

## Drug Abuse Warning Network

The Drug Abuse Warning Network (DAWN) provides information on the medical consequences of substance abuse that manifest in visits to hospital emergency departments (EDs). DAWN records substances associated with drug abuse-related ED visits; provides a means for monitoring drug abuse patterns, trends, and the emergence of new substances; assesses some of the morbidity associated with drug abuse; and generates information for national, State, and local drug abuse policy and program planning. DAWN is the responsibility of the Office of Applied Studies, Substance Abuse and Mental Health Services Administration (SAMHSA).

The DAWN ED component relies on a probability sample of non-Federal, short-stay, general hospitals that operate 24-hour emergency departments. The sample is selected to represent all such hospitals in the coterminous United States. Hospitals are oversampled in 21 Metropolitan Statistical Areas; a supplemental sample (called the "National Panel") is selected from hospitals lying outside of these 21 areas. The National Panel has no other sub-national geographic reference; its only role is to contribute to the national estimates. National estimates for the coterminous U.S. are produced by combining estimates from the 21 metropolitan areas with estimates from the National Panel.

In 2002, the DAWN sample included 549 eligible hospitals, with 437 (80%) responding. These hospitals accounted for 15.7 million emergency department visits and submitted 189,616 cases meeting DAWN reporting criteria. Extrapolating from the sample to the coterminous U.S., DAWN estimated a total of 670,307 drug abuse-related emergency department visits during 2002, out of a total of 102.8 million visits overall. While persons treated in emergency departments for conditions associated with drug abuse may represent a small fraction of drug users, they still represent an important slice of drug abuse-related morbidity.

For a case to be reported to DAWN, the patient must be between the ages of 6 and 97 and meet the following criteria:

- (1) The patient was treated in the hospital's emergency department;
- (2) The presenting problem(s) was induced by or related to drug use;
- (3) The case involves the nonmedical use of a legal drug or use of an illegal drug; and
- (4) The patient's reason for taking the substance(s) was dependence; suicide attempt or gesture; or psychic effects.

Each hospital emergency department that participates in DAWN has a reporter who reviews emergency department records to identify DAWN cases. For each reportable case, the DAWN reporter records and submits demographic and substance abuse data items. As many as 4 drugs plus alcohol-in-combination may be reported for each DAWN case. Alcohol is reportable only when present with another reportable drug. The unit of measurement for individual drugs is the "mention," which is an instance of a drug being reported ("mentioned") in a DAWN case report. On average, there are 1.8 drug mentions per drug abuse visit.

Drugs are captured at the level of detail present in the medical record; the same drug may be reported to DAWN by brand, generic, chemical, street, or nonspecific name. Brand-level estimates are not published. Nonetheless, DAWN captures more detailed drug information than

any other major substance data collection system. Because of the probability sample of hospitals, DAWN is able to produce both national and metropolitan area estimates of drug abuse-related ED visits, including long-term trends. The Food and Drug Administration, other Federal agencies, and pharmaceutical companies use information from DAWN to monitor the abuse potential of prescription and over-the-counter drugs.

Data for DAWN are extracted from retrospective reviews of medical records; no patients of health care providers are interviewed. Health care settings within the hospital but outside of the emergency department, and emergency facilities outside of hospitals, are not covered. Findings from laboratory tests to detect the presence of a drug are not recorded for DAWN cases. Alcohol-related emergencies are not included unless another reportable drug is also involved. Cases are not reportable unless a person's own drug abuse contributed to the emergency visit. Cases are not reportable if the patient's intent to abuse the drug is not demonstrated in the record. Repeat visits by the same individual cannot be linked together. Chronic conditions associated with drug abuse or a history of drug abuse is reportable along with acute cases.

DAWN does not measure the prevalence of drug abuse in the population, and many external factors unrelated to the level of drug abuse in the population may contribute to the likelihood that a person presents to an ED for a problem associated with drug abuse. The availability of health insurance and/or other sources of care may influence whether an individual seeks care in an emergency department. Documentation of drug abuse in medical records may be inhibited by insurance reimbursement practices. Purity, experience, or other factors altering the physiological effects of drugs may affect whether a drug user needs to seek care in an emergency department.

DAWN also collects data on drug abuse-related deaths reviewed by medical examiners and coroners (ME/Cs). The death investigation jurisdictions that participate in DAWN do not constitute a representative sample nor is every jurisdiction within a metropolitan area necessarily a participant. As a result, extrapolation of drug-related deaths to the Nation as a whole is not possible, and metropolitan area totals are only possible when all jurisdictions within the area participate. The number of jurisdictions that participate in DAWN varies somewhat from year to year. In 2001, the last year for which mortality data are currently available, 128 jurisdictions in 42 metropolitan areas participated. The case criteria and data collection procedures in ME/C facilities mirror those used in emergency departments.

