

Drug Abuse Warning Network, 2007: Area Profiles of Drug-Related Mortality

**U.S. Department of Health and Human Services
Substance Abuse and Mental Health Services Administration
Office of Applied Studies**

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DAWN MORTALITY DATA

The Drug Abuse Warning Network (DAWN) is a public health surveillance system that monitors drug-related deaths referred to medical examiners and coroners (ME/Cs) in selected metropolitan areas and States. Findings in this publication reflect data on drug-related deaths that occurred during calendar year 2007 and were reported by participating ME/Cs to DAWN. In selected tables, data from reporting year 2006 are included for comparison. The Office of Applied Studies (OAS) of the Substance Abuse and Mental Health Services Administration (SAMHSA), U.S. Department of Health and Human Services, is responsible for DAWN.

The mortality component of DAWN does not rely on a statistical sample of ME/Cs. Findings cannot be considered representative of ME/Cs that did not participate, and results cannot be extrapolated to the United States as a whole. DAWN mortality data for 2003 and later are not comparable to mortality data for any years prior to 2003 because of changes introduced in the 2003 reporting year.

Drug-related deaths

Since 2003, a DAWN case is any death reviewed by an ME/C that was related to recent drug use. Findings in this publication pertain to drug-related deaths and drug-related suicide deaths reported by participating death investigation jurisdictions as DAWN cases.¹

DAWN cases are identified through a retrospective review of decedent case files in each participating death investigation jurisdiction. A DAWN case is any death that is determined by the ME/C as being related to drug use. The relationship between the death and the drug need not be causal; the drug need only be implicated in the death. The drug use may have been for legitimate, therapeutic purposes or for the purpose of drug abuse or misuse, but in either case, the drug use must have been recent.

These eligibility criteria for a DAWN case are intentionally broad and inclusive. Since death record documentation varies in clarity and comprehensiveness across jurisdictions, broad criteria reduce the potential for judgment calls that could cause data to vary systematically and unexpectedly across reporters and jurisdictions. Broad criteria also capture a diverse set of drug-related deaths that support a wide variety of analytical purposes and interests.

For decedents under the age of 21, DAWN cases include deaths where the only drug involved was alcohol. For those 21 or older, there must be at least one other drug involved besides alcohol for the death to be a DAWN case.

The data items submitted on drug-related deaths are listed in Appendix A.

¹ DAWN uses the terms "death investigation jurisdiction" (or, simply, "jurisdiction") and "county" interchangeably because ME/Cs' offices are typically organized by county. The one exception occurs in Niagara County, NY, which is divided into four districts. For reporting purposes, the four districts that make up Niagara County, NY, are treated collectively as a single jurisdiction.

Drugs

Drugs that make a death eligible for DAWN include:

- Illegal or illicit drugs, such as heroin, cocaine, marijuana, and Ecstasy;
- Prescription drugs, such as Prozac[®], Vicodin[®], OxyContin[®], alprazolam, and methylphenidate;
- Over-the-counter medications, including aspirin, acetaminophen, ibuprofen, and multi-ingredient cough and cold remedies;
- Dietary supplements, including vitamins, herbal remedies, and nutritional products;
- Psychoactive, nonpharmaceutical inhalants;²
- Alcohol in combination with other drugs; and
- For those under age 21, alcohol without any other drug.

Deaths included in this publication

Findings in this publication focus on two major categories of drug-related deaths, based on the manner of death as determined by the ME/C.

(1) **Drug-related deaths (other than drug-related suicide deaths)** include the following:

- **Natural or accidental deaths with drug involvement.** These two categories capture deaths involving medical use, nonmedical use, overuse, and misuse of prescription and over-the-counter medications and drug abuse.
- **Homicide by drug.** This category was designed to capture malicious poisonings; that is, the decedent was administered a drug(s) by another person for a malicious purpose.
- **Deaths with drug involvement when manner of death denoted by the ME/C was “could not be determined” (CNBD).** This manner of death is assigned by the ME/C when a definitive ruling of suicide, homicide, natural, or accidental death is not possible.

(2) **Drug-related suicide deaths** include suicide deaths with drug involvement. The determination of suicide is made by the ME/C. Because of the broad eligibility criteria for determining DAWN cases, drug-related suicide deaths include more than deaths due to overdoses. A reported drug may not be the cause of the suicide death even if only one drug was involved. Drug(s) must be a contributing factor, though.

Findings reported in this publication are based on concluded investigations that were submitted by May 12, 2008, for deaths that occurred during 2007. Death investigations that were not concluded by the ME/C by the end of the data collection period are excluded.

² To be reportable, a nonpharmaceutical substance must be consumed by inhalation, sniffing, or snorting and must have a psychoactive effect when inhaled. Carbon monoxide is excluded from the inhalants reportable to DAWN, as is accidental inhalation of a nonpharmaceutical. Additional information on inhalants is provided in Appendix B: Glossary of Terms.

Standardized death rates

Death rates (i.e., the number of deaths per 100,000 population) are reported to permit comparisons within or across areas or across demographic subgroups. This use of death rates, as opposed to counts, is important because two areas with similar numbers of drug-related deaths may have vastly different populations. Rates, which take population differences into account, standardized these comparisons.

