OFFICE OF APPLIED STUDIES

Emergency Department Trends from the Drug Abuse Warning Network, Preliminary Estimates January-June 2001 with Revised Estimates 1994-2000

DEPARTMENT OF HEALTH AND HUMAN SERVICES
Substance Abuse and Mental Health Services Administration
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* These tables are published only on the Internet at http://www.samhsa.gov/oas/dawn.htm.

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HIGHLIGHTS

Drug Episodes vs. Drug Mentions

Drug Episode: **A drug-related ED episode is an ED visit that was induced by or related to the use of an illegal drug(s) or the nonmedical use of a legal drug for patients age 6 to 97 years.**

Drug Mention: **A drug mention refers to a substance that was recorded ("mentioned") during a drug-related ED episode. Because up to 4 drugs can be reported for each drug abuse episode, there are more mentions than episodes cited in this report.**

The Drug Abuse Warning Network (DAWN) relies on a sample of hospitals operating 24-hour emergency departments (EDs) to capture data on ED visits induced by or related to substance abuse. DAWN data do not measure prevalence of drug use in the population, but the probability sample of hospitals is designed to produce representative estimates of ED drug episodes and drug mentions for the coterminous United States and for 21 metropolitan areas. The Substance Abuse and Mental Health Services Administration (SAMHSA), the agency responsible for DAWN, is required under Section 505 of the Public Health Service Act to collect such data.

This issue of *ED Trends from DAWN* presents for the first time preliminary estimates for January to June of 2001, with comparisons to the same months of 2000. In addition, this publication introduces recent changes in the way DAWN codes and classifies drugs; and it addresses the impact of these changes on estimates published previously for 1994 to 2000. ***The revised estimates in this publication supersede the estimates published previously for 1994 through 2000.***

Findings reported here are statistically significant unless stated otherwise. Estimates for the first half of 2001 are preliminary, so there is no guarantee that statistically significant differences will remain once the data are complete and estimates for the full year produced. This publication (text and tables), additional tables grouped by metropolitan area, and tables of relative standard errors are available online at http://www.samhsa.gov/oas/dawn.htm.

TOTAL DRUG-RELATED EPISODES

- From January to June 2001, DAWN estimates that there were 308,368 drug-related ED episodes in the coterminous U.S. with 559,334 drug mentions (Table 2.1.0). Both ED drug episodes and ED drug mentions were statistically unchanged, based on comparisons of the first half of 2000 and the first half of 2001.

- Comparing preliminary estimates for the first half of 2000 and the first half of 2001 for the 21 metropolitan areas oversampled in DAWN (Table 3.1): Increases in drug episodes were evident only for Minneapolis (18%), Boston (10%), and Baltimore (9%). Decreases in drug episodes occurred in San Francisco (-12%) and Dallas (-8%).

Revised Estimates for 1994 to 2000

- DAWN estimates for 1994 to 2000 have been revised as a result of improvements in the coding and classification of drugs mentioned in ED visits and minor corrections unrelated to the drug vocabulary. Revised estimates for total ED episodes deviate only slightly (no more than 0.08 percent in any year) from previously published estimates.

Revised estimates for total drug mentions change more, but still no more than 0.2 percent in any year.

- In 2000, there were 601,563 drug-related ED episodes in the coterminous U.S. (Table 2.2.0), a rate of 243 ED episodes per 100,000 population (Table 12.2.0). On average, 1.8 drugs were reported per episode for a total of 1,099,306 drug mentions. There was no statistically significant change between 1999 and 2000 in total drug-related ED episodes or ED drug mentions (Table 2.2.0). However, total ED visits (that is, ED visits for any reason) increased 6 percent (from 91.1 million to 96.2 million) during this period.

- From 1999 to 2000, significant increases in drug episodes were found in 7 of the 21 metropolitan areas oversampled in DAWN (Table 3.2): Seattle (32%, from 8,424 to 11,115), Boston (28%, from 11,669 to 14,902), Los Angeles (22%, from 20,677 to 25,286), Miami (20%, from 7,128 to 8,560), Chicago (16%, from 26,154 to 30,327), Minneapolis (12%, from 4,643 to 5,197), and Phoenix (9%, from 8,291 to 9,072). From 1999 to 2000, significant decreases in drug episodes were found in 2 metropolitan areas: Baltimore (-19%, from 14,171 to 11,505) and San Francisco (-12%, from 8,928 to 7,857).

- Adjusting for population differences, the highest rates of ED drug episodes in 2000 were apparent in (Table 13.2): Seattle (563 ED drug episodes per 100,000 population), Chicago (502), Baltimore (483), Philadelphia (481), and San Francisco (480). Among the 21 metropolitan areas in DAWN, Minneapolis had the lowest rate of ED drug episodes (214) per 100,000 population in 2000 (Table 13.2).

MAJOR SUBSTANCES OF ABUSE

Each ED drug mention in DAWN is tabulated either as a "major substance of abuse" or as an "other substance of abuse" (described below). "Major substances of abuse" include the most common illicit drugs reported to DAWN (e.g., cocaine, heroin, marijuana), alcohol reported in combination with any other substance reported to DAWN ("alcohol-in-combination"), and lower frequency drugs of particular policy interest (e.g., club drugs such as Ecstasy and GHB, inhalants).

- Revised estimates for 1994 to 2000 deviate only slightly from previously published estimates for alcohol-in-combination, cocaine, marijuana, methamphetamine, MDMA (Ecstasy), Ketamine, and flunitrazepam (Rohypnol) (see Appendix B). Heroin and morphine have been assigned to separate categories, so the estimate for heroin mentions cannot be compared to the previously published estimate for heroin/morphine. The estimates for amphetamines, LSD, PCP, miscellaneous hallucinogens, and GHB deviate more because of adjustments to these categories. Inhalants and combinations of major substances are essentially new categories.

- Comparing preliminary estimates for the first half of 2000 and the first half of 2001, there were no significant changes in ED mentions of any of the major substances of abuse: alcohol-in-combination, cocaine, heroin, marijuana, amphetamines, methamphetamine, LSD and other hallucinogens, "club drugs" (MDMA [Ecstasy], Ketamine, flunitrazepam [Rohypnol], GHB), or inhalants (Table 2.1.0).

- From 1999 to 2000, there were significant increases in ED mentions of heroin (15%), amphetamines (37%), and methamphetamine (29%) (Table 2.2.0), while mentions of alcohol-in-combination, cocaine, and marijuana were unchanged.

- Several of the less frequently mentioned major substances of abuse had substantial increases from 1999 to 2000 (Table 2.2.0): MDMA (Ecstasy, up 58%, from 2,850 to 4,511), and PCP (48%, from 3,663 to 5,404). Mentions of GHB (4,969 in 2000), LSD (4,016), miscellaneous hallucinogens (1,849), inhalants (1,522), and Ketamine (263) were statistically unchanged form 1999 to 2000.

- **Cocaine**: Comparing preliminary estimates for the first half of 2000 and the first half of 2001 (Table 3.5), increases in cocaine mentions were evident for Boston (17%) and Baltimore (11%), and decreases occurred in New Orleans (-24%), Dallas (-16%), Denver (-13%), and San Diego (-11%).

- **Heroin**: Comparing preliminary estimates for the first half of 2000 and the first half of 2001 (Table 3.7), increases in heroin mentions were evident for Minneapolis (58%) and Miami (21%), and decreases occurred in New Orleans (-43%), Seattle (-38%), San Diego (-33%), San Francisco (-18%), and Los Angeles (-16%).

- **Methamphetamine**. Adjusting for population differences, the highest rates of ED mentions of methamphetamine in 2000 occurred in (Table 13.12): San Francisco (36 methamphetamine mentions per 100,000 population), San Diego (31), Phoenix (29), Seattle (27), and Los Angeles (16). Among these cities, methamphetamine mentions declined in Seattle (-49%), Denver (-30%), Dallas (-29%), and San Diego (-17%) from the first half of 2000 to the first half of 2001. There were no increases during this time period.

OTHER SUBSTANCES OF ABUSE

Not all cases involving prescription or over-the-counter (OTC) drugs are reportable to DAWN. However, DAWN receives reports of ED episodes involving the nonmedical use of legal drugs. These can involve deliberate abuse of prescribed or legally obtained over-the-counter (OTC) medications or of pharmaceuticals diverted for abuse. Accidental overdoses or ingestions with no intent of abuse, or adverse reactions to OTC or prescription drugs taken as directed are not reportable to DAWN unless they were present in combination with an illicit drug. Only generic drug names are presented in DAWN publications. DAWN estimates should not be attributed to drugs marketed under particular brand (trade) names.

- DAWN estimates that other substances of abuse (474,916 mentions) accounted for 43 percent of total ED drug mentions in 2000 (Table 2.2.0). Although the vast majority of these other substances are marketed legally by prescription or over the counter, it is impossible to know from DAWN the number of ED visits related to the abuse of prescription drugs by the person for whom the drug was prescribed for a therapeutic purpose.

- In 2000, ED mentions of other substances of abuse are most concentrated in 2 categories—psychotherapeutic agents (204,527 mentions) and CNS agents (203,572)—in nearly equal proportions (19% of total ED mentions each) (Table 2.2.0).

Psychotherapeutic Agents

- The most frequent psychotherapeutic agents mentioned in drug-related ED visits in 2000 were: Anxiolytics, sedatives, and hypnotics (11% of total ED mentions, 120,519 mentions), which include the benzodiazepines (8%, 91,078 mentions) and antidepressants (6%, 60,576 mentions).

- Overall, mentions of benzodiazepines have risen 22 percent (from 74,637 to 91,078 mentions) from 1994 to 2000, but have been stable from 1998 to 2000 (Table 2.2.0). Alprazolam is the only benzodiazepine with a recent increase (up 24% from 1998 to 2000, from 17,833 to 22,105) (Table 2.4.0).

CNS Agents

- Narcotic analgesics and narcotic analgesic combinations ("narcotic analgesics/ combinations") are the most frequently mentioned CNS agents in drug-related ED visits in 2000 (7% of total ED mentions, 82,373 mentions) (see Table A).

- From 1994 to 2000, mentions of narcotic analgesics/combinations rose 85 percent, 40 percent over the 2-year period 1998-2000, and 19 percent from 1999 to 2000 (Table A). Mentions of narcotic analgesics/combinations did not change significantly from the first half of 2000 to the first half of 2001.

- In 2000, the most frequently mentioned narcotic analgesics were: Hydrocodone (20,098 mentions), oxycodone (10,825), methadone (7,819), propoxyphene (5,485), codeine (5,295), and meperidine (1,085) (Table A).

- Significant long-term increases in narcotic analgesic mentions were found for hydrocodone (up 116% from 1994 to 2000), oxycodone (166%), and methadone (140%) (Table A). Fentanyl also increased significantly (nearly 2,000%), but is mentioned much less frequently (576 mentions in 2000).

- In recent years, mentions of 3 narcotic analgesics have increased substantially (Table A):

  - From 1999 to 2000, ED mentions increased for: Hydrocodone (up 32%, from 15,252 mentions), oxycodone (up 68%, from 6,429), and methadone (up 44%, from 5,426).

  - From 1998 to 2000, ED mentions increased for: Hydrocodone (up 48% from 13,611 mentions), oxycodone (up 108%, from 5,211), and methadone (up 63%, from 4,810).

  - From the first half of 2000 to the first half of 2001, ED mentions of oxycodone increased 44 percent (from 5,437 to 7,831) and mentions of methadone increased 40 percent (from 3,405 to 4,766).

- The only decrease in ED mentions of narcotic analgesics occurred for codeine, which dropped 20 percent since 1998 (from 6,620 to 5,295 in 2000) and 44 percent (from 9,439) since 1994 (Table A). From the first half of 2000 to the first half of 2001, mentions of codeine decreased 38 percent (from 2,578 to 1,593).

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New Drugs

- During the period 1994 to 2000, 6 new drugs—citalopram, mirtazapine, nefazodone (antidepressants); olanzapine, quetiapine (antipsychotics); and celecoxib and tramadol (analgesics)—had zero ED mentions followed by increasing numbers in the years following their approval by the FDA. Whether these represent an emerging drug abuse problem(s) cannot be determined based solely on this information, but future monitoring of these drugs using DAWN and other information sources may be warranted.

DEMOGRAPHIC CHARACTERISTICS

- Comparing estimates for the first half of 2000 and the first half of 2001, there were no significant changes in total drug-related episodes for any of the demographic subgroups (Table 4.1.0).

- From 1999 to 2000, increases in total ED episodes occurred for females (up 9%, from 257,983 to 281,793 mentions), patients age 12 to 17 (20%, from 52,685 to 63,443), patients age 18 to 25 (13%, from 109,579 to 123,310), and Hispanics (20%, from 56,840 to 68,282) (Table 4.2.0). Total episodes for males, older age groups, and other race/ethnicity subgroups were unchanged from 1999 to 2000.

- Adjusting for population, males and females had similar rates of ED drug episodes overall (259 and 221 episodes per 100,000 population, respectively) (Table 14.2.0). However, the rates for males were approximately double the rates for females for cocaine (95 vs. 46), heroin (52 vs. 24), and marijuana (52 vs. 26) (Tables 14.6.0, 14.8.0, and 14.10.0).

- Adjusting for differences in population, patients age 18 to 25 (426 episodes per 100,000 population) and patients age 26 to 34 (411) had the highest rates of ED drug episodes among the age groups in 2000, followed by patients age 12 to 17 (272) (Table 14.2.0). Although patients age 35 and over accounted for the largest number of ED drug episodes (Table 4.2.0), they had the lowest episode rate (201) in 2000 (Table 14.2.0).

- Patients age 26 to 34 had the highest rates of cocaine mentions (155 per 100,000 population) in 2000, followed by patients age 18 to 25 (89) and patients age 35 and over (68) (Table 14.6.0). Patients age 12 to 17 had the lowest rate of cocaine mentions in 2000 (19).

- In 1999 and 2000, the rates of heroin mentions per 100,000 population seem to have converged for patients age 26 to 34 (60 in 1999 and 72 in 2000) and patients age 18 to 25 (53 and 62) (Table 14.8.0). Heroin mentions among patients age 18 to 25 increased 21 percent from 1999 to 2000 (Table 4.8.0, 14.8.0), with this increase occurring primarily among those age 20 to 25. In 2000, rates of heroin mentions were substantially lower for patients age 35 and over (37), but notably, heroin mentions for patients age 35 and over increased 12 percent from 1999 to 2000 (Table 4.8.0, 14.8.0). Patients age 12 to 17 had the lowest rates of heroin mentions (5) and the trend appears to be flat.

- The rate of marijuana mentions per 100,000 population is highest among patients age 18 to 25 (105 in 2000) and lowest among patients age 35 and over (21). Although it may appear that the rate of marijuana mentions has been rising in recent years, it has been statistically unchanged overall and for patients age 18 to 25 from 1998 to 2000 (Table 4.10.0, Figure 10). The trends for 2 age groups (age 12 to 17 and age 26 to 34) have been nearly indistinguishable from 1994 to 2000.

EPISODE CHARACTERISTICS

- The majority (56%, 338,050 episodes in 2000) of drug-related ED episodes involve more than one drug (Table 5.2.0).

- In 2000, nearly half (47%) of episodes involving heroin involved only heroin (Table 5.8.0). However, only 28 percent of episodes involving cocaine involved cocaine alone (Table 5.6.0), and only 24 percent of episodes involving marijuana involved marijuana alone (Table 5.10.0).

- In drug-related ED episodes during 2000, *dependence* (36%, 217,122 episodes) and *suicide* (32%, 193,010) were the most frequently cited motives for taking substances (Table 5.2.0).

- In 2000, *psychic effects* was the most common motive in episodes involving marijuana (38%, 36,970 episodes) (Table 5.10.0), whereas *dependence* was the most common motive for episodes involving cocaine (59%, 103,351) (Table 5.6.0) and heroin (84%, 79,383) (Table 5.8.0).

- By far, the most common reason for ED contact cited in drug-related ED episodes in 2000 was *overdose* (44%, 264,121 episodes) (Table 5.2.0).

- In 2000, about half of drug-related ED episodes resulted in admission to the hospital (51%, 306,146 episodes) (Table 5.2.0).

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INTRODUCTION

This publication presents estimates of drug-related emergency department (ED) episodes from the Drug Abuse Warning Network (DAWN) from 1994 through the first half of 2001. DAWN is an ongoing, national data system that collects information on drug-related visits to EDs from a national probability sample of hospitals. The Office of Applied Studies (OAS) of the Substance Abuse and Mental Health Services Administration (SAMHSA) has been responsible for DAWN operations since 1992.

The DAWN system also collects data on drug-related deaths from a nonrandom sample of death investigation jurisdictions. DAWN mortality data are published annually in a separate publication entitled *Mortality Data from the Drug Abuse Warning Network*. For years prior to 2000, publications in that series were titled *Drug Abuse Warning Network Annual Medical Examiner Data.*

Except for a modification to the ED sample that occurred in the mid-1980s, DAWN has changed little during its nearly 3 decades of operation. In late 1997, OAS began a comprehensive assessment of DAWN's design in response to concerns about uses and limitations of DAWN data. An independent evaluation of DAWN was undertaken in 1999, and recommendations for an alternative design were delivered in 2001. This assessment has motivated many recent changes to the content and operation of the DAWN system, as well as to the data and information available from DAWN, and many more changes are expected over the coming years. For example, improving the timeliness of DAWN publications became a priority in 1998.

In addition, OAS receives many requests for specific information from potential and actual consumers of information from DAWN. We view these requests as expressions of the need to improve the content of DAWN publications. Therefore, the types of information needed and the problems consumers have had in locating that information in the past have guided our thinking about new content for our publications and new methods of dissemination. For example, we recently initiated a new series of short publications called *The DAWN Report*. The inaugural issue of *The DAWN Report* focused on club drugs, a topic chosen because of the large volume of requests for information on this emerging drug problem.[3] Those requests arose because of the absence of such information in the standard DAWN publications. *The DAWN Report* on club drugs combined both morbidity (emergency department) and mortality data to assess changes in the number of adverse health consequences resulting from use of those substances.

This publication—*Emergency Department Trends from the Drug Abuse Warning Network*—marks a major change in the presentation of DAWN findings from ED data. More importantly, the new title introduces a new design with major changes in format and content. These changes were designed to provide more detailed information, information about a larger number of drugs (both illicit and licit), more consistent information, and more information pertaining to the 21 metropolitan areas oversampled in DAWN. These changes, particularly the addition of more detailed information for metropolitan areas, respond to numerous requests for such information from DAWN consumers.

[3] Issues of *The DAWN Report* are available on-line at http://www.samhsa.gov/oas/dawn.htm.

ED Trends from DAWN will be published twice each year. Once each year, *ED Trends* will publish a limited set of preliminary estimates developed from the first half-year of data (i.e., January through June). Each year, a second issue of *ED Trends* will report final estimates for the most recent full year and comparisons to previous years. This report series replaces 2 semi-annual publications—*Mid-year Preliminary Emergency Department Data from DAWN* and *Year-end Emergency Department Data from DAWN*. It also replaces the trend tables (chapter 4) from the annual *Detailed ED Tables*,[4] which are published exclusively on the Internet. The change in title is intended to reduce the confusion caused by those previous, complex titles.

CONTENT OF THIS PUBLICATION

This publication has dual purposes: first, to release preliminary estimates for the first half of 2001, and second, to present revised full-year trends from 1994 to 2000 using the new format for the first time. In subsequent issues of *ED Trends from DAWN* that report preliminary half-year estimates, full-year estimates will be presented primarily for reference.

This publication contains the following estimates of drug-related ED episodes and specific drug mentions:

- Preliminary estimates for January – June 2001, with revised half-year estimates from July 1996 through December 2000 for comparison.

  Estimates for January – June 2001 are considered preliminary because some hospitals can be expected to report late and the sampling weights used to derive national and metropolitan area estimates for this period are not final (see Appendix D).

- Final, revised estimates for the full years 1994 through 2000.

The revised estimates in this publication supersede DAWN estimates published previously for 1994 through 2000.

Revisions to estimates published previously are the result of a major change in the underlying method by which drugs are coded and classified in DAWN. DAWN relies on a detailed "drug vocabulary" to categorize the thousands of substances that are reported each year. The drug vocabulary is, quite literally, the language—the codes and terminology—that DAWN uses to record and classify drugs and other substances collected from EDs. It was necessary to implement substantial changes to the existing vocabulary to ensure that reported substances are accurately and consistently classified. The overhaul and replacement of the DAWN drug vocabulary is described in detail in Appendix A.[5]

In the next section, we describe the sources and methods used to collect data for DAWN, and then highlight certain limitations of the data. Finally, we provide an overview of the new layout of this publication, including a detailed description of each new table and its proper interpretation.

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[4] Prior to 1998, *Detailed ED Tables* were published under the title *DAWN Annual Emergency Department Data.*

[5] The classification of drugs currently in use by DAWN is derived from the *Multum Lexicon*, Copyright © 2001, Multum Information Services, Inc. The classification has been modified to meet DAWN's unique requirements (2001). The Multum Licensing Agreement governing use of the *Lexicon* is provided in Appendix G to this report and can be found on the Internet at http://www.multum.com/.

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OVERVIEW OF DAWN ED COMPONENT

The DAWN system provides information on some of the health consequences of drug abuse in the United States as manifested by drug-related visits to hospital EDs. Hospitals eligible for DAWN are non-Federal, short-stay, general medical and surgical hospitals that operate 24-hour, 7-day EDs in the coterminous U.S. Since 1988, DAWN ED data have been collected from a representative sample of eligible hospitals located throughout the coterminous U.S., with oversampling in 21 metropolitan areas and a National Panel of hospitals sampled from locations outside these areas.

In 2000, the DAWN sample consisted of 578 eligible hospitals.[6] Of these, 466 (81%) participated in DAWN. Response rates in the 21 metropolitan areas ranged from 55 percent to 100 percent, with only 3 metropolitan areas having response rates below 80 percent (Table 1.1). The 2000 sample of hospitals submitted data on 185,857[7] drug abuse episodes with an average of 1.8 drug mentions per episode (Table 1.3).

For this publication, sampling weights have been applied to data from the sample to produce estimates representing all ED drug episodes and drug mentions in the total coterminous U.S.[8] and in the 21 metropolitan areas (see Appendix D). The National Panel represents hospitals outside of the 21 metropolitan areas. Data for the 21 metropolitan areas are pooled with data from the National Panel to produce the national estimates. To account for differences in population and to facilitate comparisons across metropolitan areas, estimated rates of ED drug episodes and mentions per 100,000 population are also presented (see Appendix D).

DATA COLLECTION METHODOLOGY

Within each hospital that participates in DAWN, a designated DAWN reporter, who is usually a member of the ED or medical records staff, is responsible for reviewing medical charts to identify ED visits that are eligible for submission to DAWN. DAWN reporters rely on information from medical charts that originates with hospital staff who treated the patient. Ultimately, the accuracy and completeness of the data submitted to DAWN depend on the careful recording of information by the medical staff and on the accuracy and completeness of the information provided to the medical staff by the patient.

The DAWN reporter submits an episode report to the DAWN system for each patient who visits a DAWN ED and meets certain criteria. To be included in DAWN, the patient presenting to the ED must meet all of the following criteria:

- The patient was age 6 to 97;
- The patient was treated in the hospital's ED;

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[6] The DAWN sample is updated annually, so 2000 is the last full year for which the sample was drawn. The sample for 2001 will be updated at the close of the 2001 data year.

[7] This estimate represents 16 fewer drug abuse episodes than were published previously. Episodes were dropped when they contained only non-reportable substances, based on the new drug vocabulary.

[8] The total coterminous U.S. consists of the 48 contiguous states and the District of Columbia. Alaska and Hawaii are excluded.

- The patient's presenting problem(s) (i.e., the reason for the ED visit) was induced by or related to drug use, regardless of when the drug use occurred;

- The episode involved the use of an illegal drug or the use of a legal drug or other chemical substance for nonmedical purposes; and

- The patient's reason for using the substance(s) was dependence, suicide attempt or gesture, and/or psychic effects.

In addition to drug overdoses, reportable ED episodes may result from the chronic effects of habitual drug use or from unexpected reactions. Unexpected reactions reflect cases where the drug's effect was different than anticipated (e.g., caused hallucinations). DAWN cases do **not** include accidental ingestion or inhalation of a substance with no intent of abuse, or adverse reactions to prescription or over-the-counter medications taken as prescribed.

A single drug abuse episode may have multiple drug mentions. Up to 4 different substances can be recorded for each ED episode. Therefore, not every reported substance is, by itself, necessarily a cause of the medical emergency. On the other hand, substances that contributed to a drug abuse episode may occasionally go unreported or undetected. Even when only one substance is reported for an episode, an allowance should be made for reportable drugs not mentioned or for other contributory factors.

Alcohol use is reported to DAWN **only** when consumed in combination with a reportable substance.

In addition, each report of a drug-related ED episode includes demographic information about the patient and information about the circumstances of the episode (e.g., the date and time of the ED visit, the reason the patient came to the ED). For each drug mentioned, the DAWN reporting form includes the form in which the drug was acquired (e.g., liquid, pieces), its source (e.g., street buy, patient's own legal prescription), and its route of administration (e.g., oral, injection). Only one reason for the ED contact and one reason for taking substances is recorded, regardless of the number of substances involved.

CONSIDERATIONS WHEN INTERPRETING DAWN DATA

When interpreting findings from this publication, the reader needs to recognize what DAWN can and cannot measure. DAWN does not measure the frequency or prevalence of drug use in the population, but rather the health consequences of drug use that are reflected in visits to hospital EDs. Moreover, estimates of drug episodes and mentions may increase or decrease for reasons unrelated to the size or characteristics of the drug-using population. The reader should consider the following when interpreting estimates from DAWN:

- The DAWN estimates for 2001 are the first to utilize population data from the 2000 decennial Census. The U.S. Bureau of the Census is the source for all the population data used to produce the estimated rates (see Appendix D). It is important to note that the population denominator used to calculate rates per 100,000 population is considerably larger for 2001 due to the availability of 2000 decennial Census data. (Estimates for periods prior to 2001 used estimated yearly adjustments from the 1990 Census.) Many large decreases in 2001 population-based rates are attributable to the

larger denominator. Therefore, it is important to verify reductions in rates against total estimates for the same measures.

- The number of ED episodes reported to DAWN is not equivalent to the number of individual patients, because one person may make repeated visits to an ED. DAWN data contain no individual identifiers, which would be required to estimate repeat visits. Therefore, the estimates presented in this publication pertain to total ED episodes or drug mentions, not to the number of different patients involved. In this context, rates should be regarded not as prevalence rates for the population using EDs, but as indicators of the number of ED drug abuse episodes or mentions per 100,000 population.

- DAWN data may be affected by data collection procedures and thereby reflect changes in hospital services or operations. A hospital in one city may open a new detoxification unit that diverts drug-related episodes away from the ED. Conversely, in another city, people may go to the ED to seek care for detoxification because they are unable to gain admission to a drug treatment facility or because they need medical certification before entering treatment. These factors may vary over time and place.

- Estimates of drug-related ED episodes or mentions may be affected by reporting patterns. For example, a change to computer-based recordkeeping systems in a hospital ED could increase or decrease the number of ED visits identified as drug related.

- Greater awareness and knowledge of drug-related problems may result in a greater propensity for ED staff to record drug use in the ED record. Alternatively, the sensitivity of drug-related problems may reduce patients' willingness to disclose drug use and providers' willingness to record it in the permanent medical record.

- Estimates of drug-related ED episodes or mentions can be affected if the weights applied to the data change in an irregular way. We use a set of quality control procedures to identify and investigate unusual weights and data, and our review of the weights and data used in this publication did not reveal any factors that are unduly responsible for the trends reported.

- Trends may be affected by unusual changes in the sample composition. See Appendix D for more information regarding sampling.

- Graphs illustrating trends in drug mentions often use different scales for the vertical axis.

INTERPRETATION OF STATISTICAL SIGNIFICANCE

The estimates of episodes and mentions displayed in tables in this publication are accompanied by columns indicating the percent change from one period to another. The percent change is indicated only for statistically significant differences and only when both estimates in the comparison are greater than zero. In describing statistically significant differences between DAWN estimates, the traditional level of statistical significance (p less than 0.05) is used.

In tables presenting estimates for half years, the first half of 2001 is compared to the second half of 2000, then the first halves of 2000 and 2001 are compared. The potential for seasonal distortion of comparisons between the second half of one year and the first half of another makes comparisons of those periods problematic. Therefore, the discussion of half-year findings in this publication focuses on the comparisons between the first halves of 2000 and 2001.

In tables presenting full years, the estimates for the latest year (2000) are compared to the earliest year presented in the trend (1994 in this publication), and then to the 2 previous years (1998 and 1999).

Each table of estimates has a corresponding table containing relative standard errors (RSEs) for each estimate, and all the *p*-values, including those that are 0.05 or greater, for the comparisons described above. The RSE tables are published on the Internet. The RSE values for total estimates and rates per 100,000 population are similar, so a single RSE table is provided for each pair of estimate tables. For example, Table RSE-2.2.0 presents RSEs applicable to the estimates in Table 2.2.0 and to the estimated rates in Table 12.2.0. The statistical tests used to determine the significance levels are t-tests (with infinite degrees of freedom). That is, the change score, or the difference between the 2 estimates, is divided by the standard error of the estimate. A value of zero is expected under the null hypothesis.

Although tests for statistical significance are important tools in interpreting results, significance does not always imply that the difference is large or important. Small changes that are statistically significant may occur frequently at the metropolitan area level in DAWN due to the selection of all eligible hospitals (which constitutes a census) in Baltimore, Buffalo, Denver, San Diego, and San Francisco, along with sampling many other metropolitan areas at a high frequency (Table 1.1). The closer the sample is to a census, the higher is the likelihood that a change will be statistically significant, no matter how small it may be. While technically there is no sampling variability in the 5 areas noted, some variability is due to the hospitals' nonresponse, which is treated as sampling error in the variance calculations.

RSEs for the coterminous U.S. and for each metropolitan area are summarized in Figure 1. The RSE for total drug-related episodes for the coterminous U.S. is 6.6 percent. Across the 21 metropolitan areas oversampled in DAWN, RSEs range from a low of 1.8 percent in Seattle to a high of 19.7 percent in Newark.

Nonsampling errors such as nonresponse and reporting errors may affect the outcome of significance tests. While *p* less than 0.05 significance level is used to determine statistical significance in DAWN ED tabulations, large differences associated with slightly higher *p*-values (specifically those between 0.05 and 0.10) may be of interest also. On the other hand, statistically significant differences are not always meaningful, because the size of the difference may be small or because the significance may have occurred simply by chance. In a series of 20 independent tests, it is to be expected that one test will indicate a significant difference merely by chance even if there is no real difference in the populations compared. The text often discusses more than one comparison within a given table (e.g., comparing percentages for different drugs or subgroups). We have made no attempt to adjust the level of significance to account for these multiple comparisons. Therefore, the probability of falsely rejecting the null hypothesis at least once in a family of comparisons is higher than the significance level given for individual comparisons (in this publication, 0.05).

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OTHER CONSIDERATIONS WHEN READING DAWN TABLES

In this publication, estimates with RSEs of 50 percent or higher are regarded as too imprecise for publication. In the tables, the symbol "…" (3 dots) has been substituted for estimates that did not meet this standard of precision. With an RSE of 50 percent, the 95 percent confidence interval for an estimate ranges from 2 to 198 percent of the estimate's value.

Historically, in DAWN ED publications of findings for 1998 and earlier, estimates less than 10 (and percentages corresponding to those numbers) were not shown in the tables because we deemed them and their associated RSEs to be unreliable.

Beginning with the 1999 ED data, estimates of less than 10 were no longer suppressed in DAWN ED publications. Many estimates as small as this are suppressed by virtue of having RSEs greater than 50 percent. For those that are shown in the tables, we note for the reader that small numbers and their associated RSEs should be interpreted with caution.

As described in Appendix D, the DAWN ED data for 1995 through 1997 were reweighted and reprogrammed, and the presentation of findings was improved during 1998. Improvements in the DAWN drug vocabulary (see Appendix A) resulted in revisions to estimates previously published for 1994 through 2000 (Appendix B). The charts, tables, and graphs in this publication present only revised estimates.

HOW TO USE THIS PUBLICATION

This issue of *ED Trends from DAWN* examines the nature of trends in drug-related ED episodes across 10 half-year periods ending with January – June 2001 and across the 7 full years 1994 to 2000. Statistical tests are used to compare estimates for the latest half-year period with those for the previous 2 half years, as in previous DAWN publications. For full years, estimates for 2000 are compared with estimates for 1999, 1998, and 1994. The comparisons of the latest year with the previous 2 years are consistent with previous publications. Because of the interest in long-term trends from DAWN, we added a third comparison of the latest year with the earliest shown in the tables (in this case, 2000 and 1994). We also have modified how statistically significant changes are highlighted in each table. Where we previously displayed the *p*-value and the direction (+/-) of the change, we now display the change in percent for statistically significant differences. Actual *p*-values are still available in the companion tables of relative standard errors (RSEs), which are published on the Internet.

The presentation of ED findings in this publication is divided into the following sections:

- Major substances of abuse, such as cocaine, heroin, and “club drugs;”
- Other substances of abuse, such as prescription and over-the-counter (OTC) drugs;
- Episodes in the 21 metropolitan areas oversampled in DAWN;
- Demographic characteristics of patients treated in drug-related ED episodes;
- Characteristics of the episodes themselves; and
- Discussion of results.

In another change from past practice, population-based rates are discussed within these sections by topic, rather than in a separate section. The reason is that the population-adjusted rates are best used to supplement the other estimates of episodes and mentions. By considering the estimates of drug mentions and episodes relative to the size of the population at risk, the rates yield standardized measures that can be compared across selected drugs, metropolitan areas, gender and age groups. These are the first DAWN estimates to utilize population data from the 2000 decennial Census.

Categories used to display demographic characteristics of patients and characteristics of the ED episode have been modified to provide more detailed patient characteristics and eliminate some categories (e.g., central city location) that tend to be misleading. Finally, because of changes in how data on race and ethnicity were collected by DAWN beginning in 2000, we have added an appendix to this publication to show detailed tabulations of race and ethnicity as reported to DAWN (Appendix C).

ORGANIZATION OF NEW TABLES

In this section, we explain the organization of the tables in *ED Trends* and explain the classification of drugs in the context of these tables. A detailed discussion of the revised estimates for 1994 to 2000[9] based on the new drug vocabulary and classification methods is provided in Appendix B.

