 visits per 100,000, respectively) and lower than the rates for ages 18 to 44. The lowest rates (23 and below) were evident for the oldest patients, age 55 and above.

In terms of race/ethnicity, 57% of these drug-related ED visits involved patients who were white, 22% black, and 9% Hispanic.

Figure 10

Case type *other*, ED visit rates by age and gender: Q3-Q4 2003



SOURCE: Office of Applied Studies, SAMHSA, Drug Abuse Warning Network, 2003 (03/2004 update).

Table 18
Case type *other*: Q3-Q4 2003

Drug category and selected drugs ¹	Estimated visits ^{2,3,4}	Relative standard error (RSE)	95% Confidence interval		
			Lower bound	-	Upper bound
Total drug-related ED visits	225,345	14.4	161,743	-	288,947
Major substances of abuse					
Alcohol	62,771	15.2	44,071	-	81,471
Alcohol-in-combination	62,771	15.2	44,071	-	81,471
Alcohol alone					
Cocaine	91,818	25.4	46,107	-	137,529
Heroin	31,667	18.6	20,123	-	43,211
Marijuana	67,131	26.6	32,131	-	102,131
Stimulants	32,374	27.5	14,924	-	49,824
Amphetamines	14,056	19.1	8,793	-	19,319
Methamphetamine	18,921	37.8	4,903	-	32,939
MDMA (Ecstasy)	1,886	28.9	818	-	2,954
GHB	856	25.6	427	-	1,285
Flunitrazepam (Rohypnol)	...	119.7	...	-	...
Ketamine	63	32.9	22	-	104
LSD	326	30.2	134	-	518
PCP	3,917	30.4	1,583	-	6,251
Miscellaneous hallucinogens	637	30.3	259	-	1,015
Inhalants	626	25.8	308	-	944
Combinations NTA	1,213	37.8	313	-	2,113
Other substances					
Benzodiazepines	28,727	17.5	18,874	-	38,580
Opiates/opioid analgesics	36,232	18.3	23,237	-	49,227

¹ This classification of drugs is derived from the Multum *Lexicon*, Copyright 2004, Multum Information Services, Inc. The classification has been modified to meet DAWN's unique requirements (2004). The Multum Licensing Agreement governing use of the *Lexicon* is provided in Appendix A and can be found on the Internet at <http://www.multum.com>.

² These are estimates of ED visits based on a representative sample of non-Federal, short-stay hospitals with 24-hour EDs in the coterminous U.S.

³ Estimates are all expressed in visits. Visits cannot be summed across drugs because drug-related ED visits often involve multiple drugs.

⁴ Three dots (...) indicate that an estimate with an RSE greater than 50% has been suppressed.

SOURCE: Office of Applied Studies, SAMHSA, Drug Abuse Warning Network, 2003 (03/2004 update).

Table 19

Case type *other*, by patient and visit characteristics: Q3-Q4 2003

Patient/visit characteristics	Estimated visits ^{1,2}	Patient/visit characteristics	Estimated visits ^{1,2}
Total drug-related ED visits	225,345		
Gender		Number of drugs involved	
Male	134,405	Single drug	102,993
Female	90,672	Multiple drugs	122,352
Unknown	268	Alcohol involved	62,771
Age		Disposition	
0-5 years	42	Treated and released	129,990
6-11 years	65	Discharged home	111,578
12-17 years	18,633	Released to police/jail	7,661
18-20 years	20,551	Referred to detox/treatment	10,751
21-24 years	23,348	Admitted to this hospital	71,713
25-29 years	29,410	ICU/critical care	12,946
30-34 years	26,199	Surgery	644
35-44 years	61,592	Chemical dependency/detox	2,446
45-54 years	35,480	Psychiatric unit	...
55-64 years	5,743	Other inpatient unit	22,153
65 years and older	4,121	Other disposition	23,642
Unknown	160	Transferred	14,725
Race/ethnicity		Left against medical advice	4,806
White	129,234	Died	599
Black	49,905	Other	1,271
Hispanic	20,155	Not documented	2,241
Race/ethnicity NTA	3,724		
Unknown	22,328		
Chief complaint(s)³		Selected diagnoses³	
Overdose	42,708	Drug-related diagnoses	
Intoxication	23,490	Abuse-related	125,351
Seizures	8,627	Abuse	72,613
Altered mental status	46,291	Dependence	6,205
Psychiatric condition	51,857	Overdose	25,903
Withdrawal	16,653	Toxic effects	19,071
Seeking detox	2,164	Withdrawal	12,300
Accident/injury/assault	11,861	Drug or alcohol	139,043
Abscess/cellulitis/skin/tissue	15,906	Other conditions	
Chest pain	19,466	Abscess/cellulitis	7,955
Respiratory problems	13,636	Altered mental status	11,792
Digestive problems	14,933	Injuries	9,432
Other	42,592	Pain	19,452
		Psychiatric conditions	52,195
		Suicide (other than attempt)	20,842

¹ These are estimates of ED visits based on a representative sample of non-Federal, short-stay hospitals with 24-hour EDs in the coterminous U.S.

² Three dots (...) indicate that an estimate with an RSE greater than 50% has been suppressed.

³ Components do not sum to total because multiple complaints or multiple diagnoses may be reported for a single visit.

SOURCE: Office of Applied Studies, SAMHSA, Drug Abuse Warning Network, 2003 (03/2004 update).

Overmedication, malicious poisoning, and case type *other* combined (Tables 20-21, Figure 11)

One of the primary goals of the new DAWN is to capture ED visits related to illicit drugs and the non-medical use of licit ones. When ED visits classified as overmedication and those classified as *other* are considered side by side, they appear to be complementary. Overmedication patients are more frequently female, whereas patients in the *other* case type are more frequently male. The race/ethnicity of overmedication patients is more frequently white, whereas the cases classified as case type *other* have a higher proportion of black patients. In terms of age, the youngest age groups and the oldest tend to appear more frequently in overmedication cases than in case type *other*, which has higher concentrations in the age groups in the middle (ages 18 to 44).

When the three case types associated with drug misuse and abuse (overmedication, malicious poisoning, and case type *other*) are combined, the following profile emerges. DAWN estimates 332,046 (CI: 268,266 to 395,826) such visits in Q3-Q4 2003. Less than half (46%) of these drug-related ED visits involved only a single drug.

Major substances of abuse were involved in nearly two-thirds (65%) of these drug-related ED visits. The specific drugs most commonly associated with these ED visits included:

- Cocaine (in 28% of visits), alcohol (26%), and marijuana (20%), which were similar in frequency, when the margin of error is considered;
- Heroin and major stimulants, which were each involved in 10% of visits; and
- Non-medical use of benzodiazepines and opiates/opioid analgesics, which each accounted for 17% of visits.

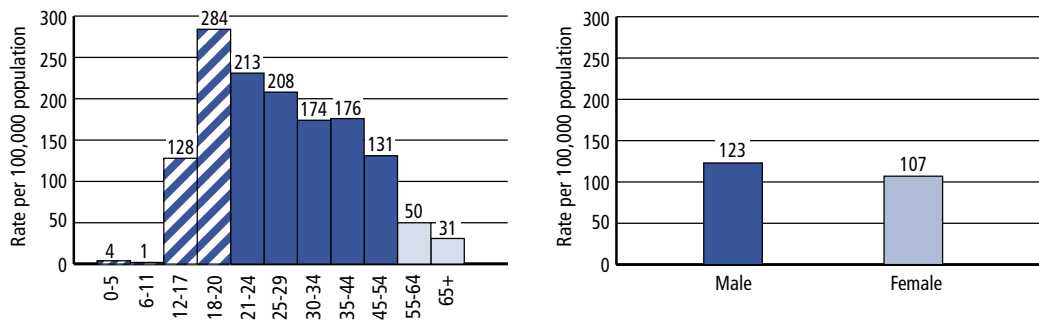
Overdose (40% of visits), altered mental status (20%), and psychiatric conditions (20%) were the most frequent chief complaints. About half (53%) of visits resulted in the patient being treated and released, whereas 35% were admitted for inpatient care (10% to critical care units).

Although only 24% of visits had a diagnosis explicitly documenting drug abuse, more than half (60%) of visits had diagnoses related to drug abuse (e.g., addiction, dependence, IVDA/IVDU, withdrawal). The diagnoses for these cases illustrate the variety in medical documentation for drug-related ED visits. Drug involvement was documented in a diagnosis in 59% of visits, including alcohol in 8%, illicit drugs in 17%, and non-illicit or unspecified drugs in 43%. Other frequent diagnoses were overdose (26% of visits), depression or another psychiatric condition (23%), other suicide (10%), and toxic effects (8%).

When considered in combination, the differences in ED visit rates between males and females disappear, as the higher concentration of females in overmedication and malicious poisoning cases offset the higher concentrations of males in case type *other*. In terms of age, the rates for patients age 18 to 20 become similar to those for patients age 21 to 29. The youngest patients (up to age 11) had the lowest rates, followed by the oldest (age 55 and over).

The combination of the three case types results in a racial/ethnic mix of patients that is 62% white, 18% black, and 8% Hispanic.

Figure 11
Overmedication, malicious poisoning, and case type *other*,
ED visit rates by age and gender: Q3-Q4 2003



SOURCE: Office of Applied Studies, SAMHSA, Drug Abuse Warning Network, 2003 (03/2004 update).

Table 20**Overmedication, malicious poisoning, and case type *other*: Q3-Q4 2003**

Drug category and selected drugs ¹	Estimated visits ^{2,3,4}	Relative standard error (RSE)	95% Confidence interval		
			Lower bound	-	Upper bound
Total drug-related ED visits	332,046	9.8	268,266	-	395,826
Major substances of abuse					
Alcohol	86,407	10.6	68,455	-	104,359
Alcohol-in-combination	86,407	10.6	68,455	-	104,359
Alcohol alone					
Cocaine	92,187	25.4	46,294	-	138,080
Heroin	31,681	18.6	20,131	-	43,231
Marijuana	67,333	26.5	32,361	-	102,305
Stimulants	33,735	26.5	16,213	-	51,257
Amphetamines	15,283	18.1	9,862	-	20,704
Methamphetamine	19,058	37.5	5,050	-	33,066
MDMA (Ecstasy)	1,910	28.6	840	-	2,980
GHB	978	23.7	523	-	1,433
Flunitrazepam (Rohypnol)	...	86.8	...	-	...
Ketamine	63	32.9	22	-	104
LSD	328	30.1	134	-	522
PCP	3,941	30.2	1,609	-	6,273
Miscellaneous hallucinogens	639	30.3	259	-	1,019
Inhalants	626	25.8	308	-	944
Combinations NTA	1,213	37.8	313	-	2,113
Other substances					
Benzodiazepines	54,947	11.0	43,101	-	66,793
Opiates/opioid analgesics	57,245	12.2	43,556	-	70,934

¹ This classification of drugs is derived from the Multum *Lexicon*, Copyright 2004, Multum Information Services, Inc. The classification has been modified to meet DAWN's unique requirements (2004). The Multum Licensing Agreement governing use of the *Lexicon* is provided in Appendix A and can be found on the Internet at <http://www.multum.com>.

² These are estimates of ED visits based on a representative sample of non-Federal, short-stay hospitals with 24-hour EDs in the coterminous U.S.

³ Estimates are all expressed in visits. Visits cannot be summed across drugs because drug-related ED visits often involve multiple drugs.

⁴ Three dots (...) indicate that an estimate with an RSE greater than 50% has been suppressed.

SOURCE: Office of Applied Studies, SAMHSA, Drug Abuse Warning Network, 2003 (03/2004 update).