There are limitations to be considered when comparing death rates. While differences in rates may signify differences in underlying drug-related mortality (or a lack of differences may suggest similarity), other factors may confound such comparisons. For example, State laws dictate which deaths are subject to ME/C review. These laws vary by State and, within each State, by time. Within ME/C offices, toxicology testing practices vary depending on local concerns, funding, and testing technology. Such factors will affect the number of deaths determined to be DAWN cases and the number of deaths attributed to particular drugs. Small changes in the number of deaths (e.g., an increase of 5 deaths) can result in a large percentage difference if the base is small (e.g., an increase of 5 to 10 deaths is a 100% increase). Even though there is no sampling error in DAWN ME/C data, the possibility of nonsampling errors (i.e., errors in reporting, changes in testing protocols) limits the interpretation of the findings.

PARTICIPATION IN DAWN 2007

DAWN relies on the voluntary cooperation of ME/Cs in selected areas of the United States to provide standardized data on drug-related deaths. For 2007, 246 jurisdictions in 63 metropolitan areas and 385 jurisdictions in 10 States submitted mortality data to DAWN.^{3,4}

Table 1 provides information on the metropolitan areas and States that participated in 2007. It includes the following:

- Name of metropolitan area,
- Total number of death investigation jurisdictions (counties) in the area,
- Number and percentage of eligible counties for which mortality data were reported to DAWN, and
- Number and percentage of the area's population that is covered by DAWN-participating jurisdictions.

An awareness of the extent of DAWN's coverage within a given area is needed to interpret DAWN mortality data appropriately. ME/C participants in DAWN are not part of a scientific sample at either the metropolitan or the national level. Within a metropolitan area, findings based on participating jurisdictions are not representative of nonparticipating jurisdictions. Reports from only a portion of jurisdictions within a metropolitan area can be extrapolated neither to the metropolitan area as a whole nor to the nation as a whole.⁵

While the data do not support any representations at a national level, some generalizations can be made at a metropolitan level, even if some ME/Cs do not participate. For example, while only 1 (10%) of the 10 counties that make up the Houston, TX, metropolitan area participated in DAWN in 2007, that county is home to 70 percent of the area's total population. The important consideration is population coverage, not ME/C participation, per se.

Among the metropolitan areas listed in Table 1, population coverage exceeded 90 percent in 45 metropolitan areas, with 100 percent coverage in 39 of those areas. The remaining metropolitan areas had response rates that range from a low of 22 percent in Dallas-Fort Worth-Arlington to 84 percent in St. Louis. Population coverage below 50 percent usually equates to the absence of large jurisdictions.

³ There is overlap between the metropolitan areas and States. In total, usable reports were received from 479 jurisdictions: 94 are only in metropolitan areas, 233 are only in States, and 152 are in both.

⁴ DAWN uses the metropolitan area definitions established by the Office of Management and Budget (OMB) in 2000 and updated in 2003. See Appendix A for additional detail.

⁵ Recruitment efforts to increase participation by ME/Cs are ongoing. However, there are no plans to make the mortality component of DAWN national in scope or representative of nonparticipating jurisdictions.

Table 1**Participation of medical examiner/coroner jurisdictions in DAWN, 2007**

Area	Total jurisdictions (counties)	Participating jurisdictions (counties)		DAWN coverage	
		Number	Percent of total	Population	Percent of area population
Sixty-three metropolitan areas	382	246	64%	101,639,035	77%
Ten States	385	385	100%	35,014,495	100%
Metropolitan areas					
Albuquerque, NM	4	4	100%	835,120	100%
Atlanta-Sandy Springs-Marietta, GA	28	7	25%	2,195,477	42%
Baltimore-Towson, MD	7	7	100%	2,668,056	100%
Bangor, ME	1	1	100%	148,784	100%
Barnstable Town, MA	1	1	100%	222,175	100%
Bend, OR	1	1	100%	154,028	100%
Birmingham-Hoover, AL	7	1	14%	658,779	59%
Blacksburg-Christiansburg-Radford, VA	4	4	100%	157,614	100%
Boston-Cambridge-Quincy, MA-NH	7	7	100%	4,482,857	100%
Buffalo-Niagara Falls, NY	2	2	100%	1,128,183	100%
Burlington-South Burlington, VT	3	3	100%	207,361	100%
Charlottesville, VA	5	5	100%	192,779	100%
Chicago-Naperville-Joliet, IL-IN-WI	14	9	64%	8,719,630	92%
Cleveland-Elyria-Mentor, OH	5	1	20%	1,295,958	62%
Corvallis, OR	1	1	100%	81,428	100%
Dallas-Fort Worth-Arlington, TX	12	2	17%	1,343,047	22%
Danville, VA	2	2	100%	105,773	100%
Denver-Aurora, CO	10	6	60%	2,380,124	97%
Detroit-Warren-Livonia, MI	6	5	83%	4,375,580	98%
Eugene-Springfield, OR	1	1	100%	343,591	100%
Fargo, ND-MN	2	2	100%	192,417	100%
Farmington, NM	1	1	100%	122,427	100%
Harrisonburg, VA	2	2	100%	117,563	100%
Houston-Sugar Land-Baytown, TX	10	1	10%	3,935,855	70%
Indianapolis-Carmel, IN	10	2	20%	1,012,755	60%
Kansas City, MO-KS	15	4	27%	1,060,856	53%
Las Cruces, NM	1	1	100%	198,791	100%
Lawton, OK	1	1	100%	113,811	100%
Lewiston-Auburn, ME	1	1	100%	106,815	100%
Los Angeles-Long Beach-Santa Ana, CA	2	1	50%	9,878,554	77%
Louisville-Jefferson County, KY-IN	13	2	15%	746,074	60%
Lynchburg, VA	6	6	100%	243,580	100%
Manchester-Nashua, NH	1	1	100%	402,302	100%
Medford, OR	1	1	100%	199,295	100%

Table 1 (continued)**Participation of medical examiner/coroner jurisdictions in DAWN, 2007**