### **Opiates/Opioids in ED Visits Related to Drug Abuse**

By 2002, mentions of narcotic analgesics/combinations in drug abuse-related visits to EDs were as frequent as mentions of heroin or marijuana, but ranked below cocaine and alcohol. In 2002, the most frequent narcotic analgesics and narcotic analgesic combinations were those reported without a specific ingredient being named. More than one-third (42,214 mentions, 35%) of narcotic analgesic mentions in drug abuse-related emergency department visits were unnamed as to ingredient (see Table 1). Most of such mentions (96% in 2002) were reported to DAWN as "opiates" or "opioid," which could indicate the presence of a prescription opiate or heroin.

The unnamed opiates/opioids were followed in frequency by mentions of narcotic analgesics and combinations containing hydrocodone (25,197, 21% of all mentions of narcotic analgesics/combinations), oxycodone (22,397, 19%), and methadone (11,709, 10%).

The long-term trends are consistent for the unnamed opiates and for those containing hydrocodone, oxycodone, and methadone. Mentions for each of these have risen substantially from 1994 to 2002: ED mentions of unnamed opiates/opioids rose 408 percent, hydrocodone/combinations 170 percent, oxycodone/combinations 450 percent, and methadone 260 percent. In terms of recent increases, ED mentions of oxycodone/combinations doubled from 2000 to 2002, while mentions of unnamed opiates/opioids rose 63 percent, methadone 50 percent, and hydrocodone/combinations 25 percent.

In contrast, ED mentions of heroin rose 48 percent from 1994 to 2002. ED mentions of heroin have been stable since 2000, following a significant increase (15%) that occurred from 1999 to 2000.

The less frequent narcotic analgesics reveal different patterns. Mentions of morphine/combinations more than doubled from 1994 to 2002 (from 1,099 to 2,775) but have been stable since 2000. Fentanyl/combinations rose to 1,506 ED mentions in 2002. Although still relatively infrequent, this is remarkable because its mentions doubled in a single year (from 710 mentions in 2001). ED mentions of hydromorphone are infrequent and no distinct trend has been observed. For both fentanyl and hydromorphone, the estimates have been too imprecise for publication in several years, with relative standard errors (RSEs) exceeding 50 percent.

Two confounding factors affect the interpretation of these DAWN estimates for narcotic analgesics.

First, the frequent DAWN case reports of “opiates” may have as their source toxicology findings that are positive for “opiates,” which could point to any of a number of prescription opiates or heroin. For this reason, we cannot attribute to any particular drug the findings associated with unnamed opiates or opioids nor can we assume that the prescription opiates/opioids and heroin are necessarily represented proportionately in the unnamed category.

Second, variability in source documentation also may affect the findings for the narcotic analgesics with named ingredients. For example, narcotic analgesics containing hydrocodone are usually reported to DAWN as acetaminophen-hydrocodone, but if the secondary ingredients (e.g., acetaminophen, aspirin, or ibuprofen) were undocumented in source records, they also would be unavailable for reporting to DAWN. Therefore, mentions reported as hydrocodone alone might also include any of the hydrocodone combinations. Similarly, mentions attributed to oxycodone might include undocumented acetaminophen- or aspirin-oxycodone combinations as well as single-ingredient formulations. Since DAWN receives drug reports by brand, generic, chemical, street, and non-specific names, attribution of findings to particular brands or formulations of drugs can be difficult.

Keeping these caveats in mind, we shall explore trends in ED drug mentions for immediate-release and sustained-release formulations of oxycodone, fentanyl, and morphine, to the extent that these distinctions can be supported with DAWN data. ED mentions of hydromorphone, hydrocodone, and unnamed opiates/opioids will be included for comparison.

## **DAWN Redesigned**

A new data collection protocol was introduced for DAWN in 2003. The new design addresses many longstanding limitations associated with DAWN data. Although the new design affects none of the estimates from 1994 through 2002, specific aspects of it may be of interest for context.

The narrow definition of a DAWN-reportable case, which was based on a patient's intent in taking a drug, has been eliminated. Beginning in 2003, reportable cases include any emergency department visit caused by or related to drug use for patients of any age. The drug use must be recent; chronic effects and history of drug abuse are no longer reportable. A data item has been added to parse out 8 different case types: suicide attempts, those seeking detox, underage alcohol use (with no other drug involved), adverse reactions to legal drugs taken as prescribed or directed, overmedication, malicious poisonings, accidental ingestions, and all others, including explicit drug abuse. Data items have been added to characterize drug-related morbidity in terms of presenting complaints, diagnoses, and disposition. An indicator associated with each drug captures whether the drug was confirmed by toxicology testing. In addition, new rules prompt DAWN reporters to use all available documentation in the medical chart to record drugs by their most specific names (e.g., OxyContin, when documented as such, instead of oxycodone), not to record the same drug by different names (e.g., heroin and opiates), and to exclude current medications unrelated to the visit. These changes, so essential to improving the information generated by DAWN, are also so fundamental that there will be no continuity of trends into 2003.