Table 21
Overmedication, malicious poisoning, case type *other*, by patient and visit characteristics: Q3-Q4 2003

Patient/visit characteristics	Estimated visits ^{1,2}	Patient/visit characteristics	Estimated visits ^{1,2}
Total drug-related ED visits	332,046		
Gender		Number of drugs involved	
Male	172,750	Single drug	154,240
Female	158,843	Multiple drugs	177,806
Unknown	452	Alcohol involved	86,407
Age		Disposition	
0-5 years	952	Treated and released	175,148
6-11 years	379	Discharged home	152,427
12-17 years	32,467	Released to police/jail	9,048
18-20 years	31,065	Referred to detox/treatment	13,673
21-24 years	31,426	Admitted to this hospital	116,229
25-29 years	41,377	ICU/critical care	32,324
30-34 years	36,917	Surgery	655
35-44 years	82,344	Chemical dependency/detox	3,121
45-54 years	51,474	Psychiatric unit	...
55-64 years	12,716	Other inpatient unit	38,023
65 years and older	10,755	Other disposition	40,669
Unknown	174	Transferred	28,977
Race/ethnicity		Left against medical advice	6,126
White	206,661	Died	774
Black	58,548	Other	1,692
Hispanic	27,953	Not documented	3,100
Race/ethnicity NTA	5,975		
Unknown	32,909		
Chief complaint(s)³		Selected diagnoses³	
Overdose	131,570	Drug-related diagnoses	
Intoxication	29,401	Abuse-related	197,756
Seizures	9,113	Abuse	78,436
Altered mental status	66,877	Dependence	6,673
Psychiatric condition	67,220	Overdose	86,326
Withdrawal	16,906	Toxic effects	27,571
Seeking detox	2,189	Withdrawal	12,467
Accident/injury/assault	13,524	Drug or alcohol	197,200
Abscess/cellulitis/skin/tissue	16,976	Other conditions	
Chest pain	21,223	Abscess/cellulitis	8,231
Respiratory problems	16,871	Altered mental status	16,113
Digestive problems	18,538	Injuries	11,033
Other	52,890	Pain	22,347
		Psychiatric conditions	77,190
		Suicide (other than attempt)	32,727

¹ These are estimates of ED visits based on a representative sample of non-Federal, short-stay hospitals with 24-hour EDs in the coterminous U.S.

² Three dots (...) indicate that an estimate with an RSE greater than 50% has been suppressed.

³ Components do not sum to total because multiple complaints or multiple diagnoses may be reported for a single visit.

SOURCE: Office of Applied Studies, SAMHSA, Drug Abuse Warning Network, 2003 (03/2004 update).

OTHER TYPES OF DRUG-RELATED ED VISITS

This chapter profiles the four remaining types of drug-related ED visits captured by new DAWN. Among these, suicide attempt and seeking detox cases are considered as separate and distinct classes of drug misuse or abuse, for reasons discussed previously. In contrast, adverse reaction cases typically result from the use of pharmaceuticals for therapeutic purposes, and accidental ingestion cases are, as the name implies, accidents involving drugs.

Suicide attempt (Tables 22-23, Figure 12)

DAWN estimates 40,044 (CI: 33,607 to 46,481) ED visits associated with drug-related suicide attempts for Q3-Q4 2003.¹⁰ It is important to remember that new DAWN includes only those suicide attempts that involve drugs. Included are persons who attempt suicide by drug overdose and by other means when drugs are involved. Excluded are suicide attempts not involving drugs (e.g., by gun alone) and those documented as something other than an attempt (e.g., suicide ideation, gesture, thought, and so forth).

On average, the drug-related suicide attempts involved 2.2 drugs per case; about 39% involved only a single drug. About one-quarter (26%) involved alcohol.

The most frequent chief or presenting complaint was overdose (90%). The most frequent diagnoses indicated suicide attempt (in 71% of visits), overdose (57%), and depression or another psychiatric condition (29%). Depression was a diagnosis in 26% of the ED visits identified as suicide attempts. Involvement of alcohol or a drug was indicated by diagnosis in 53% of visits, with 8% indicating alcohol and 50% indicating a drug. Illicit drugs were cited by diagnoses in 4% of visits.

In suicide attempts, the most frequent major substances of abuse other than alcohol were cocaine (11% of visits) and marijuana (9% of visits), but the margin of error for each of these drugs is quite large. Central nervous system agents, primarily analgesics (pain relievers), were involved in about half (56%) of suicide-related visits and included both prescription and OTC formulations. Psychotherapeutic agents, including benzodiazepines and antidepressants, were implicated in 45% of the suicide-related ED visits.

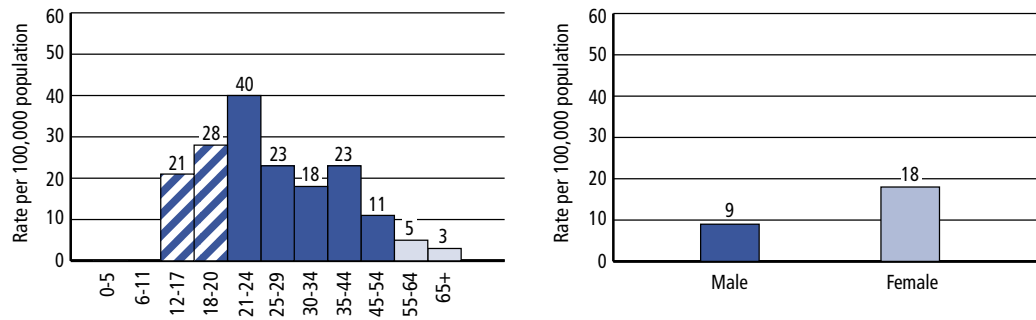
More than half (58%) of the suicide attempts were admitted for inpatient hospital care, primarily in critical care (31%) or psychiatric (16%) units. Another 29% were transferred to another health care facility; 10% were discharged home.

Nearly two-thirds (64%) of the suicide attempts involved patients who were white, with black and Hispanic patients occurring in nearly equal numbers. After accounting for population size, the rate of suicide visits for females (18 visits per 100,000 population) was double that for males (9 per 100,000). The rate for patients age 21 to 24 (40 per 100,000) exceeded the rates for most other age groups. The rates for adolescents and young adults age 12 to 20 were comparable to rates for adults age 25 to 44.

¹⁰ Even though DAWN has always had a category for suicides, in years prior to 2003 the category encompassed suicide attempts, ideation, gestures, and thoughts. Therefore, this category is not comparable to any provided previously.

Figure 12

Suicide attempt, ED visit rates by age and gender: Q3-Q4 2003



SOURCE: Office of Applied Studies, SAMHSA, Drug Abuse Warning Network, 2003 (03/2004 update).

Table 22
Suicide attempt: Q3-Q4 2003

Drug category and selected drugs ¹	Estimated visits ^{2,3,4}	Relative standard error (RSE)	95% Confidence interval		
			Lower bound	-	Upper bound
Total drug-related ED visits	40,044	8.2	33,607	-	46,481
Major substances of abuse					
Alcohol	10,447	12.6	7,868	-	13,026
Alcohol-in-combination	10,429	12.6	7,854	-	13,004
Alcohol alone	18	38.1	4	-	32
Cocaine	4,544	44.7	563	-	8,525
Heroin	495	45.2	56	-	934
Marijuana	3,603	38.1	912	-	6,294
Stimulants	1,692	36.7	475	-	2,909
Amphetamines	1,141	40.9	226	-	2,056
Methamphetamine	...	52.6	...	-	...
MDMA (Ecstasy)	35	36.5	10	-	60
GHB	...	135.7	...	-	...
Flunitrazepam (Rohypnol)					
Ketamine	...	187.3	...	-	...
LSD	...	72.5	...	-	...
PCP	187	49.9	5	-	369
Miscellaneous hallucinogens					
Inhalants	12	42.0	2	-	22
Combinations NTA	...	82.2	...	-	...
Other substances					
Psychotherapeutic agents	18,207	11.3	14,175	-	22,239
Antidepressants	7,479	15.1	5,266	-	9,692
Benzodiazepines	9,143	16.6	6,168	-	12,118
CNS agents	22,348	8.6	18,581	-	26,115
Analgesics	18,029	10.0	14,495	-	21,563
Opiates/opioids	8,047	14.4	5,775	-	10,319

¹ This classification of drugs is derived from the Multum *Lexicon*, Copyright 2004, Multum Information Services, Inc. The classification has been modified to meet DAWN's unique requirements (2004). The Multum Licensing Agreement governing use of the *Lexicon* is provided in Appendix A and can be found on the Internet at <http://www.multum.com>.

² These are estimates of ED visits based on a representative sample of non-Federal, short-stay hospitals with 24-hour EDs in the coterminous U.S.

³ Estimates are all expressed in visits. Visits cannot be summed across drugs because drug-related ED visits often involve multiple drugs.

⁴ Three dots (...) indicate that an estimate with an RSE greater than 50% has been suppressed.

SOURCE: Office of Applied Studies, SAMHSA, Drug Abuse Warning Network, 2003 (03/2004 update).

Table 23

Suicide attempt, by patient and visit characteristics: Q3-Q4 2003

Patient/visit characteristics	Estimated visits ^{1,2}	Patient/visit characteristics	Estimated visits ^{1,2}
Total drug-related ED visits	40,044		
Gender		Number of drugs involved	
Male	13,089	Single drug	15,559
Female	26,923	Multiple drugs	24,485
Unknown	32	Alcohol involved	10,447
Age		Disposition	
0-5 years		Treated and released	4,563
6-11 years	...	Discharged home	3,886
12-17 years	5,190	Released to police/jail	...
18-20 years	3,100	Referred to detox/treatment	500
21-24 years	5,879	Admitted to this hospital	23,033
25-29 years	4,539	ICU/critical care	12,272
30-34 years	3,765	Surgery	...
35-44 years	10,760	Chemical dependency/detox	196
45-54 years	4,289	Psychiatric unit	6,519
55-64 years	1,313	Other inpatient unit	4,044
65 years and older	1,185	Other disposition	12,447
Unknown	15	Transferred	11,681
Race/ethnicity		Left against medical advice	...
White	25,460	Died	11
Black	3,859	Other	...
Hispanic	3,947	Not documented	...
Race/ethnicity NTA	853		
Unknown	5,925		
Chief complaint(s)³		Selected diagnoses³	
Overdose	36,094	Drug-related diagnoses	
Intoxication	1,983	Drug or alcohol	21,359
Seizures	36	Alcohol	3,166
Altered mental status	7,310	Drug	20,027
Psychiatric condition	11,342	Illicits	1,646
Withdrawal	...	Other or unspecified drug	19,259
Seeking detox	...	Overdose	22,635
Accident/injury/assault	...	Toxic effects	3,676
Abscess/cellulitis/skin/tissue	...	Other conditions	
Chest pain	277	Altered mental status	1,873
Respiratory problems	...	Psychiatric conditions	11,644
Digestive problems	358	Depression	10,494
Other	2,265	Suicide	28,415
		Suicide attempts	25,926
		Other suicide-related	2,924

¹ These are estimates of ED visits based on a representative sample of non-Federal, short-stay hospitals with 24-hour EDs in the coterminous U.S.

² Three dots (...) indicate that an estimate with an RSE greater than 50% has been suppressed.

³ Components do not sum to total because multiple complaints or multiple diagnoses may be reported for a single visit.

SOURCE: Office of Applied Studies, SAMHSA, Drug Abuse Warning Network, 2003 (03/2004 update).