Area	Total jurisdictions (counties)	Participating jurisdictions (counties)		DAWN coverage	
		Number	Percent of total	Population	Percent of area population
Milwaukee-Waukesha-West Allis, WI	4	1	25%	951,252	62%
Minneapolis-St. Paul-Bloomington, MN-WI	13	9	69%	2,644,536	82%
New Orleans-Metairie-Kenner, LA	7	4	57%	544,788	53%
New York-Northern New Jersey-Long Island, NY-NJ-PA	23	11	48%	11,266,209	60%
Ogden-Clearfield, UT	3	3	100%	518,349	100%
Oklahoma City, OK	7	7	100%	1,192,989	100%
Philadelphia-Camden-Wilmington, PA-NJ-DE-MD	11	5	45%	3,501,044	60%
Phoenix-Mesa-Scottsdale, AZ	2	1	50%	3,880,181	93%
Pittsfield, MA	1	1	100%	129,798	100%
Portland-South Portland-Biddeford, ME	3	3	100%	513,102	100%
Portland-Vancouver-Beaverton, OR-WA	7	5	71%	1,746,320	80%
Provo-Orem, UT	2	2	100%	493,306	100%
Richmond, VA	20	20	100%	1,212,977	100%
Roanoke, VA	6	6	100%	296,532	100%
Salem, OR	2	2	100%	386,714	100%
Salisbury, MD	2	2	100%	119,616	100%
Salt Lake City, UT	3	3	100%	1,099,973	100%
San Diego-Carlsbad-San Marcos, CA	1	1	100%	2,974,859	100%
San Francisco-Oakland-Fremont, CA	5	4	80%	2,739,696	65%
Santa Fe, NM	1	1	100%	142,955	100%
Seattle-Tacoma-Bellevue, WA	3	3	100%	3,309,347	100%
Sioux Falls, SD	4	1	25%	175,272	77%
Springfield, MA	3	3	100%	682,657	100%
St. George, UT	1	1	100%	133,791	100%
St. Louis, MO-IL	17	9	53%	2,377,699	84%
Tulsa, OK	7	7	100%	905,755	100%
Virginia Beach-Norfolk-Newport News, VA-NC	16	15	94%	1,634,794	99%
Washington-Arlington-Alexandria, DC-VA-MD-WV	20	19	95%	5,255,733	99%
Worcester, MA	1	1	100%	781,352	100%

Table 1 (continued)**Participation of medical examiner/coroner jurisdictions in DAWN, 2007**

Area	Total jurisdictions (counties)	Participating jurisdictions (counties)		DAWN coverage	
		Number	Percent of total	Population	Percent of area population
States					
Maine	16	16	100%	1,317,207	100%
Maryland	24	24	100%	5,618,344	100%
Massachusetts	14	14	100%	6,449,755	100%
New Hampshire	10	10	100%	1,315,828	100%
New Mexico	33	33	100%	1,969,915	100%
Oklahoma	77	77	100%	3,617,316	100%
Oregon	36	36	100%	3,747,455	100%
Utah	29	29	100%	2,645,330	100%
Vermont	14	14	100%	621,254	100%
Virginia	132	132	100%	7,712,091	100%

SOURCE: Office of Applied Studies, SAMHSA, Drug Abuse Warning Network, 2007 (08/2008 update).

SUMMARY OF FINDINGS

Table 2 reports the rates of drug-related deaths and drug-related suicide deaths per 100,000 population for metropolitan areas and States that participated in DAWN in 2007. Table 3 compares the rates of drug-related deaths in 2007 with those found for 2006 and reports the percentage change. (Comparisons are not made for drug-related suicide deaths because of their small numbers.) Table 3 is limited to those areas where the same jurisdictions participated in 2006 as in 2007. Both tables include indicators of the population coverage in DAWN for 2007.

Table 2
Rates of drug-related deaths and drug-related suicide deaths per 100,000 population, 2007

Metropolitan area or State	Rate of drug-related deaths per 100,000 population*		DAWN coverage	
	Deaths	Suicide deaths	Population	Percent of area population
Metropolitan areas				
Albuquerque, NM	25.7	3.7	835,120	100%
Atlanta-Sandy Springs-Marietta, GA	8.2	1.0	2,195,477	42%
Baltimore-Towson, MD	20.8	1.3	2,668,056	100%
Bangor, ME	9.4	1.3	148,784	100%
Barnstable Town, MA	18.5	3.2	222,175	100%
Bend, OR	9.1	2.6	154,028	100%
Birmingham-Hoover, AL	17.5	1.1	658,779	59%
Blacksburg-Christiansburg-Radford, VA	13.3	2.5	157,614	100%
Boston-Cambridge-Quincy, MA-NH	15.5	1.6	4,482,857	100%
Buffalo-Niagara Falls, NY	7.8	1.0	1,128,183	100%
Burlington-South Burlington, VT	8.7	2.9	207,361	100%
Charlottesville, VA	5.2	2.6	192,779	100%
Chicago-Naperville-Joliet, IL-IN-WI	9.1	0.9	8,719,630	92%
Cleveland-Elyria-Mentor, OH	15.3	1.9	1,295,958	62%
Corvallis, OR	1.2	2.5	81,428	100%
Dallas-Fort Worth-Arlington, TX	6.0	0.8	1,343,047	22%
Danville, VA	7.6	0.9	105,773	100%
Denver-Aurora, CO	14.7	3.6	2,380,124	97%
Detroit-Warren-Livonia, MI	16.9	1.4	4,375,580	98%
Eugene-Springfield, OR	9.6	1.5	343,591	100%
Fargo, ND-MN	8.3	6.2	192,417	100%
Farmington, NM	15.5	3.3	122,427	100%
Harrisonburg, VA	4.3	0.9	117,563	100%
Houston-Sugar Land-Baytown, TX	14.7	2.0	3,935,855	70%
Indianapolis-Carmel, IN	11.9	1.7	1,012,755	60%
Kansas City, MO-KS	10.6	2.2	1,060,856	53%
Las Cruces, NM	12.6	2.5	198,791	100%