The new table numbering scheme is described in a separate exhibit following this chapter. The new tables are designed to array information from the very general to the very specific. This design responds directly to requests we receive for information at these different levels of detail. Figure 2 provides an illustration of the general to specific layout of the new tables.

- At the most general level (the left half of Figure 2), estimates are reported for major drug categories.
- National estimates are provided for the major drug categories in one table. The same estimates are provided for each of the 21 metropolitan areas oversampled by DAWN.
- At a more specific level (the right half of Figure 2), national estimates are provided for each of the component drugs classified under the 5 major drug categories: major substances of abuse, psychotherapeutic agents, CNS agents, respiratory agents, and cardiovascular agents. The national estimates for component drugs are followed by estimates for component drugs for the 21 metropolitan areas.

Major Drug Categories. Table 2.1.0 illustrates the standard layout of substances by drug categories. This table and others like it are divided into 2 panels with:

- "Major substances of abuse" (e.g., cocaine, heroin, marijuana) in the top panel, and
- "Other substances of abuse" in the lower panel.

Specific content for each of these major categories is described later in this section.

[9] Although we will translate data from 1990 to the present, 1994 is the earliest year for which estimates of variances can be replicated.

Table 2.1.0 contains national estimates. Tables 2.1.1 through 2.1.21 contain estimates for the 21 DAWN metropolitan areas. The third term in the table number always indicates the geographic area:

- **.0** for national estimates, and
- **.1 - .21** for the 21 metropolitan areas.

Component Drugs. A second set of tables lists the component drugs classified under the largest major categories: major substances of abuse, psychotherapeutic agents, CNS agents, respiratory agents, and cardiovascular agents. This is more detailed drug information than has ever been published previously from DAWN. In response to requests, both high and low frequency terms are displayed, as follows:

- Table 2.3.0 (estimates) and 12.3.0 (rates): component drugs of the major substances of abuse.

  This includes all the terms, including street names, reported to DAWN for the major substances of abuse. For example, users will consult this table to find estimates for "crack," which is subsumed under the major substance "cocaine" in Tables 2.1.0 and 2.2.0, and to see the relative frequency of particular terms.

- Table 2.4.0 (and 12.4.0): component drugs of psychotherapeutic agents
- Table 2.5.0 (and 12.5.0): component drugs of CNS agents
- Table 2.6.0 (and 12.6.0): component drugs of respiratory agents
- Table 2.7.0 (and 12.7.0): component drugs of cardiovascular agents

  Component drugs are always expressed at the generic substance level (e.g., fluoxetine) and will include all substances in the category, regardless of the frequency with which they were reported to DAWN. For example, users interested in the trends in ED visits involving particular narcotic analgesics will consult Table 2.5.0.

MAJOR SUBSTANCES OF ABUSE

The major substances of abuse include the most common illicit drugs reported to DAWN, alcohol reported in combination with any other substance reported to DAWN, and lower frequency drugs of particular policy interest (e.g., club drugs such as Ecstasy and GHB).

In the past, some of these substances were enumerated in published tables, but their placement differed across tables and publications. Other substances, which have emerged as problems more recently, were available only in special reports (e.g., *The DAWN Report* on Club Drugs) or unpublished tables.

As mentioned earlier, the new tables (e.g., Table 2.1.0) group major substances of abuse in a panel at the top of the table for ease of reference, and the major substances have been expanded to include 15 categories. For each of the major substances listed in Table 2.1.0,

Table 2.3.0 enumerates the component drugs, that is, the specific terms, including street names, as they were reported to DAWN. The 15 major substances of abuse are:

Alcohol-in-combination. This is the most frequently mentioned drug reported to DAWN. There has been no change in definition. Alcohol is reported to DAWN only when present in combination with another reportable drug.

Cocaine. This category includes both powder and crack cocaine. Estimates for these and other specific terms are available in the component drug tables.

Heroin. Previously, heroin mentions were reported in a category that combined mentions of heroin and morphine. We have split heroin and morphine for publication of ED estimates[10] (see narcotic analgesics, below) because consumers told us that separate categories would be more useful. It is easy to recreate the combined heroin/morphine category by summing mentions of heroin and mentions of morphine.

Marijuana. Previously, this category was reported as "marijuana/hashish." It has been renamed but continues to include both marijuana and hashish.

Amphetamines. This class of substances has been extracted from the category of CNS stimulants (described below) 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.

Methamphetamine. Previously reported as methamphetamine/speed, this category still includes the term "speed."

MDMA (methylenedioxymethamphetamine, Ecstasy). This is the "designer" or "club" drug commonly known as Ecstasy. It is classified separately as a major substance of abuse because of widespread interest.

Ketamine. This is a veterinary anesthetic classified separately as a major substance of abuse because of widespread interest.

LSD. This category definition has not changed.

PCP. Previously, this category included PCP and PCP combinations. Combinations of PCP and other major substances of abuse have been reclassified as "illicit combinations" below.

Miscellaneous hallucinogens. This category includes hallucinogens other than LSD and PCP.

[10] Heroin/morphine have not been separated in DAWN mortality data. It is often impossible to distinguish heroin from morphine during death investigations because the toxicology tests used to identify a drug involved in a drug-related death rely on a metabolite common to both drugs. This is the only such difference in drug classification between DAWN ED and mortality data.

Flunitrazepam (Rohypnol). Flunitrazepam is a benzodiazepine, not legal for marketing in the United States. It is reported under major substances because of increased interest in its use as a "designer" or "club" drug. It is therefore excluded from the list of benzodiazepines described below.

Gamma hydroxy butyrate (GHB). This category includes GHB and its precursor gamma butyrolactone (GBL). It is another of the "designer" or "club" drugs.

Inhalants. This is a completely new category with contents significantly changed from the category reported previously as "inhalants/solvents/aerosols." To create a more meaningful category, inhalants now include anesthetic gases and certain nonpharmaceuticals for which the documented route of administration was inhalation. To be classified as an inhalant a nonpharmaceutical substance must have a psychoactive effect when inhaled and falls into one of 3 subcategories: volatile solvents, nitrites, or chlorofluorohydrocarbons (see Appendix A).

To be classified as inhalants, anesthetic gases have been extracted from the category CNS agents, general anesthetics. These substances have the physical property at room temperature of being a gas or are delivered as a gas and therefore are presumed to have been inhaled. The anesthetic gases include nitrous oxide, ether, and chloroform.

Illicit combinations. This category includes compounds 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 an illicit combination, whereas separate mentions of heroin and cocaine would be classified separately in the categories heroin and cocaine. Compounds 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).

OTHER SUBSTANCES OF ABUSE

Other substances of abuse are summarized by pharmaceutical category (e.g., Table 2.1.0) using the categories and category assignments that are an integral part of the Multum *Lexicon,* with a few exceptions noted here. Many of these substances are marketed legally as prescription and over-the-counter medications. Readers should note that the purpose for which these substances are intended may be quite different from the effect for which these substances are abused. Since it is impossible to know patients' actual intentions when abusing a substance, we have chosen to classify these substances by their therapeutic use.

Four of the categories under other substances of abuse are divided into finer subcategories, and the component drugs for these 4 categories are displayed in subsequent tables (e.g., Tables 2.4.0, 2.5.0, 2.6.0, 2.7.0).

Psychotherapeutic agents are divided into the following categories:

- Antidepressants
  - MAO inhibitors
  - SSRI antidepressants
  - Trycyclic antidepressants
  - Miscellaneous antidepressants

- Antipsychotics
  - Phenothiazine antipsychotics
  - Psychotherapeutic combinations
  - Miscellaneous antipsychotic agents
- Anxiolytics, sedatives, and hypnotics
  - Barbiturates
  - Benzodiazepines – This category excludes the benzodiazepine flunitrazepam (Rohypnol), which was assigned to major substances of abuse.
  - Miscellaneous anxiolytics, sedatives, and hypnotics
- CNS stimulants. This category excludes the CNS stimulants that were assigned to major substances of abuse: amphetamines, methamphetamine, and MDMA (Ecstasy).

Central nervous system (CNS) agents are divided into the following categories:

- Analgesics
  - Antimigraine agents
  - Cox-2 inhibitors
  - Narcotic analgesics – This category excludes heroin, which is classified as a major substance of abuse.
  - Narcotic analgesic combinations.
  - Nonsteroidal anti-inflammatory agents
  - Salicylates
  - Analgesic combinations
  - Miscellaneous analgesics
- Anorexiants
- Anticonvulsants
- Antiemetic/antivertigo agents
- Antiparkinson agents
- General anesthetics – This category excludes the anesthetic gases that were assigned to major substances of abuse as inhalants.
- Muscle relaxants
- Miscellaneous CNS agents

Respiratory agents are divided into the following categories:

- Antihistamines
- Bronchodilators
- Decongestants
- Expectorants
- Upper respiratory combinations
- Respiratory agents not tabulated above (NTA) – This category has been added to capture respiratory agents that did not fit into the 5 other categories of respiratory agents.

Cardiovascular agents are divided into the following categories:

- Antiandrenergic agents, centrally acting
- Beta-andrenergic blocking agents
- Calcium channel blocking agents
- Diuretics
- Cardiovascular agents NTA – This category has been added to capture cardiovascular agents that did not fit into the 4 other categories of cardiovascular agents.

The general categories used in Table 2.2.0 are expanded in Tables 2.4.0 through 2.7.0 to enumerate the component drugs for the 4 major categories: psychotherapeutic agents, CNS agents, respiratory agents, and cardiovascular agents and their associated subcategories. For example, Table 2.2.0 presents mentions of narcotic analgesics under CNS agents; mentions of particular narcotic analgesics—morphine, codeine, and others—are displayed in Table 2.5.0.

In the tables enumerating component drugs, only generic names are used. Brand (trade) names are not used because estimates for particular brands are considered to be unreliable.[11] Therefore, for example, mentions of the miscellaneous analgesic acetaminophen are tabulated as "acetaminophen," not Tylenol.

Users of DAWN estimates have told us that it is not useful to report only the most frequently occurring substances. Therefore, in Tables 2.4.0 through 2.7.0, substances are enumerated in their relevant category, regardless of the numbers of mentions estimated from DAWN.

The following 6 categories from the Multum *Lexicon* are presented without subdivisions due to the low number of mentions:

- Alternative medicines
- Anti-infectives
- Gastrointestinal agents
- Hormones
- Nutritional products
- Topical agents

Finally, 2 additional categories, "drug unknown" and "all other substances NTA" do not appear in the Multum *Lexicon* but are needed to complete the classification of substances for DAWN.

Drug unknown. This includes 2 types of cases: those in which the drug was reported to DAWN as "unknown" and those in which drugs were reported to DAWN as "polysubstances." For the purposes of DAWN, polysubstance refers to the abuse of more than one substance when the individual substances were not identified by the source record. Because DAWN cases are identified through retrospective medical chart review, there will always be cases in which the drug abuse was known but the particular substance was unknown or unknowable. From 1995 to 1999, reporting of unknown substances seems to have stabilized at about 2 to 3 percent of drug mentions.

All other substances NTA. This category contains any substance reported to DAWN that could not be classified in the categories noted above. However, this category differs dramatically from the category "All Other Drugs" in previous DAWN publications. Because of the expansion of detail in the published tables, the number of mentions for all other substances is quite low. This category currently includes: antihyperlipidemic agents, antineoplastics, biologicals, coagulation modifiers, immunologic agents, miscellaneous agents, and plasma expanders. Miscellaneous agents include: antidotes, antigout agents, antipsoriatics, antirheumatics, chelating agents, cholinergic muscle stimulants, genitourinary tract agents, impotence agents, local injectable anesthetics, miscellaneous uncategorized agents, psoralens, and radiocontrast agents.

[11] This issue is discussed in greater detail in Appendix A.

For 1994 through 2000, this category also includes certain terms that could not be assigned reliably to any new category. These include:

- Ambiguous, nonspecific terms that could fall into any of several categories (e.g., "AIDS medicine" could be an anti-infective, an anticonvulsant, or any number of other drugs);
- Undocumented, nonspecific terms (e.g., "thought organizer"); and
- Street terms for illicit substances that could not be linked reliably to a particular illicit substance (e.g., "T," "butterflies").

We will monitor the content of this category to avoid its uncontrolled expansion in the future. Should a substance or class of substances begin to show significant growth, we intend to add such information to the published categories rather than allow this "all other" category to degrade over time. We have established a protocol to research, document, and classify new drugs and new terms for old drugs as they are submitted to DAWN. This procedure is specifically designed to document new street terms while keeping nonspecific terms from creeping into the data again. Regular updates of the Multum *Lexicon* will introduce new prescription and over-the-counter substances as they are approved for marketing and before they begin to appear in DAWN.

ADDITIONAL CONTENT AVAILABLE ON THE INTERNET

Although this publication includes a large number of tables, even more detail is available through tables that are published only on the Internet. These additional tables can be accessed online at http://www.samhsa.gov/oas/dawn.htm. Tables published exclusively on the Internet are:

- Additional tables of estimates by metropolitan area. For ease of reference, these are listed in the table of contents of *ED Trends* with their location noted.
- Relative standard errors (RSEs) for estimates provided in this publication, in a corresponding tabular format. The RSEs used for population-based rates are the same as those used for other DAWN estimates. Although there may be slight differences in the RSEs calculated for the DAWN estimates and the RSEs that would be appropriate for the population-based rates (due to sampling error in the current population estimates), they are sufficiently close for the purpose of this publication.
- Indexes listing generic and brand names for prescription and over-the-counter substances. No published estimates are provided by brand (trade) name. The index is provided as an aid for readers who may be unfamiliar with the generic names used in this publication. For reference, this index is also included in Appendix I. (Future issues of *ED Trends* will not include this index. Updates will be published online.)

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TABLE NUMBERING

Tables in *ED Trends from DAWN* follow a 3-part numbering scheme, with each of the 3 terms separated by periods (e.g., Table 2.1.0). The first (beginning) and third (ending) terms have specific meaning.

- **Table numbers <u>beginning</u> with:**

  1. contain information about the ED sample and the precision of sample estimates.

  2. through **5.** contain estimates of ED episodes and ED drug mentions.

  12. through **14.** contain corresponding rates per 100,000 population.

  Each table of estimates has a corresponding table of rates per 100,000 population. The corresponding table of rates has a **1** prefix added to the table number. For example, Table 2.3.0 contains estimates of ED mentions for major substances of abuse; Table 12.3.0 contains population-based rates of ED mentions for the same major substances of abuse.

- **Table numbers <u>ending</u> with:**

  .0 contain estimates for the coterminous U.S.

  .1 through **.21** supply estimates for the 21 metropolitan areas oversampled in DAWN, where **.1** is Atlanta, **.2** is Baltimore, … **.21** is Washington, DC.

  No third term (e.g., 3.1, 3.2, 13.1, 13.2, etc.): These tables contain summaries for all the metropolitan areas in DAWN. For example, Table 3.1 summarizes ED episodes across the 21 metropolitan areas.

- RSE tables use the same numbering scheme, with a prefix of RSE attached to the companion table number. For example, Table RSE-2.2.0 contains the RSEs associated with estimates published in Table 2.2.0.

- Tables **2.3.x** through **2.7.x** enumerate the specific substances included in the 5 high profile categories: **2.3.x** major substances of abuse, **2.4.x** psychotherapeutic agents, **2.5.x** central nervous system (CNS) agents, **2.6.x** respiratory agents, and **2.7.x** cardiovascular agents. Corresponding population-based rates are contained in Tables **12.3.x** through **12.7.x**.

- Tables **3.x** (**13.x**) summarize ED estimates (rates) across the 21 metropolitan areas.

- Tables **4.1.x** (**14.1.x**) through **4.12.x** (**14.12.x**) summarize DAWN ED cases by patient demographics.

- Tables **5.1.x** through **5.12.x** summarize DAWN ED cases by episode characteristics. No population-based rates are presented for episode characteristics.

- Tables **R.1** and **R.2** present a detailed summary of race and ethnicity as reported on DAWN forms.

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Figure 1
Relative standard errors (RSEs) for drug-related episodes by metropolitan area: 2000

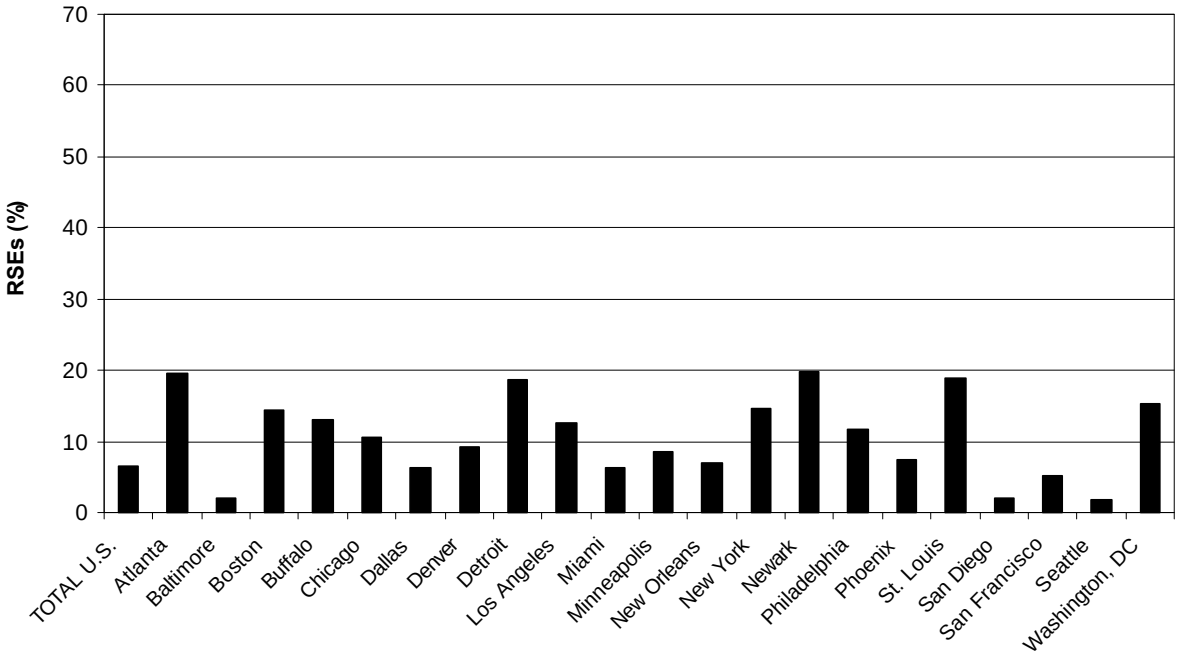
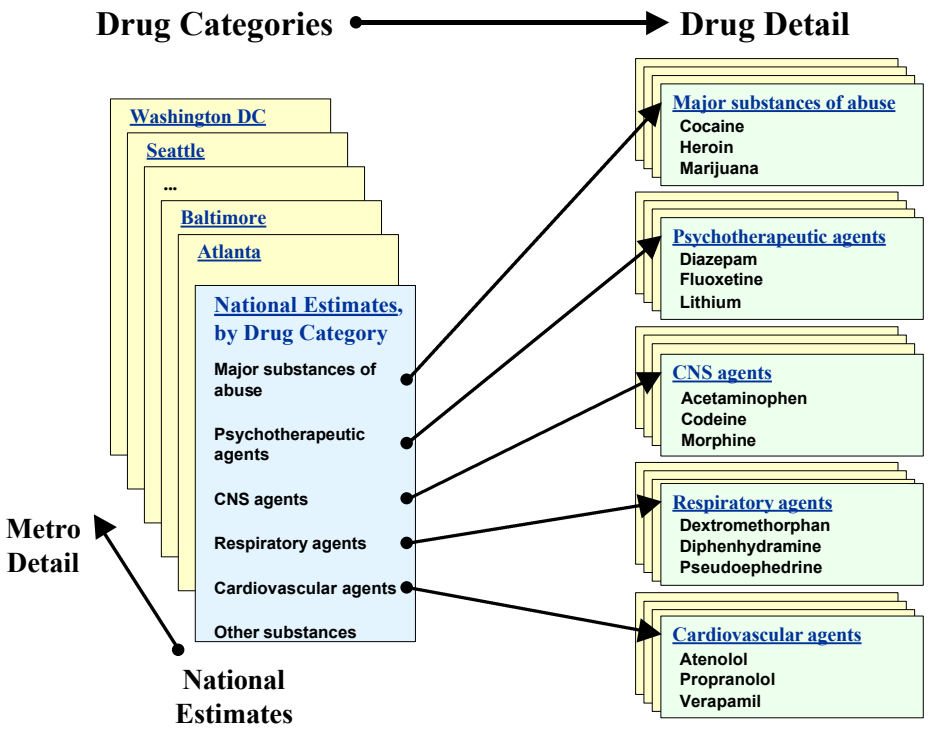


Figure 2
Tables in *ED Trends from DAWN*



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TRENDS IN MAJOR SUBSTANCES OF ABUSE

This section presents semi-annual estimates from DAWN for total drug-related ED episodes and mentions of major substances of abuse. Because of improvements in the DAWN drug vocabulary (see Appendix A) that affect estimates from previous periods, this section also discusses full-year estimates from 1994 to 2000.

"Major substances of abuse" include the most common illicit drugs reported to DAWN, alcohol reported in combination with any other substance reported to DAWN, and lower frequency drugs of particular policy interest (e.g., club drugs such as Ecstasy and GHB). The specific substances, including street terms reported to DAWN, that comprise each drug category are listed, with corresponding mentions from 1994 to 2000, in Tables 2.3.0 and 12.3.0.

One ED episode can include mentions of one drug alone or mentions of a drug with one or more other drugs. Major substances of abuse, such as cocaine, heroin, and marijuana, are often reported in combination with other drugs. Therefore, the number of drug mentions exceeds the number of episodes.

The following discussion focuses primarily on comparisons of estimates from 1994 to 2000. As indicated previously, revised estimates presented for the first time in this issue of *ED Trends* supersede previously published estimates. For ease of reference, we have made the content of this issue of *ED Trends* comprehensive, so that readers need not refer to previous publications for estimates and risk confusion of previously published with revised estimates. (A detailed discussion of the deviations between current and previously published estimates is provided in Appendix B.) Tables also show statistical tests comparing 2000 estimates with those for 1998 and, for long-term trends, comparing 2000 estimates with those for 1994 (the earliest year shown in the tables). In addition, long-term trends in drug-related ED episodes overall and for those involving the most frequently mentioned illicit drugs are shown in Figure 3.

For the semi-annual estimates, the discussion focuses exclusively on comparisons of preliminary estimates for the first half of 2001 with the first half of 2000. The potential for seasonal variations makes comparisons of the second half of 2000 with the first half of 2001 less reliable.

DAWN estimates for 2000 are based on data from a nationally representative sample of 466 hospitals (Table 1.1).

TOTAL DRUG-RELATED EPISODES

- In 2000, there were 601,563 drug-related ED episodes in the coterminous U.S. with 1,099,306 drug mentions (on average, 1.8 drugs per episode) (Table 2.2.0).

- There was no statistically significant change between 1999 and 2000 in total drug-related ED episodes or ED drug mentions (Table 2.2.0). However, total ED visits (that is, ED visits for any reason) increased 6 percent (from 91.1 million to 96.2 million) during this period.

- In 2000, drug abuse-related ED visits occurred at the rate of 243 ED episodes per 100,000 population in the coterminous U.S. (Table 12.2.0).
- Among the major substances of abuse, the highest rates of ED drug mentions in 2000 occurred for (Table 12.2.0):
  - Alcohol-in-combination (83 mentions per 100,000 population),
  - Cocaine (71),
  - Marijuana (39), and
  - Heroin (38).

ALCOHOL-IN-COMBINATION

- Alcohol-in-combination was mentioned in 34 percent (204,510) of ED drug episodes in 2000 and remains the most common substance reported in drug-related ED visits (Table 2.2.0 and Figure 3). Alcohol is reported to DAWN only when present in combination with another reportable drug, so the actual number of alcohol-related ED visits is higher than the DAWN estimate for alcohol-in-combination.
- Mentions of alcohol-in-combination were statistically unchanged from 1998 to 2000 (Table 2.2.0 and Figure 3).

COCAINE, MARIJUANA, HEROIN

- Cocaine continues to be the most frequently mentioned illicit substance, present in 29 percent of ED episodes (174,881 mentions). Cocaine was followed in frequency by marijuana (16%, 96,426 mentions) and heroin (16%, 94,804 mentions) (Table 2.2.0 and Figure 3).
- Almost a quarter of the cocaine mentions in 2000 (22%, 39,266 mentions) are attributed to "crack," which showed no significant change since 1994 (Table 2.3.0). Most cocaine mentions (77%) are reported to DAWN simply as "cocaine," and it is not possible to determine what proportion of these might be crack.
- Heroin mentions[12] increased 15 percent (from 82,192 to 94,804) from 1999 to 2000; cocaine and marijuana mentions were stable (Table 2.2.0).
- Cocaine mentions have been relatively stable across the 7-year period 1994 to 2000 (Table 12.2.0), with 71 cocaine mentions per 100,000 population in 2000. From 1994 to 2000, heroin mentions increased 50 percent (from 27 to 38 mentions per 100,000 population), and marijuana mentions increased 141 percent (from 17 to 39).

[12] Unlike previous DAWN reports, heroin and morphine are reported separately in this report. Morphine mentions are included in "narcotic analgesics" among the "central nervous system (CNS) agents." Readers may combine heroin and morphine by summing the mentions of each.

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OTHER TRENDS

- There were no significant changes in any of the major substances of abuse from the first half of 2000 to the first half of 2001 (Table 2.1.0).
- Several of the less frequently mentioned major substances of abuse showed substantial increases from 1999 to 2000 (Table 2.2.0):
  - MDMA or Ecstasy (up 58%, from 2,850 to 4,511),
  - PCP (48%, from 3,663 to 5,404),
  - Amphetamines (37%, from 12,496 to 17,134), and
  - Methamphetamine (29%, from 10,447 to 13,505) (Table 2.2.0).
- No significant changes from 1999 to 2000 were evident for (Table 2.2.0):
  - GHB (4,969 mentions in 2000),
  - LSD (4,016),
  - Miscellaneous hallucinogens (1,849),
  - Inhalants (1,522), and
  - Ketamine (263).
- From 1994 to 2000, mentions of amphetamines rose 69 percent (from 10,118 to 17,134 mentions, from 4 to 7 mentions per 100,000 population), whereas mentions of methamphetamine were stable (Tables 2.2.0, 12.2.0).
- The changes in MDMA, Ketamine, and GHB mentions over the 7-year period 1994 to 2000 are very large in percentage terms, the result of very small numbers in the earliest years (Table 2.2.0). Each of these drugs remains relatively infrequent in ED visits with no more than 2 mentions per 100,000 population in 2000 (Table 12.2.0).
- Estimates for flunitrazepam are too imprecise for publication for 1995 through 2000 (Table 2.2.0 and Figure 4).
- For the 15 major substances of abuse (displayed in Figure 4), RSEs range from a low of 8.4 for alcohol-in-combination to a high of 60.6 for flunitrazepam. Any DAWN estimate with an RSE exceeding 50 percent is considered too imprecise for publication and is therefore suppressed in the tables.

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Figure 3
Drug-related episodes and alcohol-in-combination, cocaine, and heroin mentions: 1994 through 2000

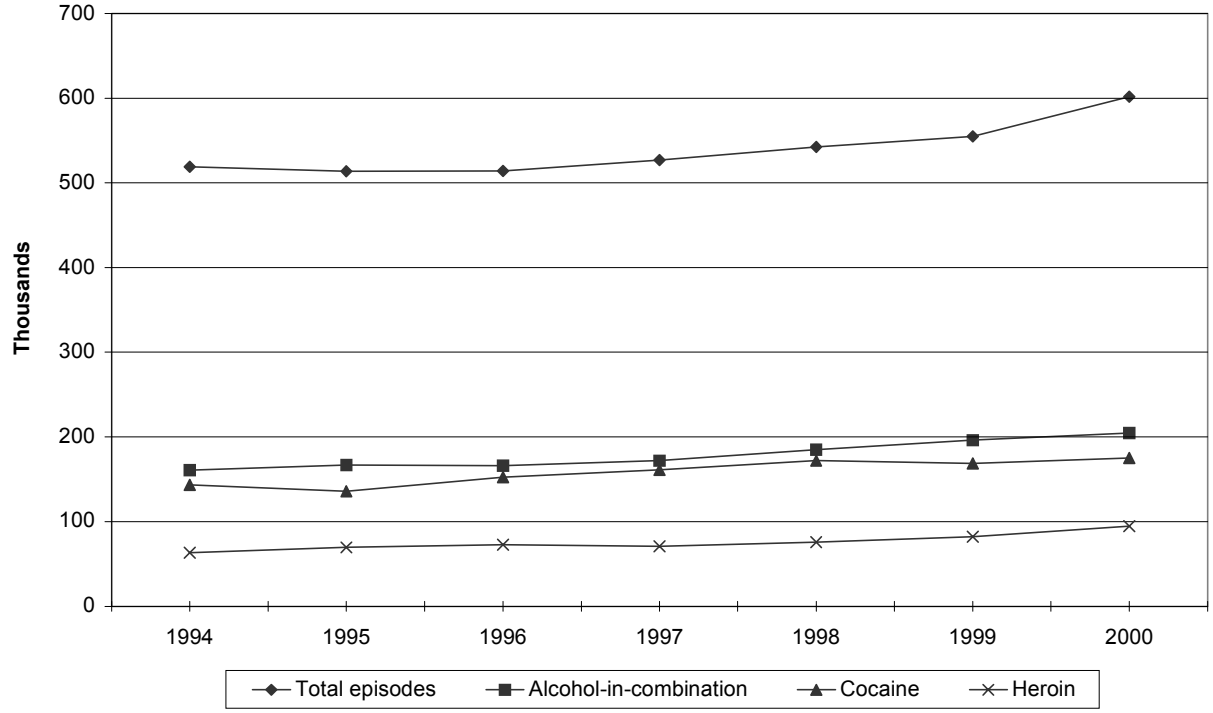
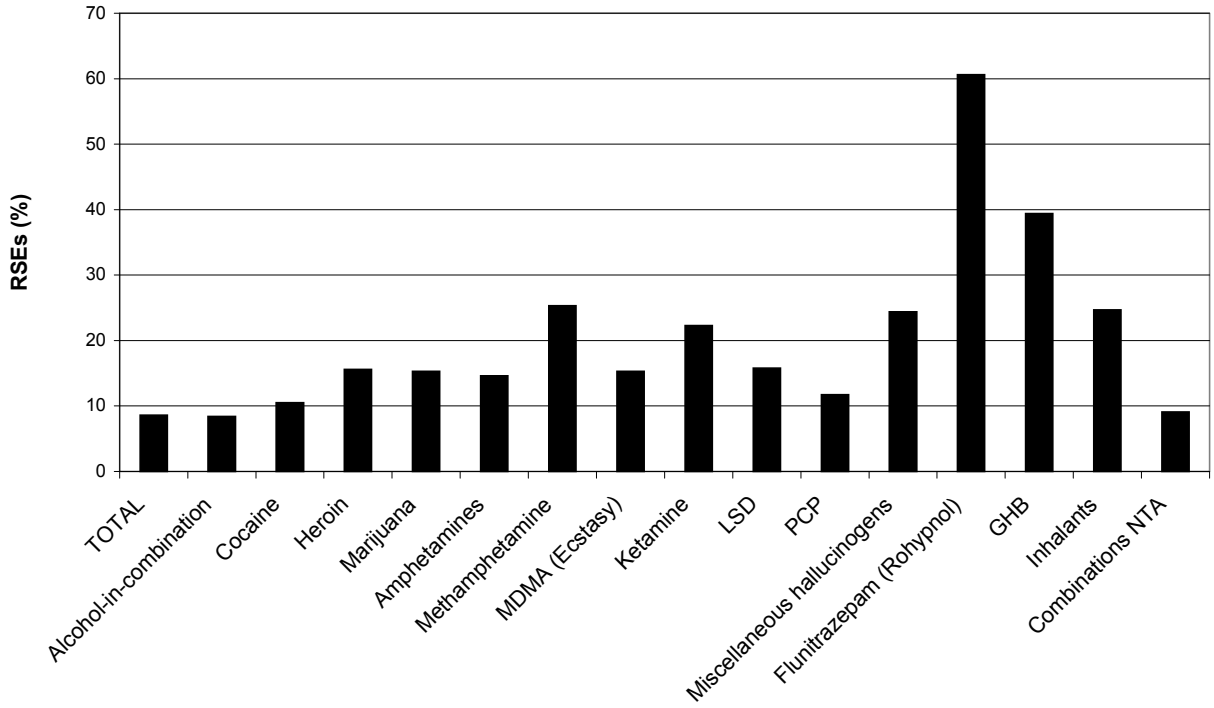


Figure 4
Relative standard errors (RSEs) for major substances of abuse: 2000



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TRENDS IN OTHER SUBSTANCES OF ABUSE

DAWN also receives reports of ED episodes involving the nonmedical use of legal drugs. These can involve deliberate abuse of prescribed or legally obtained over-the-counter (OTC) medications or of pharmaceuticals diverted for abuse. Accidental overdoses or adverse reactions to OTC or prescription drugs taken as directed are not reportable to DAWN unless they were present in combination with an illicit drug.

In a change from past practice, these "other substances of abuse" are tabulated first by categories composed of similar substances (Tables 2.2.0, 12.2.0) and then by generic drug name for the largest categories: psychotherapeutic agents (Tables 2.4.0 and 12.4.0), CNS agents (Table 2.5.0 and 12.5.0), respiratory agents (Tables 2.6.0 and 12.6.0), and cardiovascular agents (Tables 2.7.0 and 12.7.0). By design, all drug mentions in DAWN are tabulated either as major substances of abuse or other substances of abuse. There is no double counting, and the deliberate assignment of drugs into major substances is the result of specific interest in such substances.

Only generic drug names are presented in DAWN publications. DAWN estimates should not be attributed to drugs marketed under particular brand (trade) names. DAWN data are extracted from medical records produced in the course of health care delivery (no patient is ever interviewed), so DAWN case reports contain information about particular substances as that information was documented in the ED medical record. Any prescription or OTC drug may be reported to DAWN by its brand (trade) name, generic name, or chemical name, depending on what was documented in the source record. There is no way to discern whether the brand names in the medical record are always accurate or how frequently brands might have been recorded in generic terms. Therefore, we do not publish estimates for particular brands because we consider them to be unreliable. An index linking brand to generic names is provided in Appendix I and is available online. This index is provided solely as an aid to readers who may be unfamiliar with generic names.