Seeking detox (Tables 24-25, Figure 13)

DAWN estimates 61,506 (CI: 34,985 to 88,027) drug-related ED visits for patients seeking detoxification services during Q3-Q4 2003. However, as noted previously, these visits tend to be concentrated in hospitals with administrative practices that require medical clearance in the ED for admission to detox units. Therefore, it is impossible to know the full extent of the demand for detox services from this estimate.

On average, the seeking detox visits involved 2.1 drugs per case; less than 40% involved only a single drug. One-third (33%) involved alcohol, but for adults this includes only alcohol in combination with other drugs.

The most frequent presenting complaint was seeking detox (96%), with 13% presenting with a psychiatric condition, and 8% in withdrawal. The most frequent diagnoses were drug abuse (in 55% of visits), depression or another psychiatric condition (26%), dependence (16%), and withdrawal (9%). Drug and/or alcohol involvement was indicated by diagnoses in 88% of seeking detox visits. Substance abuse, based on a diagnosis of abuse, dependence, addiction, withdrawal, etc., was diagnosed in 90% of seeking detox visits.

Among the other major substances of abuse, cocaine (in 47% of visits) and heroin (25% of visits) occurred most frequently, followed by marijuana (14% of visits) and amphetamine or methamphetamine stimulants (9% of visits). Opioid pain relievers and benzodiazepines appeared to be more frequent than many of the illicit drugs. Opioids, such as hydrocodone and oxycodone, were implicated in 36% of seeking detox visits, and benzodiazepines in 19%. Again, it is important to remember that 60% of seeking detox visits implicated more than one drug.

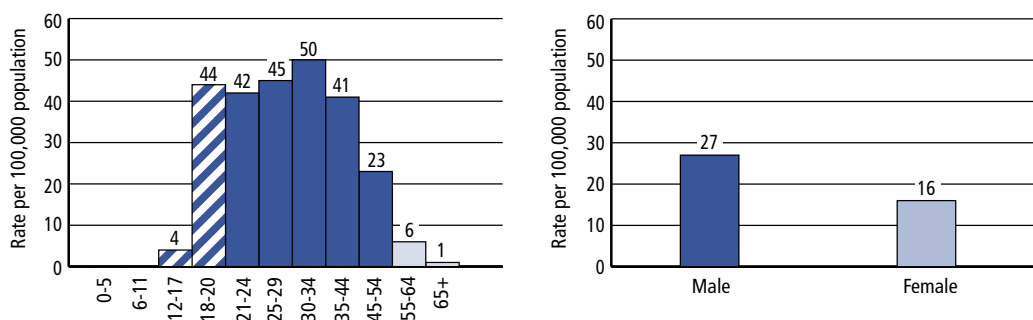
A quarter of seeking detox cases apparently did not receive the care they sought, because they were discharged to home. Only 1 in 3 such cases (32%) was admitted to inpatient detoxification or chemical dependency units in the same hospital; 1 in 5 (22%) was referred elsewhere for detox or treatment; 5% were transferred to another health care facility.

More than two-thirds (69%) of those seeking detox were white, and black patients were more frequent (18%) than Hispanic patients (5%). Patients seeking detox tended to be older, with nearly half (49%) age 35 and over.

After accounting for population, the rate of seeking detox cases was similar across all age groups in the 18 to 44 range. The rate of seeking detox visits for females was not significantly different from that for males.

Figure 13

Seeking detox, ED visit rates by age and gender: Q3-Q4 2003



SOURCE: Office of Applied Studies, SAMHSA, Drug Abuse Warning Network, 2003 (03/2004 update).

Table 24
Seeking detox: Q3-Q4 2003

Drug category and selected drugs ¹	Estimated visits ^{2,3,4}	Relative standard error (RSE)	95% Confidence interval		
			Lower bound	-	Upper bound
Total drug-related ED visits	61,506	22.0	34,985	-	88,027
Major substances of abuse					
Alcohol	20,124	22.4	11,288	-	28,960
Alcohol-in-combination	20,075	22.4	11,261	-	28,889
Alcohol alone	49	26.2	24	-	74
Cocaine	29,035	23.4	15,719	-	42,351
Heroin	15,428	21.1	9,048	-	21,808
Marijuana	8,705	26.8	4,132	-	13,278
Stimulants	5,794	41.2	1,115	-	10,473
Amphetamines	1,056	38.8	252	-	1,860
Methamphetamine	4,755	46.4	431	-	9,079
MDMA (Ecstasy)	...	68.7	...	-	...
GHB	7	43.5	1	-	13
Flunitrazepam (Rohypnol)					
Ketamine	...	124.2	...	-	...
LSD	183	49.0	7	-	359
PCP	453	30.6	181	-	725
Miscellaneous hallucinogens	43	36.9	12	-	74
Inhalants	392	26.2	190	-	594
Combinations NTA	24	45.0	2	-	46
Other substances					
Benzodiazepines	11,391	37.9	2,930	-	19,852
Opiates/opioid analgesics	22,027	34.7	7,047	-	37,007

¹ This classification of drugs is derived from the Multum *Lexicon*, Copyright 2004, Multum Information Services, Inc. The classification has been modified to meet DAWN's unique requirements (2004). The Multum Licensing Agreement governing use of the *Lexicon* is provided in Appendix A and can be found on the Internet at <http://www.multum.com>.

² These are estimates of ED visits based on a representative sample of non-Federal, short-stay hospitals with 24-hour EDs in the coterminous U.S.

³ Estimates are all expressed in visits. Visits cannot be summed across drugs because drug-related ED visits often involve multiple drugs.

⁴ Three dots (...) indicate that an estimate with an RSE greater than 50% has been suppressed.

SOURCE: Office of Applied Studies, SAMHSA, Drug Abuse Warning Network, 2003 (03/2004 update).

Table 25

Seeking detox, by patient and visit characteristics: Q3-Q4 2003

Patient/visit characteristics	Estimated visits ^{1,2}	Patient/visit characteristics	Estimated visits ^{1,2}
Total drug-related ED visits	61,506		
Gender		Number of drugs involved	
Male	38,217	Single drug	23,552
Female	23,224	Multiple drugs	37,954
Unknown	...	Alcohol involved	20,124
Age		Disposition	
0-5 years		Treated and released	29,118
6-11 years		Discharged home	15,240
12-17 years	1,026	Released to police/jail	119
18-20 years	4,790	Referred to detox/treatment	13,760
21-24 years	6,198	Admitted to this hospital	26,663
25-29 years	8,945	ICU/critical care	...
30-34 years	10,607	Surgery	...
35-44 years	18,932	Chemical dependency/detox	19,507
45-54 years	9,110	Psychiatric unit	5,672
55-64 years	1,627	Other inpatient unit	1,332
65 years and older	258	Other disposition	5,725
Unknown	...	Transferred	3,195
Race/ethnicity		Left against medical advice	1,588
White	42,458	Died	
Black	10,942	Other	411
Hispanic	2,803	Not documented	532
Race/ethnicity NTA	542		
Unknown	4,761		
Chief complaint(s)³		Selected diagnoses³	
Overdose	826	Drug-related diagnoses	
Intoxication	1,391	Abuse-related	55,081
Seizures	450	Abuse	33,856
Altered mental status	2,468	Addiction	4,380
Psychiatric condition	8,295	Dependence	10,129
Withdrawal	5,056	Detox	6,324
Seeking detox	59,353	Withdrawal	5,273
Accident/injury/assault	420	Drug or alcohol	53,828
Abscess/cellulitis/skin/tissue	1,237	Alcohol	6,681
Chest pain	880	Drug	52,535
Respiratory problems	517	Illicits	14,050
Digestive problems	1,228	Other or unspecified drug	41,226
Other	2,066	Other conditions	
		Psychiatric conditions	16,146
		Depression	12,228
		Suicide (other than attempt)	3,222

¹ These are estimates of ED visits based on a representative sample of non-Federal, short-stay hospitals with 24-hour EDs in the coterminous U.S.

² Three dots (...) indicate that an estimate with an RSE greater than 50% has been suppressed.

³ Components do not sum to total because multiple complaints or multiple diagnoses may be reported for a single visit.

SOURCE: Office of Applied Studies, SAMHSA, Drug Abuse Warning Network, 2003 (03/2004 update).

Adverse reaction (Tables 26-27, Figure 14)

As noted previously, adverse reaction cases in new DAWN are limited to prescription and OTC pharmaceuticals. Any involvement of illicit drugs is classified elsewhere. Adverse reactions exclude unexpected reactions to illicit drugs, toxicities lacking documentation of adverse reaction, and undermedication (i.e., taking too little of a prescribed medication).

For Q3-Q4 2003, DAWN estimates 155,006 (CI: 111,257 to 198,755) ED visits associated with adverse reactions. Only 14% of such cases involved multiple drugs, and very few (1%) involved alcohol in combination with another drug.

The prescription drugs most frequently implicated in adverse reaction visits included:

- Anti-infectives in 51,516 (CI: 35,765 to 67,267) visits;
- CNS agents in 36,634 (CI: 26,079 to 47,189) visits; and
- Psychotherapeutic agents in 19,964 (CI: 14,133 to 25,795) visits.

Table 26
Adverse reaction: Q3-Q4 2003

Drug category and selected drugs ¹	Estimated visits ^{2,3,4}	Relative standard error (RSE)	95% Confidence interval		
			Lower bound	-	Upper bound
Total drug-related ED visits	155,006	14.4	111,257	-	198,755
Psychotherapeutic agents	19,964	14.9	14,133	-	25,795
CNS agents	36,634	14.7	26,079	-	47,189
Anti-infectives	51,516	15.6	35,765	-	67,267

¹ This classification of drugs is derived from the Multum *Lexicon*, Copyright 2004, Multum Information Services, Inc. The classification has been modified to meet DAWN's unique requirements (2004). The Multum Licensing Agreement governing use of the *Lexicon* is provided in Appendix A and can be found on the Internet at <http://www.multum.com>.

² These are estimates of ED visits based on a representative sample of non-Federal, short-stay hospitals with 24-hour EDs in the coterminous U.S.

³ Estimates are all expressed in visits. Visits cannot be summed across drugs because drug-related ED visits often involve multiple drugs.

⁴ Three dots (...) indicate that an estimate with an RSE greater than 50% has been suppressed.

SOURCE: Office of Applied Studies, SAMHSA, Drug Abuse Warning Network, 2003 (03/2004 update).

About 4 out of 10 (42%) ED visits associated with adverse reactions had chief complaints classified as abscess/cellulitis/skin/tissue, which includes hives and rashes commonly seen in allergic drug reactions. These were followed in frequency by digestive problems (15%), altered mental status (12%), and respiratory problems (12%).

About 4 out of 10 ED visits associated with adverse reactions had diagnoses indicating adverse drug effects (43%) or specific drug involvement (49%), and 14% had diagnoses indicating allergies or allergic reactions. About one-third (33%) of ED visits related to adverse reactions had diagnoses indicating involvement of a particular body system, e.g., skin and soft tissue (14%), cardiovascular (7%), gastrointestinal (6%), etc.