**Table 1. Opiates/Opioids: Estimates of ED Mentions for the Coterminous U.S. by Year**

Drug category and selected drugs <sup>1</sup>	1994	1995	1996	1997	1998	1999	2000	2001	2002	% change <sup>2</sup> 1994, 2002	% change <sup>2</sup> 2001, 2002
<b>Total Drug Abuse-related ED Visits.....</b>	518,592	513,429	513,841	526,671	542,250	554,570	601,392	638,345	670,307	29.3	
<b>Total ED Drug Mentions.....</b>	899,180	899,977	906,078	941,627	981,286	1,013,688	1,098,915	1,165,148	1,209,938	34.6	
<b>Total ED Visits (any reason).....</b>	89,696,517	88,548,056	91,189,270	89,719,807	89,682,719	91,099,635	96,163,379	100,517,664	102,809,601	14.6	2.3
Heroin.....	63,158	69,556	72,980	70,712	75,688	82,192	94,804	93,064	93,519	48.1	
All other opiates/opioids.....	44,518	45,254	46,941	54,116	58,946	69,011	82,373	99,317	119,185	167.7	20.0
Opiates/opioids, unspecified.....	8,307	9,562	11,855	15,893	18,496	25,949	25,946	32,207	42,214	408.2	31.1
Narcotic analgesics.....	36,210	35,086	35,086	38,223	40,450	43,061	56,427	67,109	76,971	112.6	14.7
Fentanyl/combinations.....	28	22	34	203	286	337	576	710	1,506	5,278.6	112.1
Hydrocodone/combinations.....	9,320	9,686	11,419	11,570	13,611	15,252	20,098	21,567	25,197	170.4	16.8
Hydromorphone.....	1,887	569	609	604	937	1,313					
Methadone.....	3,252	4,247	4,129	3,832	4,810	5,426	7,819	10,725	11,709	260.1	
Morphine/combinations.....	1,099	1,283	864	1,300	1,955	2,217	2,483	3,403	2,775	152.5	
Oxycodone/combinations.....	4,069	3,393	3,190	5,012	5,211	6,429	10,825	18,409	22,397	450.4	
<b>Relative Standard Errors (RSEs)<sup>3</sup></b>											
<b>Drug category and selected drugs<sup>1</sup></b>	<b>1994</b>	<b>1995</b>	<b>1996</b>	<b>1997</b>	<b>1998</b>	<b>1999</b>	<b>2000</b>	<b>2001</b>	<b>2002</b>	<b>p-value</b> 1994, 2002	<b>p-value</b> 2001, 2002
<b>Total Drug Abuse-related ED Visits.....</b>	5.4	5.1	4.5	5.5	5.6	7.3	6.6	7.0	7.6	0.001	0.121
<b>Total ED Drug Mentions.....</b>	5.5	5.2	4.7	6.1	6.0	7.7	6.6	7.3	7.2	0.000	0.203
<b>Total ED Visits (any reason).....</b>	0.8	0.6	0.5	0.5	0.4	0.4	0.4	0.4	0.7	0.000	0.000
Heroin.....	8.9	9.3	7.4	9.1	9.9	13.8	15.7	12.7	10.3	0.001	0.947
All other opiates/opioids.....	8.9	7.4	8.0	7.3	7.4	9.7	10.9	11.5	11.3	0.000	0.001
Opiates/opioids, unspecified.....	15.1	13.1	12.1	10.7	12.1	15.8	14.1	15.0	15.9	0.000	0.004
Narcotic analgesics.....	8.9	7.5	8.8	8.9	9.2	10.8	14.0	15.1	15.1	0.000	0.038
Fentanyl/combinations.....	20.4	24.7	14.6	45.8	38.8	48.7	34.3	35.1	31.3	0.002	0.032
Hydrocodone/combinations.....	15.2	14.5	16.3	14.1	14.2	14.2	16.7	17.2	16.9	0.000	0.025
Hydromorphone.....	37.4	25.2	28.1	39.2	41.7	37.3	50.4	58.3	71.6	0.355	0.442
Methadone.....	12.3	15.4	11.8	12.0	10.8	14.3	15.8	17.9	14.7	0.000	0.323
Morphine/combinations.....	32.5	19.8	21.0	19.8	22.1	17.8	18.0	20.7	19.7	0.009	0.340
Oxycodone/combinations.....	16.3	15.1	15.5	16.4	16.0	17.3	28.0	21.0	21.4	0.000	0.152

<sup>1</sup> This classification of drugs is derived from the Multum Lexicon, Copyright © 2002, Multum Information Services, Inc. The classification has been modified to meet DAWN's unique requirements (2002). The Multum Licensing Agreement governing use of the Lexicon is provided in an appendix to this report and can be found on the Internet at <http://www.multum.com/>.