For the semi-annual estimates, the discussion focuses only on comparisons of preliminary estimates for the first half of 2001 with the first half of 2000 when significant differences were evident. A review of Table 2.1.0 shows there were few significant changes across these periods.

Revised estimates for 1994 to 2000 supersede all estimates published previously. For a detailed discussion of the source of the revisions, see Appendixes A and B.

OTHER SUBSTANCES OF ABUSE

- DAWN estimates that other substances of abuse (474,916 mentions) comprised 43 percent of total ED drug mentions in 2000 (Table 2.2.0).

  Although the vast majority of these other substances are marketed legally by prescription or over the counter, it is impossible to know from DAWN the number of ED visits related to the abuse of prescription drugs by the patient with a legitimate prescription.

- ED mentions in 2000 are most concentrated in 2 categories—psychotherapeutic agents (204,527 mentions) and CNS agents (203,572)—in nearly equal proportions (19% of total ED mentions each) (Table 2.2.0).

- The particular drugs involved in ED visits are sometimes unknown or unknowable. In 2000, there were 25,698 such mentions (2% of total mentions) (Table 2.2.0).

PSYCHOTHERAPEUTIC AGENTS

- Psychotherapeutic agents in DAWN are broken into 4 subcategories: antidepressants; antipsychotics; anxiolytics, sedatives, and hypnotics; and CNS stimulants.

Antidepressants

- Antidepressants (6% of total ED mentions, 60,576 mentions) are the second most frequent psychotherapeutic agents mentioned in drug-related ED visits in 2000 (Table 2.2.0). This category includes:

  - MAO inhibitors, with estimates too imprecise for publication,
  - SSRI antidepressants (26,715 mentions),
  - Tricyclic antidepressants (11,838 mentions), and
  - Miscellaneous antidepressants (21,953 mentions).

SSRI Antidepressants

- In 2000, the most frequently mentioned SSRIs (Table 2.4.0) were:

  - Citalopram (3,458 mentions), which more than doubled from 1999 to 2000,
  - Fluoxetine (7,939 mentions), which decreased 19 percent from 1998 to 2000,
  - Paroxetine (8,020 mentions), which rose 105 percent from 1994 to 2000, and
  - Sertraline (6,670 mentions in 2000), which was unchanged from the previous 2 years.

- No other significant long-term or short-term trends in SSRIs were evident.

Tricyclic Antidepressants

- In 2000, the most frequently mentioned tricyclic antidepressants (Table 2.4.0) were:

  - Amitriptyline (6,444 mentions), a 43 percent decrease from 1994 to 2000,
  - Doxepin (1,123 mentions), a 74 percent decrease since 1994,
  - Imipramine (563 mentions), an 80 percent decrease since 1994,
  - Nortriptyline (663 mentions), a 76 percent decrease since 1994, and

- Tricyclics not otherwise specified (NOS, 2,623 mentions), which doubled from 1994 to 2000.

- No other significant long-term or short-term trends in tricyclic antidepressants were evident.

Miscellaneous Antidepressants

- In 2000, the category of miscellaneous antidepressants (Table 2.4.0) includes:

  - Buproprion (3,809 mentions), a 42 percent increase since 1998 and a 403 percent increase since 1994;

  - Mirtazapine (2,416 mentions), a 70 percent increase since 1999 and a 299 percent increase since 1998;

  - Nefazodone (1,608 mentions);

  - Trazadone (9,798 mentions); and

  - Venlafaxine (3,722 mentions), a 129 percent increase since 1998 and a 992 percent increase since 1994.

- No other significant long-term or short-term trends in miscellaneous antidepressants were evident.

Antipsychotics

- Mentions of substances classified as antipsychotics rose 32 percent (from 15,223 to 20,097 mentions) from 1999 to 2000, but this represents a 20 percent decrease (from 25,012 mentions) from 1994 to 2000 (Table 2.2.0). In 2000, this category includes 3 subcategories:

  - Phenothiazine antipsychotics (2,107 mentions in 2000),

  - Psychotherapeutic combinations, with estimated mentions too imprecise for publication, and

  - Miscellaneous antipsychotic agents (17,859 mentions in 2000).

Phenothiazine Antipsychotics

- The subcategory phenothiazine antipsychotics accounted for only 10 percent of mentions of antipsychotics in 2000, a decrease from 48 percent in 1994 (Table 2.4.0). In terms of mentions, phenothiazine antipsychotics dropped 82 percent (from 11,899 to 2,107) from 1994 to 2000.

Miscellaneous Antipsychotic Agents

- The subcategory miscellaneous antipsychotic agents accounts for nearly 90 percent (17,859) of mentions of antipsychotics in 2000 and rose 37 percent from 1999 to 2000 (Table 2.2.0). Mentions of miscellaneous antipsychotic agents in 2000 were 43 percent higher than in 1994.

- In 2000, miscellaneous antipsychotic agents (Table 2.4.0) include:

  - Haloperidol (1,167 mentions), a decrease of 45 percent since 1998 and 61 percent since 1994;

  - Lithium (3,720 mentions), a drop of 38 percent since 1994;

  - Olanzapine (5,454 mentions), an increase of 66 percent since 1999 and a near doubling (98%) since 1998;

  - Quetiapine (3,009 mentions), an increase of 236 percent since 1999 and more than 500 percent since 1998; and

  - Risperidone (3,899 mentions), an increase of 81 percent since 1998 and more than 500 percent since 1994.

- No other significant long-term or short-term trends in antipsychotics were evident.

Anxiolytics, Sedatives, and Hypnotics

- Anxiolytics, sedatives, and hypnotics (11%, 120,519 mentions), are the most frequent psychotherapeutic agents mentioned in drug-related ED visits in 2000 (Table 2.2.0). This category includes 3 subcategories:

  - Barbiturates (1%, 7,102 mentions),

  - Benzodiazepines (8%, 91,078 mentions), and

  - Miscellaneous anxiolytics, sedatives, and hypnotics (2%, 22,339).

Barbiturates

- In 2000, the most frequently mentioned barbiturate reported to DAWN was phenobarbital (1,798 mentions). Phenobarbital mentions have been stable since 1994 (Table 2.4.0).

Benzodiazepines

- In 2000, the most frequently mentioned benzodiazepines (Table 2.4.0 and Figure 3) were:

  - Alprazolam with 22,105 mentions,

  - Clonazepam with 18,005 mentions,

- Diazepam with 12,090 mentions,
- Lorazepam with 10,671 mentions,
- Temazepam with 2,742 mentions, and
- Benzodiazepines-NOS with 22,376 mentions.

- Figure 5 shows trends in mentions of benzodiazepines from 1994 through 2000.
  - Overall, mentions of benzodiazepines have risen 22 percent (from 74,637 to 91,078 mentions) from 1994 to 2000, but have been stable since 1998 (Table 2.2.0 and Figure 5).
  - From 1994 to 2000, among the most frequent benzodiazepines, alprazolam has risen 29 percent, clonazepam 48 percent, and benzodiazepines-NOS 145 percent (Table 2.4.0).
  - Mentions of diazepam, lorazepam, and temazepam did not change significantly from 1994 to 2000 (Table 2.4.0).
  - All the benzodiazepines except alprazolam were stable from 1998 to 2000 and from 1999 to 2000. Alprazolam mentions rose 24 percent (from 17,833 to 22,105) from 1998 to 2000 (Table 2.4.0).
  - From 1994 to 2000, 3 of the less frequent benzodiazepines decreased significantly: chlordiazepoxide (-46%, from 2,563 to 1,384), flurazepam (-69%, from 1,497 to 463), and triazolam (-63%, from 991 to 363) (Table 2.4.0).

Miscellaneous Anxiolytics, Sedatives, and Hypnotics

- In 2000, the most frequently mentioned substances in the category miscellaneous anxiolytics, sedatives, and hypnotics were (Table 2.4.0):
  - Buspirone (2,299 mentions),
  - Diphenhydramine (7,440),
  - Hydroxyzine (1,921),
  - Zolpidem (6,810), and
  - Anxiolytics, sedatives, and hypnotics NOS (2,086).

- Among the miscellaneous anxiolytics, sedatives, and hypnotics, only buspirone increased (93%, from 1,190 to 2,299) from 1998 to 2000 (Table 2.4.0). No changes from 1999 to 2000 were evident.

- From 1994 to 2000, diphenhydramine mentions dropped 47 percent (from 13,958), and zolpidem mentions increased 383 percent (from 1,410) (Table 2.4.0).

CNS Stimulants

- In 2000, the CNS stimulants category had the fewest mentions among the psychotherapeutic agents (Table 2.4.0). However, several important stimulants—the amphetamines, methamphetamine, and MDMA (Ecstasy)—are tabulated separately as major substances of abuse.

CNS AGENTS

- CNS agents (203,572 mentions) in DAWN are divided into 8 subcategories (Table 2.2.0), but analgesics account for more than 80 percent (167,194) of mentions of CNS agents in 2000. Because of their frequency, analgesics are further subdivided into:
  - Antimigraine agents (502 mentions in 2000),
  - Cox-2 inhibitors (1,002 mentions),
  - Narcotic analgesics (47,833 mentions),
  - Narcotic analgesic combinations (34,540 mentions),
  - Nonsteroidal anti-inflammatory agents (24,793 mentions),
  - Salicylates (12,309 mentions),
  - Analgesic combinations (10,778 mentions), and
  - Miscellaneous analgesics (35,437 mentions).
- Among the CNS agents other than analgesics, 4 subcategories had substantial numbers of mentions in 2000 (Table 2.2.0):
  - Anorexiants (1,540 mentions), down 35 percent from 1994 to 2000;
  - Anticonvulsants (16,849 mentions), down 80 percent from 1994 to 2000;
  - Antiemetic/antivertigo agents (1,139 mentions), with no long- or short-term changes; and
  - Muscle relaxants (15,914 mentions), up 16 percent from 1999 to 2000 and 30 percent from 1994 to 2000.

Narcotic Analgesics and Narcotic Analgesic Combinations

Narcotic analgesics and narcotic analgesic combinations are classified separately in the Multum *Lexicon* and therefore in DAWN as well. However, to fully understand the magnitude of narcotic analgesic abuse as it manifests in ED visits, it is more informative to combine mentions of individual narcotic analgesics with their mentions as compounds or combinations. This is especially important, given the likelihood that some compounds are not always reported to DAWN as compounds. For example, the compounds acetaminophen-oxycodone or aspirin-oxycodone are sometimes reported to DAWN, but it is likely that some mentions of these oxycodone compounds are reported to DAWN simply as oxycodone. Table A presents

estimates of narcotic analgesics combined with narcotic analgesic combinations for half years 1996 through 2001 and for full years 1994 through 2000. Trends are also represented graphically in Figure 6.

- When considered together, narcotic analgesics and narcotic analgesic combinations comprise 82,373 mentions or 7 percent of ED mentions estimated for the coterminous U.S. in 2000 (see Table A).

- From 1994 to 2000, mentions of narcotic analgesics and combinations rose 85 percent, 40 percent over the 2-year period 1998-2000, and 19 percent from 1999 to 2000 (Table A and Figure 6). Mentions of narcotic analgesics and combinations did not change significantly from the first half of 2000 to the first half of 2001.

- The most frequently mentioned narcotic analgesics in 2000 (Table A) are:

  - Codeine (5,295 mentions in 2000),
  - Hydrocodone (20,098 mentions),
  - Meperidine (1,085 mentions),
  - Methadone (7,819 mentions),
  - Oxycodone (10,825 mentions), and
  - Propoxyphene (5,485 mentions).

- Significant long-term increases in narcotic analgesic mentions are found for hydrocodone (up 116% since 1994), oxycodone (up 166% since 1994), and methadone (up 140% since 1994). Fentanyl has also increased significantly (nearly 2000%), but is mentioned much less frequently (576 mentions in 2000) (Table A).

- From 1999 to 2000, hydrocodone mentions increased 32 percent (from 15,252 mentions), oxycodone mentions increased 68 percent (from 6,429), and methadone mentions increased 44 percent (from 5,426) (Table A). From the first half of 2000 to the first half of 2001, mentions of oxycodone increased 44 percent (from 5,437 to 7,831) and methadone mentions increased 40 percent (from 3,405 to 4,766).

- Considering the 2-year period 1998 to 2000, hydrocodone mentions rose 48 percent (from 13,611 mentions), oxycodone mentions rose 108 percent (from 5,211), and methadone mentions rose 63 percent (from 4,810) (Table A).

- The only decrease in ED mentions of narcotic analgesics occurred for codeine, which dropped 20 percent since 1998 (from 6,620 to 5,295 in 2000) and 44 percent (from 9,439) since 1994 (Table A). From the first half of 2000 to the first half of 2001, mentions of codeine decreased 38 percent (from 2,578 to 1,593).

Non-narcotic Analgesics

- Nonsteroidal anti-inflammatory agents (NSAIDs), salicylates, analgesic combinations, and miscellaneous analgesics are all relatively large categories of non-narcotic analgesics (Table 2.2.0). In 2000, DAWN estimates show:

- NSAIDs (24,793 mentions),
- Salicylates (12,309 mentions),
- Analgesic combinations (10,778 mentions), and
- Miscellaneous analgesics (35,437 mentions.

NSAIDs

- Mentions of the class of drugs known as NSAIDs rose 15 percent (from 21,631 mentions to 24,793) from 1999 to 2000, but dropped 14 percent (from 28,742) since 1994 (Table 2.2.0).
- The most frequently mentioned NSAIDs in drug-related ED visits in 2000 (Table 2.5.0) were:
  - Ibuprofen (18,338 mentions), up 25 percent since 1999, and
  - Naproxen (5,080 mentions), unchanged since 1998.

Salicylates

- Salicylates are primarily aspirins and aspirin compounds, with aspirin alone accounting for 90 percent of the category. Mentions of salicylates dropped 27 percent (from 16,856 to 12,309 mentions) from 1994 to 2000 (Table 2.5.0).
- In addition, mentions of salicylates decreased 42 percent from the first half of 2000 to the first half of 2001 (Table 2.1.0).

Analgesic Combinations

- Mentions of non-narcotic analgesic combinations rose 48 percent from 1999 to 2000. In 2000, these were primarily (Table 2.5.0):
  - Acetaminophen-diphenhydramine combinations (4,224 mentions),
  - APAP/ASA/caffeine combinations (3,054 mentions),
  - APAP/butalbital/caffeine combinations (1,637), and
  - ASA/butalbital/caffeine combinations (1,447).
- Of the most frequent non-narcotic combinations, acetaminophen-diphenhydramine mentions rose 38 percent and ASA/butalbital/caffeine mentions rose 96 percent from 1999 to 2000 (Table 2.5.0).
- From 1994 to 2000, mentions of non-narcotic analgesics overall rose 27 percent. However, this aggregate number masks a larger increase (179%) in acetaminophen-diphenhydramine mentions (Table 2.5.0).

Miscellaneous Analgesics

- Miscellaneous analgesics are primarily acetaminophen (32,835 out of 35,437 mentions) (Table 2.5.0). Acetaminophen alone accounts for 93 percent of the category in 2000.

- Mentions of miscellaneous analgesics rose 20 percent (from 29,491 to 35,437 mentions) from 1999 to 2000, with acetaminophen alone rising 19 percent (from 27,702 to 32,835) (Table 2.5.0). No other significant long- or short-term trends were evident.

RESPIRATORY AGENTS

- Respiratory agents comprise 1 percent (11,521) of total ED drug mentions (Table 2.2.0).

- Respiratory agents mentioned in ED episodes in 2000 are primarily (Table 2.2.0):

  - Antihistamines (3,265 mentions),

  - Decongestants (1,049), and

  - Upper respiratory combinations (5,676).

- In general, mentions of respiratory agents appear to have dropped in 1999 and then recovered in 2000. The long-term trend has been downward with the following notable exceptions (Table 2.6.0):

  - Mentions of antihistamines-NOS rose from 1998 to 2000 and from 1999 to 2000, but their numbers are still quite small (643 mentions in 2000).

  - Only one respiratory combination—acetaminophen-chlorpheniramine—posted large significant increases from 1998 to 2000 (286%, from 289 to 1,116) and from 1999 to 2000 (255%, from 314 to 1,116). The long-term trend for this compound also appears to be upward (Table 2.6.0).

CARDIOVASCULAR AGENTS

- Cardiovascular agents comprise 1 percent (9,348) of total ED drug mentions in 2000 (Table 2.2.0).

- Cardiovascular agents are divided rather evenly among 5 subcategories:

  - Antiadrenergic agents, centrally acting (1,156 mentions in 2000);

  - Beta-adrenergic blocking agents (1,956);

  - Calcium channel blocking agents (1,525);

  - Diuretics (1,049); and

  - All others (3,662) (Table 2.2.0).

- The long-term trend in mentions of cardiovascular agents appears to be downward (-28% from 1994 to 2000) (Table 2.2.0).

- Of all the cardiovascular agents, there are few specific substances with large enough numbers to warrant discussion (Table 2.7.0). The largest are:

  - Clonidine (1,093 mentions in 2000),

  - Atenolol (858),

  - Propranolol (737), and

  - Ephedrine (749).

- Of the 4 most frequent cardiovascular agents, none experienced significant changes from 1999 to 2000, and only 2 show a significant long-term trend from 1994 to 2000 (Table 2.7.0):

  - Propranolol mentions were down 48 percent (from 1,424), and

  - Ephedrine mentions were down 62 percent (from 1,992).

OTHER SUBSTANCES

- The majority (56%) of mentions in the category “other substances” come from drug unknown, with the remainder distributed across (Table 2.2.0):

  - Alternative medicines (999 mentions in 2000),

  - Anti-infectives (5,441),

  - Gastrointestinal agents (3,514),

  - Hormones (3,915),

  - Nutritional products (2,120), and

  - Topical agents (615).

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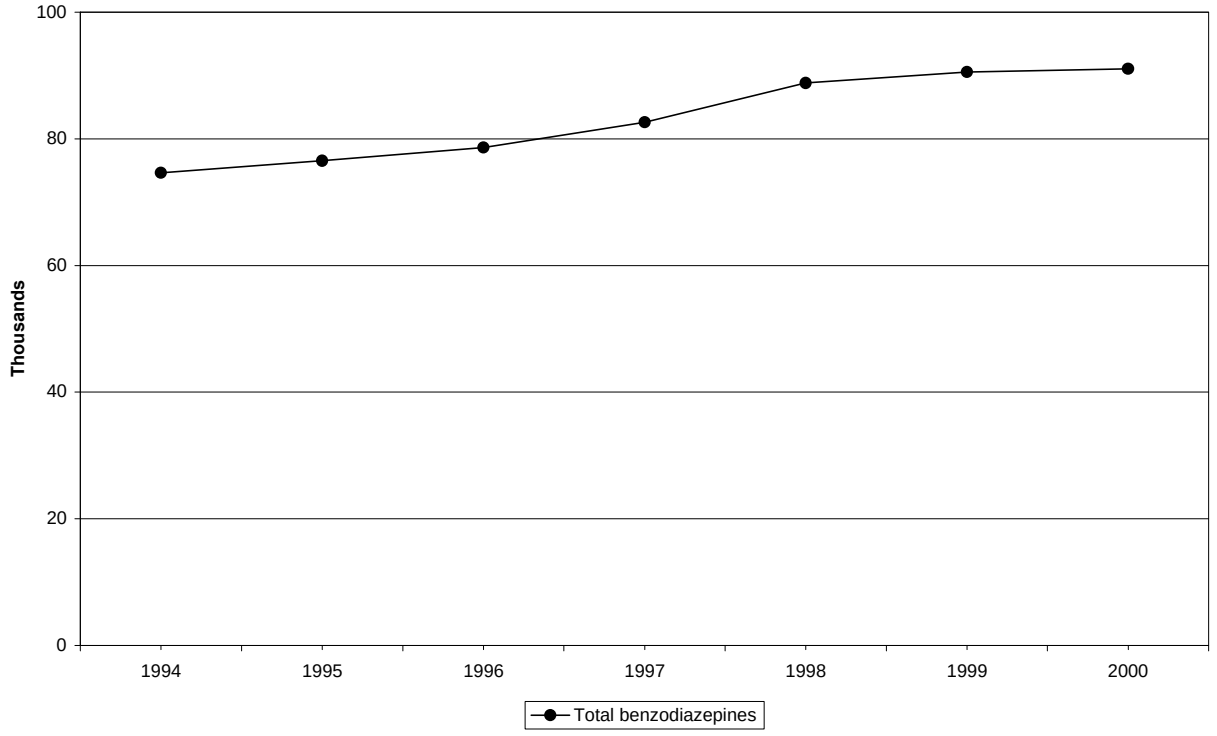
Figure 5
ED mentions of selected benzodiazepines: 1994 through 2000



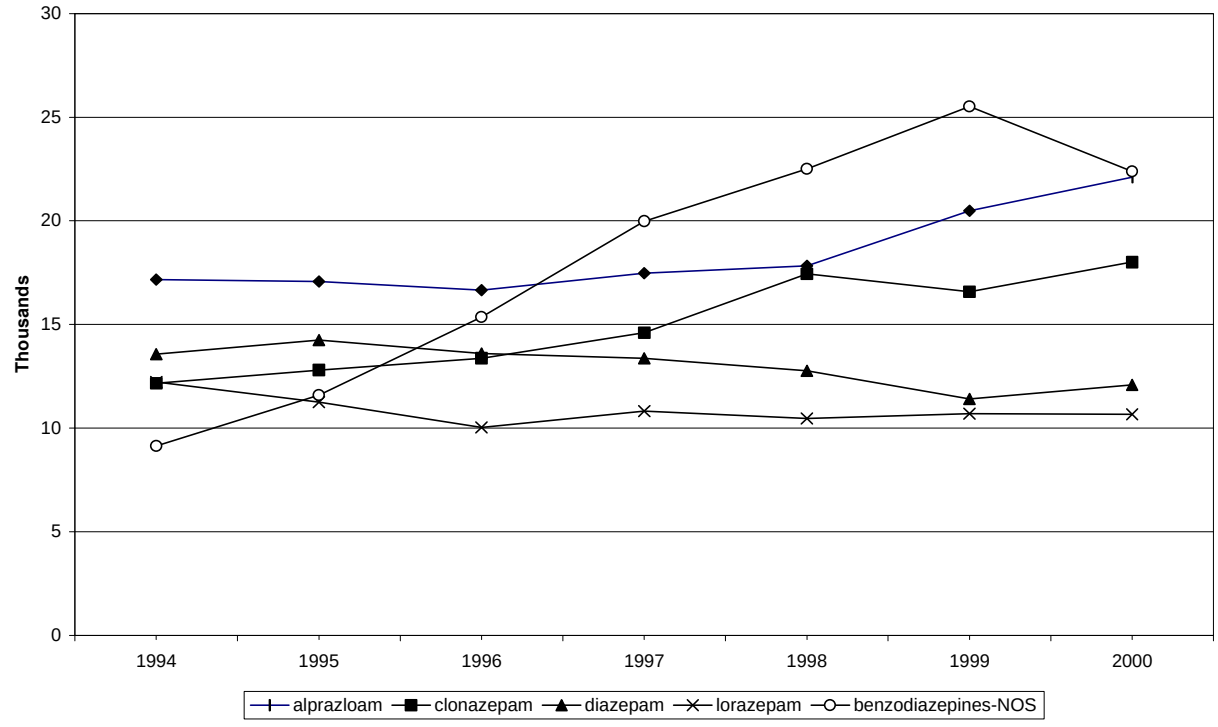


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Figure 6
ED mentions of selected narcotic analgesics: 1994 through 2000

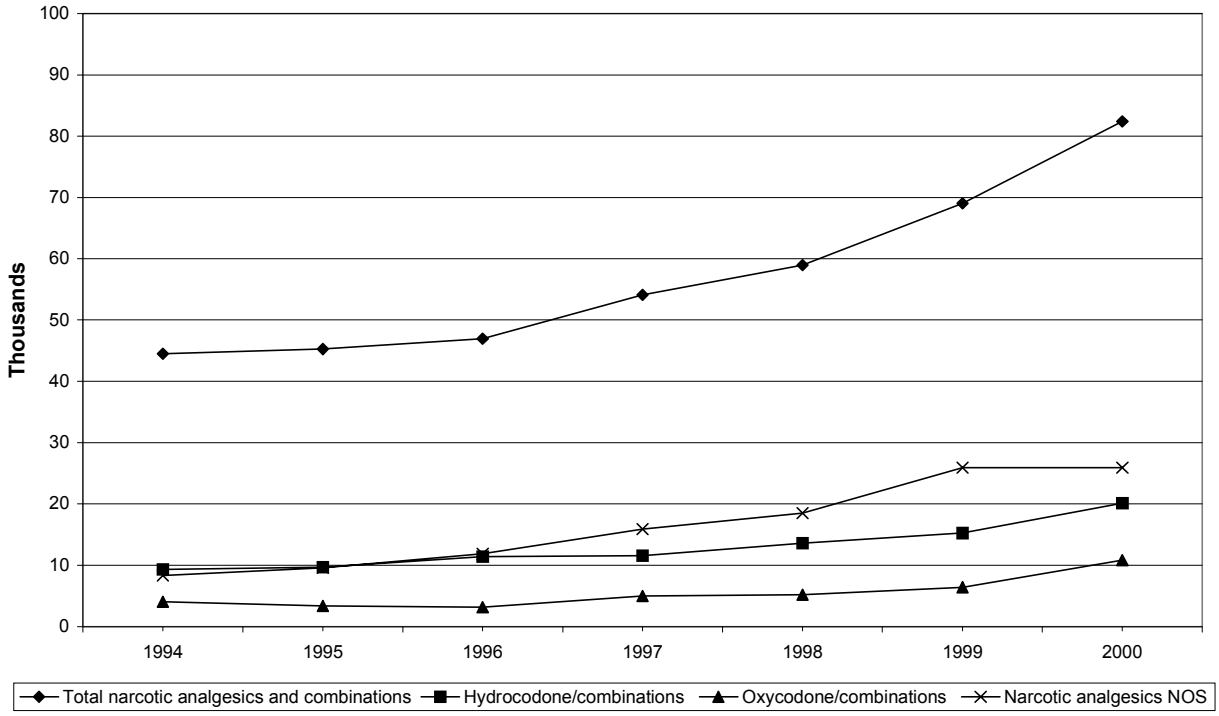

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Table A – Narcotic analgesics and narcotic analgesic combinations: Estimates by half year 1996 through 2001 and estimates by full year 1994 through 2000

Group name	Jul-Dec 1996	Jan-Jun 1997	Jul-Dec 1997	Jan-Jun 1998	Jul-Dec 1998	Jan-Jun 1999	Jul-Dec 1999	Jan-Jun 2000	Jul-Dec 2000	Jan-Jun 2001	% change[1] H2 2000, H1 2001	% change[1] H1 2000, H1 2001
Total narcotic analgesics and combinations	23,998	25,588	28,528	28,371	30,575	32,883	36,128	40,979	41,394	47,448		
Narcotic analgesics	11,877	11,945	14,353	15,510	17,063	19,689	21,987	23,429	24,404	32,026	31.2	36.7
Narcotic analgesic combinations	12,121	13,643	14,175	12,861	13,512	13,194	14,141	17,550	16,990	15,421		
Codeine/combinations	3,833	4,198	3,671	3,322	3,298	2,473	2,501	2,578	2,717	1,593	-41.4	-38.2
Dihydrocodeine/combinations	0	1	1	1	6	2	0	0	3	1		
Fentanyl/combinations	16	188	16	33	254	245	92	251	325	512		
Hydrocodone/combinations	4,954	5,526	6,044	6,465	7,145	6,806	8,446	10,123	9,975	10,322		
Meperidine/combinations	486	379	485	238	491	337	545	678	408	475		
Methadone	2,060	1,880	1,952	2,292	2,518	2,826	2,600	3,405	4,415	4,766		40.0
Morphine/combinations	525	541	759	695	1,261	1,159	1,057	1,221	1,262	1,390		
Opium/combinations	14	25	24	12	12	127	88	75	92	20		
Oxycodone/combinations	1,696	2,301	2,711	2,293	2,918	3,060	3,369	5,437	5,388	7,831	45.3	44.0
Pentazocine/combinations	96	66	136	86	243	185	78	113	111	193		
Phenacetin/combinations	0	1	0	0	1	0	0	1	0	0		-100.0
Propoxyphene/combinations	3,026	2,866	3,637	3,286	2,540	3,253	2,379	2,872	2,613	2,806		
Narcotic analgesics NOS	6,809	7,103	8,790	9,057	9,439	11,878	14,068	13,027	12,908	16,224		
All other narcotic analgesics/combinations NTA	484	512	303	592	449	532	905	1,199	1,176	1,313		

Group name	Total 1994	Total 1995	Total 1996	Total 1997	Total 1998	Total 1999	Total 2000	% change[1] 1994, 2000	% change[1] 1998, 2000	% change[1] 1999, 2000
Total narcotic analgesics and combinations	44,518	45,254	46,941	54,116	58,946	69,011	82,373	85.0	39.7	19.4
Narcotic analgesics	19,415	20,910	22,525	26,298	32,573	41,676	47,833	146.4	46.8	
Narcotic analgesic combinations	25,102	24,343	24,416	27,819	26,373	27,335	34,540	37.6	31.0	26.4
Codeine/combinations	9,439	8,732	7,594	7,869	6,620	4,974	5,295	-43.9	-20.0	
Dihydrocodeine/combinations	8	63	3	2	7	2	3			
Fentanyl/combinations	28	22	34	203	286	337	576	1,957.1		
Hydrocodone/combinations	9,320	9,686	11,419	11,570	13,611	15,252	20,098	115.6	47.7	31.8
Meperidine/combinations	925	1,045	876	864	730	882	1,085			
Methadone	3,252	4,247	4,129	3,832	4,810	5,426	7,819	140.4	62.6	44.1
Morphine/combinations	1,099	1,283	864	1,300	1,955	2,217	2,483	125.9		
Opium/combinations	104	95	30	49	24	215	167			
Oxycodone/combinations	4,069	3,393	3,190	5,012	5,211	6,429	10,825	166.0	107.7	68.4
Pentazocine/combinations	289	153	196	202	329	262	224			
Phenacetin/combinations	2	0	0	1	1	0	1			
Propoxyphene/combinations	6,731	6,294	5,889	6,502	5,826	5,632	5,485			
Narcotic analgesics NOS	8,307	9,562	11,855	15,893	18,495	25,946	25,935	212.2	40.2	
All other narcotic analgesics/combinations NTA	946	680	862	815	1,041	1,437	2,375			

[1] This column denotes statistically significant ($p < 0.05$) increases and decreases between estimates for the periods noted.

NOTE: These estimates are based on a representative sample of non-Federal, short-stay hospitals with 24-hour emergency departments in the coterminous U.S.

H1 = first half (Jan-Jun) of year, H2 = second half (Jul-Dec) of year, NOS = not otherwise specified, NTA = not tabulated above.

SOURCE: Office of Applied Studies, SAMHSA, Drug Abuse Warning Network, 2001 (9/2001 update).

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TRENDS IN MAJOR SUBSTANCES OF ABUSE IN 21 METROPOLITAN AREAS

This section presents findings for the major substances of abuse for the 21 metropolitan areas oversampled in DAWN. As noted previously, "major substances of abuse" include the most common illicit drugs reported to DAWN, alcohol reported in combination with any other substance reported to DAWN, and lower frequency drugs of particular policy interest (e.g., club drugs such as Ecstasy and GHB).

This section of *ED Trends* focuses on Tables 3.1 to 3.12 (ED episodes and mentions) and 13.1 to 13.12 (rates of ED episodes and mentions per 100,000 population). Each of these tables summarizes estimates across the 21 metropolitan areas for: total episodes, total mentions, and mentions of 4 of the major substances of abuse: cocaine, heroin, marijuana, and methamphetamine. Except for methamphetamine, these are the largest illicit drugs tracked by DAWN. Metropolitan area estimates for methamphetamine are highlighted because of the drug's concentration in particular areas. Metropolitan area estimates for methamphetamine tend to be more meaningful than national estimates.

Metropolitan area summaries are not provided for the other major substances of abuse because of their relatively small numbers, but these estimates are presented in this publication in Tables 2.2.1 to 2.2.21 (episodes and mentions) and 12.2.1 to 12.2.21 (rates).[13] As noted in the introduction, 3-part table numbers ending in "**.1**" to "**.21**" contain estimates for the 21 metropolitan areas. Some readers will be interested in findings only for a particular area. For these readers, we also provide 21 complete sets of tables, one for each metropolitan area, online at http://www.samhsa.gov/oas/dawn.htm.

Readers should note that very small changes in the estimates for some metropolitan areas may result in statistically significant differences. This occurs when all or nearly all eligible hospitals are included in the sample for those cities. Those interested in making comparisons across metropolitan areas should rely on the rates per 100,000 population because these account for differences in population across the metropolitan areas.

TOTAL ED EPISODES

- Nationwide, total ED drug episodes and drug mentions were stable from 1999 to 2000 (Table 3.2) and from the first half of 2000 to the first half of 2001 (Table 3.1).

- From 1999 to 2000, significant increases in drug episodes were found in 7 metropolitan areas oversampled in DAWN (Table 3.2):

[13] In addition, demographic characteristics of patients are presented in Tables 4.2.1 to 4.2.21 (episodes and mentions) and 14.2.1 to 14.2.21 (rates). Estimates of episode characteristics are presented in Tables 5.2.1 to 5.2.21 (there are no rates calculated for episode characteristics). Because of the detail involved, this publication focuses little on these estimates by metropolitan area.

  - Seattle (32%, from 8,424 to 11,115),
  - Boston (28%, from 11,669 to 14,902),
  - Los Angeles (22%, from 20,677 to 25,286),
  - Miami (20%, from 7,128 to 8,560),
  - Chicago (16%, from 26,154 to 30,327),
  - Minneapolis (12%, from 4,643 to 5,197), and
  - Phoenix (9%, from 8,291 to 9,072).