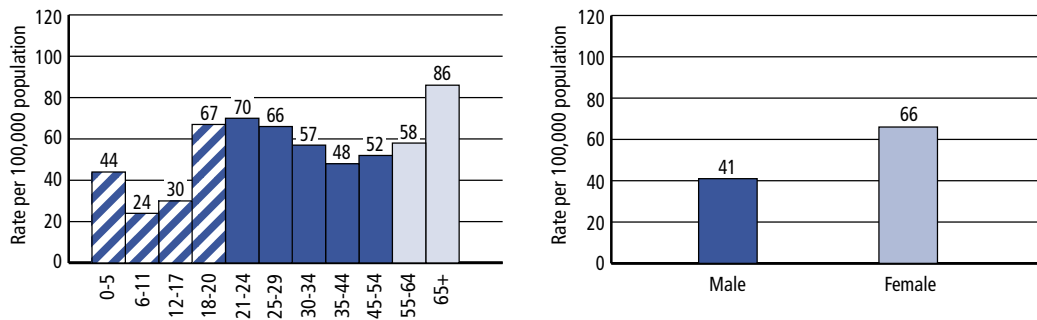
Patients were discharged home in about 9 out of 10 (92%) of the ED visits related to adverse reactions, but 8% were admitted to inpatient units.

The characteristics of patients treated for adverse reactions in EDs look quite different from those in case types discussed previously. About 11% of visits involved patients younger than age 12, and 19% involved patients age 65 and older. Patients age 35-64 accounted for about a third (37%) of such visits. However, taking population into account, the rates of ED visits (per 100,000 population) associated with adverse reactions varied little across the age groups from young adults to the elderly. However, the rate for females was higher than that for males.

About 7 out of 10 (71%) of adverse reaction visits involved patients who were white, 10% black, and 5% Hispanic.

Figure 14

Adverse reaction, ED visit rates by age and gender: Q3-Q4 2003



SOURCE: Office of Applied Studies, SAMHSA, Drug Abuse Warning Network, 2003 (03/2004 update).

Table 27

Adverse reaction, by patient and visit characteristics: Q3-Q4 2003

Patient/visit characteristics	Estimated visits ^{1,2}	Patient/visit characteristics	Estimated visits ^{1,2}
Total drug-related ED visits	155,006		
Gender		Number of drugs involved	
Male	57,395	Single drug	133,359
Female	97,571	Multiple drugs	21,647
Unknown	39	Alcohol involved	1,686
Age		Disposition	
0-5 years	10,676	Treated and released	142,035
6-11 years	6,296	Discharged home	141,897
12-17 years	7,540	Released to police/jail	56
18-20 years	7,347	Referred to detox/treatment	81
21-24 years	10,351	Admitted to this hospital	11,727
25-29 years	13,184	ICU/critical care	...
30-34 years	11,999	Surgery	31
35-44 years	22,463	Chemical dependency/detox	...
45-54 years	20,585	Psychiatric unit	815
55-64 years	14,715	Other inpatient unit	9,559
65 years and older	29,830	Other disposition	1,244
Unknown	20	Transferred	...
Race/ethnicity		Left against medical advice	71
White	110,291	Died	...
Black	16,096	Other	59
Hispanic	8,148	Not documented	473
Race/ethnicity NTA	2,026		
Unknown	18,444		
Chief complaint(s)³		Selected diagnoses³	
Overdose	414	Drug-related diagnoses	
Intoxication	99	Adverse drug effects	66,669
Seizures	1,337	Drug or alcohol	76,002
Altered mental status	18,762	Alcohol	958
Psychiatric condition	1,955	Drug	75,807
Withdrawal	278	Body systems (includes infections)	51,716
Seeking detox	...	Respiratory	6,024
Accident/injury/assault	1,075	Cardiovascular	11,518
Abscess/cellulitis/skin/tissue	65,749	Gastrointestinal	9,032
		Skin and soft tissue (excludes abscess/cellulitis)	21,958
Chest pain	7,478	Head and neck	5,714
Respiratory problems	18,596	Other conditions	
Digestive problems	23,292	Allergies	20,977
Other	58,563	Altered mental status	4,879
		Psychiatric conditions	4,521

¹ These are estimates of ED visits based on a representative sample of non-Federal, short-stay hospitals with 24-hour EDs in the coterminous U.S.

² Three dots (...) indicate that an estimate with an RSE greater than 50% has been suppressed.

³ Components do not sum to total because multiple complaints or multiple diagnoses may be reported for a single visit.

SOURCE: Office of Applied Studies, SAMHSA, Drug Abuse Warning Network, 2003 (03/2004 update).

Accidental ingestion (Tables 28-29, Figure 15)

For Q3-Q4 2003, DAWN estimates 16,769 (CI: 12,398 to 21,140) ED visits associated with accidental ingestion of drugs. Accidental ingestions include accidental child poisonings as well as patients who took the wrong medication by mistake.

Most accidental ingestions (84%) involved a single drug. So few accidental ingestions involved major substances of abuse that reliable estimates could not be produced for those drugs. For Q3-Q4 2003, the drugs most frequently cited in accidental ingestion were:

- CNS agents (26% of visits), primarily analgesics, including acetaminophen and nonsteroidal anti-inflammatory agents such as ibuprofen; and
- Psychotherapeutic agents (17% of visits), primarily benzodiazepines; other anxiolytics, sedatives, and hypnotics, including diphenhydramine and zolpidem; and antidepressants.

In about 10% of visits, the accidental ingestion involved an unknown drug.

Table 28
Accidental ingestion: Q3-Q4 2003

Drug category and selected drugs ¹	Estimated visits ^{2,3}	Relative standard error (RSE)	95% Confidence interval		
			Lower bound	-	Upper bound
Total drug-related ED visits	16,769	13.3	12,398	-	21,140
Psychotherapeutic agents	2,816	17.4	1,856	-	3,776
CNS agents	4,347	16.7	2,924	-	5,770
Drug unknown	1,593	24.9	815	-	2,371

¹ This classification of drugs is derived from the Multum *Lexicon*, Copyright 2004, Multum Information Services, Inc. The classification has been modified to meet DAWN's unique requirements (2004). The Multum Licensing Agreement governing use of the *Lexicon* is provided in Appendix A and can be found on the Internet at <http://www.multum.com>.

² These are estimates of ED visits based on a representative sample of non-Federal, short-stay hospitals with 24-hour EDs in the coterminous U.S.

³ Estimates are all expressed in visits. Visits cannot be summed across drugs because drug-related ED visits often involve multiple drugs.

SOURCE: Office of Applied Studies, SAMHSA, Drug Abuse Warning Network, 2003 (03/2004 update).

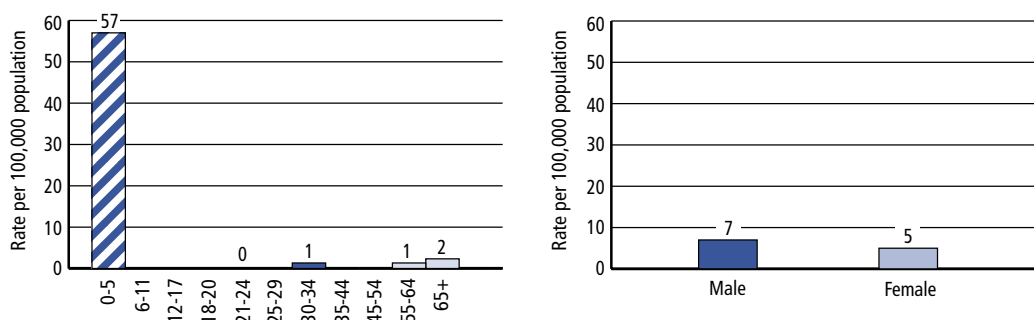
In terms of chief complaint, 42% of the accidental ingestion visits presented with overdose. Unfortunately, 44% could not be classified in any of the major complaint categories. Diagnoses indicated accidental ingestion (24%) or overdose (15%). About half (55%) of accidental ingestion visits had a diagnosis indicating drug involvement.

The majority (82%) of accidental ingestion visits resulted in patients being treated and released, while 13% were admitted for inpatient care.

The rates of accidental ingestion visits were highest for children under the age of 6. DAWN estimates 57 ED visits per 100,000 population for this age group. Patients 65 and over were the next most frequent age category (5% of cases), but the rate of such visits was quite low (2 per 100,000 population). However, it is important to note that elderly patients who exceeded a recommended dose of a prescribed medication (e.g., because they forgot they had already taken a dose or to make up for a missed dose) would be classified in overmedication, not in accidental ingestion. Accidental ingestion occurred at similar rates for females and males.

About two-thirds (68%) of visits related to accidental ingestion involved patients who were white, 7% black, and 8% Hispanic.

Figure 15
Accidental ingestion, ED visit rates by age and gender: Q3-Q4 2003



SOURCE: Office of Applied Studies, SAMHSA, Drug Abuse Warning Network, 2003 (03/2004 update).

Table 29
Accidental ingestion, by patient and visit characteristics: Q3-Q4 2003

Patient/visit characteristics	Estimated visits ^{1,2}	Patient/visit characteristics	Estimated visits ^{1,2}
Total drug-related ED visits	16,769		
Gender		Number of drugs involved	
Male	9,492	Single drug	14,058
Female	7,278	Multiple drugs	2,712
Unknown		Alcohol involved	...
Age		Disposition	
0-5 years	13,920	Treated and released	13,764
6-11 years	...	Discharged home	13,657
12-17 years	...	Released to police/jail	...
18-20 years	...	Referred to detox/treatment	
21-24 years	59	Admitted to this hospital	2,138
25-29 years	...	ICU/critical care	...
30-34 years	299	Surgery	
35-44 years	...	Chemical dependency/detox	
45-54 years	...	Psychiatric unit	
55-64 years	212	Other inpatient unit	1,803
65 years and older	760	Other disposition	867
Unknown		Transferred	...
Race/ethnicity		Left against medical advice	...
White	11,483	Died	
Black	1,230	Other	...
Hispanic	1,420	Not documented	41
Race/ethnicity NTA	260		
Unknown	2,378		
Chief complaint(s)³		Selected diagnoses³	
Overdose	7,000	Drug-related diagnoses	
Intoxication	...	Accidental ingestion	4,069
Seizures	...	Drug or alcohol	9,158
Altered mental status	1,415	Alcohol	6
Psychiatric condition	5	Drug	9,153
Withdrawal		Illicits	386
Seeking detox		Other or unspecified drug	8,982
Accident/injury/assault	1,545	Overdose	2,570
Abscess/cellulitis/skin/tissue	...	Toxic effects	827
Chest pain	...		
Respiratory problems	877		
Digestive problems	653		
Other	7,393		

¹ These are estimates of ED visits based on a representative sample of non-Federal, short-stay hospitals with 24-hour EDs in the coterminous U.S.

² Three dots (...) indicate that an estimate with an RSE greater than 50% has been suppressed.

³ Components do not sum to total because multiple complaints or multiple diagnoses may be reported for a single visit.

SOURCE: Office of Applied Studies, SAMHSA, Drug Abuse Warning Network, 2003 (03/2004 update).

Appendixes

APPENDIX A

MULTUM LEXICON END-USER LICENSE AGREEMENT

1. Introduction

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APPENDIX B

TECHNICAL NOTES: CHANGES TO IMPROVE THE QUALITY OF DAWN DATA

Introduction

The changes to DAWN introduced in 2003 include many designed to improve the quality and reliability of the data. The following changes are discussed in this appendix:

- Case finding by a retrospective review of ED medical records for every patient treated in a participating ED.
- Conversion from paper to electronic reporting.
- Addition of data items to characterize the health effects of drug use and more specifically identify patient disposition.
- Elimination of incidental drug reporting.
- Emphasis on accurate, specific, non-redundant drug reporting.
- Confirmation of drugs by laboratory testing.
- Systematic training and certification of DAWN reporters.
- In-house review and cleaning of DAWN case reports.