Table 2 (continued)**Rates of drug-related deaths and drug-related suicide deaths per 100,000 population, 2007**

Metropolitan area or State	Rate of drug-related deaths per 100,000 population*		DAWN coverage	
	Deaths	Suicide deaths	Population	Percent of area population
Lawton, OK	8.8	1.8	113,811	100%
Lewiston-Auburn, ME	8.4	1.9	106,815	100%
Los Angeles-Long Beach-Santa Ana, CA	9.9	1.4	9,878,554	77%
Louisville-Jefferson County, KY-IN	13.5	3.1	746,074	60%
Lynchburg, VA	5.3	0.4	243,580	100%
Manchester-Nashua, NH	9.9	3.0	402,302	100%
Medford, OR	12.0	7.5	199,295	100%
Milwaukee-Waukesha-West Allis, WI	18.7	1.7	951,252	62%
Minneapolis-St. Paul-Bloomington, MN-WI	7.0	0.9	2,644,536	82%
New Orleans-Metairie-Kenner, LA	26.1	1.1	544,788	53%
New York-Northern New Jersey-Long Island, NY-NJ-PA	9.2	1.1	11,266,209	60%
Ogden-Clearfield, UT	15.8	2.7	518,349	100%
Oklahoma City, OK	15.2	1.9	1,192,989	100%
Philadelphia-Camden-Wilmington, PA-NJ-DE-MD	18.8	1.4	3,501,044	60%
Phoenix-Mesa-Scottsdale, AZ	17.2	4.5	3,880,181	93%
Pittsfield, MA	9.2	4.6	129,798	100%
Portland-South Portland-Biddeford, ME	10.7	1.6	513,102	100%
Portland-Vancouver-Beaverton, OR-WA	11.6	2.4	1,746,320	80%
Provo-Orem, UT	16.6	0.6	493,306	100%
Richmond, VA	4.2	1.0	1,212,977	100%
Roanoke, VA	7.1	2.0	296,532	100%
Salem, OR	9.1	3.6	386,714	100%
Salisbury, MD	12.5	0.0	119,616	100%
Salt Lake City, UT	20.2	2.5	1,099,973	100%
San Diego-Carlsbad-San Marcos, CA	11.9	3.1	2,974,859	100%
San Francisco-Oakland-Fremont, CA	14.0	3.4	2,739,696	65%
Santa Fe, NM	19.6	0.7	142,955	100%
Seattle-Tacoma-Bellevue, WA	14.9	2.3	3,309,347	100%
Sioux Falls, SD	1.1	4.0	175,272	77%
Springfield, MA	17.0	1.3	682,657	100%
St. George, UT	10.5	3.7	133,791	100%
St. Louis, MO-IL	11.1	1.9	2,377,699	84%
Tulsa, OK	20.8	2.4	905,755	100%
Virginia Beach-Norfolk-Newport News, VA-NC	6.7	1.2	1,634,794	99%
Washington-Arlington-Alexandria, DC-VA-MD-WV	8.8	1.8	5,255,733	99%
Worcester, MA	13.1	1.9	781,352	100%

Table 2 (continued)**Rates of drug-related deaths and drug-related suicide deaths per 100,000 population, 2007**

Metropolitan area or State	Rate of drug-related deaths per 100,000 population*		DAWN coverage	
	Deaths	Suicide deaths	Population	Percent of area population
States				
Maine	10.0	1.7	1,317,207	100%
Maryland	14.6	1.1	5,618,344	100%
Massachusetts	15.8	1.7	6,449,755	100%
New Hampshire	12.6	2.6	1,315,828	100%
New Mexico	21.0	3.2	1,969,915	100%
Oklahoma	15.0	1.9	3,617,316	100%
Oregon	10.1	2.9	3,747,455	100%
Utah	17.6	2.0	2,645,330	100%
Vermont	10.1	2.7	621,254	100%
Virginia	5.9	1.5	7,712,091	100%

* Drug-related deaths exclude drug-related suicide deaths.

SOURCE: Office of Applied Studies, SAMHSA, Drug Abuse Warning Network, 2007 (08/2008 update).