- From 1999 to 2000, significant decreases in drug episodes were found in 2 metropolitan areas (Table 3.2):
  - Baltimore (-19%, from 14,171 to 11,505) and
  - San Francisco (-12%, from 8,928 to 7,857).
- Comparing preliminary estimates for the first half of 2000 and the first half of 2001 (Table 3.1):
  - Increases in drug episodes were evident only for Minneapolis (18%), Boston (10%), and Baltimore (9%).
  - Decreases in drug episodes occurred in San Francisco (-12%) and Dallas (-8%).
- Adjusting for population differences, the highest rates of ED drug episodes in 2000 were apparent in (Table 13.2):
  - Seattle (563 ED drug episodes per 100,000 population),
  - Chicago (502),
  - Baltimore (483),
  - Philadelphia (481), and
  - San Francisco (480).
- Among the 21 metropolitan areas in DAWN, Minneapolis had the lowest rate of ED drug episodes (214) per 100,000 population in 2000 (Table 13.2).

COCAINE

- Nationwide, ED mentions of cocaine were stable from 1999 to 2000 (Table 3.6) and from the first half of 2001 to the first half of 2001 (Table 3.5).
- From 1999 to 2000, significant increases in cocaine mentions were found in 6 metropolitan areas oversampled in DAWN (Table 3.6):

- Los Angeles (34%, from 6,768 to 9,094),
- Seattle (33%, from 2,519 to 3,338),
- Atlanta (19%, from 5,236 to 6,229),
- Boston (15%, from 3,560 to 4,099),
- Chicago (11%, from 13,399 to 14,879), and
- Miami (9%, from 4,018 to 4,383),

■ From 1999 to 2000, significant decreases in cocaine mentions were found in 4 metropolitan areas (Table 3.6):

- Baltimore (-29%, from 6,921 to 4,943),
- Newark (-13%, from 3,124 to 2,726),
- Washington, DC (-10%, from 3,150 to 2,830), and
- New Orleans (-7%, from 2,139 to 1,998).

■ Comparing preliminary estimates for the first half of 2000 and the first half of 2001 (Table 3.5):

- Increases in cocaine mentions were evident for Boston (17%) and Baltimore (11%).
- Decreases in cocaine mentions occurred in New Orleans (-24%), Dallas (-16%), Denver (-13%), and San Diego (-11%).

■ Adjusting for population differences, the highest rates of cocaine ED mentions in 2000 were apparent in (Table 13.6):

- Chicago (246 cocaine mentions per 100,000 population),
- Miami (225),
- Atlanta (221),
- Philadelphia (216), and
- Baltimore (208). From 1994 to 1999, Baltimore had the highest rates of cocaine mentions in the 21 metropolitan areas represented in DAWN.

■ Among the 21 metropolitan areas in DAWN, the lowest rates of ED cocaine mentions in 2000 (Table 13.2) were found in:

- Minneapolis (35 cocaine mentions per 100,000 population) and
- San Diego (41).

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HEROIN

- Nationwide, ED mentions of heroin rose 15 percent from 1999 to 2000 (Table 3.8) but were unchanged from the first half of 2000 to the first half of 2001 (Table 3.7).
- From 1999 to 2000, significant increases in heroin mentions were found in 8 metropolitan areas oversampled in DAWN (Table 3.8):
  - Miami (58%, from 917 to 1,452),
  - New Orleans (51%, from 649 to 982),
  - Boston (35%, from 2,861 to 3,867),
  - Buffalo (31%, from 522 to 681),
  - Chicago (29%, from 9,629 to 12,454),
  - Detroit (25%, from 2,653 to 3,328),
  - Minneapolis (25%, from 182 to 228), and
  - Atlanta (17%, from 415 to 485),
- From 1999 to 2000, significant decreases in heroin mentions were found in 2 metropolitan areas (Table 3.8):
  - Baltimore (-23%, from 6,999 to 5,405), and
  - San Francisco (-10%, from 3,050 to 2,756).
- Comparing preliminary estimates for the first half of 2000 and the first half of 2001 (Table 3.7):
  - Increases in heroin mentions were evident for Minneapolis (58%) and Miami (21%).
  - Decreases in heroin mentions occurred in New Orleans (-43%), Seattle (-38%), San Diego (-33%), San Francisco (-18%), and Los Angeles (-16%).
- Adjusting for population differences, the highest rates of heroin ED mentions in 2000 were apparent in (Table 13.8):
  - Newark (238 heroin mentions per 100,000 population),
  - Baltimore (227). From 1994 to 1999, Baltimore had the highest rates of heroin mentions in the 21 metropolitan areas represented in DAWN.
  - Chicago (206).

- Among the 21 metropolitan areas in DAWN, the lowest rates of ED heroin mentions in 2000 (Table 13.8) were found in:
  - Minneapolis (9 heroin mentions per 100,000 population),
  - Atlanta (17), and
  - Dallas (19).

MARIJUANA

- Nationwide, ED mentions of marijuana were stable from 1999 to 2000 (Table 3.10) and from the first half of 2000 to the first half of 2001 (Table 3.9).
- From 1999 to 2000, significant increases in marijuana mentions were found in 7 metropolitan areas oversampled in DAWN (Table 3.10):
  - Seattle (75%, from 808 to 1,414),
  - Boston (50%, from 1,960 to 2,945),
  - Miami (38%, from 1,283 to 1,768),
  - San Francisco (34%, from 469 to 627),
  - Minneapolis (29%, from 625 to 803),
  - Denver (21%, from 677 to 817), and
  - Chicago (19%, from 4,555 to 5,398).
- From 1999 to 2000, there were no significant decreases in marijuana mentions in the 21 metropolitan areas (Table 3.10).
- Comparing preliminary estimates for the first half of 2000 and the first half of 2001 (Table 3.9):
  - Increases in marijuana mentions were evident for Minneapolis (38%), Phoenix (34%), Baltimore (30%), Philadelphia (18%), and Seattle (15%).
  - Decreases in marijuana mentions occurred only in Dallas (-19%).
- Adjusting for population differences, the highest rates of marijuana ED mentions in 2000 were apparent in (Table 13.10):
  - Philadelphia (101 marijuana mentions per 100,000 population),
  - Detroit (99),
  - Miami (91),
  - Chicago (89),

- New Orleans (87), and
- Atlanta (86).

- Among the 21 metropolitan areas in DAWN, the lowest rates of ED marijuana mentions in 2000 (Table 13.10) were found in:
  - Newark (29 marijuana mentions per 100,000 population) and
  - Minneapolis (33).

METHAMPHETAMINE

- Looking across the 21 DAWN metropolitan areas, ED mentions of methamphetamine in 2000 are concentrated in 5 cities in the western United States: Los Angeles (1,375 mentions), San Diego (747), Phoenix (600), San Francisco (591), and Seattle (540) (Table 3.12).
- Among the 10 metropolitan areas with at least 100 mentions of methamphetamine in 1999 or 2000, significant increases from 1999 to 2000 were evident in 6 (Table 3.12):
  - Phoenix (76%, from 341 to 600),
  - Seattle (53%, from 353 to 540),
  - Los Angeles (51%, from 910 to 1,375),
  - Dallas (35%, from 100 to 135),
  - San Diego (28%, from 584 to 747), and
  - Atlanta (31%, from 83 to 109).
- From 1999 to 2000, there were no significant decreases in methamphetamine mentions in the metropolitan areas with at least 100 mentions (Table 3.12).
- Comparing preliminary estimates for the first half of 2000 and the first half of 2001 (Table 3.11), methamphetamine mentions declined in Seattle (-49%), Denver (-30%), Dallas (-29%), and San Diego (-17%). There were no statistically significant increases in methamphetamine mentions in any of the DAWN metropolitan areas during this time period.
- Adjusting for population differences, the highest rates of methamphetamine ED mentions in 2000 were apparent in (Table 13.12):
  - San Francisco (36 methamphetamine mentions per 100,000 population),
  - San Diego (31),
  - Phoenix (29),
  - Seattle (27), and
  - Los Angeles (16).

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TRENDS IN OTHER SUBSTANCES OF ABUSE IN 21 METROPOLITAN AREAS

This section presents findings for the 21 metropolitan areas oversampled in DAWN for an extensive collection of substances, most of which are marketed legally by prescription or over the counter. However, only ED visits involving the nonmedical use of prescription and OTC medications are reportable to DAWN. Since it is impossible to know patients' actual intentions when abusing a substance, these substances are classified based on their therapeutic use. In this section, we focus only on the largest categories of drugs, leaving exploration of small subcategories and individual substances to readers interested in particular metropolitan areas.

This section of *ED Trends* focuses primarily on Tables 2.2.1 to 2.2.21 (episodes and mentions) and 12.2.1 to 12.2.21 (rates) to present findings for each metropolitan area for the selected drug categories.[14] As noted in the introduction, 3-part table numbers ending in "**.1**" to "**.21**" present estimates for each of the metropolitan areas. Because of the detail involved, metropolitan area summaries are not provided in this publication for each individual drug. For readers interested in findings for a particular metropolitan area, 21 complete sets of tables, one for each metropolitan area, are available online at http://www.samhsa.gov/oas/dawn.htm.

Readers should note that very small changes in the estimates for particular metropolitan areas may produce statistically significant differences. This occurs when all or nearly all eligible hospitals are included in the sample for those cities. Those interested in making comparisons across metropolitan areas should rely on the rates per 100,000 population because these account for differences in population sizes across the metropolitan areas.

PSYCHOTHERAPEUTIC AGENTS

- Nationwide, episodes involving psychotherapeutic agents were stable from 1999 to 2000 (Table 2.2.0) and from the first half of 2000 to the first half of 2001 (Table 2.1.0). Nationally, there were 83 mentions of psychotherapeutic agents per 100,000 population in 2000 (Table 12.2.0).

- From 1999 to 2000, significant increases in mentions of psychotherapeutic agents were found in 5 metropolitan areas oversampled in DAWN (Tables 2.2.1 through 2.2.21):

  - Seattle (43%, from 1,839 to 2,630),

  - Miami (23%, from 1,307 to 1,603),

  - Chicago (17%, from 3,834 to 4,491),

[14] In addition, demographic characteristics of patients are presented in Tables 4.2.1 to 4.2.21 (episodes and mentions) and 14.2.1 to 14.2.21 (rates). Estimates of episode characteristics are presented in Tables 5.2.1 to 5.2.21 (there are no rates calculated for episode characteristics). Because of the detail involved, these estimates are not discussed.

- St. Louis (12%, from 2,239 to 2,506), and
- Minneapolis (12%, from 2,043 to 2,282).

- From 1999 to 2000, significant decreases in mentions of psychotherapeutic agents were found in 3 metropolitan areas (Tables 2.2.1 through 2.2.21):
  - Baltimore (-9%, from 1,973 to 1,790),
  - Denver (-9%, from 1,403 to 1,272), and
  - San Diego (-9%, from 2,601 to 2,377).
- Adjusting for population differences, the highest rates of psychotherapeutic agents in 2000 were apparent in (Tables 12.2.1 through 12.2.21):
  - Philadelphia (149 mentions of psychotherapeutic agents per 100,000 population),
  - Phoenix (145),
  - Seattle (133),
  - Boston (130),
  - St. Louis (103), and
  - Dallas (100).

Antidepressants

- From 1999 to 2000, mentions of antidepressants were stable for the coterminous U.S. (Table 2.2.0). However, mentions of antidepressants increased in 2 metropolitan areas (Tables 2.2.1 through 2.2.21):
  - Seattle (36%) and
  - Phoenix (13%).
- From 1999 to 2000, mentions of antidepressants decreased in 5 metropolitan areas (Tables 2.2.1 through 2.2.21):
  - Atlanta (-22%),
  - Buffalo (-7%),
  - Denver (-19%),
  - San Diego (-7%), and
  - San Francisco (-21%).

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Antipsychotics

- In the coterminous U.S., mentions of antipsychotics increased 32 percent from 1999 to 2000 (Table 2.2.0).
- From 1999 to 2000, mentions of antipsychotics increased in 3 metropolitan areas oversampled in DAWN (Tables 2.2.1 through 2.2.21):
  - Buffalo (144%),
  - St. Louis (47%), and
  - Seattle (50%).
- From 1999 to 2000, mentions of antipsychotics decreased in 4 metropolitan areas (Tables 2.2.1 through 2.2.21):
  - Baltimore (-9%),
  - Chicago (-28%),
  - New York (-34%), and
  - San Diego (-29%).

Anxiolytics, Sedatives, and Hypnotics

- Overall, anxiolytics, sedatives, and hypnotics, the most frequent category of psychotherapeutic agents in drug-related ED episodes, were stable from 1999 to 2000 in the coterminous U.S. (Table 2.2.0).
- However, anxiolytics, sedatives, and hypnotics increased from 1999 to 2000 in 4 of the DAWN metropolitan areas (Tables 2.2.1 through 2.2.21):
  - Chicago (26%),
  - Miami (24%),
  - Minneapolis (11%), and
  - Seattle (48%).
- Among the metropolitan areas oversampled in DAWN, mentions of anxiolytics, sedatives, and hypnotics decreased from 1999 to 2000 only in Baltimore (-10%) (Tables 2.2.1 through 2.2.21).

Benzodiazepines

- Benzodiazepines, which accounted for 8 percent of ED drug mentions in the coterminous U.S., were stable from 1999 to 2000 (Table 2.2.0).

- Benzodiazepine mentions increased from 1999 to 2000 in 4 of the DAWN metropolitan areas (Tables 2.2.1 through 2.2.21):
  - Chicago (34%),
  - Miami (28%),
  - Minneapolis (29%), and
  - Seattle (55%).
- Among the metropolitan areas oversampled in DAWN, benzodiazepine mentions decreased from 1999 to 2000 in only one: Baltimore (-9%) (Tables 2.2.1 through 2.2.21).

Miscellaneous Anxiolytics, Sedatives, and Hypnotics

- Substances classified as miscellaneous anxiolytics, sedatives, and hypnotics were stable from 1999 to 2000 in the coterminous U.S. (Table 2.2.0).
- Mentions of miscellaneous anxiolytics, sedatives, and hypnotics increased from 1999 to 2000 in 5 of the metropolitan areas oversampled in DAWN (Tables 2.2.1 through 2.2.21):
  - Dallas (40%),
  - Denver (16%),
  - New Orleans (38%),
  - St. Louis (32%), and
  - Seattle (29%).
- Mentions of miscellaneous anxiolytics, sedatives, and hypnotics decreased from 1999 to 2000 in only one DAWN metropolitan area: San Diego (-21%) (Tables 2.2.1 through 2.2.21).

CNS AGENTS

- Nationwide, episodes involving CNS agents rose 19 percent from 1999 to 2000 (Table 2.2.0) but were unchanged from the first half of 2000 to the first half of 2001 (Table 2.1.0). Nationally, there were 82 ED mentions of CNS agents per 100,000 population in 2000 (Table 12.2.0).
- From 1999 to 2000, significant increases in mentions of CNS agents were found in 7 metropolitan areas oversampled in DAWN (Tables 2.2.1 through 2.2.21):
  - Seattle (38%, from 2,201 to 3,040),
  - Boston (27%, from 2,674 to 3,401),

- Miami (24%, from 860 to 1,070),
- St. Louis (22%, from 1,651 to 2,019),
- San Francisco (15%, from 1,207 to 1,389),
- Denver (15%, from 1,470 to 1,685), and
- Buffalo (12%, from 813 to 914).

- From 1999 to 2000, there were no significant decreases in mentions of CNS agents in the 21 metropolitan areas (Tables 2.2.1 through 2.2.21).
- Adjusting for population differences, the highest rates of CNS agents in 2000 were apparent in (Tables 12.2.1 through 12.2.21):
  - Phoenix (164 mentions of CNS agents per 100,000 population),
  - Seattle (154),
  - Minneapolis (110),
  - Baltimore (107),
  - Philadelphia (108),
  - Denver (104).

Narcotic Analgesics and Narcotic Analgesic Combinations

- When considered together, narcotic analgesics and narcotic analgesic combinations comprise 82,373 mentions (7%) of ED mentions for the coterminous U.S. (Table A).
- Nationwide, narcotic analgesic mentions rose 19 percent from 1999 to 2000 (Table A). From 1999 to 2000, significant increases in mentions of narcotic analgesics were found in 6 metropolitan areas oversampled in DAWN:[15]
  - Seattle (37%, from 1,237 to 1,699),
  - Boston (35%, from 1,488 to 2,011),
  - Miami (35%, from 274 to 370),
  - Buffalo (31%, from 522 to 685),
  - St. Louis (24%, from 663 to 824), and
  - Denver (16%, from 522 to 607).

[15] These numbers were generated by compiling information from a number of DAWN ED tables. They are not published elsewhere in this report or on the Internet.

- Focusing on the 5 most frequently mentioned narcotic analgesics (hydrocodone, oxycodone, methadone, propoxyphene, and codeine):[15]

  - Hydrocodone mentions, which increased 32 percent nationally, increased in 7 metropolitan areas from 1999 to 2000: Miami (118%), Boston (90%), Philadelphia (71%), St. Louis (71%), Seattle (68%), San Francisco (47%), and Phoenix (26%). During this period, hydrocodone decreased only in Buffalo (-20%).

  - Oxycodone mentions, which increased 68 percent nationally, increased in 12 metropolitan areas from 1999 to 2000: Dallas (238%), Detroit (165%), Seattle (126%), St. Louis (124%), Boston (103%), San Francisco (82%), Miami (78%), Atlanta (72%), Philadelphia (72%), Chicago (50%), New Orleans (44%), and Baltimore (28%), and decreased in none.

  - Methadone mentions, which increased 44 percent nationally, increased also in 8 metropolitan areas from 1999 to 2000: Buffalo (200%), St. Louis (80%), Seattle (77%). Chicago (62%), Denver (54%), Miami (50%), Phoenix (50%), and Baltimore (12%). During this period, methadone mentions decreased only in San Diego (-52%).

  - Propoxyphene mentions, which were unchanged nationally, increased in Baltimore (14%) from 1999 to 2000 and decreased in 5 areas: San Francisco (-35%), Detroit (-33%), Minneapolis (-33%), San Diego (-32%), and Buffalo (-15%).

  - Codeine mentions, which were unchanged nationally, increased in 3 metropolitan areas from 1999 to 2000: Chicago (61%), Phoenix (30%), and Minneapolis (23%). Codeine mentions decreased in 4 metropolitan areas during this period: Atlanta (-51%), San Diego (-40%), Philadelphia (-25%), and Baltimore (-19%).

RESPIRATORY AGENTS

- Nationwide, mentions of respiratory agents in ED episodes rose 32 percent from 1999 to 2000 (Table 2.2.0) but were unchanged from the first half of 2000 to the first half of 2001 (Table 2.1.0). Nationally, there were only 5 mentions of respiratory agents per 100,000 population in 2000 (Table 12.2.0).

- Adjusting for population differences, the highest rates of respiratory agents in 2000 were found in (Tables 12.2.1 through 12.2.21):

  - Dallas (10 episodes involving respiratory agents per 100,000 population),

  - Phoenix (9),

  - Minneapolis (8),

  - Seattle (8), and

  - St. Louis (7).

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CARDIOVASCULAR AGENTS

- Nationwide, mentions of cardiovascular agents in ED episodes remained stable from 1999 to 2000 (Table 2.2.0) and from the first half of 2000 to the first half of 2001 (Table 2.1.0). Nationally, there were only 4 mentions of cardiovascular agents per 100,000 population in 2000 (Table 12.2.0).

- Adjusting for population differences, the highest rates of cardiovascular agents in 2000 were found in (Tables 12.2.1 through 12.2.21):

  - Phoenix (8 mentions of cardiovascular agents per 100,000 population) and

  - Minneapolis (7).

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TRENDS IN ED DRUG EPISODES BY PATIENT DEMOGRAPHICS

This section presents findings for demographic subgroups by gender, race/ethnicity, and age for total drug-related ED episodes and for cocaine, heroin, and marijuana mentions.

This section of *ED Trends* focuses primarily on trends in episodes and mentions by patient demographic characteristics, as presented in Tables 4.1.0 and 4.2.0 (total episodes), 4.5.0 and 4.6.0 (cocaine mentions), 4.7.0 and 4.8.0 (heroin mentions), and 4.9.0 and 4.10.0 (marijuana mentions). Tables showing total drug mentions by patient demographics are provided as well (Tables 4.3.0 and 4.4.0), but our discussion focuses on the more meaningful episode-level analysis of patient characteristics. Although cocaine, heroin, and marijuana estimates are expressed in mentions in these tables, mentions are equivalent to episodes when a single drug is under consideration.

This section also compares the rates of ED drug episodes and mentions of cocaine, heroin, and marijuana per 100,000 population for gender and age groups. It is important to use rates when making comparisons across demographic groups because the rates take into account the differing sizes of the gender and age groups in the population. For this discussion, we focus on Tables 14.1.0 and 14.2.0 (total episodes), 14.5.0 and 14.6.0 (cocaine mentions), 14.7.0 and 14.8.0 (heroin mentions), and 14.9.0 and 14.10.0 (marijuana mentions). Tables showing rates of drug mentions by gender and age are provided (Tables 14.3.0 and 14.4.0) but not discussed for the reasons noted earlier.

To illustrate the different perspectives revealed from comparisons based on mentions or rates, Figure 7 shows trends from 1994 to 2000 in the number of drug-related episodes by age group. Figure 8 shows the same trends for the same age groups expressed in rates per 100,000 population. Figures 9 through 11 illustrate trends by age group in the rate of mentions of cocaine, heroin, and marijuana, respectively, from 1994 to 2000.

Population-based rates are not available for racial or ethnic subgroups because the race and ethnicity categories in DAWN do not match sufficiently the categories available from the Census. For the same reason, there can be no comparisons of estimates by race/ethnicity across the metropolitan areas in DAWN. For more information regarding DAWN reporting on race/ethnicity, see Appendix C.

All of the trends by patient demographics are available also for the 21 metropolitan areas oversampled by DAWN, but in the interests of space, these are not discussed. See the table of contents for a complete listing of tables and their locations.

TOTAL DRUG-RELATED EPISODES

- From 1999 to 2000, increases in total ED episodes occurred for females (up 9%, from 257,983 to 281,793 mentions), patients age 12 to 17 (20%, from 52,685 to 63,443), patients age 18 to 25 (13%, from 109,579 to 123,310), and Hispanic patients (20%, from 56,840 to 68,282) (Table 4.2.0). Total episodes for males, older age groups, and other race/ethnicity subgroups were unchanged from 1999 to 2000.

- Comparing estimates for the first half of 2000 and the first half of 2001, there were no significant changes in total drug-related episodes for any of the demographic subgroups (Table 4.1.0).

COCAINE, HEROIN, MARIJUANA

- From 1999 to 2000, increases in cocaine mentions occurred for Hispanic patients (up 16%, from 20,456 to 23,728), and patients age 35 and over (9%, from 85,869 to 93,357) (Table 4.6.0). Cocaine mentions for males and females, younger age groups, and other race/ethnicity subgroups were unchanged from 1999 to 2000.

- From 1999 to 2000, increases in heroin mentions occurred for males (up 13%, from 55,561 to 62,719), females (16%, from 26,054 to 30,146), white patients (21%, from 31,827 to 38,426), patients age 18 to 25 (21%, from 14,901 to 18,065), and patients age 35 and over (12%, from 46,356 to 51,698) (Table 4.8.0). Heroin mentions were unchanged for other race/ethnicity subgroups and for the 12 to 17 and 26 to 34 age groups.

- From 1999 to 2000, increases in marijuana mentions occurred for Hispanic patients (up 30%, from 9,064 to 11,739) but for no other demographic subgroup (Table 4.10.0).

- Comparing estimates for the first half of 2000 and the first half of 2001, cocaine mentions increased 16 percent (from 54,297 to 63,117 mentions) for males and 18 percent for patients age 35 and over (from 44,783 to 52,827) (Table 4.5.0). Otherwise, there were no significant changes in cocaine, heroin, or marijuana mentions for demographic subgroups for this period (Tables 4.5.0, 4.7.0, 4.9.0).

METHAMPHETAMINE

National estimates for methamphetamine are presented in Tables 4.11.0, 4.12.0 (mentions) and Tables 4.11.0 and 14.12.0 (rates). However, national estimates for methamphetamine tend to be quite volatile, so we refer readers instead to estimates by metropolitan area, with particular attention to the 5 metropolitan areas with the highest rates: San Francisco (36 methamphetamine mentions per 100,000 population), San Diego (31), Phoenix (29), Seattle (27), and Los Angeles (16). The rates of methamphetamine mentions for all 21 metropolitan areas are summarized in Tables 13.11 and 13.12. The demographic characteristics by metropolitan area are available online in tables with numbers beginning with **4.11.** and **4.12.** (mentions) and **14.11.** and **14.12.** (rates). Remember that the third term of the table number indicates the metropolitan area (i.e., San Francisco tables end in **.19**, San Diego **.18**, Phoenix **.16**, Seattle **.20**, and Los Angeles **.9**).

POPULATION-ADJUSTED RATES BY GENDER

- Adjusting for population, males and females had rates of drug-related ED episodes that were not statistically different (259 and 221 episodes per 100,000 population, respectively) (Table 14.2.0). However, the rates for males were approximately double the rates for females for cocaine (95 vs. 46), heroin (52 vs. 24), and marijuana (52 vs. 26) (Tables 14.6.0, 14.8.0, and 14.10.0).

- In 2000, among the 21 metropolitan areas oversampled by DAWN:

  - Rates of drug-related ED episodes involving males were highest in Seattle (634 episodes per 100,000 population), Chicago (608), and San Francisco (601) (Tables 14.2.1 through 14.2.21). Rates for males were lowest in Mineapolis (191), Dallas (277), and Washington, DC (283).

  - Rates of drug-related ED episodes involving females were highest in Seattle (483) and Phoenix (406) (Tables 14.2.1 through 14.2.21). Rates for females were lowest in Buffalo (204), New York (209), Los Angeles (234), Minneapolis (231), Washington, DC (231), and New Orleans (238).

POPULATION-ADJUSTED RATES BY AGE

Trends in ED drug episodes from 1994 to 2000, by age group, can be shown in terms of numbers of episodes (Figure 7) or in rates of episodes per 100,000 population (Figure 8). Focusing on the number of episodes is useful for determining which age groups are most frequently seen in EDs for drug-related emergencies. This is an estimate of utilization. In the case of total episodes, patients age 35 to 97 are responsible for the greatest number of ED episodes and those age 12 to 17 for the fewest (Figure 7). However, we cannot use these findings to make valid comparisons across age groups because of differences in the size of the population for each age category. For example, episodes for the age 35 to 97 group may be highest simply because this age group is, by far, the largest in the population.

- When we account for these differences in population (Figure 8), we find that patients 18 to 34 account for the highest and those age 35 to 97 account for the lowest rate of ED episodes per 100,000 population.

- Adjusting for differences in population, patients age 18 to 25 (426 episodes per 100,000 population) and patients age 26 to 34 (411) had the highest rates of ED drug-related episodes among the age groups in 2000, followed by patients age 12 to 17 (272) (Table 14.2.0). Although patients age 35 and over accounted for the largest number of ED drug episodes (Table 4.2.0), they had the lowest rate (201) of episodes in 2000 (Table 14.2.0).

- Patients age 26 to 34 had the highest rates of cocaine mentions per 100,000 population in 2000 (155), followed by patients age 18 to 25 (89) and patients age 35 and over (68) (Table 14.6.0 and Figure 9). Patients age 12 to 17 had the lowest rates of cocaine mentions in 2000 (19).

- Patients age 26 to 34 had the highest rates of heroin mentions per 100,000 population from 1994 to 1998 (range: 58 to 63) (Table 14.8.0 and Figure 10). However, in 1999 and 2000, the rates for patients age 26 to 34 (60 in 1999 and 72 in 2000) and for patients age 18 to 25 (53 and 62) seem to have converged (Table 14.8.0). Heroin mentions among patients age 18 to 25 increased 21 percent from 1999 to 2000 (Table 4.8.0, 14.8.0), with this increase occurring primarily among those age 20 to 25. In 2000, rates of heroin mentions were substantially lower for patients age 35 and over (37), but notably, heroin mentions for patients age 35 and over increased 12 percent from 1999 to 2000 (Table 4.8.0, 14.8.0). Patients age 12 to 17 had the lowest rates of heroin mentions (5) and the trend appears to be flat.

- Although it appears that the rate of marijuana mentions per 100,000 population have been rising in recent years overall and especially for patients age 18 to 25, the trend has been statistically unchanged from 1998 to 2000 (Table 4.10.0 and Figure 9). However, the rate of marijuana mentions is highest among patients age 18 to 25 (105 in 2000) and lowest among patients age 35 and over (21). Taking into account the variability in DAWN estimates, the rates of marijuana mentions for patients age 18 to 25 and patients age 12 to 17 are not statistically different. The rate for patients age 12 to 17 (67) is nearly identical to that for patients age 26 to 34 (66) in 2000, and the trends for these 2 age groups have been nearly indistinguishable from 1994 to 2000.

- In 2000, across the 21 metropolitan areas oversampled by DAWN:

  - Rates of drug-related ED episodes involving patients age 12 to 17 ranged from 532 episodes per 100,000 population in Phoenix to 117 in New York (Tables 14.2.1 through 14.2.21).

  - Rates of drug-related ED episodes involving patients age 18 to 25 ranged from 975 per 100,000 population in Seattle to 350 in San Diego (Tables 14.2.1 through 14.2.21).

  - Rates of drug-related ED episodes involving patients age 26 to 34 ranged from 921 per 100,000 population in Philadelphia to 257 in Minneapolis (Tables 14.2.1 through 14.2.21).

  - Rates of drug-related ED episodes for patients age 35 and older ranged from 498 per 100,000 population in Seattle to 132 in Minneapolis (Tables 14.2.1 through 14.2.21).