Case finding by direct chart review

DAWN cases are found through a retrospective review of ED medical records for every patient treated in a participating ED. Patients or families are never interviewed. There is no sampling of patients or visits. In each participating facility, a trained DAWN reporter performs the review of medical records to find DAWN cases. For each DAWN case found, the reporter abstracts 14 data items from the source record and submits these data items electronically to the central database. The reporter also submits a tally of the total number of ED visits for the facility and the total number of charts reviewed for each month. No other information is submitted on ED visits that are not DAWN cases.

In very large hospitals, direct chart review means that tens of thousands of ED charts are reviewed to find the DAWN cases. Studies conducted during the evaluation found that alternate methods of case finding were substantially inferior to direct chart review.¹¹ The studies showed that screening methods based on ED logs or diagnosis codes assigned for billing missed large numbers of DAWN cases.

Conversion from paper to electronic reporting

Data for new DAWN are submitted electronically via eHERS,¹² a secure, Internet-based data entry system. eHERS provides the technological means for validating DAWN data as they are entered. Built-in edits and prompts provide immediate feedback to the DAWN reporter so that errors can be corrected while the reporter still has the medical chart available. Intelligent prompts improve the quality of the drug data received. In addition, electronic data entry

¹¹ *Redesigning DAWN's Case Definition, Data Elements and Case Screening Procedures* in Substance Abuse and Mental Health Services Administration, Office of Applied Studies. *Drug Abuse Warning Network: Development of a New Design (Methodology Report)*. DAWN Series M-4, DHHS Publication No. (SMA) 02-3754, Rockville, MD, 2002, pp. 99-126.

¹² eHERS is the electronic Hospital Emergency Reporting System.

eliminates the processing and management of paper forms, eliminates the manual effort of double-keying data, and streamlines data management processes. Full conversion to electronic data entry was achieved early in 2004.

Improvements to data items

New DAWN collects presenting complaint(s), diagnoses, and a verbatim case description taken from the medical chart. Although DAWN has been a public health surveillance system operated by the U.S. Department of Health and Human Services for at least two decades, this marks the first time that DAWN collects data on the health of those treated in EDs for drug-related problems.

Up to 4 diagnoses are collected from the medical record for each DAWN case. The diagnoses are text; they are not coded according to the International Classification of Diseases (ICD-9-CM or ICD-10) or any other standard. Since these diagnoses include a mixture of medical and psychiatric conditions, symptoms, references to body systems, drugs and drug-taking behavior, and external events such as accidents, the taxonomy for analysis was developed empirically using DAWN data from Q3-Q4 2003. About 2% of the DAWN cases received had diagnoses that were completely missing or could not be classified.

Disposition is not a new data item, but it has been expanded to provide additional detail, including referrals to detoxification/substance abuse treatment and the type of unit for inpatient admissions. Participating facilities use the detailed disposition categories to better understand the demands that DAWN cases place on specialized treatment units, the type of units affected, and the need for such units where they do not exist. For example, for the first time, DAWN can assess the volume of patients who present to EDs seeking detoxification services and whether they receive those services, through direct admission or referral.

The case report form showing all the DAWN data items was shown in Figure 2.

Improvements to drug data

Other important changes have been made to improve the reliability and specificity of the drug data collected by DAWN.

- Elimination of incidental drug reporting

Incidental drug reporting is the inclusion of drugs or substances that are not related to the ED visit. Under the new DAWN data collection protocol, reporters are instructed to record only those substances that are related to the ED visit. They should not report drugs that are taken as prescribed or labeled and are unrelated to the condition that brought the patient to the ED.

Current medications are typically listed in the medical chart and may show up in toxicology test results, but are frequently unrelated to the ED visit. Incidental reporting of current medications in old DAWN made interpretation of some findings, particularly the high numbers of OTC medications, problematic at best.

- Emphasis on accurate, specific, non-redundant drug reporting

The detailed drug vocabulary used by DAWN has been described elsewhere.¹³ Because collecting accurate and specific drug information is DAWN's central responsibility, several new requirements have been integrated into the data collection protocol for new DAWN.

First, electronic data entry via eHERS provides the means for DAWN reporters to select complicated drug names from a list. This reduces the possibility of transcription errors and automatically associates the drug name with its numeric code. The latter was a separate step, performed manually after data submission, when the data were submitted on paper forms.

Second, training and prompts in eHERS emphasize entering drugs as specifically as possible. Brand (trade) names, the most specific, are preferred over generic names, which are preferred over chemical or non-specific classes. For example, Xanax® (a brand name) is more specific than alprazolam (a generic name), which is more specific than benzodiazepine (the therapeutic class). To assist DAWN reporters in making these determinations, drug names are color-coded in eHERS to indicate levels of specificity. If a drug class (e.g., benzodiazepine) is entered, a pop-up message prompts the reporter to review the chart for a specific benzodiazepine.

Third, potentially redundant entries are discouraged. For example, an entry of Xanax® and benzodiazepine for the same DAWN case may be redundant. Since the best time to adjudicate errors of this type is when the reporter has the chart available, eHERS automatically prompts the reporter when a potential duplicate has been entered.

Fourth, if a drug name found in an ED chart does not appear in the eHERS vocabulary list, the reporter enters the new name verbatim into a text field along with a description of the drug, if available. This is particularly valuable for recording new street names and linking them to their proper ingredients and category. Each new entry is reviewed before an addition to the permanent drug vocabulary is made.

Fifth, new prescription drugs are added to the drug vocabulary when they are approved for marketing by the Food and Drug Administration (FDA).

- Confirmation of drugs by laboratory testing

An indicator denoting whether a particular drug was confirmed by laboratory testing now accompanies each drug reported to DAWN. This is the first time that DAWN has had any explicit confirmation of the drug data. While this is an improvement, these indicators are subject to variations in drug testing protocols across hospitals. When testing is not performed, no confirmatory data are possible.

¹³ Substance Abuse and Mental Health Services Administration, Office of Applied Studies. *Emergency Department Trends From DAWN: Preliminary Estimates January-June 2001 with Revised Estimates 1994-2000*. DAWN Series D-20, DHHS Publication No. (SMA) 02-3634, Rockville, MD, 2001. The classification of drugs in use by DAWN is derived from the Multum *Lexicon*, Copyright © 2004, Multum Information Services, Inc. The classification has been modified to meet DAWN's unique requirements (2004). The Multum Licensing Agreement governing use of the *Lexicon* is provided in Appendix A and can be found on the Internet at <http://www.multum.com/>.

Quality assurance in new DAWN

The primary objective of new quality assurance protocols is to identify points in the data collection processes where threats to data quality can be avoided or identified and corrected.

The quality of DAWN data may be compromised if: (1) all charts are not reviewed or charts are reviewed incompletely; (2) ED visits not meeting the case criteria are reported (false positives); (3) ED visits meeting the case criteria are not reported (false negatives); (4) case types are assigned incorrectly; (5) data items are not coded or contain inaccurate values; (6) the same case is reported multiple times; or (7) tallies of ED visits and/or charts reviewed are inaccurate. This section describes key changes in the methods used to identify and resolve discrepancies in new DAWN data that arise from these threats.

Systematic training and certification of DAWN reporters

Quality assurance in the new DAWN starts with training of DAWN reporters.

The accuracy and completeness of the data submitted to DAWN depend on a careful review of each ED chart; an excellent understanding of the DAWN case criteria and data items; accurate abstraction of demographic and drug information; and faithful adherence to the data collection and confidentiality protocols. Each DAWN facility has one or more DAWN reporters to perform these tasks on the facility's behalf. The reporter may be a member of the hospital staff who conducts DAWN data collection as part of his or her job or during off-duty hours, or an employee of the DAWN contractor who conducts DAWN data collection on behalf of the facility. All DAWN reporters are required to use direct review of ED medical charts to find DAWN cases, extract relevant data items, and submit the data electronically to DAWN.

Each DAWN reporter receives a *Reference Guide* and a computer-based training tutorial (CBTT). The *Reference Guide* documents all the activities and processes that DAWN data collection requires. It serves as a permanent reference for the reporter and is updated periodically. To be certified as a DAWN reporter, each reporter must successfully complete the CBTT. The CBTT includes a set of interactive lessons specific to the new case criteria and individual data items. Explanations in the CBTT are followed by examples of reportable and non-reportable visits drawn from actual case files as well as practice exercises for the reporter to apply the concepts covered by each lesson. The CBTT concludes with a mastery test designed to assess the reporter's comprehension of all the lessons covered. The reporter must pass the mastery test in order to receive the credential that authorizes him or her to begin reporting DAWN data.

DAWN reporters also receive additional hands-on training and periodic performance feedback and have access to a toll-free technical assistance help line. Periodic quality assurance audits provide opportunities for additional training, if needed. New reporters who are employees of the contractor are audited before the end of their probationary periods.

Starting in 2004, the DAWN performance report for ED directors was initiated. This report, which summarizes total ED visits, charts reviewed, and DAWN cases submitted for each month, is sent to each facility's ED director each quarter, as a final check on the completeness of DAWN data. ED directors receiving the quarterly performance report are asked to review the numbers and notify the DAWN contractor if the numbers appear suspect in any way.

In-house review and cleaning of DAWN case reports

After submission, each DAWN case report is reviewed for case eligibility, case type assignment, completeness, accuracy, and duplication. When necessary, reviewers modify the data in existing records, but the original data are retained along with a record of the change, including date, time, and the reviewer's initials. Changes are summarized and used as performance feedback to DAWN reporters.

The case description entered on each DAWN case report is used to validate the DAWN case determination. The case description describes how the drug was related to the ED visit using text (verbatim, whenever possible) from the medical chart. For 2003, every case was independently reviewed for eligibility. This method follows a model used successfully by the Consumer Product Safety Commission's National Electronic Injury Surveillance System (NEISS), which collects product-related injury cases through direct review of ED charts in hospitals across the U.S.

A workgroup of SAMHSA/OAS and contractor staff met regularly to discuss ambiguous cases and case descriptions in order to refine and clarify reporting guidelines for reviewers and DAWN reporters alike. The decision tree for assigning type of case was a product of these discussions. The need for the workgroup declined over time as the rules became clearer and everyone gained experience with the new DAWN protocol.

In addition to the error and validity checks performed at data entry by eHERS, in-house data management staff conducted range checks, consistency checks, frequency checks, and problem resolution to monitor and clean the data submitted to DAWN.

Review of the case type data item was as important as review of case eligibility. For 2003, case eligibility and type of case assignment were subjected to 100% blind double review. All cases in which the first and second reviewers did not agree were sent to a third reviewer for adjudication.

Review of case types in the aggregate is also informative. A mix of case types that deviates from established norms (e.g., low rates of underage drinking, adverse reactions, accidental poisonings, or inpatient admissions) may indicate a potential problem.

Impact of review and data cleaning on 2003 data

The intensive reviews of case type, case description, and diagnoses revealed some reporting problems in the 2003 data. Given the scope of the changes introduced in 2003, data for the first two quarters (Q1-Q2) of 2003 were deemed too incomplete and unreliable for use.

For drug-related ED visits in Q3-Q4 2003, problems in the assignment of case type (see Table B1) were detected in:

- 54% of cases originally coded as *suicide attempt*;
- 36% of cases originally coded as *malicious poisoning*;
- 25% of cases originally coded as *accidental ingestion*;
- 24% of cases originally coded as *overmedication*;
- 14% of cases originally coded as case type *other*; and
- 11% of cases originally coded as *adverse reaction*.