Table 3**Rates of drug-related deaths and percentage change, 2006 and 2007**

Metropolitan area or State*	Rate of drug-related deaths per 100,000 population [†]		Percent change in rate, 2006 to 2007	DAWN coverage	
	2006	2007		Population	Percent of area population
Metropolitan areas					
Albuquerque, NM	26.0	25.7	-0.8%	835,120	100%
Baltimore-Towson, MD	19.8	20.8	5.3%	2,668,056	100%
Barnstable Town, MA	15.6	18.5	18.5%	222,175	100%
Birmingham-Hoover, AL	17.5	17.5	-0.3%	658,779	59%
Boston-Cambridge-Quincy, MA-NH	13.4	15.5	16.2%	4,482,857	100%
Buffalo-Niagara Falls, NY	7.7	7.8	0.8%	1,128,183	100%
Cleveland-Elyria-Mentor, OH	17.3	15.3	-11.5%	1,295,958	62%
Denver-Aurora, CO	13.9	14.7	5.2%	2,380,124	97%
Detroit-Warren-Livonia, MI	20.2	16.9	-16.3%	4,375,580	98%
Houston-Sugar Land-Baytown, TX	11.4	14.7	28.6%	3,935,855	70%
Indianapolis-Carmel, IN	11.3	11.9	5.6%	1,012,755	60%
Kansas City, MO-KS	8.3	10.6	27.4%	1,060,856	53%
Manchester-Nashua, NH	8.2	9.9	21.4%	402,302	100%
Milwaukee-Waukesha-West Allis, WI	19.6	18.7	-4.3%	951,252	62%
Ogden-Clearfield, UT	11.3	15.8	40.6%	518,349	100%
Oklahoma City, OK	7.3	15.2	106.8%	1,192,989	100%
Philadelphia-Camden-Wilmington, PA-NJ-DE-MD	26.0	18.8	-27.6%	3,501,044	60%
Phoenix-Mesa-Scottsdale, AZ	16.9	17.2	1.8%	3,880,181	93%
Portland-South Portland-Biddeford, ME	8.0	10.7	34.3%	513,102	100%
Provo-Orem, UT	16.0	16.6	3.7%	493,306	100%
Salt Lake City, UT	19.3	20.2	4.6%	1,099,973	100%
San Diego-Carlsbad-San Marcos, CA	8.4	11.9	41.7%	2,974,859	100%
Seattle-Tacoma-Bellevue, WA	15.6	14.9	-4.1%	3,309,347	100%
Springfield, MA	13.0	17.0	31.0%	682,657	100%
St. Louis, MO-IL	13.7	11.1	-18.6%	2,377,699	84%
Tulsa, OK	13.4	20.8	55.3%	905,755	100%
Washington-Arlington-Alexandria, DC-VA-MD-WV	6.3	8.8	41.3%	5,255,733	99%
Worcester, MA	13.5	13.1	-3.3%	781,352	100%

Table 3 (continued)**Rates of drug-related deaths and percentage change, 2006 and 2007**

Metropolitan area or State*	Rate of drug-related deaths per 100,000 population [†]		Percent change in rate, 2006 to 2007	DAWN coverage	
	2006	2007		Population	Percent of area population
States					
Maine	9.2	10.0	8.6%	1,317,207	100%
Maryland	13.6	14.6	7.3%	5,618,344	100%
Massachusetts	14.2	15.8	11.3%	6,449,755	100%
New Hampshire	8.9	12.6	41.8%	1,315,828	100%
New Mexico	19.2	21.0	9.3%	1,969,915	100%
Oklahoma	8.4	15.0	78.8%	3,617,316	100%
Utah	15.9	17.6	10.4%	2,645,330	100%
Vermont	11.5	10.1	-12.1%	621,254	100%

* The table is limited to those areas where the same jurisdictions participated in both years.

[†] Drug-related deaths exclude drug-related suicide deaths.

SOURCE: Office of Applied Studies, SAMHSA, Drug Abuse Warning Network, 2007 (08/2008 update).

PROFILES AND SPOTLIGHTS

DAWN mortality data are reported for metropolitan areas with 30 or more deaths and for all participating States in six figures and tables that span two or more pages. These are referred to as “full profiles.” Metropolitan areas with fewer than 30 deaths or areas with less than 50 percent coverage receive an “abbreviated profile” that includes just one of the six tables. Large, individual jurisdictions that are part of a multijurisdictional area and reported 60 or more deaths receive a full profile that is referred to as a “spotlight.”

Among the 63 metropolitan areas, full profiles are provided for 40 metropolitan areas. Abbreviated profiles are provided for 21 metropolitan areas that submitted 30 or fewer drug-related deaths and for 2 metropolitan areas with less than 50 percent population coverage. Spotlights are provided for 47 individual jurisdictions.

Table 4 lists the metropolitan area profiles and spotlights for jurisdictions within those areas. Table 5 lists State profiles and profiles for metropolitan areas located wholly within those States.

At the end of this publication, the profiles and spotlights appear in separate sections in alphabetical order by State and metropolitan area name. The Contents to this publication lists the profiles and spotlights in the order in which they appear.

Table 4
Metropolitan area profiles and county spotlights

Type of profile	Metropolitan area profile	County spotlight(s)
Full	Albuquerque, NM	Bernalillo County
Abbreviated	Atlanta-Sandy Springs-Marietta, GA	Fulton County
Full	Baltimore-Towson, MD	Anne Arundel County Baltimore City Baltimore County
Abbreviated	Bangor, ME	None
Full	Barnstable Town, MA	None
Abbreviated	Bend, OR	None
Full	Birmingham-Hoover, AL	None
Abbreviated	Blacksburg-Christiansburg-Radford, VA	None
Full	Boston-Cambridge-Quincy, MA-NH	Essex County Middlesex County Norfolk County Plymouth County Suffolk County
Full	Buffalo-Niagara Falls, NY	Erie County
Abbreviated	Burlington-South Burlington, VT	None
Abbreviated	Charlottesville, VA	None
Full	Chicago-Naperville-Joliet, IL-IN-WI	Cook County Lake County
Full	Cleveland-Elyria-Mentor, OH	None
Abbreviated	Corvallis, OR	None
Abbreviated	Dallas-Fort Worth-Arlington, TX	None
Abbreviated	Danville, VA	None
Full	Denver-Aurora, CO	Arapahoe County Denver County
Full	Detroit-Warren-Livonia, MI	Macomb County Oakland County Wayne County
Full	Eugene-Springfield, OR	None
Abbreviated	Fargo, ND-MN	None
Abbreviated	Farmington, NM	None
Abbreviated	Harrisonburg, VA	None
Full	Houston-Sugar Land-Baytown, TX	None
Full	Indianapolis-Carmel, IN	Marion County
Full	Kansas City, MO-KS	Jackson County
Abbreviated	Las Cruces, NM	None
Abbreviated	Lawton, OK	None
Abbreviated	Lewiston-Auburn, ME	None
Full	Los Angeles-Long Beach-Santa Ana, CA	None
Full	Louisville-Jefferson County, KY-IN	Jefferson County
Abbreviated	Lynchburg, VA	None
Full	Manchester-Nashua, NH	None