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Figure 7
Drug-related episodes by age group: 1994 through 2000

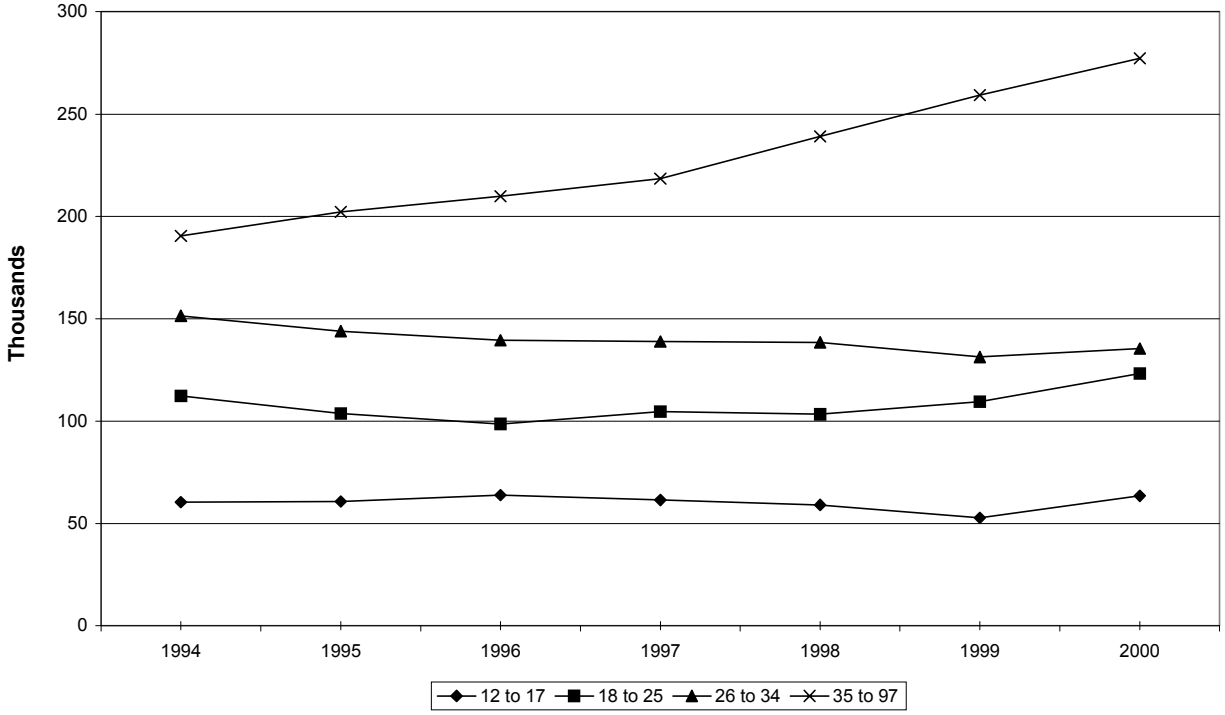

Figure 8
Rate of drug-related episodes per 100,000 population by age group: 1994 through 2000

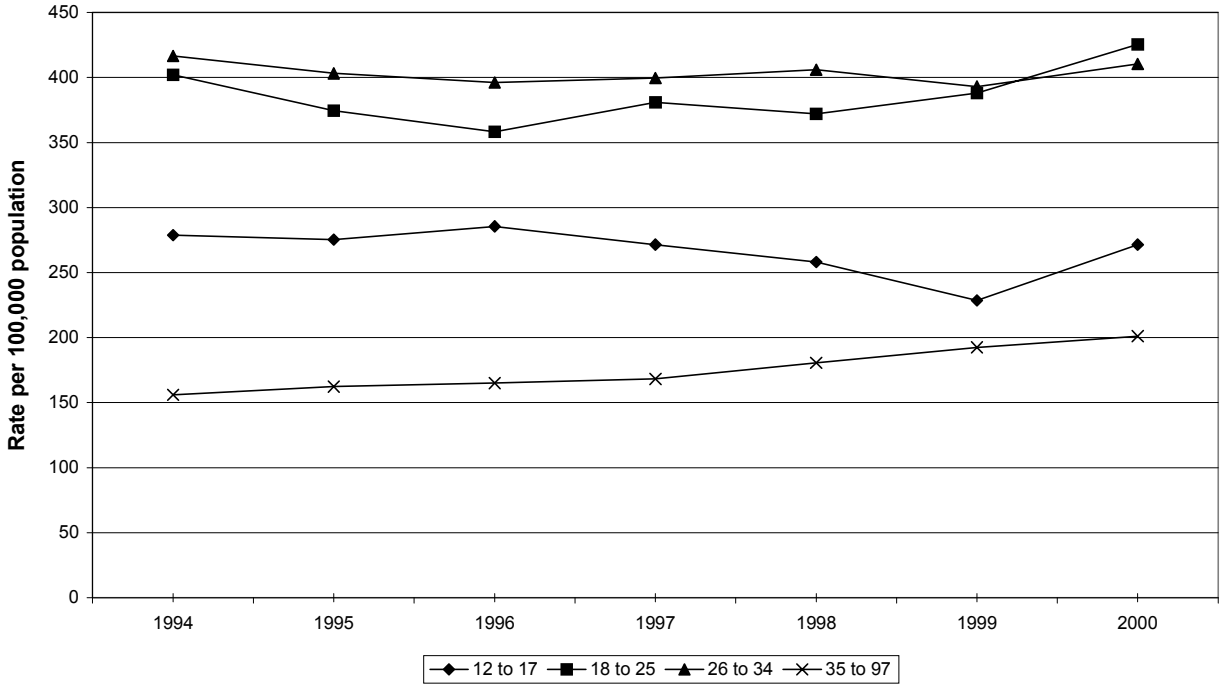

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Figure 9
Rate of cocaine mentions per 100,000 population by age group: 1994 through 2000

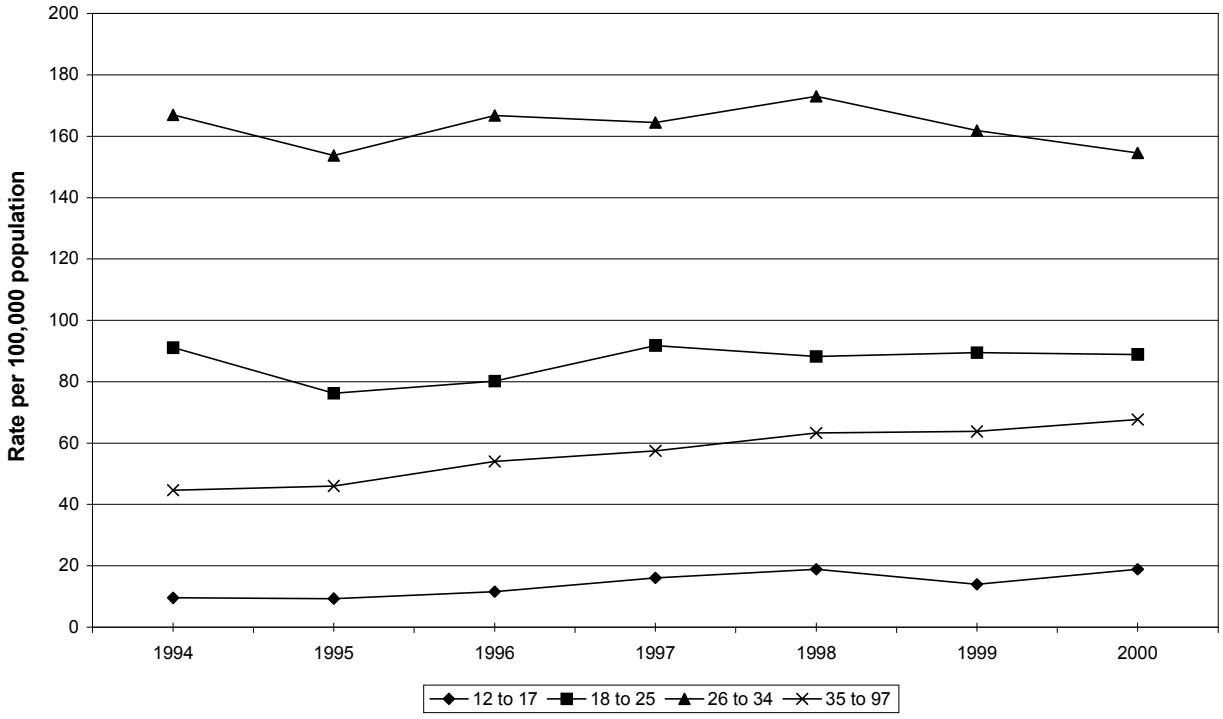

Figure 10
Rate of heroin mentions per 100,000 population by age group: 1994 through 2000

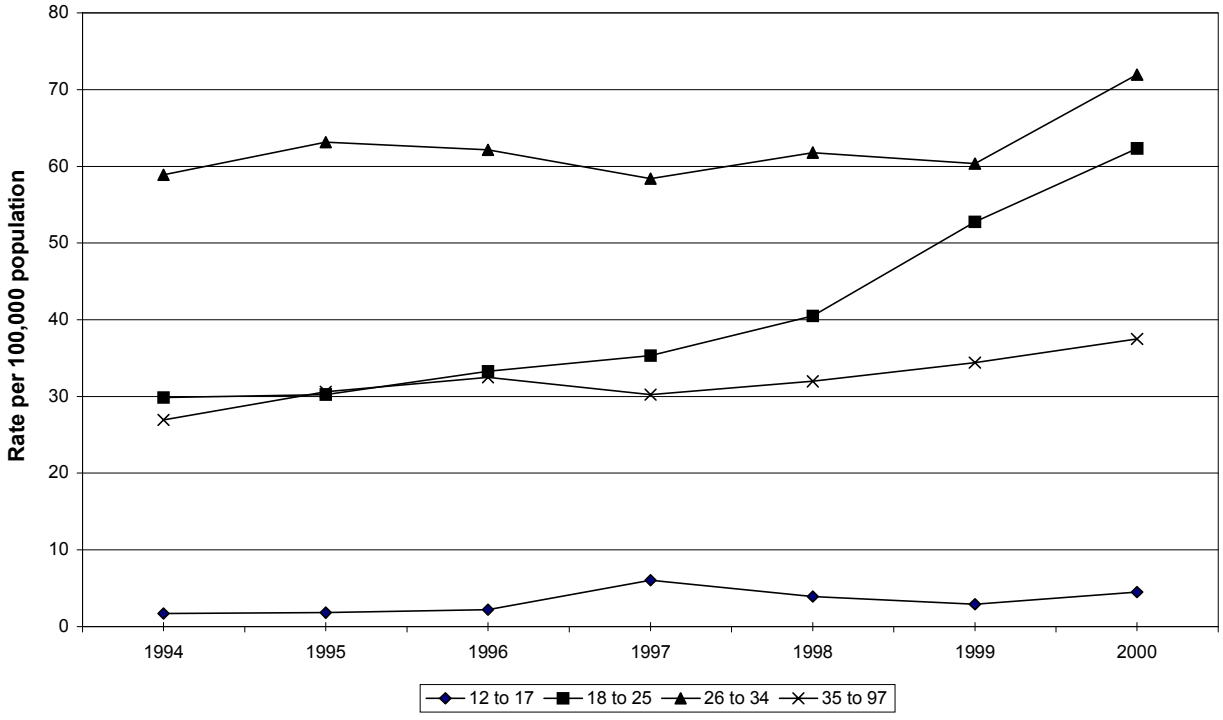

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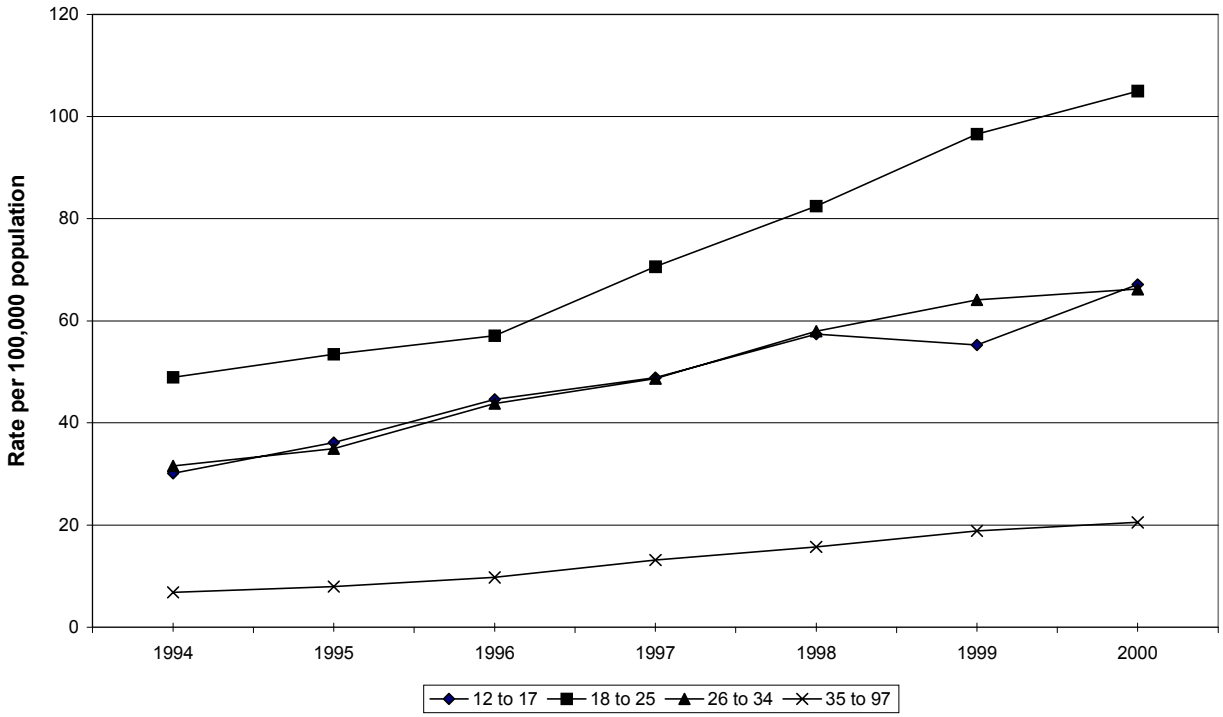
Figure 11
Rate of marijuana mentions per 100,000 population by age group: 1994 through 2000



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TRENDS IN ED DRUG EPISODES BY EPISODE CHARACTERISTICS

This section presents findings of episode characteristics for drug-related ED episodes overall; for episodes involving cocaine, heroin, marijuana, and methamphetamine; and for the 21 metropolitan areas oversampled by DAWN. Episode characteristics are summarized in Tables 5.1.0 through 5.12.0. Population-based rates for episode characteristics are not produced, so comparisons of episode characteristics across metropolitan areas are not advised.

DRUG CONCOMITANCE

- The majority (56%, 338,050 episodes in 2000) of drug-related ED episodes involve more than one drug (Table 5.2.0).
- From 1999 to 2000, single-drug episodes reported to DAWN increased 10 percent (from 239,655 to 263,513) (Table 5.2.0). However, from 1998 to 2000, multiple-drug episodes increased 12 percent (from 302,743 to 338,050). There was no significant change from the first half of 2000 to the first half of 2001 (Table 5.1.0).
- In 2000, nearly half (47%) of episodes involving heroin involved only heroin (Table 5.8.0). However, only 28 percent of episodes involving cocaine involved cocaine alone (Table 5.6.0), and only 24 percent of episodes involving marijuana involved marijuana alone (Table 5.10.0).

DRUG USE MOTIVE

- In drug-related ED episodes during 2000, *dependence* (36%, 217,122 episodes) and *suicide* (32%, 193,010) were the most frequently cited motives for taking substances (Table 5.2.0).
- From 1999 to 2000, episodes with a motive of *psychic effects* increased 13 percent (from 105,460 to 118,700), and episodes with a motive of *dependence* increased 15 percent from 1998 to 2000 (Table 5.2.0).
- In 2000, *psychic effects* was the most common motive in episodes involving marijuana (38%, 36,970 episodes) (Table 5.10.0), whereas *dependence* was the most common motive for episodes involving cocaine (59%, 103,351) (Table 5.6.0) and heroin (84%, 79,383) (Table 5.8.0).

REASON FOR ED CONTACT

- By far, the most common reason for ED contact cited in drug-related ED episodes in 2000 was *overdose* (44%, 264,121 episodes) (Table 5.2.0).

- From 1999 to 2000, episodes involving patients *seeking detoxification* increased 24 percent (from 72,960 to 90,625) and episodes involving *overdose* increased 14 percent (from 232,183 to 264,121) (Table 5.2.0).

- In 2000, *seeking detoxification* was the most common reason for ED contact in episodes involving heroin (38%, 36,070 episodes) and cocaine (28%, 49,527) (Tables 5.6.0 and 5.8.0). *Unexpected reaction* was the most common reason for ED contact in episodes involving marijuana (32%, 31,218 episodes) and methamphetamine (23%, 3,104) (Tables 5.10.0 and 5.12.0).

PATIENT DISPOSITION

- In 2000, about half of drug-related ED episodes resulted in admission to the hospital (51%, 306,146 episodes) (Table 5.2.0).

- In 2000, ED episodes involving cocaine resulted in admission to the hospital in 47 percent of cases (Table 5.6.0), heroin 42 percent (Table 5.8.0), and marijuana 43 percent (Table 5.10.0). It is important to remember that a high proportion of episodes involving marijuana (76%) and those involving cocaine (72%) also involved other drugs.

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DISCUSSION OF RESULTS

This is the inaugural issue of a new publication series under a new title *Emergency Department Trends from the Drug Abuse Warning Network*. Ordinarily, this publication would focus almost exclusively on preliminary estimates from the first half of 2001, with comparisons to the same period in 2000. This issue of *ED Trends*, while presenting preliminary estimates for January – June 2001, covers several other issues.

This publication presents for the first time a new layout and design, incorporating a completely new set of tabulations of DAWN estimates. The content of this publication reflects the influence of many specific requests for information that we have received over the past few years. These requests originate from Federal, State, and local agencies; researchers in universities; representatives of pharmaceutical manufacturers; the Community Epidemiology Workgroup; the media; and a myriad of other consumers of information from DAWN.

This issue of *ED Trends* is designed also to become a reference volume. It documents the major changes in how DAWN codes and classifies thousands of illicit, prescription, over-the-counter, and nonpharmaceutical substances. It describes in detail the overhaul and replacement of DAWN's obsolete coding system with a new drug vocabulary and classification system based on therapeutic uses of prescription and OTC medications. The code set on which these changes are based is the Multum *Lexicon*, which has been adapted and modified to meet DAWN's unique requirements for coding and aggregating (see Appendix A).

Even readers uninterested in the mechanics of drug terminology and classification will be interested in the spillover effects of these improvements, specifically, revisions to estimates for the years 1994 to 2000. This issue of *ED Trends* documents the source of changes to estimates that were previously published as final (see Appendix B). The body of the publication also contains a relatively comprehensive review of findings from 1994 to 2000, based solely on the revised estimates. **We intend that this publication will <u>replace</u> earlier publications on our readers' shelves. Estimates in this publication supersede those published previously for 1994 to 2000.**

Finally, we use this section of *ED Trends* to highlight issues that cut across topics discussed previously and to discuss the possible implications of those findings. Given the wealth of new information in this publication, limiting the number of topics for discussion has been a challenge. Again, we have selected topics for discussion that correspond to the topics of most interest to those consumers of DAWN who contact us with feedback or questions.

OVERVIEW OF TRENDS

Revised estimates of drug-related ED episodes and mentions reveal a number of significant changes between 1999 and 2000. The total number of drug-related ED visits was relatively stable from 1999 to 2000, while total ED visits increased 6 percent. Comparing the first halves of 2000 and 2001, neither total episodes nor mentions changed significantly. However, total ED visits increased 2 percent. Over the long-term, presented here as 1994 to 2000, we find a 16 percent rise in drug-related ED visits and a 22 percent rise in ED drug mentions. From 1994 to 2000, total ED visits increased only 7 percent.

Beginning with this issue of *ED Trends*, we highlight a selected list of "major substances of abuse" as distinct from "other substances of abuse." The former is comprised of 15, mostly illicit substances of high frequency or substantial policy interest; the latter is primarily those substances that are marketed legally by prescription or over the counter.

MAJOR SUBSTANCES OF ABUSE

Among the 15 major substances of abuse, none changed significantly from the first half of 2000 to the first half of 2001. However, ED mentions increased from 1999 to 2000 for several: Heroin (up 15%), amphetamines (37%), methamphetamine (29%), MDMA (Ecstasy, 58%), PCP (48%), and major substance combinations (35%). ED mentions of alcohol-in-combination, cocaine, marijuana, LSD, and other hallucinogens were stable from 1999 to 2000. Two of these major substances have increased over the long-term (1994 to 2000), but have leveled off in recent years. Alcohol-in-combination (up 27% from 1994 to 2000) and marijuana (141%) fall into this category.

Among the major substances of abuse, ED mentions of the "designer" or "club" drugs MDMA (Ecstasy), Ketamine, and GHB had extremely low numbers in 1994 (253, 19, and 56, respectively), and significant growth from 1994 to 2000. MDMA mentions rose from 253 to 4,511 mentions; Ketamine from 19 to 263, and GHB from 56 to 4,969. This growth is enormous in percentage terms (1,683%, 1,284%, and 8,773%, respectively) and may represent the leading edge of an important emerging trend. However, we caution readers to consider the size of estimates, not just the percentage changes. Very small numbers can yield percentage changes that are statistically significant, but not particularly meaningful. For example, a change from 1 to 2 mentions is a 100 percent increase but could hardly be considered meaningful. However, a goal of *ED Trends* is to make all of this information more accessible to readers than ever before, and arraying small estimates alongside large ones provides opportunities to consider the relative magnitudes of estimates in context.

OTHER SUBSTANCES OF ABUSE

The expanded content of *ED Trends* provides the opportunity to perform more in depth analysis of ED mentions of prescription and OTC drugs than ever before. This analysis shows that ED mentions are most concentrated in 2 categories—psychotherapeutic agents (204,527 mentions in 2000) and CNS agents (203,572)—in nearly equal proportions (19% of total mentions each).

Anxiolytics, sedatives, and hypnotics (the category that includes the benzodiazepines, barbiturates, and other anxiolytics, sedatives, and hypnotics) are the most frequent of the psychotherapeutic agents mentioned in drug-related ED visits. Anxiolytics, sedatives, and hypnotics are followed in frequency by antidepressants and antipsychotics.

The analgesics are, by far, the most frequent subcategory of CNS agents, with the narcotic analgesics more prevalent among ED episodes than any of the non-narcotic forms. We found significant increases in narcotic analgesics that were concentrated in a few of the narcotics, specifically, the hydrocodones, the oxycodones, and methadone.

It is important to remember that, while ED visits may be one indicator of the drug abuse problem in communities, the population that presents to a hospital ED may differ dramatically

from the drug-using population at large. According to the 2000 National Household Survey on Drug Abuse (NHSDA),[16] 3.8 million Americans age 12 and over had used certain prescription drugs nonmedically in the past month. This number rose to 8.8 million when the period was expanded to include nonmedical use of such drugs in the preceding year. The types of prescription drugs cited by the NHSDA are: pain relievers (2.8 million users), tranquilizers (1.0 million users), stimulants (0.8 million users), and sedatives (0.2 million users). Although these categories do not match the DAWN categories exactly, they are certainly consistent and underscore the importance of monitoring the abuse of these particular classes of prescription drugs.

EMERGING DRUG ABUSE TRENDS

A primary mission of DAWN is to identify and track the new and emerging substances whose abuse results in major health consequences, i.e., those that result in ED admissions and deaths. Historically, DAWN has not been capable of identifying emerging trends. Delays in publication of estimates limited the usefulness of those estimates. The approach to disseminating findings from DAWN concentrated primarily on the most frequently mentioned drugs, in particular, 4 major illicit drugs. A consistent method for classification of similar drugs was lacking. Moreover, prescription and OTC medications had to be submitted as mentions for a drug to enter the database, and this caused additional delays in new drugs being recognized.

We have been addressing these issues one by one. Estimates from DAWN are being published in a more timely manner, and we expect further improvements in the near future. *ED Trends* does not limit its focus to drugs mentioned frequently, and DAWN now has a mechanism for coding all types of drugs, with a consistent method for classification. New drugs enter the choice set for DAWN as they are approved for marketing by the FDA.

Given these improvements, it may now be possible to begin to ask the question: What can DAWN tell us about emerging trends in drug abuse?

In the following discussion, we address this question from 2 perspectives: First, we will focus on new drugs, that is, drugs new to the marketplace for which there may be no pre-existing information about abuse potential. For this approach, we will highlight drugs that had no mentions in early years followed by growing numbers of mentions more recently. Second, we will examine those drugs with substantial increases and decreases over the period 1994 to 2000. Third, we will focus on the size and strength of changes in ED mentions within 2 classes of drugs with high abuse potential. For this, we highlight psychotherapeutic agents and CNS agents, the substances most likely to have a psychoactive effect if used contrary to standard medical practice.

ED Mentions of New Drugs

Monitoring ED mentions of a drug beginning shortly after it gains FDA approval for the marketplace may offer the opportunity to identify emerging problems associated with prescription drugs at their earliest point. Policymakers and regulators may find this type of information useful, as might pharmaceutical manufacturers interested in tracking misuse of their

[16] Substance Abuse and Mental Health Services Administration, *Summary of Findings from the 2000 National Household Survey on Drug Abuse*. Office of Applied Studies, NHSDA Series H-13, DHHS Publication No. (SMA) 01-3549. Rockville, MD, 2001.

products early on. To address the issue of new drugs, we have identified the set of drugs that were never reported to DAWN (i.e., had 0 mentions) in 1994 and subsequent years and then grew to have over 1,000 mentions by 2000.

Three antidepressants met these criteria (Table 2.4.0):

- **Citalopram**, an SSRI antidepressant, had 0 mentions from 1994 through 1998, appeared with 1,563 mentions in 1999, then increased 121 percent, to 3,458 mentions in 2000. According to the FDA Orange Book,[17] citalopram was first approved by the FDA in 1998.

- **Mirtazapine**, a miscellaneous antidepressant, had 0 mentions from 1994 through 1996. This was followed by a 299 percent increase (from 606 to 2,416 mentions) from 1998 to 2000. Mirtazapine was first approved by the FDA in 1996.

- **Nefazodone**, another miscellaneous antidepressant, had 0 mentions in 1994, 234 mentions in 1995 and 1,608 mentions in 2000. Nefazodone was first approved by the FDA in 1994.

Two antipsychotics met these criteria (Table 2.4.0):

- **Olanzapine**, a miscellaneous antipsychotic, had 0 mentions in 1994 through 1996, 1,449 mentions in 1997, increasing to 5,454 mentions in 2000. Olanzapine was first approved by the FDA in 1996.

- **Quetiapine**, another miscellaneous antipsychotic, had 0 mentions in 1994 through 1997, 484 mentions in 1998, increasing to 3,009 mentions in 2000. Quetiapine was first approved by the FDA in 1997.

Two CNS agents met these criteria (Table 2.5.0):

- **Celecoxib**, a non-narcotic analgesic, had 0 mentions from 1994 through 1998, an estimate in 1999 that was too imprecise for publication, and 1,002 mentions in 2000. Celecoxib was first approved by the FDA in 1998. This is not only a new drug; it also marks the introduction of Cox-2 inhibitors, a new class of analgesic.

- **Tramadol**, a miscellaneous analgesic, had 0 mentions in 1994 followed by 645 mentions in 1995, more than 1,000 mentions in each of the succeeding years, with 1,810 mentions in 2000. Tramadol was first approved by the FDA in March 1995.

Most of these new drugs are psychotherapeutic agents; the remainder are CNS agents. No respiratory (Table 2.6.0) or cardiovascular agents (Table 2.7.0) met the selection criteria for new drugs. It is important to note here that this is a limited look at new drugs. ED mentions will not occur for all new drugs, and although drugs with no mentions at all are present in the tabulations in *ED Trends*, we have not examined each and every one. In addition, there are many other examples of drugs approved well before 1994, which had new formulations approved between 1994 and 2000. Since DAWN data cannot be used to track mentions of drugs by brand (trade)

[17] All information about drug approvals is derived from: Food and Drug Administration, Center for Drug Evaluation and Research, *Approved Drug Products with Therapeutic Equivalence Evaluations*. The electronic *Orange Book* can be queried online (go to http://www.fda.gov/cder/orange/default.htm).

names, it is much more difficult to identify instances where newly approved formulations may be affecting a previously stable trend. It may be informative, however, to assess whether new approvals may be affecting an upward trend, and we have done this below.

Drugs with Increasing and Decreasing Trends

It may be important also to assess how increases in one drug may be associated with countervailing decreases in other drugs in the same or related categories. Substitution may occur, when one drug falls out of favor or for some other reason is replaced by another drug in the same category or having similar effects. DAWN data may reflect changes in prescribing practices, with physicians prescribing (and individuals abusing) new drugs as they appear on the market, with concomitant decreases in prescriptions (and abuse) of older formulations. If substitution is occurring, it would be important to examine both increasing and decreasing trends to gain a more complete picture of change. Focusing only on specific drugs (e.g., new drugs) to the exclusion of others may provide a different and (possibly) misleading perspective.

Although an in depth analysis of therapeutic uses and possible substitution effects among drugs goes beyond DAWN's capabilities, we can use DAWN data to identify potential candidates for such an analysis. Table B summarizes the psychotherapeutic, CNS, respiratory, and cardiovascular agents that had at least 1,000 ED mentions in 1994, followed by significant decreases and those that had at least 1,000 mentions in 2000, preceded by significant increases.[18]

Among the psychotherapeutic agents, we find substantial declines in ED mentions of several tricyclic antidpressants and substantial increases in paroxetine, an SSRI, and bupropion and venlafaxine, which are classified as miscellaneous antidepressants. Several of the phenothiazine and miscellaneous antipsychotics had significant declines, while mentions of risperidone, another miscellaneous antipsychotic, rose substantially. The benzodiazepines chlordiazepoxide and flurazepam decreased, while mentions of the more frequent alprazolam and clonazepam increased. Among the miscellaneous anxiolytics, sedatives, and hypnotics, diphenhydramine mentions dropped, and zolpidem mentions rose. Mentions of acetaminophen-diphenhydramine combinations (classified as a CNS agent) also rose.

Among the CNS agents, we find that ED mentions of codeine (a narcotic analgesic), NSAIDs, and salicylates decreased from 1994 to 2000, while mentions of the narcotic analgesics hydrocodone, methadone, morphine, and oxycodone rose dramatically. Mentions of carisoprodol, a muscle relaxant, also increased. Mentions of the anticonvulsant carbamazepine declined, and divalproex sodium in the same subcategory increased. We also find a decrease in mentions of benztropine, an antiparkinson agent.

The only countervailing trend within the narcotic analgesics appears to be a decline in codeine mentions, but this is insufficient to balance the increases in other narcotics. Similarly, substantial long-term declines in ED mentions of NSAIDs and salicylates, both non-narcotic analgesics, cannot balance the increases in the more powerful narcotics.

Only a few respiratory or cardiovascular agents met our selection criteria. Among the respiratory agents, mentions of theophylline (a bronchodilator) and pseudoephedrine (a decongestant) fell, while acetaminophen-chlorpheniramine (an upper respiratory combination

[18] Please note that drugs with 0 mentions in 1994 or in 2000 are excluded from this analysis because, mathematically, tests of statistical significance cannot be performed or percent changes computed when 0 mentions is part of the calculation.

with decongestant properties) rose. Among the cardiovascular agents, we find that mentions of one beta blocker and one calcium channel blocker fell, and ephedrine (classified as a miscellaneous cardiovascular agent) also declined.

Classes of Drugs with High Abuse Potential

Figure 12 shows that 80 percent of ED drug mentions come from only 7 categories: alcohol-in-combination, cocaine, heroin, marijuana, antidepressants, benzodiazepines, and analgesics. Because they are illicit drugs, cocaine, heroin, and marijuana are well known, long-standing problems that receive much attention from many data systems. The antidepressants, benzodiazepines, and analgesics are different in this respect. Few data systems are capable of monitoring the abuse of these substances at all, and none matches the level of detail present in DAWN. Taken together, the antidepressants, benzodiazepines, and analgesics constitute 318,848 ED mentions in 2000, or nearly 30 percent of total ED drug mentions. Therefore, it makes sense to focus on these classes of drugs to search for concentrations of abuse.

Unlike the benzodiazepines, ED mentions of narcotic analgesics are on the rise, with a 19 percent increase from 1999 to 2000, a 40 percent increase from 1998 to 2000, and an 85 percent increase over the 7-year period 1994 to 2000.

As noted previously, from 1994 to 2000, mentions more than doubled for 4 narcotic analgesics: hydrocodone (up 116%, 20,098 mentions in 2000), oxycodone (166%, 10,825), methadone (140%, 7,819), and morphine (126%, 2,478). Of these, the relative frequencies are remarkable. According to DAWN, there are approximately 8 ED mentions of hydrocodone and 4 of oxycodone for every 1 mention of morphine.

In recent years, hydrocodone and oxycodone mentions have grown, while morphine mentions have been stable and codeine mentions have declined. From 1999 to 2000, hydrocodone mentions rose 32 percent and oxycodone mentions rose 68 percent. From 1998 to 2000, hydrocodone mentions rose 48 percent and oxycodone mentions 108 percent. These indicators suggest that narcotic analgesic abuse is a growing problem, and both hydrocodone and oxycodone should be monitored closely. Based on a nonscientific analysis of recent media reports, oxycodone is receiving considerable attention, while hydrocodone is not.

ED mentions of methadone also have grown substantially (44% from 1999 to 2000 and 63% from 1998 to 2000), but this finding is especially difficult to interpret. Is this evidence of methadone abuse per se, or is it that methadone is often coincident with another reportable drug? DAWN data show that ED episodes involving methadone usually (63% of episodes) involve multiple drugs, and about one-quarter of the multi-drug episodes include heroin among the other drug(s) reported. The remainder of these other drugs tends to be concentrated in alcohol-in-combination, cocaine, marijuana, narcotic analgesics, benzodiazepines, and few others.

Finally, one other narcotic analgesic is mentioned much less frequently in ED episodes but has grown substantially from 1994 to 2000. Fentanyl mentions grew from 28 in 1994 to 576 in 1999. Given the small numbers, it is somewhat surprising that this particular change is statistically significant, but the RSEs associated with the fentanyl estimates for these years are relative modest (19% and 34%, respectively). As with morphine, fentanyl mentions have been relatively stable since 1998, but the RSEs on estimates from these years were also higher (39% in 1998 and 49% in 1999).

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CONCLUSION

It is important to recognize that findings from DAWN alone cannot define an emerging drug abuse problem. Instead, DAWN can help identify sentinel events, indicators of a potential drug abuse problem, and DAWN can monitor these indicators over time. This information can then be put together with information from other sources to determine whether a new drug abuse problem is emerging. Relying on information from DAWN alone would likely result in false positives—identification of problem substances when no problem exists—but this is a hazard when trying to track any problem in its early stages and it is not a hazard peculiar to DAWN.

In addition, with all prescription and OTC drugs, it is possible that some proportion of mentions will be prescription drugs taken as directed and present coincident with another reportable substance. It is not possible to quantify this issue, but we urge public policymakers, regulators, and others to take these factors into account. We also have demonstrated that the timing of drug approvals needs to be factored into the decision process about which new drugs represent a new drug abuse problem. Nonetheless, it is important to look for emerging drugs, even if they contribute only a few mentions to the total of ED drug-related visits reported by DAWN. Emerging drugs and rapidly increasing drug mentions can indicate an impending problem that can become more serious over time.

DAWN data show only one dimension of the total consequences of drug abuse, specifically the impact of drug use that manifests in visits to hospital EDs. DAWN does not measure the prevalence of drug use in the population, the untreated health consequences of drug use, or the impact of drug use on health care settings other than hospital EDs. For measures of prevalence, we refer readers to the National Household Survey on Drug Abuse (NHSDA), a national survey of households that explores drug abuse in the population.

Many other factors can influence the DAWN estimates of ED visits and mentions of particular substances. Changes in the number of drug-related emergencies may also be due to changes in the use of drug combinations; patterns of drug use, such as route of administration; amount of drug used per administration; drug purity; or drug price. For example, a decrease in the purity of cocaine or heroin could result in fewer users experiencing unexpected reactions and overdoses. Estimates of drug-related ED episodes could increase or decrease over time for reasons unrelated to the size of the drug using population, such as factors that affect reporting patterns. For example, some possible factors are:

- Greater awareness of these problems by hospital staff who therefore report drug use more carefully on medical charts,
- Changing patterns of use of EDs by drug users,
- Different ED usage patterns by population subgroups, and
- Other data collection or sample composition changes (see Appendix D).

Appendix D includes a detailed account of known procedural anomalies in DAWN. Analysis of procedural factors that might contribute to spurious results suggests that procedural factors are unlikely to account for the differences reported here.