Table B1
Type of case re-assignments: Q3-Q4 2003

Final type of case	Original type of case								Total
	Suicide attempt	Seeking detox	Alcohol only (age < 21)	Adverse reaction	Over-medication	Malicious poisoning	Accidental ingestion	Other	
Suicide attempt	3,739	8	4	1	48	1		180	3,981
Seeking detox	73	8,560	13	5	8	1		761	9,421
Alcohol only (age < 21)	2	4	2,829	1		2	2	54	2,894
Adverse reaction	8	3		8,693	246		14	355	9,319
Overmedication	3,010	12	1	153	2,879	9	243	3,014	9,321
Malicious poisoning	3		2	2	2	107	11	39	166
Accidental ingestion				31	25	1	1,026	84	1,167
Other	1,322	536	53	843	600	45	68	27,847	31,314
Total	8,157	9,123	2,902	9,729	3,808	166	1,364	32,334	67,583

SOURCE: Office of Applied Studies, SAMHSA, Drug Abuse Warning Network, 2003 (03/2004 update).

Most of these problems were relatively easy to remedy, once the source of the misunderstanding was uncovered. For example, initial reluctance to code large numbers of cases into case type *other* came from a concern that a category called *other* could not be frequent or important. Other necessary clarifications included:

- Suicide cases should include only documented suicide attempts (and exclude suicide gestures, thoughts, ideation, and so forth), a more restrictive definition than in old DAWN.
- Adverse reaction cases should include only licit drugs (and exclude “unexpected reactions” to illicit drugs, a category from old DAWN).
- Overmedication cases should include only licit drugs (and are not synonymous with “overdose”).
- Malicious poisoning should not include all types of “poisoning.”

Once the data for the complete period were assembled, one final review focused on the possibility of incomplete data, that is, DAWN cases missed due to incomplete chart review or inappropriate application of the case criteria. As a result of this final step, all data for 37 hospitals (39 EDs) and an additional 69 hospital months (71 ED months) were deemed unusable and were deleted from the final data used for estimation.

APPENDIX C

GLOSSARY OF TERMS

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

Case description: A description of how the drug(s) was related to the patient's ED visit. The case description, in conjunction with the chief complaint and diagnosis, is used to determine if the ED visit is reportable to DAWN. It is copied verbatim from the patient's chart when possible.

Chief complaint: The symptom(s) or condition(s) for which the patient was seeking treatment in the ED. Includes the following categories:

- *Overdose*—A condition associated with consumption of an excessive or toxic quantity of a drug or other substance.
- *Intoxication*—The condition produced by the toxic effect of a drug(s), often alcohol.
- *Seizures*—Neurologic events associated with abnormal electrical activity in the brain. Seizures manifest clinically as a change in consciousness, motor sensory, or behavioral symptoms.
- *Altered mental status*—Abnormal changes in basic mental functioning. Patient or those in attendance may state that the patient is disoriented as to time and place, is delirious, is having hallucinations, is combative, or exhibits other symptoms of that nature.
- *Psychiatric condition*—In DAWN, a general term used to denote mental illness or psychological dysfunction, specifically those mental, emotional, or behavioral problems not caused by a physical disease. These include suicidal ideation, depression, schizophrenia, bipolar disorder, and so forth.
- *Withdrawal*—The physical state/symptoms produced by abstention from drugs to which the person is addicted.
- *Seeking detox*—Cases characterized by documentation in the chart that the patient is seeking "detox," "rehab," or medical clearance or help for a drug problem.
- *Accident/injury/assault*—Cases involving self-inflicted injuries or injuries resulting from fights, accidents, or assaults with documented use of substances.
- *Abscess/cellulitis/skin/tissue*—Cases involving cellulitis, abscess, infection, or skin problems such as rashes.
- *Chest pain*—A category of symptoms associated with pain or discomfort in the chest or upper thorax.
- *Respiratory problems*—A category of conditions associated with breathing. Examples include shortness of breath, coughing, and wheezing.
- *Digestive problems*—A category of conditions associated with the gastrointestinal system. Examples include indigestion, nausea, vomiting, diarrhea, and constipation.
- *Other*—Complaints that do not fit into the pre-recorded categories.

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

Coterminous U.S.: The contiguous 48 States and Washington, DC; excludes Alaska and Hawaii.

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

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

Treated and released includes three categories:

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

Admitted to this hospital includes five categories:

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

Other Disposition includes five categories:

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

Drug: This refers to a substance that was recorded in a DAWN case report. In addition to alcohol, up to 6 substances (“drugs”) can be reported for each ED visit. Therefore, the total number of drugs exceeds the total number of ED visits. Even when only one drug is reported, it should not be assumed that the substance was the sole and direct cause of the visit; allowances should be made for reportable drugs not listed or other contributory factors. (See also **Single-drug case**.)

Drug category: A generic grouping of pharmaceuticals and other substances reported to DAWN, based on the classification of Multum Information Services. Multum Information Services is a subsidiary of the Cerner Corporation and a developer of clinical drug information systems and a drug knowledge base. More information is available at <http://www.multum.com/>. In general, the Multum categories follow the therapeutic uses for prescription and over-the-counter pharmaceuticals.

Additional clarification is provided for the following drug categories:

- *Alcohol alone*—DAWN collects data on alcohol when used alone only if the patient is under age 21.
- *Alcohol-in-combination*—Alcohol-in-combination is the category for alcohol present in combination with another reportable substance. DAWN does not gather data on alcohol used alone if the patient is over age 21. For patients 21 and older, alcohol must be used with another substance to be reported. Alcohol-in-combination is reportable for all ages.
- *Amphetamines*—This class of substances has been extracted from the category of central nervous system (CNS) stimulants because of its importance as a major substance of abuse. For purposes of classification, “amphetamines” (plural) includes a class of compounds derived from or related to the drug amphetamine. Although some “designer” drugs fall into the class of amphetamines, we choose to report some of them individually as major substances of abuse (e.g., methamphetamine). This category does not include other CNS stimulants, such as caffeine or methylphenidate.
- *Combinations not tabulated above (NTA)*—This category includes combinations composed of two or more major substances of abuse that are mixed and taken together. For example, “speedball,” which usually refers to the combination of heroin and cocaine taken at once, would be classified as a combination NTA, whereas heroin and cocaine used separately would be classified separately in the categories heroin and cocaine. Combinations consisting of a major substance of abuse and another substance are classified in the category of the major substance (e.g., heroin with scopolamine is classified as heroin).
- *Inhalants*—This category includes anesthetic gases and psychoactive non-pharmaceutical substances for which the documented route of administration was inhaled, sniffed, or snorted. Psychoactive non-pharmaceuticals fall into one of the following 3 categories: (1) **volatile solvents**—adhesives (model airplane glue, rubber cement, household glue), aerosols (spray paint, hairspray, air freshener, deodorant, fabric protector), solvents and gases (nail polish remover, paint thinner, correction fluid and thinner, toxic markers, pure toluene, cigar lighter fluid, gasoline, carburetor cleaner, octane booster), cleaning agents (dry cleaning fluid, spot remover, degreaser), food products (vegetable cooking spray, dessert topping spray such as whipped cream, whippets), and gases (butane, propane, helium); (2) **nitrites**—amyl nitrites (“poppers,” “snappers”) and butyl nitrites (“rush,” “locker room,” “bolt,” “climax,” “video head cleaner”); or (3) **chlorofluorohydrocarbons** (freons). Anesthetic gases (e.g., nitrous oxide, ether, chloroform) are presumed to have been inhaled.

Drug-related ED visit: Any ED visit related to recent drug use. To be a DAWN case, a drug needs only to be implicated in the visit; the drug does not have to have caused the visit. One patient may make repeated visits to an ED or to several EDs, thus producing a number of visits. It is impossible to determine the number of unique patients involved in the reported drug-related ED visits because no patient identifiers are collected.

Estimate: A statistical estimate is the value of a parameter (such as the number of drug-related ED visits) for the universe that is derived by applying sampling weights to data from a sample.

Hospital emergency department (ED): Only hospitals that meet eligibility criteria for DAWN are recruited to participate. To be eligible, hospitals must be non-Federal, short-stay, general medical and surgical facilities with EDs that are open 24 hours a day, 7 days a week, and located in the coterminous United States. Specialty hospitals, hospital units of institutions, long-term care facilities, pediatric hospitals, hospitals operating part-time EDs, hospitals in Alaska and Hawaii, and hospitals operated by the Veterans Health Administration and the Indian Health Service are excluded.

Metropolitan area: An area comprising a relatively large core city or cities and the adjacent geographic areas. Conceptually, these areas are integrated economic and social units with a large population nucleus. The current DAWN ED sample, which was designed in the 1980s, is based on the definitions of Metropolitan Statistical Areas (MSAs) and Primary Metropolitan Statistical Area (PMSAs) issued by the Office of Management and Budget (OMB) in 1983, with a few exceptions.

Not otherwise specified (NOS): Catch-all category for substances that are not specifically named in the listing. Terms are classified into an NOS category only when assignment to a more specific category is not possible based on information in the source documentation (ED patient charts).

Not tabulated above (NTA): Designation used when categories are not presented in complete detail; smaller units are combined in the NTA category.

***p*-value:** A measure of the probability (p) that the difference between two estimates could have occurred by chance, if the estimates being compared were really the same. The larger the p -value, the more likely the difference could have occurred by chance. For example, if the difference between two DAWN estimates has a p -value of 0.01, it means that there is a 1% probability that the difference observed could be due to chance alone.

Population: See **Universe**.

Precision: The extent to which an estimate agrees with its mean value in repeated sampling. The precision of an estimate is measured inversely by its standard error (SE) or relative standard error (RSE). In DAWN publications, estimates with RSEs of 50% or higher are regarded as too imprecise to be published. ED table cells where such estimates would have appeared contain the symbol "... " (3 dots). (See also **Relative standard error**.)

Race/ethnicity: Beginning in January 2000, the race and ethnicity categories collected on DAWN cases changed to match a change in the standard protocol issued by the OMB in 1997. The 1997 protocol permits separate reporting of race and Hispanic ethnicity, the ability to capture more than one race for an individual, modifications in nomenclature (e.g., "Black" was changed to "Black or African American"), division of certain categories ("Asian or Pacific Islander" was split into two categories, "Asian" and "Native Hawaiian or Other Pacific Islander"), and elimination of the "Other" category.

The race/ethnicity categories on the DAWN data collection forms are as follows:

- *White*—A person having origins in any of the original peoples of Europe, the Middle East, or North Africa.
- *Black or African American*—A person having origins in any of the black racial groups of Africa.

- *Hispanic or Latino*—A person of Cuban, Mexican, Puerto Rican, South or Central American, or other Spanish culture or origin, regardless of race.
- *Asian*—A person having origins in any of the original peoples of the Far East, Southeast Asia, or the Indian subcontinent including, for example, Cambodia, China, India, Japan, Korea, Malaysia, Pakistan, the Philippine Islands, Thailand, and Vietnam.
- *American Indian or Alaska Native*—A person having origins in any of the original peoples of North and South America (including Central America), and who maintains tribal affiliation or community attachment.
- *Native Hawaiian or Other Pacific Islander*—A person having origins in any of the original peoples of Hawaii, Guam, Samoa, or other Pacific Islands.
- *Not documented*—Used when documentation of race is not available from source records.

Despite the increased detail allowed by these categories, the actual race/ethnicity data reported to DAWN changed very little because race and ethnicity are often not documented with this level of specificity in patient/decedent records. As a result, we have retained the classification used previously to tabulate DAWN data. The one exception is that we now collapse the less commonly used categories into a category termed “Not tabulated above (NTA)” instead of “Other.” Categories used to tabulate race and ethnicity data in the ED publications are:

- *White*—Anyone meeting the definition of white (above). Those who are identified as white and Hispanic are classified as Hispanic.
- *Black*—Anyone meeting the definition of black or African American (above). Those who are identified as black or African American and Hispanic are classified as Hispanic.
- *Hispanic*—Anyone whose ethnicity is Hispanic or Latino (above) is placed in the category Hispanic, regardless of race.
- *Race/ethnicity NTA*—This includes those categories that are too small to report independently including: 2 or more races, American Indian or Alaska Native, Asian, Native Hawaiian or Other Pacific Islander.
- *Unknown*—Race and ethnicity are unknown. Those who are identified only as Hispanic are classified as Hispanic.