Table 4 (continued)**Metropolitan area profiles and county spotlights**

Type of profile	Metropolitan area profile	County spotlight(s)
Abbreviated	Medford, OR	None
Full	Milwaukee-Waukesha-West Allis, WI	None
Full	Minneapolis-St. Paul-Bloomington, MN-WI	Hennepin County
Full	New Orleans-Metairie-Kenner, LA	Jefferson Parish
Full	New York-Northern New Jersey-Long Island, NY-NJ-PA	Bronx County Kings County New York County Queens County Suffolk County
Full	Ogden-Clearfield, UT	None
Full	Oklahoma City, OK	Oklahoma County
Full	Philadelphia-Camden-Wilmington, PA-NJ-DE-MD	Bucks County Delaware County Montgomery County Philadelphia County
Full	Phoenix-Mesa-Scottsdale, AZ	None
Abbreviated	Pittsfield, MA	None
Full	Portland-South Portland-Biddeford, ME	None
Full	Portland-Vancouver-Beaverton, OR-WA	Multnomah County
Full	Provo-Orem, UT	Utah County
Full	Richmond, VA	None
Abbreviated	Roanoke, VA	None
Full	Salem, OR	None
Abbreviated	Salisbury, MD	None
Full	Salt Lake City, UT	Salt Lake County
Full	San Diego-Carlsbad-San Marcos, CA	None
Full	San Francisco-Oakland-Fremont, CA	Contra Costa County San Francisco County
Abbreviated	Santa Fe, NM	None
Full	Seattle-Tacoma-Bellevue, WA	King County Pierce County Snohomish County
Abbreviated	Sioux Falls, SD	None
Full	Springfield, MA	Hampden County
Abbreviated	St. George, UT	None
Full	St. Louis, MO-IL	St. Louis City St. Louis County
Full	Tulsa, OK	Tulsa County
Full	Virginia Beach-Norfolk-Newport News, VA-NC	None
Full	Washington-Arlington-Alexandria, DC-VA-MD-WV	District of Columbia Prince George's County
Full	Worcester, MA	None

Table 5**State profiles and metropolitan area profiles wholly in those States**

State profile	Metropolitan area profiles	Type of profile
Maine	Bangor, ME	Abbreviated
	Lewiston-Auburn, ME	Abbreviated
	Portland-South Portland-Biddeford, ME	Full
Maryland	Baltimore-Towson, MD	Full
	Salisbury, MD	Abbreviated
Massachusetts	Barnstable Town, MA	Full
	Pittsfield, MA	Abbreviated
	Springfield, MA	Full
	Worcester, MA	Full
New Hampshire	Manchester-Nashua, NH	Full
New Mexico	Albuquerque, NM	Full
	Farmington, NM	Abbreviated
	Las Cruces, NM	Abbreviated
	Santa Fe, NM	Abbreviated
Oklahoma	Lawton, OK	Abbreviated
	Oklahoma City, OK	Full
	Tulsa, OK	Full
Oregon	Bend, OR	Abbreviated
	Corvallis, OR	Abbreviated
	Eugene-Springfield, OR	Full
	Medford, OR	Abbreviated
	Salem, OR	Full
Utah	Ogden-Clearfield, UT	Full
	Provo-Orem, UT	Full
	Salt Lake City, UT	Full
	St. George, UT	Abbreviated
Vermont	Burlington-South Burlington, VT	Abbreviated
Virginia	Blacksburg-Christiansburg-Radford, VA	Abbreviated
	Charlottesville, VA	Abbreviated
	Danville, VA	Abbreviated
	Harrisonburg, VA	Abbreviated
	Lynchburg, VA	Abbreviated
	Richmond, VA	Full
	Roanoke, VA	Abbreviated

Full profiles

The full profile is composed of six exhibits plus a map and demographic information on the State or metropolitan area and its constituent counties. Figure 1 shows the general layout of the full profile. All profiles observe the following conventions:

- Total population of the area,
- Population covered by participating jurisdictions, and
- Percentage of population residing in participating jurisdictions.⁷

Table A: Metro area overview: Deaths and population by county, 2007

Below the map, Table A lists each of the component jurisdictions for the area. Each jurisdiction is numbered to correspond to the numbers shown on the area map. In metropolitan areas that cross State borders, jurisdictions are ordered first by State and then alphabetically by county name. Nonparticipating jurisdictions are included in the list with a shaded background to distinguish them from participating jurisdictions.

Information in Table A for each jurisdiction includes the following:

- Number of drug-related deaths and corresponding rates (deaths per 100,000 population),
- Number of drug-related suicide deaths and corresponding rates (suicide deaths per 100,000 population), and
- Population for the jurisdiction.

The top row of the table totals this information for just the participating jurisdictions.

Rates, because they are population adjusted, can be compared across jurisdictions, metropolitan areas, and States. This standardization does not take into account, however, the differences in applicable laws that specify which deaths are subject to ME/C review or other factors that may confound comparisons.