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Table B – Selected psychotherapeutic, CNS, respiratory, and cardiovascular agents with large and significant changes, 1994 to 2000

Drug name	Drug category	Number of mentions 1994	2000	% change
Psychotherapeutic agents				Decreasing
amitriptyline	Tricyclic antidepressants	11,266	6,444	-43%
doxepin	Tricyclic antidepressants	4,272	1,123	-74%
imipramine	Tricyclic antidepressants	2,757	563	-80%
nortriptyline	Tricyclic antidepressants	2,707	663	-76%
chlorpromazine	Phenothiazine antipsychotics	2,607	613	-77%
fluphenazine	Phenothiazine antipsychotics	1,475	89	-94%
perphenazine	Phenothiazine antipsychotics	2,212	168	-92%
thioridazine	Phenothiazine antipsychotics	3,189	782	-76%
trifluoperazine	Phenothiazine antipsychotics	1,391	49	-97%
haloperidol	Misc. antipsychotics	3,014	1,167	-61%
lithium	Misc. antipsychotics	5,964	3,720	-38%
chlordiazepoxide	Benzodiazepines	2,563	1,384	-46%
flurazepam	Benzodiazepines	1,497	463	-69%
diphenhydramine	Misc. anxiolytics, sedatives, hypnotics	13,958	7,440	-47%
caffeine	CNS stimulants	3,176	1,674	-47%
				Increasing
paroxetine	SSRI antidepressants	3,914	8,020	105%
tricyclic antidepressant-NOS	Tricyclic antidepressants	1,301	2,623	102%
bupropion	Misc. antidepressants	757	3,809	403%
venlafaxine	Misc. antidepressants	341	3,722	992%
risperidone	Misc. antipsychotic agents	588	3,899	563%
barbiturates-NOS	Barbiturates	2,852	4,848	70%
alprazolam	Benzodiazepines	17,168	22,105	29%
clonazepam	Benzodiazepines	12,165	18,005	48%
benzodiazepines-NOS	Benzodiazepines	9,139	22,376	145%
zolpidem	Misc. anxiolytics, sedatives, hypnotics	1,410	6,810	383%
CNS agents				Decreasing
codeine/combinations	Narcotic analgesics	9,439	5,295	-44%
NSAIDS	NSAIDS	28,742	24,793	-14%
aspirin	Salicylates	14,586	11,096	-24%
salicylates-NOS	Salicylates	1,772	931	-48%
carbamazepine	Anticonvulsants	3,879	2,276	-41%
benztropine	Antiparkinson agents	2,790	658	-76%
				Increasing
hydrocodone	Narcotic analgesics	9,320	20,098	116%
methadone	Narcotic analgesics	3,252	7,819	140%
morphine	Narcotic analgesics	1,098	2,478	126%
oxycodone	Narcotic analgesics	4,069	10,825	166%
narcotic analgesics-NOS	Narcotic analgesics	8,307	25,935	212%
acetaminophen-diphenhydramine	Analgesic combinations	1,513	4,224	179%
divalproex sodium	Anticonvulsants	1,762	6,235	254%
carisoprodol	Muscle relaxants	6,569	9,520	45%
Respiratory agents				Decreasing
theophylline	Bronchodilators	1,662	255	-85%
pseudoephedrine	Decongestants	2,050	938	-54%
				Increasing
acetaminophen-chlorpheniramine	Upper respiratory combinations	20	1,116	5480%
Cardiovascular agents				Decreasing
propranolol	Beta andrenergic blocking agents	1,424	737	-48%
nifedipine	Calcium channel blocking agents	1,342	305	-77%
ephedrine	Misc. cardiovascular agents	1,992	749	-62%

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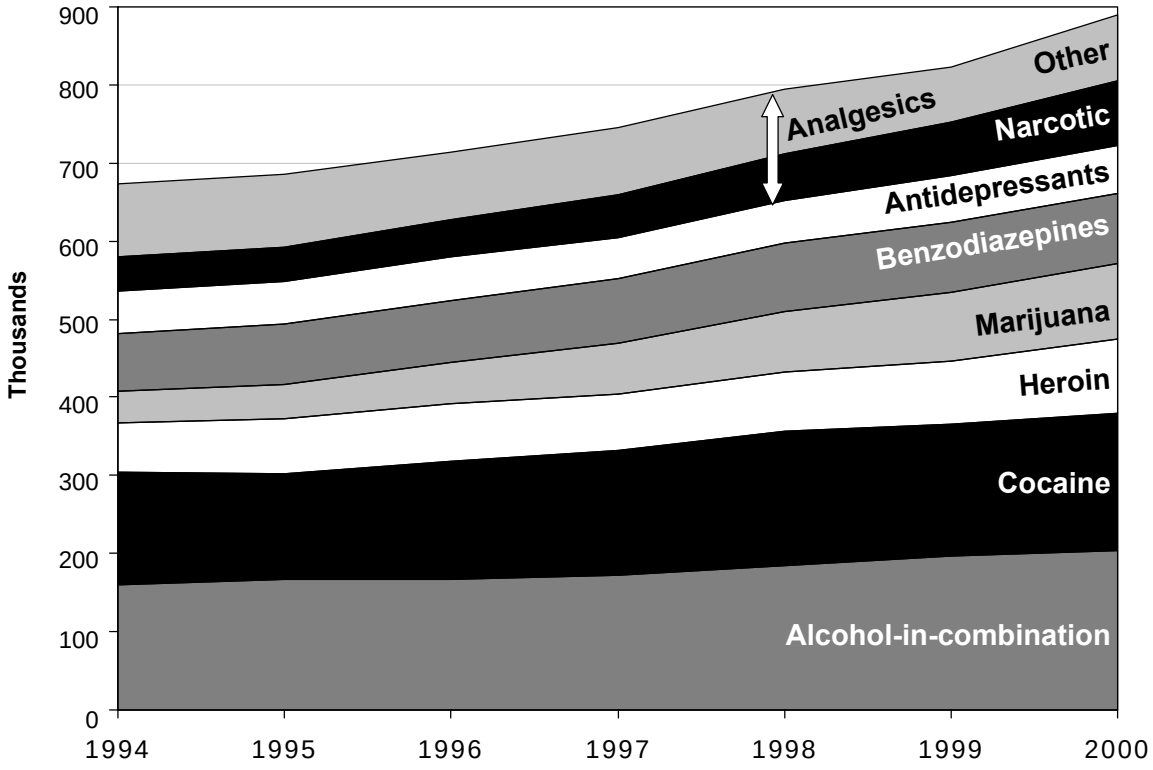
Figure 12
ED mentions of selected drugs: 1994 through 2000



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APPENDIX A: IMPACT OF CHANGES IN THE DAWN DRUG VOCABULARY

This issue of *ED Trends from DAWN* introduces major changes in content that were designed to provide more information in better formats. These improvements are a response to feedback received from DAWN consumers. Although not every request could be accommodated, we have tried to address the most common requests raised by users.

Before such dramatic changes were possible, a change in the underlying data was necessary. A critical review and, ultimately, replacement of the DAWN drug vocabulary was essential to our efforts to improve the content of DAWN publications. The drug vocabulary is, quite literally, the language—the codes and terminology—that DAWN uses to record and classify drugs and other substances reported by participating facilities. The "old" DAWN drug vocabulary had evolved but deteriorated over time.

In this section, we describe the new drug vocabulary, discuss the problems it was designed to solve, and demonstrate how it will be used in publications such as *ED Trends from DAWN*. We begin by describing the process we followed to develop a new drug vocabulary, including the objectives that guided our decision making. This is followed by an overview of the new table formats and a description of their content. The impact of the new drug vocabulary on estimates published previously is reviewed in Appendix B. This publication presents revised estimates for the years 1994 through 2000 for the first time using the new drug vocabulary.

BACKGROUND

Every aspect of our initiative to improve DAWN must deal with the tension between consistency and change. On the one hand, maintaining continuity in a statistical series is important, and this argues for keeping things the same. On the other hand, improvements are desirable when the old ways of doing things are limited or flawed. But improvement often means sacrificing continuity. All of our deliberations on redesign issues acknowledge this tension.

The old drug vocabulary contained about 8,000 specific substances reported to DAWN over nearly 3 decades of continuous operation. It also included classification schemes intended for grouping similar drugs into categories for publication of DAWN estimates and for internal analyses. In recent years, our efforts to improve DAWN publications and respond to special requests for information (especially those from Federal agencies such as the Food and Drug Administration and the Office of National Drug Control Policy) provided a growing body of evidence of how poorly the old drug vocabulary carried out these intentions.

To meet the current information needs of DAWN users, a drug vocabulary must meet 4 objectives. It must be:

- Useful for reporting, both for recurring publications and for special requests,
- Accurate,

- User friendly, and
- Easy to maintain.

In 1999, an internal DAWN Workgroup composed of OAS staff and representatives from the two DAWN contractors convened to evaluate the old DAWN drug vocabulary and a design for a replacement that had been proposed in 1997.[19] The workgroup's analysis of the old vocabulary's design, content, and functioning concluded that reclamation was not a viable option.

The old drug vocabulary met none of the 4 objectives for a drug vocabulary. Its major flaws included:

- Multiple classification schemes that required reprogramming for virtually all standard and custom tabulations. The system included:
  - Multiple classification methods, none of which were complete or adequate for reporting, and
  - Significant classification errors (discussed in detail later in this publication).
- Inadequate standards for maintenance that resulted in the inclusion and retention of
  - Ambiguous and nonspecific terms (e.g., "heart pill," "thought organizer"),
  - Obsolete terms (about 4,000 terms last used in the 1970s and 1980s), and
  - Spelling errors (e.g., separate entries for Rohypnol and Rohypnal).

Guided by the 4 objectives, the DAWN Workgroup agreed that a new approach and a new drug vocabulary were required. We concluded that an externally maintained code set—one designed and maintained by subject matter experts apart from DAWN—would serve DAWN's needs better than a system developed and maintained in-house. An external code set would meet the objectives for accuracy and ease of maintenance while minimizing development time and cost.

There were few external code sets from which to choose, and none met DAWN's needs entirely. Deliberations of the Computer-based Patient Records Workgroup (CPR-WG) of the National Committee on Vital and Health Statistics (NCVHS)[20] coincided with our search. Pursuant to the Health Insurance Portability and Accountability Act of 1996, CPR-WG was investigating the standards necessary to facilitate the development of computer-based patient record systems in order to report on these to Congress. In May 1999, the CPRWG held hearings on terminologies and code sets, including those for drugs.[21]

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[19] Originally, the goal was to replace the old drug vocabulary with a new, improved version that would continue to be developed and maintained in-house for DAWN. A conceptual design for this new version was proposed in October 1997. However, its implementation ran into obstacles and that activity stalled. The DAWN Workgroup ultimately rejected the replacement proposed in 1997 because it failed to meet the 4 objectives.

[20] The NCVHS is a public advisory committee to the U.S. Department of Health and Human Services.

[21] The work of the CPR-WG, in particular, these hearings were instrumental in our search for a drug vocabulary for DAWN. More information on the hearings is available at http://ncvhs.hhs.gov/990517ag.htm. The final report of the CPR-WG underscores the

The CPR-WG identified 3 terminologies for drugs. Of these, only the terminology produced by Multum Information Services met all 4 of our objectives and provided a framework onto which components that are unique to substance abuse and DAWN could be added. The latter include street names for illicit substances, metabolites commonly reported in DAWN mortality data, household products and other non-medicinal substances, and substances classified based on their route of administration as "inhalants."

DAWN'S NEW DRUG REFERENCE VOCABULARY

We adopted the Multum *Lexicon*, a drug vocabulary and classification tool developed and maintained by Multum Information Services, Inc., a private sector firm.[22] Multum distributes the *Lexicon* (a complete database in Microsoft Access format) and regular updates through its website. At the time of its adoption, Multum permitted use of its *Lexicon* free of charge; a license agreement specified the terms required of users. We identified no impediments to our use of the *Lexicon* or compliance with the Multum license agreement, which permitted redistribution and modification of the *Lexicon*. In accordance with the license agreement, DAWN publications, tabulations, and software applications cite the Multum *Lexicon* as the source and basis for the DAWN drug vocabulary. A copy of the license agreement is reproduced in Appendix G.

DAWN actually uses only a fraction of the Multum *Lexicon* because DAWN case reports typically lack the most precise drug product information. For example, DAWN case reports supply drug names, but not strength or dosage, so it is not feasible to code drugs at the granularity of National Drug Codes (NDCs), even though the Multum *Lexicon* includes such detail. On the other hand, the specificity of drug information reported to DAWN varies depending on the detail available in the source documents, that is, ED medical records or death investigation files. The Multum *Lexicon* not only accommodates such variability but it provides a consistent method for aggregating very detailed information (such as brands) into consistent generic drug categories.

To accommodate DAWN data on substances that are not part of the Multum *Lexicon*, we have adopted the Multum *Lexicon* structure and designed a drug database that:

- Incorporates Multum *Lexicon* content for:
  - generic names—e.g., ibuprofen,
  - brand or trade names—e.g., Advil
  - 3-level nested categories—e.g., for ibuprofen:

    central nervous system agents (level 1)
    analgesics (level 2)
    nonsteroidal anti-inflammatory agents (level 3)
- Adds other DAWN reportable substances in a compatible structure.

limitations of extant terminologies for drugs. The final report of the CPR-WG, *Uniform Data Standards for Patient Medical Record Information*, is available at http://ncvhs.hhs.gov/hipaa000706.pdf. The discussion of drug terminologies is found on pages 33-34.

[22] 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.

The result of this combination of the Multum *Lexicon* and DAWN-specific substances is referred to as the DAWN *Drug Reference Vocabulary*.

All drug entries in DAWN were translated into the new vocabulary. When possible, automated procedures were used to make this translation. When necessary, drug entries were assigned manually. All assignments were subjected to multiple, iterative layers of quality control. At each iteration, multiple years of DAWN data were translated into the new vocabulary and estimates produced; then, the components of each new drug and drug category were evaluated for validity and consistency. Then, all necessary changes were implemented, and the process repeated. When necessary, early decisions about assignment and classification of DAWN-specific substances were revisited, reevaluated, and revised. For example, the method for coding and classifying inhalants was revised several times. Rules for maintenance became a natural by-product of the assignment and quality control process.

The final step in this development process was to create new DAWN analytic files from 1994 forward with all drug information recoded to the new reference vocabulary using a cross-reference developed for this purpose.[23] These became the basis of estimates reported here and in subsequent publications.[24]

IMPACT OF THE DRUG VOCABULARY ON DAWN PUBLICATIONS

Changing the way DAWN codes and classifies drugs provided the optimal opportunity to improve the content in recurring DAWN publications. The format of the tables presented here for the first time is quite different from that used in prior DAWN publications. We are replacing several old table formats (all containing similar information arrayed in different ways) with one standard format. Overall, this standardization will make maintenance and production of DAWN publications more efficient. More importantly, it will make finding information easier for consumers.

In general, the new tables and this new publication were designed to address specific problems or limitations of the previous table and publication formats. They are designed to achieve 5 goals:

1. HIGHLIGHT ILLICIT DRUGS OF SPECIAL INTEREST

Issues

- Illicit drugs of special policy interest (e.g., cocaine, marijuana, heroin, methamphetamine) were scattered in published tables, and the locations of these drugs varied from table to table. It was difficult for users to locate and compare these drugs of interest.

[23] Users of DAWN raw data will receive copies of the recoded analytic files, the cross-reference, and a copy of the reference vocabulary, with updates as they occur. The reference vocabulary is maintained in Microsoft Access.

[24] Since this activity has proceeded in parallel with a larger initiative to evaluate major design aspects of DAWN (with the ultimate goal being a redesigned DAWN), an important question is whether this new vocabulary will serve the needs of the new DAWN. For example, the DAWN redesign is considering changes to the case definition that would make adverse drug reactions reportable. We believe that the Multum *Lexicon* will be an even greater asset, given such a change, because the Multum vocabulary is comprehensive, its framework is robust, and it is updated as new pharmaceuticals come to market. Moreover, a reference vocabulary such as this is essential for the electronic data collection technologies that will be an integral component of DAWN's future.

- Many low-frequency and/or emerging drugs of abuse did not appear in published tables at all. As a result, we received many special requests for unpublished estimates. Also, many users believed that DAWN collected data on a relatively limited list of drugs.

- Some drugs (e.g., heroin and morphine) were reported in combinations that obscured their content.

New approach

- "Major Substances of Abuse" are presented in a separate panel at the top of the standard table. Included are:

  - alcohol-in-combination, the most frequently reported substance in DAWN,

  - the most common illicit drugs (e.g., cocaine, heroin, marijuana),

  - illicit drugs of particular interest (e.g., amphetamines, methamphetamine, MDMA, Ketamine, Rohypnol, GHB/GBL, LSD, PCP, other hallucinogens), regardless of their frequency,

  - non-pharmaceutical inhalants, and

  - illicit combinations (e.g., speedball, a mix of cocaine and heroin).

- Combinations that obscured content (e.g., heroin/morphine) have been split to make the data more useful.[25] Users can recombine such categories by summing mentions from the detail provided.

2. CLASSIFY PHARMACEUTICALS AND OTHER LICIT SUBSTANCES USING A CONSISTENT AND MEANINGFUL CLASSIFICATION SCHEME

Issues

- Some DAWN tables listed drugs without any useful groupings and in no apparent order. Other tables classified drugs into categories erroneously called "therapeutic classes."

- Content of tables was static so that, over time, high numbers of mentions accumulated into "other/unspecified" categories, and combination drugs were handled inconsistently.

- The category inhalants/solvents/aerosols included many nonpharmaceutical products that were unlikely to have been inhaled (because they lacked psychoactive effects) and for which the route of administration was undocumented or did not involve inhalation.

[25] In *Mortality Data from DAWN*, we will continue to tabulate mentions of heroin and morphine together. Although heroin may be the ingested drug, it metabolizes to morphine so that, depending on the toxicology testing protocols used, heroin and morphine may not be distinguishable in a given decedent. For this reason, both heroin and morphine will continue to be reported in a single category in DAWN mortality data.

New approach

- The Multum *Lexicon's* 3-level nested categories will be used to classify substances. On that basis, we will:
  - Report the most detail (3-level) for the most commonly abused drugs (e.g., psychotherapeutic agents and CNS agents),
  - Report detail (2-level) for respiratory and cardiovascular agents, and
  - Report categories, such as alternative medicines, anti-infectives, gastrointestinal agents, with relatively low numbers of mentions.
- For reference, the complete classification structure will be extracted from the Multum *Lexicon* and published online.
- For substances that could be classified into multiple categories,[26] we adopted a hierarchy, so that each drug is classified only once in published tables.
- For combinations (compounds) of multiple substances, we followed the Multum *Lexicon* approach. Several prescription and over-the-counter substances are compounds of multiple substances (e.g., acetaminophen with codeine), and are classified as such in the Multum *Lexicon*, and some compounds (e.g., narcotic analgesic combinations) have dedicated categories. We adopted a similar approach for the major substances of abuse. Compounds containing two or more major substances have a dedicated category (e.g., speedball, a combination of cocaine and heroin, is classified under combinations of major substances). However, compounds containing a major substance of abuse and another substance are classified with the major substance (e.g., heroin with scopolamine is classified under heroin). The relative frequency of all major substance compounds is documented in Table 2.3.0.
- For nonpharmaceutical inhalants, which are unique to DAWN and not part of the original Multum *Lexicon*, we established new rules for inclusion. Inhalants now include anesthetic gases and nonpharmaceuticals for which the documented route of administration was inhalation. In addition, to be classified as an inhalant a nonpharmaceutical substance must have a psychoactive effect when inhaled and fall into one of the following subcategories:
  - 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 (nitrous oxide, butane, propane, helium).[27]

[26] For example, cough preparations containing codeine can be classified according to their therapeutic use as respiratory agents or, because of their codeine content, as narcotic analgesics. In published tables, codeine cough syrups are classified only as respiratory agents. However, the multiple categories have been preserved in the underlying data for use in special analyses.

[27] See http://www.inhalants.org/.

- Nitrites: amyl nitrites ("poppers," "snappers") and butyl nitrites ("rush," "locker room," "bolt," "climax," "video head cleaner").

- Chlorofluorohydrocarbons: Freons.

In addition, anesthetic gases are extracted from the category CNS agents, general anesthetics, to be classified as inhalants. These substances have the physical property at room temperature of being a gas or are delivered as a gas and therefore are presumed to have been inhaled. The anesthetic gases include nitrous oxide, ether, and chloroform.

3. ITEMIZE THE SPECIFIC SUBSTANCES REPORTED TO DAWN

Issues

- Many users want to know about mentions of specific substances, and these substances of interest change with changing patterns of drug use.

- Previously, published tables from DAWN were static, and adding new rows to accommodate new drugs could not be accomplished easily. Over time, the usefulness of the list of specific substances degraded as new substances became common (but were not displayed) and old substances decreased in frequency (but were not eliminated from the display).

New approach

- Major substances of abuse: Specific names (including street names) as they are reported to DAWN are itemized in a separate table. The content of this table is dynamic, so it will change as the illicit substances reported to DAWN change. Example:

  - Table 2.1.0 summarizes mentions of cocaine. Table 2.3.0 shows mentions for “cocaine,” “coke,” “crack,” and other terms used to report cocaine to DAWN.

- Other substances of abuse: Specific substances reported in the 4 most commonly reported categories (e.g., psychotherapeutic agents, CNS agents, respiratory agents, and cardiovascular agents) are itemized in separate tables. Example:

  - Table 2.1.0 summarizes mentions of narcotic analgesics. Table 2.5.0 shows mentions for codeine, meperidine, methadone, and all other drugs that make up the narcotic analgesic category.

4. SUPPLY A MAP FROM GENERIC TO BRAND (TRADE) NAMES, BUT DO NOT ATTRIBUTE MENTIONS TO PARTICULAR BRANDS (EVEN AS EXAMPLES)

Issues

- DAWN depends on source records and the specificity of drug information varies with the medical documentation. For example, patients may report to ED clinicians a common brand name (e.g., a trade name such as “Tylenol”) even when a generic (acetaminophen) or another brand was actually consumed. Conversely, a medical chart may indicate a generic name when a particular brand was consumed.

- The use of brand (trade) names in previous publications has been inconsistent and may be misleading.
- Pharmaceutical firms may object to having one brand cited over another, even if the brand is cited only as an example.
- However, a translation between generic and brand (trade) names is a useful aid for readers who may be more familiar with brand than generic names (e.g., Prozac may be a more familiar name than fluoxetine).

New approach

- Identification of substances by brand (trade) name has been eliminated from the new tables and text because brand-level information from DAWN is unreliable.
- Specific substances by generic substance name are itemized in separate tables (e.g., Tables 2.4.0 - 2.7.0).
- For reference, two indexes—generic-to-brand and brand-to-generic—have been extracted from the *Multum Lexicon* and published in Appendix I and online.

5. PROVIDE STATISTICAL TESTS FOR LONG- AND SHORT-TERM TRENDS AND MAKE IT EASIER FOR USERS TO KNOW THE MAGNITUDE OF A CHANGE

Issues

- Users are interested in long-term as well as short-term trends. Previous DAWN publications provide statistical tests only for short-term trends.
- DAWN findings are usually discussed in terms of percentage changes, but this information was never displayed in the published tables.
- In previous publications, statistical tests are provided for differences in estimates of episodes and mentions, but not for rates per 100,000 population.

New approach

- New trend tables highlight statistically significant differences based on 3 comparisons:
  - The first and last periods shown on the table (in this issue of *ED Trends*, the first and last years are 1994 and 2000),
  - The second-to-last and last periods shown on the table (1998 and 2000 here), and
  - The last 2 periods shown on the table (1999 and 2000 here).
- Statistically significant differences expressed in terms of percentages are displayed in the published tables for each of the 3 comparison periods.
- Statistical tests are included now in the tables displaying estimated rates per 100,000 population (Tables 12.1.0 through 14.12.0).

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APPENDIX B: REVISIONS TO ESTIMATES, 1994 TO 2000

Adoption of a new drug vocabulary and its application to DAWN legacy data for 1994 to 2000 produced some inevitable ripple effects. Indeed, the new drug vocabulary and classification methods make estimates from old and new publications incompatible or, at the very least, difficult to compare. **The trends shown in this publication for 1994 to 2000 supersede any estimates published previously for these periods.**

METHODS

The purpose of this section is to account for the deviations from previously published estimates. For the aggregate measures of total ED episodes and total drug mentions and for selected drugs and drug categories enumerated in previous DAWN publications, we provide the following breakdowns for 1994 through 2000:

	1994	1995	1996	1997	1998	1999	2000
a. Previously published estimates							
b. Corrections							
c. Adjusted baselines (a + b)							
d. Drug vocabulary adjustments							
e. Revised estimates (c + d)							
f. Percent change overall (e - a)/a * 100							

- Previously published estimates (a): those reported in prior DAWN publications.
- Corrections (b): changes (+/-) unrelated to the drug vocabulary (discussed below).
- Adjusted baselines (c = a + b): produced by applying corrections to the original estimates.
- Drug vocabulary adjustments (d): changes (+/-) resulting exclusively from the new drug vocabulary.
- Revised estimates (e = c + d): the revised estimates account for all the changes.
- Percent change overall (f = [(e – a)/a * 100]): the difference between previously published and fully revised estimates, expressed as a percent.

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ADJUSTMENTS TO TOTAL EPISODES AND TOTAL MENTIONS

Revised estimates for total ED episodes deviate only slightly (no more than 0.08 percent in any year) from previously published estimates (see below). Revised estimates for total drug mentions change more, but still no more than 0.2 percent in any year. Corrections unrelated to the drug vocabulary development were applied to 1994, 1995, 1996, and 1999 estimates.

- Correction of a minor error in hospital weights for 1994 resulted in an across-the-board increase in episodes and mentions (+457 episodes, +573 mentions).
- Removal of duplicate records affected 1995, 1996, and 1999 estimates (-2 mentions in 1995, -185 episodes and -252 mentions in 1996, -45 mentions in 1999).

Total ED episodes	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**
a. Previously published estimates	518,521	513,633	514,347	527,058	542,544	554,932	601,776
b. Corrections	457	0	-185	0	0	0	0
c. Adjusted baselines	518,978	513,633	514,162	527,058	542,544	554,932	601,776
d. Drug vocabulary adjustments	-98	-114	-229	-240	-112	-165	-213
e. Revised estimates	**518,880**	**513,519**	**513,933**	**526,818**	**542,432**	**554,767**	**601,563**
f. Percent change overall	0.07%	-0.02%	-0.08%	-0.05%	-0.02%	-0.03%	-0.04%

Total ED mentions	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**
a. Previously published estimates	900,317	901,206	907,561	943,937	982,856	1,015,206	1,100,539
b. Corrections	573	-2	-252	0	0	-45	0
c. Adjusted baselines	900,890	901,204	907,304	943,937	982,856	1,015,161	1,100,539
d. Drug vocabulary adjustments	-1,290	-917	-938	-1,555	-1,092	-918	-1,233
e. Revised estimates	**899,600**	**900,287**	**906,366**	**942,382**	**981,764**	**1,014,243**	**1,099,306**
f. Percent change overall	-0.08%	-0.10%	-0.13%	-0.16%	-0.11%	-0.09%	-0.11%

The largest adjustment to total ED mentions from the drug vocabulary comes from reformulation of the category of “inhalants” to eliminate nonpharmaceutical substances (e.g., household products) that were not documented as inhaled. In addition, duplicate mentions were eliminated, and in a few instances, residual mentions of alcohol without another drug were deleted. A duplicate is defined as 2 or more mentions of the same drug (defined at the generic drug level) in a given episode. For example, separate mentions of Tylenol and acetaminophen in one episode would be considered a duplicate. Residual mentions of alcohol resulted when all other drug mentions on the episode were deleted and alcohol remained alone.

Total ED mentions: Adjustments due to drug vocabulary[a]	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**
Non-pharmaceuticals not inhaled	-758	-510	-762	-1,021	-778	-724	-766
Duplicate drug mentions	-462	-388	-168	-516	-303	-138	-452
Residual alcohol-only mentions	-70	-19	-8	-18	-11	-55	-14
Total drug vocabulary adjustments	-1,290	-917	-938	-1,555	-1,092	-917	-1,232

[a] Elements may not sum to total due to rounding.

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REVISED ESTIMATES FOR SPECIFIC DRUGS AND DRUG CATEGORIES

The principal effects of the new drug vocabulary come from corrections to classification, i.e., rearrangement of drugs, which are internal adjustments that do not affect total mentions. Therefore, although the overall changes in drug mentions due to the drug vocabulary are small, the changes to particular drugs and particular categories are sometimes substantial. In the following sections we analyze changes to those drugs and drug categories previously shown in DAWN publications. Corrections unrelated to the drug vocabulary (those discussed above) are shown but are not discussed further.

Major Substances of Abuse

Estimates for the major substances of abuse actually changed relatively little as a result of the new drug vocabulary and its classification schemes. The largest revisions to these estimates come from deliberate decisions to modify the manner in which drugs are classified and tabulated, for example, to create a new category for illicit combinations and to classify particular substances in a more meaningful way.

Cocaine. Changes to cocaine estimates due to the drug vocabulary are minimal. The minor differences from previously published estimates are due to corrections of classification errors and reassignment of illicit combinations.

Cocaine	1994	1995	1996	1997	1998	1999	2000
a. Previously published estimates	**142,878**	**135,801**	**152,433**	**161,087**	**172,014**	**168,763**	**174,896**
b. Corrections	480	0	0	0	0	0	0
c. Adjusted baselines	143,358	135,801	152,433	161,087	172,014	168,763	174,896
d. Drug vocabulary adjustments	-21	-90	-13	-4	-3	-12	-15
e. Revised estimates	**143,337**	**135,711**	**152,420**	**161,083**	**172,011**	**168,751**	**174,881**
f. Percent change overall	0.3%	-0.1%	0.0%	0.0%	0.0%	0.0%	0.0%

Heroin. Most of the change in heroin estimates comes from moving morphine to the narcotic analgesics category for ED data. Users who want to reproduce the heroin/morphine category can do so by summing the mentions of heroin and the mentions of morphine.

Heroin	1994	1995	1996	1997	1998	1999	2000
a. Previously published estimates	64,013	70,838	73,846	72,010	77,645	84,409	97,287
b. Corrections	241	0	0	0	0	0	0
c. Adjusted baselines	64,254	70,838	73,846	72,010	77,645	84,409	97,287
d. Drug vocabulary adjustments	-1,096	-1,282	-866	-1,298	-1,957	-2,217	-2,483
e. Revised estimates	**63,158**	**69,556**	**72,980**	**70,712**	**75,688**	**82,192**	**94,804**
f. Percent change overall	-1.3%	-1.8%	-1.2%	-1.8%	-2.5%	-2.6%	-2.6%

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Marijuana. Minor differences from previously published estimates are due to correction of classification errors and reassignment of illicit combinations.

Marijuana	1994	1995	1996	1997	1998	1999	2000
a. Previously published estimates	40,183	45,271	53,789	64,744	76,870	87,150	96,446
b. Corrections	62	0	0	60	0	0	0
c. Adjusted baselines	40,245	45,271	53,789	64,804	76,870	87,150	96,446
d. Drug vocabulary adjustments	-211	-13	-19	-84	-28	-82	-20
e. Revised estimates	**40,034**	**45,259**	**53,770**	**64,720**	**76,842**	**87,068**	**96,426**
f. Percent change overall	-0.4%	0.0%	0.0%	0.0%	0.0%	-0.1%	0.0%

Amphetamines. This category has been reformulated to report amphetamines separately from other central nervous system (CNS) stimulants. The category called "amphetamines" includes: amphetamine, dextroamphetamine, benzphetamine, cathinone, dimethoxymethamphetamine (DOM), methcathinone, methylenedioxyamphetamine (MDA), and amphetamine/dextroamphetamine combinations.

Amphetamines	1994	1995	1996	1997	1998	1999	2000
a. Previously published estimates	9,664	9,380	9,308	10,235	11,751	11,954	16,189
b. Corrections	32	0	0	0	0	0	0
c. Adjusted baselines	9,696	9,380	9,308	10,235	11,751	11,954	16,189
d. Drug vocabulary adjustments	422	201	464	261	432	542	946
e. Revised estimates	**10,118**	**9,581**	**9,772**	**10,496**	**12,183**	**12,496**	**17,134**
f. Percent change overall	4.7%	2.1%	5.0%	2.6%	3.7%	4.5%	5.8%

Methamphetamine. Methamphetamine is another central nervous system (CNS) stimulant classified separately as a major substance of abuse. The minimal change in methamphetamine mentions is due to correction of classification errors.

Methamphetamine	1994	1995	1996	1997	1998	1999	2000
a. Previously published estimates	17,665	15,936	11,002	17,154	11,491	10,447	13,513
b. Corrections	31	0	0	0	0	0	0
c. Adjusted baselines	17,696	15,936	11,002	17,154	11,491	10,447	13,513
d. Drug vocabulary adjustments	-158	-3	0	0	-5	0	-8
e. Revised estimates	**17,537**	**15,933**	**11,002**	**17,154**	**11,486**	**10,447**	**13,505**
f. Percent change overall	-0.7%	0.0%	0.0%	0.0%	0.0%	0.0%	-0.1%

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Hallucinogens. Hallucinogens have been divided into 3 categories: LSD, PCP, and miscellaneous hallucinogens. Of these, LSD estimates are nearly the same as those published previously, with most of the changes occurring for PCP and miscellaneous hallucinogens.

Hallucinogens	1994	1995	1996	1997	1998	1999	2000
a. Previously published estimates	12,757	13,384	10,107	11,107	10,867	11,688	12,452
b. Corrections	9	0	0	0	0	0	0
c. Adjusted baselines	12,766	13,384	10,107	11,107	10,867	11,688	12,452
d. Drug vocabulary adjustments	-132	-276	-497	-633	-600	-1,366	-1,183
e. Revised estimates	**12,634**	**13,108**	**9,610**	**10,474**	**10,267**	**10,322**	**11,269**
f. Percent change overall	-1.0%	-2.1%	-4.9%	-5.7%	-5.5%	-11.7%	-9.5%

LSD. The very minor change in LSD mentions is due to correction of classification errors.

LSD	1994	1995	1996	1997	1998	1999	2000
a. Previously published estimates	5,150	5,681	4,569	5,219	4,982	5,126	4,016
b. Corrections	8	0	0	0	0	0	0
c. Adjusted baselines	5,158	5,681	4,569	5,219	4,982	5,126	4,016
d. Drug vocabulary adjustments	0	2	0	0	0	0	0
e. Revised estimates	**5,158**	**5,682**	**4,569**	**5,219**	**4,982**	**5,126**	**4,016**
f. Percent change overall	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

PCP. PCP mentions decreased from 1994 to 2000 by as much as 26 percent (18 percent in 2000). These reductions are due to correction of classification errors and reassignment of PCP combinations to illicit combinations.

PCP	1994	1995	1996	1997	1998	1999	2000
a. Previously published estimates	6,019	6,237	3,924	4,195	4,033	4,969	6,583
b. Corrections	3	0	0	0	0	0	0
c. Adjusted baselines	6,022	6,237	3,924	4,195	4,033	4,969	6,583
d. Drug vocabulary adjustments	-123	-274	-484	-569	-597	-1,305	-1,179
e. Revised estimates	**5,899**	**5,963**	**3,441**	**3,626**	**3,436**	**3,663**	**5,404**
f. Percent change overall	-2.0%	-4.4%	-12.3%	-13.6%	-14.8%	-26.3%	-17.9%

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Miscellaneous hallucinogens. This category includes: datura stramonium, mescaline, morning glory seeds, and psilocybin. Rather substantial changes to these estimates are due to reassignments to correct classification errors.

Miscellaneous hallucinogens	1994	1995	1996	1997	1998	1999	2000
a. Previously published estimates	6,019	6,237	3,924	4,195	4,033	4,969	6,583
b. Corrections	3	0	0	0	0	0	0
c. Adjusted baselines	6,022	6,237	3,924	4,195	4,033	4,969	6,583
d. Drug vocabulary adjustments	-123	-274	-484	-569	-597	-1,305	-1,179
e. Revised estimates	**5,899**	**5,963**	**3,441**	**3,626**	**3,436**	**3,663**	**5,404**
f. Percent change overall	-2.0%	-4.4%	-12.3%	-13.6%	-14.8%	-26.3%	-17.9%

Club drugs. Due to widespread interest in "club drugs" as an emerging substance abuse problem, MDMA (Ecstasy), Ketamine, flunitrazepam (Rohypnol), and GHB are classified separately in major substances of abuse. The only major change to these categories (+205 mentions in 1999) is for GHB, which now also includes the precursor gamma butyrolactone (GBL). The club drugs show minimal changes due to classification because they were recent additions to DAWN publications.