Relative standard error (RSE): A measure of an estimate’s relative precision. The RSE of an estimate is equal to the estimate’s standard error (SE) divided by the estimate itself. For example, an estimate of 2,000 cocaine visits with an SE of 200 visits has an RSE of 10%. The larger the RSE, the less precise the estimate. Estimates with an RSE of 50% or more are not published by DAWN. (See also **Precision** and **Standard error**.)

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

Sampling frame: A list of units from which the ED sample is drawn. All members of the sampling frame have a probability of being selected. A sampling frame is constructed such that there is no duplication and each unit is identifiable. Ideally, the sampling frame and the universe are the same. The sampling frame for the DAWN hospital ED sample is derived from the American Hospital Association (AHA) Annual Survey of Hospitals.

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

Sampling weights: Numeric coefficients used to derive population estimates from a sample.

Standard error (SE): A measure of the sampling variability or precision of an estimate. The SE of an estimate is expressed in the same units as the estimate itself. For example, an estimate of 10,000 visits with an SE of 500 indicates that the SE is 500 visits.

Strata (plural), stratum (singular): Subgroups of a population within which separate ED samples are drawn. Stratification is used to increase the precision of estimates for a given sample size, or, conversely, to reduce the sample size required to achieve the desired level of precision. The DAWN ED sample is stratified into 21 metropolitan area cells plus an additional cell for the remainder of the coterminous U.S. Then, within these cells strata are defined according to the annual number of ED visits, whether the hospital is located inside or outside the central city of the metropolitan area, and by the presence or absence of an organized outpatient department, alcohol/chemical dependence inpatient unit, or both. The strata are as follows:

Stratum	Annual ED visits	Location within metropolitan area	Outpatient department or alcohol/chemical dependence inpatient unit
In the 21 DAWN metropolitan areas:			
0	>80,000	Not applicable	Not applicable
1	<80,000	Central city	Both
2	<80,000	Central city	One only
3	<80,000	Central city	Neither
4	<80,000	Outside central city	Both
5	<80,000	Outside central city	One only
6	<80,000	Outside central city	Neither
In the remainder of the coterminous U.S.:			
0	>80,000	Not applicable	Not applicable
7	<80,000	Not applicable	Both
8	<80,000	Not applicable	One only
9	<80,000	Not applicable	Neither
Note: Stratum "0" is defined for each of the 21 metropolitan areas and for the remainder of the coterminous U.S. See <i>Drug Abuse Warning Network Sample Design and Estimation Procedures: Technical Report</i> , November 1997.			

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

Single-drug visit: A single-drug visit is one in which only one drug was involved. Because multiple substances may be recorded for each DAWN case (see **Drug**), readers should exercise caution in interpreting the relationship between a given drug and the number of associated ED visits. For example, if records for a given patient documented marijuana use, this does not mean that marijuana was the only drug involved in the ED visit or that the marijuana caused the ED visit. One should always consider whether and how many other drugs were used in combination, but even then attributing a causal relationship between the visit and a particular drug

may not be possible. Additionally, DAWN can only provide single-drug visit totals for alcohol if the patient was younger than age 21.

Type of case: A classification used to group similar DAWN cases. Each case is coded into one and only one category, the first that applies from the following hierarchy: Suicide attempt, seeking detox, alcohol only (age < 21), adverse reaction, overmedication, malicious poisoning, accidental ingestion, and *other*.

Universe: The entire set of units for which generalizations are drawn. The universe for the DAWN ED sample is all non-Federal, short-stay, general medical and surgical hospitals in the coterminous United States with EDs operating 24 hours a day, 7 days a week. (See also **Coterminous U.S.**).

APPENDIX D

ESTIMATES AND RATES

DAWN estimates and the margin of error

Each hospital in the DAWN sample was selected to represent itself and other hospitals in its area with similar characteristics. Therefore, each estimate produced from the sample data is subject to sampling variability, the so-called “margin of error,” which is the variation in the estimate that would be observed naturally if different samples were drawn from the same population using the same procedures. The sampling variability of an estimate is measured by its standard error (SE) and relative standard error (RSE), which is defined as the SE expressed as a percentage of the value of the estimate. The precision of an estimate is related to the degree of sampling variability as measured by the RSE; the greater the RSE value, the lower the precision.

For example, if there are 10,000 estimated visits involving a given drug and this estimate has an SE of 500, then the RSE value is 5%:

$$\begin{aligned} \text{RSE} &= \text{SE/Estimate} \\ \text{RSE} &= 500/10,000 \\ \text{RSE} &= 0.05 \end{aligned}$$

In this publication, “confidence intervals” (CIs) are included in most of the tables and are cited in the text along with the estimates. A CI, which is expressed as a range of values, is useful because it reflects both the estimate and its corresponding RSE. If the sampling distribution for the estimate is normal, then the 95% CI would be calculated as:

$$\text{CI} = \text{Estimate} \pm 1.96 \times \text{RSE} \times \text{Estimate}$$

where 1.96 comes from the table of normal distribution z-values. Ninety-five percent of the normal distribution lies between the z-values of ± 1.96 .

Applying the formula to the example above, the CI would be:

$$\begin{aligned} 10,000 \pm 1.96 \times 0.05 \times 10,000 &= 10,000 \pm 980.0 \\ \text{Lower limit: } 10,000 - 980 &= 9,020 \\ \text{Upper limit: } 10,000 + 980 &= 10,980 \\ \text{Confidence interval: } &9,020 \text{ to } 10,980 \end{aligned}$$

This means that if repeated samples were drawn from the same population of hospitals using the same sampling and data collection procedures, the true population value would fall within the confidence interval 95% of the time.

DAWN estimates with RSE values of 50% or higher are regarded as too imprecise for publication and are not shown in tables. With an RSE of 50%, the 95% CI for an estimate ranges from 2% to 198% of the estimate’s value. In the tables, 3 dots (“...”) have been substituted for estimates that have an RSE of 50% or higher.

Estimates adjusted for population size

Standardized measures are needed to make valid comparisons of estimates across age and gender categories. For age in particular, the size of the underlying population differs considerably across age groups; for example, the number of individuals age 18 to 20 in the U.S. is much lower than the number of individuals age 35 to 44. A higher estimate for the larger group in the population would be expected to occur naturally.

To take the size of the underlying population into account, rates of ED visits or drugs per 100,000 population are calculated using population data from the U.S. Bureau of the Census.¹⁴

For each age and gender category, the estimate for a category is divided by the population for that category, which is divided by 100,000. For example, consider an estimate of 1,000 visits for an age group of 1,000,000 persons and an estimate of 1,000 visits for an age group of 500,000 persons. The rates would be calculated as:

$$\begin{aligned} 1,000 / (1,000,000/100,000) &= 1,000 / 10 \\ &= 100 \text{ visits per } 100,000 \text{ population} \end{aligned}$$

$$\begin{aligned} 1,000 / (500,000/100,000) &= 1,000 / 5 \\ &= 200 \text{ visits per } 100,000 \text{ population} \end{aligned}$$

Population estimates used for this publication are provided in Appendix E.

Standardized rates are not calculated for race and ethnicity subgroups because the race/ethnicity categories available to DAWN are much less detailed than the race and ethnicity categories in the Census data. Appendix F describes the race and ethnicity data reported for DAWN.

¹⁴ Population counts from U.S. Census 2000 Summary File 1 (SF-1) (see <http://www.census.gov/Press-Release/www/2001/sumfile1.html>). Population estimates for 2003, as of July 1, 2003, from U.S. Census Bureau County Population Dataset CO-EST2003-ALLDATA (see <http://www.census.gov/popest/counties/files/CO-EST2003-alldata.csv>).

Table E1 – Population by age and gender by metropolitan area, 2003¹APPENDIX E
POPULATION DATA

Gender and age	Coterminous U.S.	Atlanta	Baltimore	Boston	Buffalo	Chicago	Dallas	Denver
TOTAL	288,861,182	4,276,139	2,616,229	4,032,129	941,293	6,562,831	3,653,034	2,205,845
0-5 years	24,419,263	393,285	212,459	318,095	71,696	585,327	363,655	194,617
6-11 years	26,323,729	402,433	240,267	337,678	82,866	606,042	352,878	197,352
12-17 years	25,300,894	364,903	225,201	310,327	80,604	557,747	324,714	186,507
18-20 years	10,949,464	155,414	86,383	119,841	31,854	244,582	145,761	78,403
21-24 years	14,757,533	228,088	114,846	198,045	42,564	359,592	212,784	115,602
25-29 years	19,913,605	368,974	166,472	303,395	54,769	526,241	322,260	182,655
30-34 years	21,161,469	389,673	197,128	336,337	64,008	525,516	323,116	185,805
35-44 years	46,726,438	770,236	452,875	696,384	150,787	1,055,502	639,279	388,839
45-54 years	39,218,789	582,635	377,591	562,336	131,404	850,444	459,386	316,789
55-64 years	25,326,545	315,871	235,771	350,717	86,967	537,709	255,565	169,346
65 years and older	34,763,454	304,627	307,236	498,975	143,775	714,129	253,636	189,930
MALES	140,993,545	2,105,361	1,251,420	1,942,660	448,926	3,189,547	1,821,507	1,101,139
0-5 years	11,923,786	192,036	103,834	155,507	35,202	286,341	177,609	94,774
6-11 years	12,846,262	196,950	117,440	164,650	40,264	296,309	172,877	96,541
12-17 years	12,344,279	176,890	110,564	151,299	39,407	272,472	157,853	90,635
18-20 years	5,364,144	73,805	43,435	57,831	15,640	117,815	68,615	37,250
21-24 years	7,405,079	112,657	60,512	101,915	21,697	180,477	104,244	56,492
25-29 years	10,029,078	184,899	87,731	155,552	28,321	263,871	158,961	88,775
30-34 years	10,678,914	195,654	103,284	171,807	33,057	262,954	158,353	90,319
35-44 years	23,797,884	391,697	236,243	356,617	78,289	537,876	317,443	193,749
45-54 years	20,107,818	302,593	196,958	292,327	68,162	442,111	234,437	159,685
55-64 years	13,218,283	162,453	123,480	184,901	46,595	286,596	131,743	86,921
65 years and older	20,152,111	181,144	181,329	297,063	85,732	426,461	149,393	109,565
FEMALES	147,867,637	2,170,778	1,364,809	2,089,469	492,367	3,373,284	1,831,527	1,104,706
0-5 years	12,495,566	201,252	108,626	162,587	36,494	298,986	186,045	99,843
6-11 years	13,477,520	205,483	122,824	173,029	42,600	309,735	180,003	100,811
12-17 years	12,956,472	188,010	114,639	159,028	41,198	285,273	166,860	95,871
18-20 years	5,585,321	81,609	42,948	62,011	16,215	126,767	77,146	41,153
21-24 years	7,352,454	115,432	54,334	96,130	20,867	179,115	108,540	59,110
25-29 years	9,884,527	184,074	78,741	147,843	26,447	262,370	163,299	93,880
30-34 years	10,482,555	194,019	93,845	164,529	30,950	262,562	164,763	95,485
35-44 years	22,928,554	378,539	216,632	339,768	72,499	517,626	321,836	195,091
45-54 years	19,110,970	280,041	180,633	270,008	63,242	408,332	224,950	157,104
55-64 years	12,108,262	153,418	112,292	165,816	40,372	251,112	123,822	82,425
65 years and older	14,611,343	123,484	125,907	201,912	58,042	287,668	104,243	80,365

¹ Average 2003 civilian noninstitutional population estimated using data from 2 Census Bureau data files: 2000 Census Counts by Age, Sex, and Race (ASR files); and County-Level Population Estimates (CPOP file).