The subsequent tables and figures (B through F) are based on data aggregated across the participating jurisdictions in each metropolitan area or State.

Figure B: Deaths by manner of death, 2007

Figure B is a pie chart that displays manner of death for drug-related deaths and drug-related suicide deaths. The manner of death reported here is that assigned by the ME/C using the categories provided on the U.S. Standard Certificate of Death. Solid-colored slices are reserved for drug-related deaths other than suicides; the patterned slice shows the suicide deaths. Reading clockwise, the manners of death are identified as follows:

- Suicide, black lines on white background,
- Homicide deaths, white,
- Deaths for which manner of death could not be determined, light blue,
- Accidental deaths, medium blue, and
- Natural deaths, darkest blue.

⁷ Population estimates for 2006 and 2007 were obtained from the U.S. Census Bureau County-Level Population Estimates (CPOP file), Vintage 2007, released August 2008. (Available at <http://www.census.gov/popest/estimates.html>.)

Figure C: Top 5 drugs involved: Drug-related deaths, 2007
Top 5 drugs involved: Drug-related suicide deaths, 2007

Separate bar charts show the five most common types of drugs (e.g., opiates/opioids, benzodiazepines) reported to DAWN for drug-related deaths and drug-related suicide deaths across the participating jurisdictions. The number shown above each bar is the number of deaths reported for a specific drug type. The name of the drug type is printed below each bar. Each bar is partitioned to display separately the portion of deaths involving a single drug type (solid blue area in bottom portion of bar) versus multiple drug types (striped area in top of bar). A bar is not printed if there are fewer than four deaths associated with a drug type, and therefore, fewer than five bars may appear. The top 5 drug types are identified from among 17 different drug types, as listed in Table F (see below).

A single death that involved two drugs of *different types* (e.g., cocaine and heroin) would be counted in two bars (e.g., cocaine and heroin, respectively). As a result, summing the number of deaths reported in each bar will double-count deaths that involved multiple types of drugs. A death that involved two drugs of the *same type* (e.g., multiple opiates/opioids, such as methadone and heroin) will be counted once (e.g., in the bar for opiates/opioids).

Grouping drugs by drug type eliminates double counting due to the following causes: redundant drug reports (e.g., "cocaine" and its metabolite "benzoylecgonine" being reported for the same death); redundant reports from nonspecific terms (e.g., "heroin" and "opiates" being reported for the same death); and drug reports that may be indistinguishable (e.g., "heroin" and "morphine").

Figure D: Death rates by gender and age: Drug-related, 2007
Death rates by gender and age: Drug-related suicide deaths, 2007

Figure D displays the gender and categorical age of decedents in drug-related deaths and drug-related suicide deaths, in terms of deaths per 100,000 population. Only population in participating jurisdictions is considered in the calculation of these rates. Taking population size into account enables comparisons to be made across age and gender subgroups.

Table E: Place of death, 2007

Table E reports the place of death for drug-related deaths and drug-related suicide deaths. Deaths in emergency departments and other health care facilities have been combined into the single category "Health care facility."

Table F: Drug-related deaths by drug category, 2006-2007

Table F reports, by drug type or drug, the count of drug-related deaths and drug-related suicide deaths for 2006 and 2007. The first row of Table F summarizes deaths across all drug categories; the subsequent rows provide detail for 17 specific drug types or drugs of particular interest.

Data for both 2006 and 2007 are reported when the same jurisdictions participated in both years. If comparable data for 2006 are not available (e.g., the State of Oregon did not participate in 2006) or are not comparable to those shown for 2007 (e.g., in the San Francisco metropolitan area, Contra Costa and San Francisco counties participated in 2007 but not in 2006), the columns are left blank.

Counts of drug-related deaths and drug-related suicide deaths include deaths that involved both single and multiple drugs. Summing these deaths across drug types or drugs could result in double counting deaths associated with multiple drug types. To help provide a better understanding of single versus multidrug involvement, counts of single-drug deaths are reported. Single-drug deaths involve the listed drug type or drug and no other, and they are a subset of the total count of deaths.

The 17 drug categories shown in this table are derived from DAWN's standard drug classification scheme and include the following:⁸

- **Alcohol.** Alcohol is reportable to DAWN for all ages if at least one other reportable substance was also present. In decedents under age 21, alcohol may be reported alone. Therefore, any single-drug death for alcohol is for a decedent under age 21. Alcohol is not included among the illicit drugs, although it is an illegal drug for individuals under age 21.

The next six rows in Table F pertain to illicit drugs:

- **Cocaine**, which includes both crack and powder cocaine.
- **Marijuana**, which includes marijuana and hashish. Some jurisdictions do not conduct toxicology tests for the presence of marijuana and do not report marijuana to DAWN. The full extent of the underreporting of marijuana is unknown.
- **Stimulants**, which include amphetamines and methamphetamine. This category does not include other central nervous system stimulants, such as caffeine or methylphenidate.
- **Club drugs**, which include methylenedioxymethamphetamine (MDMA, or Ecstasy); gamma hydroxy butyrate (GHB) and its precursor, gamma butyrolactone (GBL); flunitrazepam (Rohypnol); and ketamine. In other settings or studies, the drugs classified as club drugs may exclude some of these drugs or include others, such as LSD or methamphetamine. Such differences limit comparisons with other sources.
- **Hallucinogens**, which include LSD, PCP, and miscellaneous hallucinogens, such as psilocybin.
- **Inhalants**, which include anesthetic gases and any psychoactive nonpharmaceutical substance for which the documented route of administration was inhalation and the inhalation was not accidental.