Club drugs: Revised estimates	1994	1995	1996	1997	1998	1999	2000
MDMA (Ecstasy)	253	421	319	637	1,143	2,850	4,511
Ketamine	19	151	81	318	209	396	263
Flunitrazepam (Rohypnol)	13	111	217	293	624	540	469
GHB	56	145	638	762	1,282	3,178	4,969

Inhalants. Reformulation of the inhalant category (see Appendix B) did not affect estimates in any consistent way. The changes in estimates vary from -15 percent in 2000 to +9 percent in 1998. The major substantive change in this category is due to our decision to require that nonpharmaceutical substances reported as inhalants actually have a documented route of administration that is inhalation. This ensures consistency in a category that lacked it previously.

Inhalants	1994	1995	1996	1997	1998	1999	2000
a. Previously published estimates	1,637	1,006	1,465	2,283	2,023	1,180	1,795
b. Corrections	1	0	0	1	0	-1	0
c. Adjusted baselines	1,638	1,006	1,465	2,284	2,023	1,179	1,795
d. Drug vocabulary adjustments	-127	30	-152	-59	188	-17	-273
e. Revised estimates	**1,511**	**1,036**	**1,313**	**2,225**	**2,211**	**1,162**	**1,522**
f. Percent change overall	-8%	3%	-10%	-3%	9%	-2%	-15%

Combinations Not Tabulated Above (NTA). This is a totally new category that includes mentions of any compounds of 2 or more major substances of abuse. Previously, these were not classified in a consistent fashion.

Major substances of abuse: Combinations NTA	1994	1995	1996	1997	1998	1999	2000
e. New estimates	**495**	**163**	**383**	**201**	**125**	**94**	**127**

Other Substances of Abuse

As described earlier, the Multum *Lexicon* provided DAWN for the first time with a consistent and comprehensive classification scheme for prescription and over-the-counter medications, which form the bulk of "other substances." In addition, classification errors uncovered during the vocabulary development tended to be concentrated in the other substances of abuse, which had received much less maintenance attention previously. As a result of these 2 factors, the most dramatic changes in estimates are found in the other substances of abuse. This section discusses some of these major changes, by category of drug.

Psychotherapeutic Agents

The new drug vocabulary introduced major changes to estimates of psychotherapeutic agents. Each subcategory is discussed in turn.

Antidepressants. The revised estimates for antidepressants show a dramatic increase as a result of corrections to classification. First, some drugs erroneously classified as antidepressants have been moved elsewhere. Second, several antidepressants with substantial numbers of mentions—citalopram, fluvoxamine, paroxetine, sertraline, buproprion, mirtazapine, and venlafaxine—have been moved into the antidepressant categories.

Antidepressants	1994	1995	1996	1997	1998	1999	2000
a. Previously published estimates	44,632	41,299	39,484	37,694	32,978	31,143	29,430
b. Corrections	-82	0	0	3	0	0	0
c. Adjusted baselines	44,550	41,299	39,484	37,697	32,978	31,143	29,430
d. Drug vocabulary adjustments	9,892	12,465	16,402	16,441	21,404	27,821	31,146
e. Revised estimates	54,442	53,764	55,886	54,138	54,382	58,964	60,576
f. Percent change overall	22.0%	30.2%	41.5%	43.6%	64.9%	89.3%	105.8%

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Antipsychotics. The revised estimates for antipsychotics show a dramatic increase as a result of corrections to classification. First, some drugs previously classified as antipsychotics have been moved elsewhere. Second, several antipsychotics with substantial numbers of mentions—clozapine, lithium, olanzapine, and quetiapine—are now classified correctly as antipsychotics.

Antipsychotics	1994	1995	1996	1997	1998	1999	2000
a. Previously published estimates	17,240	13,515	11,874	8,710	6,984	3,699	3,712
b. Corrections	0	0	0	0	0	0	0
c. Adjusted baselines	17,240	13,515	11,874	8,710	6,984	3,699	3,712
d. Drug vocabulary adjustments	7,772	8,387	7,073	8,273	9,286	11,524	16,385
e. Revised estimates	25,012	21,902	18,947	16,983	16,270	15,223	20,097
f. Percent change overall	45.1%	62.1%	59.6%	95.0%	133.0%	311.5%	441.4%

Barbiturates. This next table compares a new category "barbiturates" with the category defined in previous DAWN publications as "barbiturate sedatives." Changes to these estimates are primarily the result of correcting the assignment of analgesic combinations that had been erroneously classified as barbiturates. In addition, barbiturate combinations—ephedrine/pentobarbital, ephedrine/phenobarbital, ephedrine/secobarbital, and pentobarbital/phenobarbital—previously classified elsewhere have been added to the barbiturate category.

Barbiturates	1994	1995	1996	1997	1998	1999	2000
a. Previously published estimates	6,215	7,145	7,551	7,443	9,300	7,779	7,253
b. Corrections	28	0	0	0	0	-1	0
c. Adjusted baselines	6,243	7,145	7,551	7,443	9,300	7,778	7,253
d. Drug vocabulary adjustments	-356	-352	-422	-404	-540	-1	-151
e. Revised estimates	5,887	6,793	7,129	7,039	8,760	7,777	7,102
f. Percent change overall	-5.3%	-4.9%	-5.6%	-5.4%	-5.8%	0.0%	-2.1%

Three new categories of psychotherapeutics had no comparable categories in prior DAWN publications:

Benzodiazepines. Previous DAWN publications had no category defined specifically as "benzodiazepines." A category previously defined as "tranquilizers" contained several of the benzodiazepines, but also contained drugs now classified as antipsychotics, analgesics, muscle relaxants, and miscellaneous anxiolytics, sedatives, and hypnotics. Other benzodiazepines were erroneously classified in other categories. The current benzodiazepine category includes all the benzodiazepines with the exception of flunitrazepam (Rohypnol).

Miscellaneous anxiolytics, sedatives, and hypnotics. Previous DAWN publications had no comparable category. Drugs in this category include: buspirone, diphenhydramine, doxylamine, hyodroxyzine, and zolpidem, as well as nonspecific sedatives.

CNS stimulants. This category—which excludes amphetamines, methamphetamine, and MDMA (Ecstasy)—had no comparable category in previous DAWN publications. Drugs in this category include caffeine, methylphenidate, and unspecified CNS stimulants.

Central Nervous System Agents

Among the CNS agents, only categories for narcotic and non-narcotic analgesics were present in previous DAWN publications. Substantial reclassification of particular narcotic and non-narcotic analgesics resulted from the drug vocabulary effort. Numerous changes in classification actually involved relatively few mentions. However, in at least one instance (discussed below), corrections of previous classification errors involved large numbers of mentions.

Narcotic analgesics. The large changes for this category are primarily due to the placement of heroin in the major substances of abuse. Minor changes in classification account for the remainder of the difference.

Narcotic analgesics	1994	1995	1996	1997	1998	1999	2000
a. Previously published estimates	99,972	107,633	113,659	117,293	129,043	146,166	171,790
b. Corrections	273	0	0	160	0	-1	0
c. Adjusted baselines	100,245	107,633	113,659	117,453	129,043	146,165	171,790
d. Drug vocabulary adjustments	-55,728	-62,380	-66,718	-63,336	-70,097	-77,154	-89,417
e. Revised estimates	44,517	45,253	46,941	54,117	58,946	69,011	82,373
f. Percent change overall	-55.5%	-58.0%	-58.7%	-53.9%	-54.3%	-52.8%	-52.1%

Narcotic analgesic combinations. This is a new category that had no comparable category in previous DAWN publications.

Non-narcotic analgesics. Several new categories—antimigraine agents, Cox-2 inhibitors, nonsteroidal anti-inflammatory agents (commonly known as NSAIDs), salicylates, analgesic combinations, and miscellaneous analgesics—replace the category previously defined as “non-narcotic analgesics.” The most significant changes in classification affect the category for NSAIDs. Most mentions of the NSAIDs (e.g., ibuprofen and naproxen) had never been classified as analgesics.

Non-narcotic analgesics	1994	1995	1996	1997	1998	1999	2000
a. Previously published estimates	67,974	63,416	62,799	58,956	55,992	47,777	56,346
b. Corrections	-125	0	0	64	0	0	0
c. Adjusted baselines	67,849	63,416	62,799	59,020	55,992	47,777	56,346
d. Drug vocabulary adjustments	24,572	28,560	24,898	27,248	26,991	21,885	28,475
e. Revised estimates	92,421	91,976	87,697	86,268	82,983	69,662	84,821
f. Percent change overall	36.0%	45.0%	39.6%	46.3%	48.2%	45.8%	50.5%

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Drug Unknown and All Other Drugs

Two of the most significant changes due to conversion to the new drug vocabulary are perhaps the least obvious. These involve changes to the categories defined as "all other drugs" and "drug unknown." Stringent maintenance procedures have been put in place to prevent the erosion of these categories under the new system.

Drug unknown. Mentions in the category defined as "drug unknown" had been decreasing steadily since 1994, but adjustments made during vocabulary development did not follow this trend. Additions to "drug unknown" are primarily due to the assignment of ambiguous and undocumented terms from legacy data into this category. Documentation protocols now in place should result in sharp reductions in this category in the future.

Drug unknown	1994	1995	1996	1997	1998	1999	2000
a. Previously published estimates	32,273	24,208	15,691	17,947	14,628	14,307	10,801
b. Corrections	-62	0	0	0	0	-4	0
c. Adjusted baselines	32,211	24,208	15,691	17,947	14,628	14,303	10,801
d. Drug vocabulary adjustments	1,956	3,204	4,580	8,274	9,076	18,501	14,897
e. Revised estimates	34,167	27,412	20,271	26,221	23,704	32,804	25,698
f. Percent change overall	5.9%	13.2%	29.2%	46.1%	62.0%	129.3%	137.9%

All other drugs. In previous DAWN publications, the category defined as "all other drugs" accumulated entries steadily over time as the old drug classification scheme degraded. By 2000, "all other drugs" had become the second largest category (second only to alcohol-in-combination) in mentions. Implementation of the new drug vocabulary led to a 98 percent reduction in the category "all other drugs" for each year from 1994 to 2000. New maintenance procedures and regular updating of the content of DAWN published tables will prevent uncontrolled growth in this category in the future.

All other drugs	1994	1995	1996	1997	1998	1999	2000
a. Previously published estimates	141,827	147,817	139,290	142,275	148,761	159,154	175,322
b. Corrections	-168	0	0	382	0	-38	0
c. Adjusted baselines	141,659	147,817	139,290	142,657	148,761	159,116	175,322
d. Drug vocabulary adjustments	-138,459	-144,441	-135,821	-139,788	-145,613	-156,182	-171,678
e. Revised estimates	3,200	3,376	3,469	2,869	3,148	2,934	3,644
f. Percent change overall	-97.7%	-97.7%	-97.5%	-98.0%	-97.9%	-98.2%	-97.9%

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REVISED ESTIMATES FOR SELECTED DRUGS, 1994 TO 2000

The impact of revisions due to the drug vocabulary varies across the particular substances classified under other substances of abuse. The substances enumerated here are those listed specifically in previous DAWN publications as Table 2 (in *Year-end* and *Mid-year* DAWN publications) and as Table 4.03 (in *Detailed ED Tables*).

Among the other substances of abuse enumerated in previous DAWN publications, major changes in estimates due to the drug vocabulary occurred for 5 specific substances (see table below). A major change is defined here as a change of more than 10 percent in 2 or more years from 1994 to 2000.

Substantial decreases were noted in aspirin, propoxyphene, hydrocodone, and oxycodone mentions. A substantial increase was noted for diphenhydramine mentions. For the analgesics, these changes are attributable to reclassification of analgesic combinations into separate categories. For diphenhydramine, the changes are due to corrections of classification errors and the addition of compounds containing diphenhydramine that were previously reported elsewhere (e.g., OTC sleep aids).

Drugs with major changes in estimates	1994	1995	1996	1997	1998	1999	2000
Aspirin	-24.7%	-24.1%	-25.5%	-23.2%	-24.3%	-26.9%	-29.1%
d-Propoxyphene (propoxyphene)	-79.7%	-84.8%	-84.3%	-84.7%	-83.9%	-86.9%	-90.8%
Diphenhydramine	46.4%	37.6%	38.3%	26.3%	31.9%	23.8%	18.7%
Hydrocodone	-86.4%	-85.3%	-85.0%	-91.6%	-84.8%	-85.8%	-88.3%
Oxycodone	-96.6%	-96.6%	-96.9%	-92.3%	-80.2%	-71.9%	-65.0%

Note. New reporting names are presented in parentheses. Major change is defined as a change that exceeded +/- 10%.

The following drugs experienced only minor changes (i.e., less than 10%) to estimates as a result of the drug vocabulary development:

Drugs with minor changes in estimates	
Acetaminophen	Haloperidol
Acetamin./codeine (acetaminophen-codeine)	Hydromorphone
Alprazolam	Ibuprofen
Amitriptyline	Imipramine
Carbamazepine	Lithium carbonate (lithium)
Carisoprodol	Lorazepam
Chloral hydrate	Meperidine HCl (meperidine)
Chlordiazepoxide	Meprobamate
Chlorpromazine	Methadone
Clonazepam	Methylphenidate
Clorazepate	Naproxen
Codeine	Pentobarbital
Cyclobenzaprine	Phenobarbital
Desipramine	Secobarbital
Diazepam	Thioridazine
Doxepin	Trazodone
Ethchlorvynol	Triazolam
Fluoxetine	Trifluoperazine

Note. New reporting names are presented in parentheses.

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WHERE HAVE THE OLD CATEGORIES GONE?

Some drug categories presented in previous DAWN publications may appear to have "disappeared" but actually have been folded into new categories, based on the Multum *Lexicon*. These include:

Previously published category	Placement of mentions in new tables
Hallucinogens	LSD
	PCP
	Miscellaneous hallucinogens
Narcotic analgesics	Narcotic analgesics
	Narcotic analgesic combinations
Nonbarbiturate sedatives	Benzodiazepines
Tranquilizers	Miscellaneous anxiolytics, sedatives, and hypnotics
Non-narcotic analgesics	Antimigraine agents
	Cox-2 inhibitors
	Nonsteroidal anti-inflammatory agents
	Salicylates
	Analgesic combinations
	Miscellaneous analgesics

In addition, the following terms enumerated in previous DAWN publications have been eliminated totally or nearly so. Categories—amitriptyline, butalbital, and codeine combinations; OTC diet aids; OTC sleep aids—have been redefined according to the Multum *Lexicon*. Mentions previously attributed to diphenylhydantoin sodium and hydantoin have been reclassified, principally to the anticonvulsant phenytoin.

Eliminated
Amitriptyline combinations
Butalbital combinations
Codeine combinations
Diphenylhydantoin sodium
Hydantoin
OTC diet aids
OTC sleep aids

THE 50 MOST FREQUENTLY MENTIONED DRUGS

Table C shows the 50 most frequently mentioned drugs in drug-related ED visits for 2000, based on the revised estimates and the new drug vocabulary. This table expresses the top 50 drugs at the generic drug level. A column indicating the category for each of the drugs is also included for reference.

The content of this table differs somewhat from that published previously (see Tables 2.06a and 2.06b in Detailed ED Tables, 2000). The absolute ranking of the top 50 drugs changed in almost all cases, with the exceptions of alcohol-in-combination, cocaine, and acetaminophen, which continue to be ranked first, second, and fifth, respectively. However, the rank remained relatively stable for the top 20 drugs. Of these, only 4 drugs—narcotic analgesics-NOS, acetaminophen-hydrocodone, poly-drugs, and drug unknown—that appear in the top 20 now did

not appear in the top 20 previously. Greater variation can be observed in the remaining 30 drugs.

As a result of the new drug vocabulary, drugs such as narcotic analgesics-NOS, benzodiazepines-NOS, barbiturates-NOS, drug unknown, and poly-drugs are revealed in the top 50, as are particular analgesic combinations and narcotic analgesic combinations.

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Table C – Top 50 drugs mentioned most frequently in drug-related episodes, revised estimates, 2000

Ordered by rank

Drug name	Drug category	Number of mentions	Percent of total episodes	Rank
alcohol in combination	Alcohol-in-combination	204,510	34.00%	1
cocaine (Schedule I substance)	Cocaine	174,881	29.07%	2
cannabis (Schedule I substance)	Marijuana	96,416	16.03%	3
heroin (Schedule I substance)	Heroin	94,804	15.76%	4
acetaminophen	Miscellaneous analgesics	32,835	5.46%	5
narcotic analgesics-NOS	Narcotic analgesics	25,935	4.31%	6
benzodiazepines-NOS	Benzodiazepines	22,376	3.72%	7
alprazolam	Benzodiazepines	22,105	3.67%	8
ibuprofen	Nonsteroidal anti-inflammatory agents	18,338	3.05%	9
clonazepam	Benzodiazepines	18,005	2.99%	10
acetaminophen-hydrocodone	Narcotic analgesic combinations	17,538	2.92%	11
amphetamine	Amphetamines	16,193	2.69%	12
poly-drugs	Drug unknown	14,897	2.48%	13
methamphetamine	Methamphetamine	13,505	2.24%	14
diazepam	Benzodiazepines	12,090	2.01%	15
aspirin	Salicylates	11,096	1.84%	16
drug unknown	Drug unknown	10,801	1.80%	17
lorazepam	Benzodiazepines	10,671	1.77%	18
trazodone	Miscellaneous antidepressants	9,798	1.63%	19
carisoprodol	Muscle relaxants	9,520	1.58%	20
paroxetine	SSRI antidepressants	8,020	1.33%	21
fluoxetine	SSRI antidepressants	7,939	1.32%	22
methadone	Narcotic analgesics	7,819	1.30%	23
diphenhydramine	Misc. anxiolytics, sedatives, & hypnotics	7,440	1.24%	24
zolpidem	Misc. anxiolytics, sedatives, & hypnotics	6,810	1.13%	25
sertraline	SSRI antidepressants	6,670	1.11%	26
acetaminophen-oxycodone	Narcotic analgesic combinations	6,637	1.10%	27
amitriptyline	Tricyclic antidepressants	6,444	1.07%	28
divalproex sodium	Anticonvulsants	6,235	1.04%	29
olanzapine	Miscellaneous antipsychotic agents	5,454	0.91%	30
phencyclidine (Schedule I substance)	PCP	5,404	0.90%	31
naproxen	Nonsteroidal anti-inflammatory agents	5,080	0.84%	32
acetaminophen-propoxyphene	Narcotic analgesic combinations	4,891	0.81%	33
gamma hydroxy butyrate	Gamma-hydroxy butyrate (GHB & GBL)	4,853	0.81%	34
barbiturates-NOS	Barbiturates	4,848	0.81%	35
methylenedioxymethamphetamine	MDMA (Ecstasy)	4,511	0.75%	36
gabapentin	Anticonvulsants	4,465	0.74%	37
acetaminophen-diphenhydramine	Analgesic combinations	4,224	0.70%	38
lysergic acid diethylamide	LSD	4,016	0.67%	39
cyclobenzaprine	Muscle relaxants	3,975	0.66%	40
risperidone	Miscellaneous antipsychotic agents	3,899	0.65%	41
acetaminophen-codeine	Narcotic analgesic combinations	3,849	0.64%	42
bupropion	Miscellaneous antidepressants	3,809	0.63%	43
oxycodone	Narcotic analgesics	3,792	0.63%	44
venlafaxine	Miscellaneous antidepressants	3,722	0.62%	45
lithium	Miscellaneous antipsychotic agents	3,720	0.62%	46
citalopram	SSRI antidepressants	3,458	0.57%	47
APAP/ASA/caffeine	Analgesic combinations	3,054	0.51%	48
quetiapine	Miscellaneous antipsychotic agents	3,009	0.50%	49
temazepam	Benzodiazepines	2,742	0.46%	50

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APPENDIX C:
RACE AND ETHNICITY DATA IN DAWN

Beginning in January 2000, the race and ethnicity categories on DAWN data collection forms changed to match a revised standard protocol.[28] The new protocol permits separate reporting of race and Hispanic ethnicity, and it incorporates 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 2 categories, "Asian" and "Native Hawaiian or Other Pacific Islander"); and elimination of the "Other" category. Table R.1 compares the race/ethnicity terms used on the current DAWN report form to those on the report form used previously. The complete DAWN report form is reproduced in Appendix H.

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—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 R.2.[29] 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 (that is, 2 or more races 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 for 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 too small to report independently: 2 or more races,[30] American Indian or Alaska Native, Asian, and Native Hawaiian or Other Pacific Islander. Race/ethnicity NTA replaces the category previously termed "Other." All cases reported to DAWN as Hispanic or Latino ethnicity are tabulated as Hispanic race/ethnicity, regardless of race.

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[28] 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.

[29] These detailed estimates conform to the OMB guidance on tabulation of race and ethnicity data in Office of Management and Budget, *Draft Provisional Guidance on the Implementation of the 1997 Standards for the Collection of Federal Data on Race and Ethnicity*, February 17, 1999.

[30] One exception is that if 2 races are reported and the second is reported as unknown, the episode is coded for the known 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.

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Table R.1 – Changes in race and ethnicity coding effective in 2000[1]

OLD categories	
Data collection (1 data element)	Data tabulation (1 data element)
Race/ethnicity	Race/ethnicity
1 - White, not Hispanic	White
2 - Black, not Hispanic	Black
3 - Hispanic	Hispanic
4 - American Indian or Alaskan Native	Other
5 - Asian or Pacific Islander	Other
6 - Other	Other
7 - Unknown	Unknown

NEW categories[2]	
Data collection (2 data elements)	Data tabulation (1 data element)
Ethnicity	Race/ethnicity
Hispanic or Latino	Hispanic
Not Hispanic or Latino	
Unknown	
Race	
White	White
Black/African American	Black
American Indian or Alaska Native	Race/ethnicity NTA
Asian	Race/ethnicity NTA
Native Hawaiian/OPI	Race/ethnicity NTA
Unknown	Unknown

DATA TABULATION	
OLD	NEW
White	White
Black	Black
Hispanic	Hispanic
Other	Race/ethnicity NTA
Unknown	Unknown

[1] During 2000, DAWN began to implement the revised Federal standards whereby race and ethnicity are collected as separate data elements, and one or more races for an individual can be collected, when available. This level of detail is not shown in most tables because of the need to report consistently from the data collected using old and new categories. Further, at this level of detail, small sample sizes produce some estimates that are unreliable.

[2] When tabulating DAWN cases by race and ethnicity using the new categories, ethnicity of Hispanic or Latino overrides race. See Table R.1 for a detailed tabulation of the racial and ethnic characteristics of DAWN cases.

NTA = not tabulated above, OPI = Other Pacific Islander.

SOURCE: Office of Applied Studies, SAMHSA, Drug Abuse Warning Network, 2001.

Table R.2 – ED drug episodes by detailed race and ethnicity: Estimates for the coterminous U.S.[1], 2000

Race	Ethnicity			Total
	Hispanic	Not Hispanic	Ethnicity unknown	
SINGLE RACE				
White	22,127	253,770	81,044	356,941
Black/African American	340	83,971	49,753	134,064
Asian	21	2,035	1,553	3,608
American Indian/Alaska Native	91	303	705	1,099
Native Hawaiian/Other Pacific Islander	33	188	250	470
Race unknown	45,652	2,750	56,818	105,219
TWO RACES				
White + Black/African American		6	5	10
White + Asian		3		3
White + Native Hawaiian/Other Pacific Islander		1		1
White + Unknown		4	1	5
Black/African American + American Indian/Alaska Native		5	1	6
Black/African American + Native Hawaiian/Other Pacific Islander			1	1
Black/African America + Unknown	2	1	9	12
Asian + American Indian/Alaska Native		3		3
Asian + Native Hawaiian/Other Pacific Islander		13	9	22
Asian + Unknown			4	4
American Indian/Alaska Native + Unknown		1	1	2
Native Hawaiian/Other Pacific Islander + Unknown	17	68	7	92
TOTAL DRUG ABUSE EPISODES	68,282	343,121	190,160	601,563

[1] This detailed tabulation of the racial and ethnic characteristics of DAWN cases is provided in accordance with the *Draft Provisional Guidance on the Implementation of the 1997 Standards for the Collection of Federal Data on Race and Ethnicity* (Office of Management and Budget, 2/1999). During 2000, DAWN began to implement the revised Federal standards whereby race and ethnicity are collected as separate data elements, and one or more races for an individual can be collected, when available. This level of detail is not shown in most tables because of the need to report consistently from the data collected using old and new categories. Further, at this level of detail, small sample sizes produce some estimates that are unreliable and could pose a threat to patient confidentiality. Up to 5 race categories can be indicated for each patient, but only those categories that had at least 1 entry are reported here.

NOTE: These estimates are based on a representative sample of non-Federal, short-stay hospitals with 24-hour emergency departments in the coterminous U.S.

ED = emergency department.

SOURCE: Office of Applied Studies, SAMHSA, Drug Abuse Warning Network, 2001 (09/2001 update).

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APPENDIX D:
DETAILED DESCRIPTION OF DAWN

SAMPLE DESIGN

The Drug Abuse Warning Network (DAWN) is a voluntary, national data collection system that gathers information on substance abuse that manifests in visits to hospital emergency departments (EDs) in the coterminous U.S. Currently, DAWN provides semi-annual and annual estimates of the number of drug-related visits to hospital EDs from a nationally representative sample of hospitals located throughout the coterminous U.S. The DAWN system is managed by the Office of Applied Studies (OAS), a component of the Substance Abuse and Mental Health Services Administration (SAMHSA) of the U.S. Department of Health and Human Services (DHHS).

Several changes have been made to the sample design since DAWN began in 1972 under the Drug Enforcement Administration (DEA). In the early 1970s, the DAWN sample consisted of a random sample of hospital EDs. Over time, however, a number of facilities were lost from the original sample because of closures, mergers, attrition, or voluntary termination. New hospitals were recruited to participate, but no sample maintenance plan was devised for selecting new hospitals to sustain the randomness of the sample. As a result, attrition and nonrandom replacement led to a sample that was no longer representative of all hospital EDs in the coterminous U.S.

When the National Institute on Drug Abuse (NIDA) assumed responsibility for DAWN in 1980, one of the agency's goals was to implement a new sample that could be used to produce estimates for the Nation as a whole and for the separate DAWN metropolitan areas. Once a design was determined and the units were selected, the sample required the recruitment of 300 new hospitals. The cost of the project delayed its initiation until early 1986.

Hospitals eligible for DAWN are non-Federal, short-stay general surgical and medical hospitals in the coterminous U.S. that have a 24-hour ED. The American Hospital Association's (AHA) 1984 and 1985 Annual Surveys of Hospitals were used to obtain a sampling frame. (For a definition of sampling frame and other technical terms used in this publication, see the Glossary of Terms in Appendix F.)

Hospitals in the sampling frame were stratified according to several characteristics. First, the sampling frame was divided into the 21 DAWN metropolitan areas and the remainder of the country (called the National Panel). Hospitals having 80,000 or more annual ED visits were assigned to a single stratum for selection with certainty. Then, the remaining hospitals in the 21 metropolitan areas were classified by location (inside or outside the central city) and by whether the hospital had an organized outpatient department and/or a chemical/alcohol inpatient unit (that is, whether they had zero, one, or both types of units). Similarly, hospitals in the National Panel were classified by the presence/absence of such units.

The 21 metropolitan area boundaries correspond to the Office of Management and Budget (OMB) 1983 definitions of Metropolitan Statistical Areas (MSAs) and Primary Metropolitan Statistical Areas (PMSAs) with a few exceptions. In the case of the Boston metropolitan area, the OMB definition was replaced by the definition for the New England County Metropolitan

Area (NECMA). In several metropolitan areas, use of the PMSAs excluded some counties covered by DAWN prior to 1988, such as Nassau and Suffolk Counties in New York, certain counties in the Chicago area, and Niagara County in the Buffalo area. In other areas, such as Atlanta, counties not previously covered in DAWN were included. In addition to geographic coverage, the central cities in the new statistical areas differ from those in the old MSAs used previously in DAWN. For example, Hialeah joined Miami as a central city in the new Miami-Hialeah area, and Long Beach joined the Los Angeles-Long Beach area. In some instances in this publication, only the first city name is cited, but it always refers to the complete metropolitan area.

Sample sizes for the metropolitan areas and the National Panel were determined for each stratum so as to achieve specified levels of precision in the estimates. In this context, precision refers to the amount of sampling fluctuation inherent in the estimate; the less the fluctuation, the greater the precision. Target precision levels were expressed as relative standard errors (RSEs), defined as the ratio of the standard error (SE) of an estimate to the value of the estimate, expressed as a percentage. Lower RSE values are associated with higher levels of precision and, other things being equal, increases in sample size serve to reduce the RSE and thus increase the level of precision of the estimates. Estimates are considered unreliable and are suppressed in DAWN if their RSEs exceed 50 percent. Target RSEs for total episodes were 6 percent for the national estimates; 6 percent for the Chicago, Los Angeles, and New York metropolitan areas; and 8 percent for all other metropolitan areas. In 5 of the metropolitan areas (Baltimore, Buffalo, Denver, San Diego, and San Francisco), such a large proportion of facilities in each area would have been required to reduce the RSE to 8 percent that the decision was made simply to select all eligible hospitals. Figure 1 shows RSEs for total drug-related episodes in 2000 by metropolitan area.

Once the sample size for each metropolitan area and the National Panel was determined, the number of sample units was allocated to the various strata based on the theory of optimal allocation. With this approach, strata with greater variability in drug-related episodes (from hospital to hospital) receive a proportionally larger number of sample units. Optimal allocation serves to reduce the RSE of the estimates for a given overall sample size or to enable a specified RSE to be achieved with a smaller sample, relative to proportional or random allocation to strata.

A total of 685 hospitals was selected for the new sample. Many of the facilities selected, particularly the larger ones, were already participating in DAWN. As noted earlier, 300 new hospitals had to be recruited. Recruitment started in April 1986 and proceeded in phases. By 1988, recruitment of the selected facilities was sufficiently complete to produce estimates based on the new sample.

Some facilities already participating in DAWN were not selected for the new sample. These facilities were retained in the system for sufficient time to obtain overlapping data for calibrating the estimates and developing estimation procedures for prior years. The period of overlap differed by metropolitan area but generally included the last quarter of 1988 and the first half of 1989. Most terminations of nonselected facilities were made in the second half of 1989 or in 1990.

The total number of eligible sample facilities has not remained at the original 685 because some hospitals have closed or become ineligible since the sample was selected while others have been added as part of sample maintenance. To preserve the integrity of the sample and ensure that the DAWN estimates will continue to be representative, sample maintenance is

performed annually. Maintaining the sample involves updating the sampling frame with the most recent available information on the population of eligible hospitals. One purpose for updating the sampling frame is to identify newly eligible hospitals, or hospitals that are eligible and previously did not have a chance of selection, so that they can be sampled. A second purpose, which focuses on the estimation process, is to determine the population of eligible hospitals that the estimates must apply to, as well as the total number of ED visits among this population, which is used in the calculation of the analytical weights.

WEIGHTS AND PRECISION OF THE ESTIMATES

By 1988, hospital recruitment progressed to a point where national estimates and estimates for each of the 21 metropolitan areas could be made with reasonable precision. National estimates are obtained by adding the estimates from the 21 metropolitan areas and the estimate from the National Panel for each estimation category.

The development of estimates from the sample data involves the application of analytical weights calculated on the basis of data from the sampling frame and from DAWN reporting records. Weights are calculated for each quarter of data using a 3-component model that considers:

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

The estimation procedure was modified in 1989 to include the adjustments for 2 types of nonresponse and the ratio or benchmark adjustment based on ancillary data from AHA.

Each estimate from the DAWN ED sample data is subject to sampling variability. This is the variation of the estimate that would be observed if different samples were drawn from the same population using the same procedures. The sampling variability of an estimate is measured by its SE and RSE, which is the standard error divided by the estimate. The precision of an estimate is inversely related to the degree of sampling variability as measured by the RSE; the greater the RSE value, the lower the precision.

PRELIMINARY VERSUS FINAL ESTIMATES

Final estimates are produced annually when all hospitals participating in DAWN have submitted their data for that year and when ancillary data used in estimation have become available. In recent years, the final publication has included separate final estimates for the first half and the second half of the year (quarterly estimates were produced in earlier years). In addition to the final estimates, preliminary estimates are also produced semi-annually based on responding hospitals. Data are weighted to produce national and metropolitan area estimates of ED drug-related mentions. The following factors clarify differences between preliminary and final estimates:

- Data from a small number of late-reporting hospitals are used in the production of final estimates. Data are continuously updated for a fixed time period. As such, final estimates usually have higher response rates.

- Additional hospitals are added to the sample and incorporated into the final estimates for a given year (not the preliminary estimates for that same year). Most of these hospitals are "newly eligible" because they became DAWN eligible sometime after the original sample was selected. The final DAWN estimates are produced after we receive the most current AHA Annual Survey of Hospitals file. This file is used initially to establish a sampling frame for DAWN. The most current AHA file is used once a year to maintain representativeness of the sample. Between the releases of the preliminary and final estimates, the use of the newer AHA survey can result in hospitals being added to the sample and incorporated into the final estimates.

- Data from the most current AHA file also are used to produce the final benchmark-adjusted weights.

ESTIMATES OF RATES PER 100,000 POPULATION

Rates of ED episodes or mentions per 100,000 population are generated using population data from the U.S. Bureau of the Census. The Office of Management and Budget (OMB) defines *Metropolitan Area* as the city core and its immediately adjacent geographic areas that are highly integrated economically and socially with the city core. Estimates of incidence rates are obtained by taking the estimates of total episodes and mentions for a given demographic category, dividing by the population estimate for that demographic category, and dividing by 100,000. These standardized measures provide the means for comparing drug abuse episodes and mentions across cities and over time. Semi-annual estimates are based on preliminary data from the first half of the year and are not comparable to annual estimates, which are based on 12 months of data.

Population estimates are derived from the following U.S. Census Bureau files:

- Civilian Noninstitutional Population of the United States by Age, Sex, and Race, which provides monthly population estimates by age, gender, race, and Hispanic origin for the total United States;

- Decennial Census Counts by Age, Sex, and Race, which provides population estimates by state and county, broken out by combinations of age, gender, race, and Hispanic origin; and

- County-Level Population Estimates, which provides estimates of annual total population by county as of July 1 of each year.