<sup>2</sup> This column denotes statistically significant ( $p < 0.05$ ) increases and decreases between estimates for the periods noted.

<sup>3</sup> The relative standard error (RSE) is the standard error of the estimate expressed as a percentage of the estimate's value.

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. Dots (...) indicate that an estimate with an RSE greater than 50% has been suppressed. Shaded cells contain estimates with RSEs greater than 30%.

SOURCE: Office of Applied Studies, SAMHSA, Drug Abuse Warning Network, 2002 (03/2003 update).



## Treatment Episode Data Set

The Treatment Episode Data Set (TEDS) provides information on the demographic characteristics and substance abuse problems of clients admitted to treatment for abuse of alcohol and drugs in the United States. The information in TEDS is compiled from State administrative systems and is collected by the States from those treatment facilities that they monitor or fund. TEDS records represent admissions rather than individuals, as a person may be admitted to treatment more than once. Approximately 1.7 million admissions records are submitted to TEDS each year. TEDS is maintained by the Office of Applied Studies, Substance Abuse and Mental Health Services Administration (SAMHSA).

While TEDS does not represent the total national demand for substance abuse treatment, it does comprise a significant proportion (an estimated 80 percent) of all admissions to substance abuse treatment, and includes those admissions that are subsidized by public funds. Differences in State systems of licensure, certification, accreditation, and disbursement of public funds affect the scope of facilities included in TEDS. Treatment facilities that are operated by private for-profit agencies, hospitals, and the State correctional system, if not licensed through the State substance abuse agency, may be excluded from TEDS. TEDS does not include data on facilities operated by Federal agencies (the Bureau of Prisons, the Department of Defense, and the Veterans Administration).

TEDS data on treatment admissions include:

- demographic information
- primary secondary and tertiary substances of abuse, their route of administration, frequency of use, and age at first use
- source of referral to treatment
- number of prior treatment episodes
- service type, including planned use of methadone

Among the substances of abuse collected in TEDS are opiates. This category is further broken down into three subcategories: heroin, non-prescription methadone, and other opiates/synthetics. "Other opiates" is comprised almost entirely of narcotic analgesics. While admissions involving use of "other opiates" represent a very small proportion of total TEDS admissions (1.5% in 2000), in the past decade, there has been a dramatic increase in the admissions for drugs in this category. Most of this growth has occurred since 1997. From 1992-2000, total admissions increased 15%, heroin admissions increased 62% and other opiate admissions increased 88%. Preliminary data for 2001 indicate an even steeper rise in admissions for "other opiates" between 2000 and 2001.

	1992		1997		2000	
	N	%	N	%	N	%
Total admissions	1,527,930	100.0	1,607,957	100.0	1,754,274	100.0
Heroin admissions	168,321	11.0	221,520	14.6	243,523	15.5
Other opiates	12,357	0.8	15,065	0.9	26,467	1.5

Admissions for “other opiates” are primarily white and growing faster among whites than among other racial/ethnic groups. The rate of increase is the same for both males and females. Increases are greatest among the youngest age groups, especially 15-19 years and 20-24 years.

TEDS is an exceptionally large and powerful data set. Like all data sets, however, care must be taken that interpretation does not extend beyond the limitations of the data. Limitations fall into two broad categories: those related to the scope of the data collection system, and those related to the difficulties of aggregating data from the highly diverse State data collection systems. Limitations to be kept in mind while analyzing TEDS data include:

- TEDS is an admission-based system, and TEDS admissions do not represent individuals. An individual admitted to treatment twice within a calendar year would be counted as two admissions. Most States cannot, for reasons of confidentiality, identify clients with a unique ID assigned at the State level. Consequently TEDS is unable to follow individual clients through a sequence of treatment episodes.
- TEDS attempts to enumerate treatment episodes by distinguishing the initial admission of a client from his/her subsequent transfer to a different service type (for example, from residential treatment to outpatient) within a single continuous treatment episode. However, States differ greatly in their ability to identify transfers; some can distinguish transfers within providers but not across providers. Some admission records may in fact represent transfers, and therefore the number of admissions reported probably overestimates the number of treatment episodes.
- The number and client mix of TEDS admissions does not represent the total national demand for substance abuse treatment, nor the prevalence of substance abuse in the general population.
- The primary, secondary, and tertiary substances of abuse reported to TEDS are those substances which led to the treatment episode, and not necessarily a complete enumeration of all drugs used at the time of admission.