SOURCE: Office of Applied Studies, SAMHSA, Drug Abuse Warning Network, 2003 (03/2004 update).

Table E1 – Population by age and gender by metropolitan area, 2003¹ (continued)

Gender and age	Detroit	Los Angeles	Miami	Minneapolis	New Orleans	New York	Newark	Philadelphia
TOTAL	4,634,526	9,871,506	2,341,167	2,971,098	1,289,516	9,418,583	1,959,969	5,100,273
0-5 years	398,351	944,781	185,960	262,028	109,119	784,536	171,144	411,781
6-11 years	443,772	999,118	205,056	279,483	119,493	813,972	179,619	469,091
12-17 years	401,502	861,504	200,015	267,325	121,544	738,766	160,393	446,759
18-20 years	161,401	407,858	88,635	104,704	52,749	345,111	62,566	170,592
21-24 years	210,330	576,728	117,857	150,740	67,544	527,826	86,428	231,289
25-29 years	321,044	812,184	170,008	218,795	87,542	768,861	126,716	326,613
30-34 years	352,378	836,546	180,203	242,926	90,634	796,605	153,732	371,936
35-44 years	769,867	1,579,092	376,156	534,647	206,670	1,507,324	338,108	850,415
45-54 years	647,273	1,197,709	295,155	411,305	181,653	1,221,556	274,743	704,539
55-64 years	392,676	726,433	216,434	228,635	109,904	824,127	178,203	450,596
65 years and older	535,933	929,553	305,687	270,509	142,664	1,089,899	228,318	666,660
MALES	2,252,261	4,867,554	1,125,053	1,467,126	614,110	4,461,151	942,844	2,438,437
0-5 years	194,244	461,120	90,726	128,103	53,480	383,775	83,640	201,755
6-11 years	216,396	488,680	100,453	136,353	58,341	398,352	87,593	229,168
12-17 years	196,052	420,288	98,179	130,424	59,960	361,693	78,431	218,536
18-20 years	78,455	197,605	44,010	50,531	27,005	169,950	30,268	84,318
21-24 years	106,831	285,094	60,260	76,155	35,788	274,035	43,948	120,228
25-29 years	164,237	402,517	86,368	109,693	46,573	401,231	65,253	168,926
30-44 years	179,045	411,866	91,385	121,591	47,471	411,487	79,846	193,554
35-44 years	392,859	792,635	193,637	267,421	108,671	782,342	174,397	441,163
45-54 years	331,953	621,174	155,935	208,262	94,816	655,449	144,102	368,304
55-64 years	204,338	383,623	115,774	117,339	58,268	455,287	93,889	239,354
65 years and older	317,854	539,348	179,386	158,101	85,035	663,831	135,758	396,530
FEMALES	2,382,265	5,003,952	1,216,114	1,503,972	675,406	4,957,432	1,017,125	2,661,836
0-5 years	204,109	483,661	95,234	133,925	55,640	400,762	87,503	210,027
6-11 years	227,375	510,437	104,603	143,131	61,153	415,618	92,027	239,923
12-17 years	205,449	441,217	101,836	136,901	61,583	377,073	81,963	228,222
18-20 years	82,946	210,254	44,625	54,173	25,744	175,160	32,298	86,274
21-24 years	103,499	291,634	57,597	74,585	31,756	253,791	42,480	111,062
25-29 years	156,807	409,667	83,640	109,102	40,969	367,631	61,463	157,687
30-34 years	173,333	424,680	88,818	121,335	43,163	385,119	73,886	178,382
35-44 years	377,008	786,456	182,519	267,226	97,999	724,981	163,711	409,252
45-54 years	315,319	576,534	139,220	203,043	86,837	566,106	130,641	336,235
55-64 years	188,338	342,810	100,660	111,296	51,636	368,840	84,313	211,242
65 years and older	218,078	390,205	126,301	112,409	57,629	426,069	92,560	270,131

¹ Average 2003 civilian noninstitutional population estimated using data from 2 Census Bureau data files: 2000 Census Counts by Age, Sex, and Race (ASR files); and County-Level Population Estimates (CPOP file).

SOURCE: Office of Applied Studies, SAMHSA, Drug Abuse Warning Network, 2003 (03/2004 update).

Table E1 – Population by age and gender by metropolitan area, 2003¹ (continued)

Gender and age	Phoenix	St. Louis	San Diego	San Francisco	Seattle	Washington, DC
TOTAL	3,389,260	2,568,909	2,930,886	1,695,211	2,400,820	4,807,766
0-5 years	323,998	211,211	258,793	108,588	187,121	415,290
6-11 years	315,664	238,487	273,914	112,039	200,905	434,173
12-17 years	283,529	235,966	244,476	104,064	192,543	390,957
18-20 years	143,350	94,526	115,316	47,904	84,001	146,964
21-24 years	196,601	120,403	173,380	85,298	122,304	235,699
25-29 years	272,207	166,264	230,047	154,505	188,082	371,461
30-34 years	266,368	179,620	233,634	163,546	206,710	416,031
35-44 years	525,224	431,350	483,058	294,434	433,441	869,992
45-54 years	406,379	352,960	375,737	251,900	357,674	705,475
55-64 years	268,104	222,706	218,579	155,046	194,642	410,008
65 years and older	387,835	315,416	323,952	217,886	233,396	411,717
MALES	1,690,418	1,235,348	1,450,898	843,708	1,194,048	2,334,613
0-5 years	158,183	103,210	126,343	53,023	91,146	203,423
6-11 years	154,104	116,766	133,305	54,657	97,760	212,384
12-17 years	137,779	115,606	119,169	50,549	93,940	190,979
18-20 years	68,150	46,524	57,134	22,355	41,170	70,667
21-24 years	93,682	62,783	85,415	42,254	61,042	121,114
25-29 years	130,863	86,109	111,843	75,209	92,505	190,903
30-34 years	128,054	92,633	114,706	77,796	100,795	214,236
35-44 years	259,820	221,941	240,661	142,353	214,644	447,489
45-54 years	208,472	183,201	191,958	127,102	180,878	369,055
55-64 years	140,876	117,348	114,975	80,302	98,107	211,884
65 years and older	218,859	187,443	184,480	125,903	134,783	241,020
FEMALES	1,698,842	1,333,561	1,479,988	851,503	1,206,772	2,473,153
0-5 years	165,815	108,002	132,450	55,567	95,975	211,866
6-11 years	161,560	121,723	140,609	57,381	103,145	221,792
12-17 years	145,751	120,358	125,307	53,515	98,603	199,975
18-20 years	75,201	48,002	58,183	25,550	42,831	76,297
21-24 years	102,919	57,620	87,966	43,044	61,262	114,585
25-29 years	141,344	80,155	118,204	79,296	95,577	180,558
30-34 years	138,314	86,987	118,928	85,750	105,914	201,795
35-44 years	265,404	209,410	242,396	152,081	218,796	422,503
45-54 years	197,907	169,759	183,779	124,798	176,796	336,420
55-64 years	127,228	105,358	103,604	74,744	96,535	198,125
65 years and older	168,976	127,974	139,472	91,983	98,614	170,696

¹ Average 2003 civilian noninstitutional population estimated using data from 2 Census Bureau data files: 2000 Census Counts by Age, Sex, and Race (ASR files); and County-Level Population Estimates (CPOP file).

SOURCE: Office of Applied Studies, SAMHSA, Drug Abuse Warning Network, 2003 (03/2004 update).

APPENDIX F

RACE AND ETHNICITY IN DAWN

Beginning in January 2000, the race and ethnicity categories used by DAWN changed to match a revised standard protocol issued by the Office of Management and Budget (OMB).¹⁵ The new protocol permitted separate reporting of race and Hispanic ethnicity, and it incorporated the ability to capture more than one race for an individual, a few modifications in nomenclature (e.g., “black” was changed to “black or African American”), division of certain categories (“Asian or Pacific Islander” was split into two categories, “Asian” and “Native Hawaiian or Other Pacific Islander”), and elimination of the “Other” category. The complete DAWN ED case form is reproduced in Figure 2 in this report.

Despite the increased detail allowed by the new categories, the actual race and ethnicity data extracted from source records and submitted to DAWN changed very little. This is because the source documents (that is, the ED medical records from which DAWN data are abstracted) rarely contain such detailed information on race and ethnicity of patients.

For reference, estimates of race and ethnicity in drug-related ED visits are presented in Table F1. This analysis, which is based on the most detailed coding of race and ethnicity in DAWN case reports, reveals that estimates for the following categories are too small to be meaningful:

- Two or more races and/or ethnicity (that is, 2 or more races and/or ethnicity were documented in the source record for the same individual),
- Hispanic or Latino ethnicity with any specific race indicated,
- American Indian or Alaska Native,
- Asian, and
- Native Hawaiian or Other Pacific Islander.

Therefore, in the tables of estimates in this and other DAWN publications we have retained the categories used previously to tabulate DAWN data, with one exception. A new category called “Race/ethnicity not tabulated above (NTA)” is used to tabulate those categories that are too small to report independently.¹⁶ All cases reported to DAWN as Hispanic or Latino ethnicity are tabulated as Hispanic race/ethnicity, regardless of race.

This lack of detailed race and ethnicity data in DAWN case reports also prevents us from generating rates per 100,000 population for race and ethnicity categories. Data from the 2000 decennial Census were collected and are being tabulated according to the revised race and ethnicity protocol and are therefore incompatible with DAWN estimates.

¹⁵ See Office of Management and Budget, Revisions to the Standards for the Classification of Federal Data on Race and Ethnicity, *Federal Register*, 62 FR 58782, October 30, 1997.

¹⁶ One exception is that if two races are reported and the second is reported as unknown, the episode is coded for the known race.

Table F1**Drug-related ED visits, by detailed race/ethnicity: Q3-Q4 2003**

Race/ethnicity	Estimated visits ^{1,2,3}
Total drug-related visits	627,923
One race/ethnicity	622,917
White	410,473
Black/African American	92,409
Hispanic	47,157
Asian	1,064
American Indian/Alaska Native	3,391
Native Hawaiian/Other Pacific Islander	...
Race unknown	67,610
Two races/ethnicity	4,999
White + Black/African American	339
White + Hispanic	4,127
White + Asian	...
White + American Indian/Alaska Native	...
Black/African American + Hispanic	43
Black/African American + Asian	...
Black/African American + American Indian/Alaska Native	...
Hispanic + Asian	...
Hispanic + American Indian/Alaska Native	11
Asian + American Indian/Alaska Native	7
American Indian/Alaska Native + Native Hawaiian/Other Pacific Islander	...
Three races/ethnicity	8
White + Black/African American + Hispanic	8

¹ These are estimates of ED visits based on a representative sample of non-Federal, short-stay hospitals with 24-hour EDs in the coterminous U.S.

² Estimates are all expressed in visits.

³ Three dots (...) indicate that an estimate with an RSE greater than 50% has been suppressed.

SOURCE: Office of Applied Studies, SAMHSA, Drug Abuse Warning Network, 2003 (03/2004 update).