Population estimates are obtained by:

- Adjusting the annual County-Level Population Estimates to the Census Counts by Age, Sex, and Race to produce annual county demographic counts;

- Adjusting the annual county demographic counts to the Civilian Noninstitutional Population data to produce monthly county demographic counts; and

- Summing the monthly county demographic counts across all counties in the metropolitan area and across all months in the quarter (half-year or year), to produce semi-annual or annual demographic counts for each DAWN area.

Population estimates for 1994 through 2000 rely on 1990 Census data, and those beginning with 2001 use data from the 2000 Census. Incidence rate estimates per 100,000 population for the first half of 2001 use the Census data alone; the other two files were not available at the time this publication was prepared. Inevitably, the accuracy of population estimates deteriorates over time relative to actual census counts. New population data used for the first half of 2001 increased considerably relative to population estimates generated for recent years. As a result, the incidence rates for the first half of 2001 may appear to have decreased significantly when the difference may be a mere artifact of the increase in the population estimate used in the denominator of these rates. Changes in incidence rate estimates between the first half of 2001 and prior years should be compared to changes in the corresponding episode or mention estimates and their significance levels to verify changes in incidence rates. If a statistically significant change in episode or mention estimates did not occur, it is likely that statistically significant change in the incidence rate was due to changes in population.

REVIEW OF ESTIMATION SYSTEM

In 1997 and 1998, a thorough review of the DAWN estimation system was undertaken by Westat. As a result of this review, the computer programs that compute the weighted estimates were rewritten to make them more accurate and efficient. While the methodology for computing weights did not change, errors were discovered in the prior programs that affected the estimates for 1995 and 1997. Final estimates for these 2 years were presented for the first time in *Mid-year 1998 Preliminary ED Data from DAWN*. The 1995 estimate of total drug-related episodes decreased by less than 1 percent (from 517,800 to 513,600) while the 1997 estimate increased by 5.5 percent (from 487,600 to 514,300). These changes had varying effects on the metropolitan area estimates.

The following changes had the greatest effect on the estimates:

- A change was made in the method for assigning eligibility status to a hospital. The current system tracks partial year eligibility, which improves the sensitivity of the DAWN nonresponse adjustment. Formerly, there was no recognition that a hospital could change its eligibility status during the year.

- A concerted effort was made to ascertain the current eligibility status of all nonparticipating DAWN sampled hospitals. Changes in status from eligible nonrespondent to ineligible (or vice versa) also affected the nonresponse adjustment.

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APPENDIX E:
SOURCES OF ERROR IN DAWN ESTIMATES

When producing estimates from any sample survey, 2 types of errors are possible—sampling and nonsampling errors. The sampling error of an estimate is the error caused by the selection of a sample instead of a census of hospitals. Sampling error is reduced by selecting a large sample or by using efficient sample design and estimation strategies such as stratification, optimal allocation, and ratio estimation. Nonsampling errors include nonresponse, difficulties in the interpretation of the collection form, coding errors, computer processing errors, errors in the sampling frame, and reporting errors.

Many procedures, such as data auditing and periodic retraining of data collectors, are used in DAWN data collection to minimize nonsampling errors. Moreover, nonrespondent hospitals are identified for additional recruitment. Late reporters are assigned for priority data collection and respondents with changes in reporting are designated for followup. Since data are abstracted from medical records completed by hospital staff who treated the patients, the accuracy of these reports depends on their careful recording of these conditions.

It is also important to recognize that DAWN does not provide a complete picture of problems associated with drug use, but rather focuses on the impact that these problems have on hospital EDs in the United States. If a patient is admitted to another part of the hospital for treatment, or treated in a physician's office or at a drug treatment center, the episode would not be included in DAWN.

CHANGES IN SAMPLE COMPOSITION AND REPORTING OF EPISODES

Periodic minor modifications are made to the sample to keep it current. Adjustments are made in the weights to account for lapses in reporting by the sampled hospitals. It is unlikely that modifications to the sample will affect estimates of the total drug, cocaine, and heroin mentions over time. Analyses of the previous changes in the sample composition have found them to have little impact on trends across several years.

It is important to consider the potential impact on DAWN trends from changes in the sample composition or reporting anomalies in key sample hospitals, particularly for metropolitan area data. Historically, DAWN analysts and field staff have attempted to identify and document such situations in the period before data release, and events that may have had a significant impact on the estimates were published in this section.

However, choosing the particular situations to highlight often involves more art than science, given that the actual impact on the estimates rarely has been known at the time of publication. This practice led us to question whether the situations that were being highlighted actually had the anticipated impact on DAWN estimates.

We analyzed some specific situations highlighted in recent DAWN publications to determine if those situations had the anticipated effect on DAWN estimates. These analyses have shown that generally, the types of situations published previously as limitations did not have the anticipated effects. Changes in small hospitals do not have a large impact on the estimates, and the DAWN estimation system already corrects for many nonsampling errors. Extensive

quality control measures have been implemented to investigate and address irregularities in the data prior to publication.

As a result of this analysis, we have concluded that listing inconsequential, nonsampling errors discredits the DAWN system unnecessarily and possibly contributes to misinterpretation of DAWN data. Therefore, we have decided to discontinue reporting data limitations unless the impact on the estimates is clear.

NOTEWORTHY SOURCES OF ERROR, JANUARY – JUNE 2001: ATLANTA

Estimates for Atlanta could not be produced for January – June of 2001 because insufficient data were submitted by participating facilities for this period. Therefore, in the tables presented in this publication and those published online, estimates for Atlanta are marked with "---" for this time period.

The national estimates from DAWN also depend on data from the metropolitan areas. The national estimates are actually calculated by summing the estimates for each of the 21 metropolitan areas and the estimate for the National Panel. To preserve the integrity of the national estimate, given that absence of estimates for Atlanta, we explored 2 options. The first option would involve adjusting the weights that would be applied to the limited data submitted for Atlanta for the first half of 2001. This option would make use of the existing mechanism for adjusting the weights for nonresponse. The second option was to impute the Atlanta contribution to the national estimates. Imputation refers to the assignment of values to replace missing data and typically involves standard statistical methods and practices. Upon evaluation of these options, we concluded that imputation would yield more defensible national estimates, particularly for individual drugs. Therefore, to calculate the Atlanta contribution to preliminary January – June 2001 national estimates, we combined (1) data that were submitted by Atlanta hospitals for the first half of 2001 with (2) data for the first half of 2000 from eligible Atlanta facilities that submitted insufficient data during the first half of 2001. In essence, we imputed the missing data for Atlanta for 2001 using data actually submitted by Atlanta hospitals in 2000. This is a conservative approach, which would tend to yield national estimates biased toward no statistically significant differences.

The imputation of missing data from Atlanta is also a temporary approach, necessary to produce this publication in a timely manner. We expect to receive enough missing data from participating facilities in Atlanta to produce Atlanta estimates for both halves of 2001 in time to produce the next issue of *ED Trends*. At that time, we will produce and report estimates using data from Atlanta for each half of 2001, and we will recalculate and incorporate the Atlanta contribution to the national estimates.

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APPENDIX F: GLOSSARY OF TERMS

This glossary defines terms used by the Drug Abuse Warning Network (DAWN), in data collection activities, analyses and publications. DAWN collects data and publishes findings separately for emergency departments (EDs) and death investigation jurisdictions. As a result, there are a number of terms that are unique to each component of DAWN.

This Appendix is divided into three sections. The first section contains terms common to both the ED component and the mortality data component of DAWN. The second section focuses on terms specific to the DAWN ED system, while the third section focuses on terms specific to the mortality data system.

DEFINITIONS OF TERMS COMMON TO DAWN'S ED AND MORTALITY COMPONENTS

Drug abuse: The nonmedical use of a substance for any of the following reasons: psychic effect, dependence, or suicide attempt/gesture. In DAWN, nonmedical use means:

- the use of prescription drugs in a manner inconsistent with accepted medical practice;
- the use of over-the-counter drugs contrary to approved labeling; or
- the use of any substance (e.g., heroin, marijuana, peyote, glue, aerosols) for psychic effect, dependence, or suicide.

Drug category: A generic grouping of substances reported to DAWN, based on the classification of generic drugs by 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. The DAWN system has accumulated a vocabulary of thousands of substance names that have been mentioned in incidents of abuse. This vocabulary is updated monthly by the inclusion of new abuse substances and, through receipt of identifying information, the reclassification of drugs. Occasionally, this reclassification may result in a drug being shifted to a different drug grouping. The DAWN drug groupings are periodically reviewed in order to reflect the most recent changes in pharmaceutical classifications and drug legislation. Occasional changes in drug classification should be taken into consideration when comparing drug data from this publication with other DAWN publications. These classifications may involve street names and brand names, which are sometimes used to identify a substance and its generic drug group. Individual drugs comprising the most commonly reported drug categories can be found in Tables 2.3 to 2.7 of *Emergency Department Trends from DAWN.*

Additional clarification is provided for the following drug categories:

- *Alcohol-in-combination* – DAWN does not gather data on alcohol used alone, only alcohol used concomitantly with another abused substance. Therefore, all alcohol mentions are combination mentions.

- *Club drugs* – During the 1990s, use of certain illicit drugs was linked to "raves" and dance clubs. These substances are commonly referred to as "club drugs." When used in DAWN, the term "club drugs" includes Ketamine, flunitrazepam (Rohypnol), gamma-hydroxy butyrate (GHB, or its precursor, gamma butyrolactone [GBL]), and methylenedioxymethamphetamine (MDMA or Ecstasy). Although commonly used in the rave scene, methamphetamine and hallucinogens are classified separately from club drugs in DAWN.

- *Drug unknown* – "Drug unknown" may be recorded when drug abuse was known or suspected to have been involved, but the specific substance could not be determined.

- *Heroin* and *Heroin/morphine* – This is the only drug classified differently in the ED and mortality components of DAWN. In the ED publications, heroin is classified as a major substance of abuse, separate from morphine, which is classified as a narcotic analgesic under central nervous system (CNS) agents. In the mortality data publications, heroin and morphine are classified together in a single category. When heroin is ingested, it is metabolized to morphine, so that the toxicology testing commonly used in death investigations often does not distinguish between the two. Therefore, a mention of either substance is recorded as heroin/morphine. A case mentioning both heroin and morphine will be "de-duplicated" and counted as a single heroin/morphine mention.

- *Inhalants* – This category includes anesthetic gases and psychoactive nonpharmaceutical substances for which the documented route of administration was inhaled, sniffed, or snorted. Psychoactive nonpharmaceuticals 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.

- *Major Substances of Abuse* – We use this term to refer to the most commonly abused drugs (e.g., alcohol-in-combination and cocaine) and those drugs that are typically referred to as "illicit."

- *Other Substances of Abuse* – We use this term to refer to pharmaceutical agents not included in the Major Substances of Abuse.

Drug mention – This refers to a substance that was recorded ("mentioned") in a DAWN case report. In addition to alcohol-in-combination, up to 4 substances ("mentions") can be reported for each ED episode, and up to 6 substances can be reported for each drug abuse death. Therefore, the total number of drug mentions exceeds the total number of ED visits or deaths. Even when only one drug is mentioned, it should not be assumed that the substance was the sole and direct cause of the episode or death; allowances should be made for reportable drugs not mentioned or other contributory factors. (See also ***Single-drug episode/death***.)

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 redesigned 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. Metropolitan areas represented in the DAWN mortality data system are consistent with those represented in the DAWN emergency department system, also with a few exceptions. Users of DAWN should note that the emergency department component provides estimates for each of the 21 metropolitan areas. However, in the mortality data component, only raw counts are provided, and in many instances less than 100% of the MSA is represented in those counts.

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 and death investigation case files).

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

Race/ethnicity: Beginning in January 2000, the race and ethnicity categories collected on DAWN case report forms changed to match a change in the standard protocol issued by the Office of Management and Budget in 1997.[31] The new 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 2 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:

Race

- *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.
- *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.
- *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.

[31] 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.

- *Native Hawaiian or Other Pacific Islander* – A person having origins in any of the original peoples of Hawaii, Guam, Samoa, or other Pacific Islands.

- *Unknown* – Used when documentation of race is not available from source records.

Ethnicity

- *Hispanic or Latino* – A person of Cuban, Mexican, Puerto Rican, South or Central American, or other Spanish culture or origin, regardless of race.

- *Not Hispanic or Latino* – Ethnicity does not meet the definition of Hispanic or Latino.

- *Unknown* – Used when documentation of ethnicity is not available from source records.

Despite the increased detail allowed by the new 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 is placed in the category Hispanic, regardless of race.

- *Race/ethnicity not tabulated above (NTA)* – This includes those categories that are too small to report independently including: two 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.

In *Mortality Data from DAWN*, race/ethnicity data are tabulated as White, Black, Hispanic, and All others, where "All others" includes other reported races and ethnicities as well as unknown or missing data.

Route of drug administration: DAWN reporters are asked to record the method by which the substance was taken into the drug abuser's body according to the following categories:

- *Oral* – Substance was ingested through the mouth (swallowed).

- *Injection* – Substance entered the body through a vein (intravenously), into the muscle (intramuscularly), or under the skin (subcutaneously).

- *Inhaled* – Gases or fumes of a substance were taken into the body by inhaling through the nose or mouth into the lungs (e.g., inhaling the fumes of glue, aerosols, paints, gasoline).

- *Smoked (includes freebase)* – Substance was consumed by smoking a cigarette, pipe, or similar device.

- *Sniffed/snorted* – Substance, acquired in a powder or crystalline form, was forcefully inhaled through the nose.

- *Other* – This category is used when the route of administration of the substance cannot logically be included as any of the above.

Readers should note that this information is often not documented in patient/decedent files and is therefore missing in DAWN tabulations. Caution should therefore be exercised in interpreting this information.

Single-drug episode/death: A single-drug episode or death is that in which only one drug was involved. Because multiple substances may be recorded for each DAWN case (see ***Drug mention***), readers should exercise caution in interpreting the relationship between a given drug and the number of associated ED visits or deaths. For example, if records for a given patient "mentioned" marijuana, 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, because alcohol is only documented if used in combination with another drug, DAWN cannot provide single-drug episode/death totals for alcohol.

DEFINITIONS OF TERMS FOR THE DAWN ED COMPONENT

Coterminous U.S.: The contiguous 48 continental States and Washington, DC. Excludes Alaska and Hawaii. National estimates from DAWN refer only to the coterminous U.S.

Disposition of ED patient: Suggestions or recommendations made or actions taken by the hospital as they relate to the patient's presenting problem:

- *Treated and released or referred* – The patient was given appropriate ED treatment and was released or, after appropriate ED treatment, the hospital referred the patient to another agency or to a private physician for additional services.

- *Admitted to hospital* – The patient was admitted as an inpatient to a hospital.

- *Left against medical advice* – The patient left the treatment setting without a physician's approval.

- *Died* – The patient expired.

Drug abuse episode: A reported ED visit that involved drug abuse. Episodes involving patients under the age of 6 or over the age of 97 are not reported to the DAWN system. The number of ED patients in DAWN is not synonymous with the number of patients

involved. One patient may make repeated visits to an ED or to several EDs, thus producing a number of episodes. It is impossible to determine the number of unique patients involved in the reported ED episodes because no patient identifiers are collected.

Drug concomitance: This term refers to whether a drug abuse episode involved a single drug (one mention) or multiple drugs (multiple mentions).

Drug use motive: DAWN classifies ED drug abuse episodes according to one or more of the following reasons for taking a substance(s):

- *Psychic effects* - A conscious action to use drugs to improve or enhance any physical, emotional, or social situation or condition. Two categories of psychic effect are:
  - Use of drugs for experimentation or to enhance a social situation (e.g., curiosity, peer pressure, "just wanted to know what it felt like," "wanted to have fun," "to get high," "for kicks," "to party"); and
  - Use of drugs to improve or enhance any mental, emotional, or physical state (e.g., depression, anxiety, to relieve headache, reduce pain, stay awake, lose weight, relax, help study, get to sleep). Referred to in DAWN as "other psychic effects."
- *Dependence* – A physiological or psychological condition characterized by a compulsion to take the drug on a continuous or periodic basis in order to experience its effects or to avoid the discomfort of its absence (e.g., had to take, had to have, needed a fix).
- *Suicide attempt or gesture* – Successful or unsuccessful action(s) taken for the purpose of self destruction or to gain attention.
- *Other reason* – Used when the reason for taking the substance cannot be classified into the categories above.

Estimate: A statistical estimate is the value of a parameter (such as the number of drug-related ED episodes) for the universe that is derived by applying sampling weights to data from a sample. DAWN produces representative statistical estimates for 21 metropolitan areas based on data from a sample of EDs in each of the 21 areas. An estimate for the coterminous U.S. is produced by summing estimates for the 21 metropolitan areas and an estimate for the National Panel.

Form in which drug was acquired: The form in which the substance was received by the user/abuser, not the form in which the substance was consumed. Categories are: tablet/capsule/pill, aerosol, liquid, powder/crystal, paper, pieces/chunks, injectable liquid, cigarette, plant material, unknown, and other. Readers should note that this information is often not documented in ED records and is therefore missing in DAWN tabluations. Caution should therefore be exercised in interpreting this information.

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 U.S. Specialty hospitals; hospital units of institutions; long-term care facilities; pediatric hospitals; hospitals operating part-time emergency

departments; hospitals in Alaska and Hawaii; and hospitals operated by the Veterans Health Administration and the Indian Health Service are excluded.

National Panel: This term is used to denote 2 concepts relative to DAWN ED data: (1) The universe of eligible hospitals outside the 21 DAWN metropolitan areas but within the coterminous U.S. and (2) The sample of hospitals in DAWN that were selected from this universe. The National Panel sample is weighted to produce estimates for the National Panel universe. (See also ***Metropolitan area***.)

p-value: The probability value is the actual probability associated with a statistical estimate; this is then compared with the significance level to determine whether that value is statistically significant. For a statistically significant result, the *p*-value must be less than or equal to the significance level. The traditional significance levels are *p* less than 0.001, 0.01, 0.05, and 0.10. A result with a *p*-value less than 0.05 is considered statistically significant in DAWN ED publications.

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 an RSE of 50 percent 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***.)

Rank: A rank indicates the relative frequency of a measure, such as mentions for a particular drug category. For example, a drug category ranked second indicates that it accounted for the second highest number of mentions among all drug categories. When 2 or more drugs receive equal numbers of mentions, they are assigned the same rank. A difference in rank should be considered only as indicative of a difference in frequency among drugs reported to DAWN, regardless of the size of the difference. Such differences are not necessarily meaningful or statistically significant.

Reason for present ED contact: The reason for the patient's visit to the ED, based on documentation provided in the medical record. Categories are:

- *Overdose/toxic ingestion* – Either intentional or accidental (e.g., effects of suicide attempt, coma). Anyone whose reason for contact is overdose is placed in this category, regardless of other reasons.
- *Unexpected reaction* – The drug's effect was different than anticipated, thus causing concern (e.g., bad trip, panic, hallucinations).
- *Withdrawal* – Symptoms which occur when a patient stops taking a substance upon which she/he is physiologically dependent and suffers physical symptoms, including abdominal pain, cold sweat, hyperactivity, and tremors that require treatment.
- *Chronic effects* – Secondary conditions resulting from habitual use or dependence, including malnutrition, tetanus, blood poisoning, and so forth.

- *Seeking detoxification* – Patients with identified problems with chronic substance abuse who seek admission to a detoxification program and receive treatment from emergency department staff. This category was added to the data collection form in 1987. Some hospitals require patients to be processed in the ED prior to admission for detoxification. Caution should therefore be exercised in interpretation of this category and the remaining information.

- *Accident/injury* – Injuries resulting from accidents that were caused by or related to drug abuse. This category was added to the data collection form in 1987.

- *Other* – Reasons which cannot be classified into one of the aforementioned categories.

Reason for taking substance: See ***Drug use motive***.

Relative standard error (RSE): A measure of the sampling variability or precision of an estimate defined as the estimate's standard error (SE) expressed as a percentage of the estimate's value. For example, an estimate of 2,000 cocaine mentions with an SE of 200 mentions has an RSE of 10 percent. (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 episodes at the responding hospitals selected for the sample.

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

Source of substance: The immediate source of the substance that the patient abused is coded as follows:

- *Patient's own legal prescription* – This is coded only when the abuser was legally prescribed the drug of abuse. If one patient obtains a drug by legal prescription and sells it to another who abuses it, the source to the abuser is marked "street buy." If the patient for whom the prescription was issued gives the drug to another patient who abuses it, the source to the abuse is "other unauthorized procurement."

- *Street buy* – The drug abuser purchased a drug and/or prescription from a source other than legitimate channels.

- *Other unauthorized procurement* – The drug was acquired in a manner not consistent with accepted medical care but was not bought on the street. This category includes drugs purchased using forged prescriptions, stolen, or received as a gift.

- *Other* – Used when the source of the substance cannot logically be included as any of the above. This category includes all over-the-counter medications.

- *Unknown* – Reported when information on source was unavailable.

Readers should note that this information is often not documented in ED records and is therefore missing in DAWN tabulations. Caution should therefore be exercised in interpreting this information.

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 cocaine mentions with an SE of 500 indicates that the SE is 500 mentions.

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 National Panel. 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 National Panel:			
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 the National Panel cells. See *Drug Abuse Warning Network Sample Design and Estimation Procedures: Technical Report*, November 1997.

Statistically significant: A difference between 2 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***.)

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 U.S. with EDs open 24 hours a day, 7 days a week. (See also ***Coterminous U.S.***).

DEFINITIONS OF TERMS FOR THE DAWN MORTALITY COMPONENT

Cause of death: Cases are reportable to DAWN if the death investigation concludes that the death was either directly or indirectly caused by drug abuse. If a death was directly caused by drug abuse (e.g., a drug overdose), DAWN refers to the death as ***drug-induced***. If drug abuse was a contributing factor in the death, but not the immediate or sole cause, then DAWN refers to the death as ***drug-related***. It is important to note that DAWN data include both types of deaths. It is also important to note that a drug-induced death may involve more than a single drug. (See ***Single-drug episode***.)

Certified death: Any case accepted and reviewed by a medical examiner or coroner, who uses information from the death investigation to complete the death certificate.

Consistent panel: DAWN does not impute missing data for jurisdictions that have not reported for all or part of a given year. Therefore, tables and charts showing trends in deaths over time are based on a ***consistent panel*** of reporting jurisdictions. A consistent panel includes those jurisdictions that have reported data for at least 10 months of each year reflected in the trend table/chart. The reason for a consistent panel is to ensure that apparent changes over time are not a result of gaps in reporting. Because participating jurisdictions may change from year to year, consistent panels used in published reports will also change from year to year. This means that trends published in one annual report are not necessarily comparable to trends published in subsequent annual reports.

Coroner: Death investigation jurisdictions typically use either a medical examiner system or a coroner system. Unlike medical examiners, coroners need not be physicians; usually the only prerequisite for serving as a coroner is that the individual be more than 18 years of age and a resident of the county or district to be served. Coroners are typically elected rather than appointed. They may have jurisdiction over counties or districts within states. (See also ***Jurisdiction*** and ***Medical examiner***.)

Drug combinations: Published tables from the DAWN mortality data refer to “drug combinations” rather than “drug concomitance” (the term used in the ED component). This term refers to multiple drug mentions for a single death, and tables show particular combinations of substances reported for deaths. Readers should note that DAWN cannot differentiate between drugs actually *used* in combination (simultaneously) and drugs used sequentially.

Drug-induced death: A death directly resulting from drug abuse or other substance abuse, such as drug overdoses or the interactive effects of drug combinations. When more than one drug is mentioned, it cannot be determined which or whether one drug was the sole and direct cause of the episode or death.

Drug-related death: A death in which the abuse of a drug is a contributing factor, but is not the sole cause of death. Such cases include drug abuse that exacerbates a pre-existing *physiological condition*; drug abuse in combination with an *external physical event* (e.g., a fall or automobile accident); or a *medical disorder* that was itself caused by drug abuse (e.g., hepatitis contracted through injection drug use). Drug-related deaths are classified into two types, *confirmed* and *presumed*. The drug-relatedness is "confirmed" if documentation in the decedent's file substantiates that conclusion. The drug-relatedness is "presumed" if the investigation suggests drug involvement, but the medical examiner/coroner has insufficient evidence to list drug abuse as a contributing cause on the death certificate. Both confirmed and presumed deaths are included in the published mortality data tables.

Jurisdiction: DAWN uses the term "jurisdiction" to mean the geographic area for which a medical examiner/coroner's office is responsible. In many states, there is a 1:1 correspondence between jurisdictions and counties. In some states, there are multiple medical examiner/coroner offices within a given county, or there may be multiple counties covered by a "district" that includes one or more medical examiners/coroners. A few states are organized as a single statewide jurisdiction.

Understanding jurisdictions is important because this assists readers in interpreting aggregated data. Published DAWN mortality data are aggregated into metropolitan areas, which often comprise multiple jurisdictions. In some states, there are different death investigation procedures for different jurisdictions (most notably, some jurisdictions have medical examiner systems, while others have coroner systems). There are nearly always some differences in death investigation procedures across states (and notably, some metropolitan areas include jurisdictions in multiple states). Readers should be mindful of these variations when interpreting or comparing data.

Information on death investigation practices and an updated list of jurisdictions throughout the U.S. and Canada are available from the Centers for Disease Control's Epidemiological Program Office at www.cdc.gov/epo/dphsi/mecisp/death_investigation.htm.

Manner of death: This variable is used to describe how the decedent died. It is applicable to both drug-induced and drug-related deaths. On the DAWN data collection form, manner of death is coded into the following categories:

- *Accidental/Unexpected* – Although the drug abuse was deliberate, the resulting death was unintended.
- *Suicide* – Death in which there is evidence that the decedent deliberately used drugs to bring about his/her demise.
- *Homicide* – Death in which the decedent's life was taken by another individual by means of drugs. These cases, which do not involve the intentional abuse of drugs by the decedent, are not currently included in published tabulations of DAWN mortality data.

- *Natural* – Death was due to natural causes such as a medical disorder or disease process, if drug abuse caused or worsened the decedent's condition.

- *Undetermined* – The manner of death cannot be determined from all available evidence.

In *Mortality Data from DAWN*, manner of death is collapsed into three categories: suicide, accidental/unexpected, and "All others." The "All others" category includes cases for which manner of death was recorded as natural, unknown, or undetermined, and cases for which manner of death was missing.

Medical Examiner (ME): Death investigation jurisdictions typically use either a medical examiner system or a coroner system. Most medical examiners are licensed physicians or forensic pathologists, and are generally appointed (rather than elected). They may have jurisdiction over a county, district, or entire state. (See also ***Coroner*** and ***Jurisdiction***.)

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APPENDIX G:
MULTUM LICENSE AGREEMENT

LEXICON LICENSE

Multum Lexicon[1]

End-User License Agreement

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APPENDIX H: DAWN EMERGENCY DEPARTMENT REPORT FORM

FORM NUMBER

XXXXXXX

(Sample Form Only)

DEPARTMENT OF HEALTH AND HUMAN SERVICES
PUBLIC HEALTH SERVICE

SUBSTANCE ABUSE AND MENTAL HEALTH SERVICES ADMINISTRATION

FORM APPROVED:
OMB NO. 0930-0078
Expires: 11/30/2002

DRUG ABUSE WARNING NETWORK (DAWN) EMERGENCY DEPARTMENT REPORT

(Sample Form Only)

1. PROVIDER NUMBER

2. CROSS REFERENCE *(Facility Use Only)*

PATIENT INFORMATION

3. DATE OF VISIT — Month / Day / Year

4. TIME OF VISIT — Hours / Minutes — *(Mark [X])* 1. ☐ am 2. ☐ pm 3. ☐ military

5. AGE — *(Must be 06-97 yrs.)*

6. SEX — 1 ☐ Male 2 ☐ Female

7a. ETHNICITY *(mark [x] one response)*
1 ☐ Hispanic or Latino
2 ☐ Not Hispanic or Latino
3 ☐ Unknown

7b. RACE *(mark [x] for all that apply)*
☐ White
☐ Black or African American
☐ American Indian or Alaska Native
☐ Asian
☐ Native Hawaiian or Other Pacific Islander
☐ Unknown

8. PATIENT'S HOME ZIP CODE

(Otherwise mark [X] one response)
1 ☐ Unknown 2 ☐ No Fixed Address *(See reverse side)*

9. REASON FOR TAKING SUBSTANCE(S) *(Mark [X] one response)*
1 ☐ Dependence
2 ☐ Suicide Attempt or Gesture
3 ☐ Psychic Effects: "Recreational Use" *(e.g., to get high, kicks)*
4 ☐ Other Psychic Effects *(See reverse side)*
5 ☐ Unknown
6 ☐ Other *(Specify)* _____

10. REASON FOR PRESENT CONTACT
A. Was This an Overdose/Toxic Ingestion?
1 ☐ Yes ☐ No
B. If "No," mark one response
2 ☐ Unexpected Reaction
3 ☐ Chronic Effects *(See reverse side)*
4 ☐ Withdrawal
5 ☐ Seeking Detoxification
6 ☐ Accident/Injury
7 ☐ Unknown
8 ☐ Non-toxic Ingestion/Other
(Specify) _____ *(See reverse side)*

11. DISPOSITION FROM EMERGENCY DEPARTMENT
1 ☐ Treated and Released or Referred
2 ☐ Admitted as Inpatient to This or Any Hospital
3 ☐ Left Against Medical Advice
4 ☐ Died

DRUG/SUBSTANCE INFORMATION

12. ALCOHOL INVOLVED *(Mark [X] one response)*
1 ☐ Yes 2 ☐ No 3 ☐ Unknown

13. LIST EACH DRUG/SUBSTANCE SEPARATELY *(Generic, Trade, or Street Name)* IN ONE OF THE SPACES BELOW **(Do NOT list alcohol)**

SAMHSA USE ONLY

Mark [x] if confirmed by toxicology tests

1 _____ ☐
2 _____ ☐
3 _____ ☐
4 _____ ☐

*For each non-alcohol substance listed above, mark [X] **one** response in each data item below.*

14. FORM IN WHICH DRUG WAS ACQUIRED		SUBSTANCES 1	2	3	4
Tablet/Capsule/Pill	01				
Aerosol	02				
Liquid *(oral)*	03				
Powder/Crystal	04				
Paper *(e.g., LSD/Acid)*	05				
Pieces/Chunks *(e.g., Crack)*	06				
Injectable Liquid	07				
Cigarette	08				
Plant Material	09				
Unknown	10				
Other	11				

15. ROUTE OF ADMINISTRATION		SUBSTANCES 1	2	3	4
Oral	1				
Injection	2				
Inhaled *(e.g., fumes)*	3				
Smoked *(Includes Freebase)*	4				
Sniffed, Snorted	5				
Unknown	6				
Other	7				

16. SOURCE OF SUBSTANCE		SUBSTANCES 1	2	3	4
Patient's Own Legal R_x	1				
Street Buy	2				
Other Unauthorized Procurement *(e.g., stolen, gift, etc.)*	3				
Unknown	4				
Other (Includes Over-The-Counter [OTC])	5				

17. CODED REMARKS
(If case involves an IV drug user with HIV+/AIDS, please write "HIV+" or "AIDS" in the first four spaces below.)

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(Sample Form Only)

SELECTED REPORTING GUIDELINES AND INSTRUCTIONS DRUG ABUSE WARNING NETWORK (DAWN) EMERGENCY DEPARTMENT REPORT

I. General

The following abbreviated guidelines and instructions highlight critical reporting items. Please refer to the detailed instructions found in the Instruction Manual for Emergency Departments for further information.

II. Reporting Guidelines

Report data on all patients seen in the emergency department for problems induced by or related to drug abuse. For DAWN, drug abuse is defined as the use of any illegal drug or the nonmediacal use of a legal drug where the reason for taking the substance was for: psychic effects, dependence, or suicide attempt or gesture.

Detailed discussion of the "nonmedical" use definition and other case selection criteria can be found in Chapter II, Case Identification Guidelines, of the Instruction Manual for Emergency Departments.

III. Abbreviated Instructions for Completing Selected Items

Data Item #8 - Patient's Home Zip Code

Use *"no fixed address"* for the homeless (even if staying at a shelter) and for prisoners brought into the hospital.

Data Item #9 - Reason for Taking Substance(s)

The response categories are: Dependence, Suicide Attempt or Gesture, Psychic Effects: "Recreational Use," Other Psychic Effects, Unknown, and Other (Specify). The definitions are as follows:

1. *Dependence* - A physiological or psychological condition characterized by a compulsion to take the drug on a continuous or periodic basis in order to experience its effects or to avoid the discomfort of its absence (i.e., to avoid withdrawal).

2. *Suicide Attempt or Gesture* - Successful or unsuccessful action(s) taken for the purpose of self-destruction or to gain attention.

3. *Psychic Effects: "Recreational Use"* - Use of drug(s) for experimentation or to enhance social situations or conditions. Examples of common patient responses are: "just wanted to know what it felt like," "wanted to have fun," or "to get high."

4. *Other Psychic Effects* - Use of drug(s) to improve or enhance, any mental, emotional, or physical state. Examples of common patient responses concerning this self-applied medication are: "needed to relax," "wasn't feeling well," "to stay awake," "depression," "anxiety," "lose weight," "fight with a boyfriend/mate."

5. *Unknown* - Should be used only if information is unobtainable or unavailable.

6. *Other* (Specify) - Should be used only when the Reason for Taking the Substance cannot be classified into the categories above. Write the appropriate reason in the space provided.

Data Item #10 - Reason for Present Contact

This data item has two parts, A and B. Part A requires a selection of "YES" or "NO" to indicate whether the case is an Overdose / Toxic Ingestion. If the response to part A is "NO," part B requires a response.

3. *Chronic Effects* - Includes Hepatitis, Abscess, Cellulitis, Tremors, and AIDS contracted by IV drug abuse (see manual for additional examples).

8. *Non-Toxic Ingestion / Other* (Specify) - Should be used only when Reason for Present Contact cannot be classified into the categories above. (For example, police bring patient in for toxicological testing related to commission of a crime or parents force a child to come in to be checked because of strange behavior.) If Other, write reason in space provided.

Data Item #17 - Coded Remarks

Please be certain to write "HIV+" or "AIDS" in the first four blocks if the patient is a confirmed IV drug user.

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APPENDIX I:
INDEX LINKING BRAND AND GENERIC DRUG NAMES

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