The remaining rows in Table F are devoted to prescription and over-the-counter pharmaceuticals. For this table, heroin is categorized and reported on as an opiate/opioid. Low-frequency drugs have been aggregated into higher-level categories:

- **Antidepressants**, which include monoamine oxidase inhibitors (MAOIs), selective serotonin reuptake inhibitors (SSRIs), tricyclic antidepressants, and miscellaneous antidepressants, such as bupropion and venlafaxine.
- **Antipsychotics**, which include phenothiazine antipsychotics, psychotherapeutic combinations, thioxanthenes, and miscellaneous antipsychotic agents, such as lithium and quetiapine.
- **Benzodiazepines**, which include alprazolam, clonazepam, diazepam, and others, including those reported simply as "benzodiazepines." Flunitrazepam, which is classified as a club drug, is not included as a benzodiazepine.

⁸ The classification of drugs used by DAWN is derived from the Multum *Lexicon*, © 2008, Multum Information Services, Inc. The classification has been modified to meet DAWN's unique requirements. The Multum Licensing Agreement governing use of the *Lexicon* is provided in Appendix C. (Also available at <http://www.multum.com/>.)

- **Miscellaneous anxiolytics, sedatives, and hypnotics**, which include diphenhydramine and zolpidem.
- **Opiates/opioids**, which include all types of natural and synthetic opiates and opioid analgesics. This category is the only one that is subdivided.⁹ The subdivisions are the following:
 - **Heroin (specified)**, which includes heroin reported by name or its specific metabolites;¹⁰
 - **Methadone**; and
 - **All other opiates/opioids**, which include the balance of deaths reported in the row labeled “Opiates/opioids” and also include codeine, hydrocodone, oxycodone, and morphine, as well as drug reports designated simply as “opiates.”¹¹
- **Nonsteroidal anti-inflammatory agents (NSAIDs)**, which include ibuprofen and naproxen. Cox-2 inhibitors are not classified as NSAIDs in the taxonomy used by DAWN.
- **Salicylates/combinations**, which include aspirin alone and in combination with other ingredients.
- **Miscellaneous analgesics/combinations**, which are primarily acetaminophen alone or in combination with other ingredients.
- **Anticonvulsants**, which include carbamazepine and gabapentin.
- **Muscle relaxants**, which include carisoprodol and cyclobenzaprine.

Limitations to data

Not every reported substance (drug) is, by itself, the cause of death or even a contributor to the death. DAWN’s broad definition of drug involvement requires only that the drug is related to the death. Therefore, even in single-drug deaths, reported drugs may not be a direct cause of death. Furthermore, incidental reporting (i.e., reporting of drugs unrelated to the death) is unavoidable due to ambiguities and insufficiencies in the ME/C’s records.

The total number of deaths in some drug categories is often quite small and of limited significance. The intent in reporting small counts is primarily to indicate the relative occurrence of deaths in different drug categories.

Numbers less than four but greater than zero are suppressed.

Abbreviated profiles for selected metropolitan areas

To warrant a full profile, the participating jurisdictions of a metropolitan area in combination must have reported more than 30 drug-related deaths or drug-related suicide deaths, and the area’s population coverage must exceed 50 percent. If either of these two conditions was not met, an abbreviated profile is provided for the area. In contrast to full profiles, abbreviated profiles include only a map and Table A (see above).

⁹ Some examples may assist readers in interpreting this classification. A death that involved heroin and methadone would be counted in the “Opiates/opioids” row, in the “Heroin (specified)” row, and in the “Methadone” row. A death that involved morphine would be counted in the “Opiates/opioids” row and in the “All other opiates/opioids” row. A death that involved both morphine and codeine would be counted in the “Opiates/opioids” row and in the “All other opiates/opioids” row.

¹⁰ Note that morphine and unspecified opiates are *not* grouped in the “Heroin (specified)” category. Morphine is not classified as heroin because it is not possible to differentiate morphine, the metabolite of heroin, from morphine itself. Most drugs in the category “Heroin (specified)” were reported to DAWN as heroin or its metabolite monoacetylmorphine. A few were reported as acetylmorphine, diacetylmorphine, acetylcodeine, monoacetylcodeine, heroin dope, or black tar heroin.

¹¹ The term “morphine” or “free morphine” accounted for most drug reports classified as “morphine,” and the term “opiates” accounted for most of the unspecified opiates.

Spotlights

Spotlights are produced for individual jurisdictions in which 60 or more drug-related deaths were reported. The purpose is to distinguish findings for a single location from those of the metropolitan area as a whole. Spotlights may appear for jurisdictions even if the metropolitan area itself had less than 50 percent population coverage. In some instances, even if a jurisdiction has 60 or more deaths, a spotlight may not be needed. Such is the case when a metropolitan area contains only one county or had only one county participating in DAWN.

Spotlights have essentially the same format as the full metropolitan area profile. Spotlights include the map; Figures B, C, and D; and Tables E and F, as described above. Because of the small numbers, drug-related suicide deaths have been removed from all exhibits except the jurisdiction summary and Figure B.

State profiles

Ten statewide ME/C systems participated in DAWN in 2007. A full profile is provided for each of the following States:

- Maine,
- Maryland,
- Massachusetts,
- New Hampshire,
- New Mexico,
- Oklahoma,
- Oregon,
- Utah,
- Vermont, and
- Virginia.

Any metropolitan areas that fell wholly within the 10 statewide ME/C systems and reported more than 30 drug-related deaths or drug-related suicide deaths to DAWN in 2007 received a full profile (Table 5).

Additional detail on the DAWN data collection methodology is provided in Appendix A. A Glossary of Terms used in this report appears in Appendix B.