



Weekly

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Unintentional and Undetermined Poisoning Deaths ---11 States, 1990--2001

During 1990--2001, the death rate from poisoning* in the United States increased 56%, from 5.0 per 100,000 population in 1990 to 7.8 in 2001 (1). In 2001, of 22,242 poisoning deaths, 14,078 (63%) were unintentional (1). To describe trends in poisoning deaths, state health professionals in 11 states† analyzed vital statistics data for 1990--2001. This report summarizes the results of that analysis, which indicated that increases in state death rates from unintentional and undetermined poisonings varied, but increased by an average of 145%; a total of 89% of poisonings involved drugs and other biologic substances. State public health professionals can use local, state, and national surveillance data to monitor trends in drug misuse and to develop effective interventions that can reduce deaths from drug overdoses.

Overall poisoning death rates per 100,000 population and sex-, age-, and intent-specific death rates were calculated. Trends were examined for the following categories§: 1) all poisonings, 2) unintentional poisonings, 3) suicides, 4) homicides, and 5) poisonings of undetermined intent. Poisoning deaths might be classified as of undetermined intent if the medical examiner or coroner lacked sufficient evidence to determine whether the death was unintentional, suicide, or homicide. Unintentional and undetermined subcategories were combined for most of the analyses. States with low poisoning death rates because of undetermined intent had high unintentional poisoning death rates and vice versa because intent coding practices varied by state.

Of the 11 states, eight¶ had multiple cause-of-death data for 1999 and 2000 to identify the specific substances or classes of substances involved in poisoning deaths in their states. To analyze these data, codes were used from *International Classification of Diseases and Related Health Problems, Tenth Revision* (ICD-10), which was implemented in 1999. ICD-10 contains specific information about substances and classes of substances in codes T36--T50 (i.e., poisoning by drugs, medications, and biologic substances). Because more than one T-code was reported for deaths for which multiple substances were implicated, the percentages reported for specific substances represent each substance as a percentage of all identified T-codes.

During 1990--2001, death rates attributed to unintentional and undetermined poisoning increased in all 11 states (Figure), with an average increase of 145% (range: 28%--325%); poisoning homicide rates were stable, and poisoning suicide rates declined. Nine states (Colorado, Delaware, Florida, Kentucky, New Mexico, North Carolina, Oregon, Washington, and Wisconsin) reported increases in unintentional poisoning deaths; Massachusetts and Utah reported increases in undetermined poisoning deaths. The largest percentage increases in poisoning deaths were in Florida (325%), Kentucky (252%), and Massachusetts (228%). In Colorado (125%), Massachusetts, and Washington (108%), death rates began to increase during 1991--1992. The death rates in Florida, Kentucky, North Carolina (80%), and Wisconsin (123%) were stable during 1990--1996 but increased thereafter. In contrast, the rates in Delaware (186%),

New Mexico (105%), Oregon (28%), and Utah (183%) increased substantially during 1990--1998, but declined thereafter.

During 1990--2001, in all 11 states, the increases in unintentional and undetermined poisoning death rates were greatest for persons aged 45--54 years (average increase: 359%; range: 139%--710%) and persons aged 35--44 years (average increase: 195%; range: 14%--910%). Among persons aged ≥ 65 years, the rate declined an average of 28%. Sex-specific unintentional and undetermined poisoning death rates also increased for males (average increase: 126%; range: 11%--339%) and females (average increase: 203%; range: 95%--486%).

Narcotics and psychodysleptics accounted for 51% of all poisoning deaths. In the eight states that examined T-code frequencies, the substances associated most frequently with unintentional and undetermined poisoning deaths were cocaine (15% of all identified T-codes), alcohol (8%), heroin (7%), antidepressants (5%), benzodiazepines (5%), and methadone (5%). However, the proportion of deaths for which these substances were listed varied substantially by state ([Table](#)). Nonspecific categories, such as "other opioids" (e.g., codeine, morphine, oxycodone, and hydrocodone), "other synthetic narcotics," "other and unspecified narcotics," and "other and unspecified drugs, medicaments, and biological substances" accounted for approximately half of all the documented substances associated with unintentional and undetermined poisoning deaths.

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Editorial Note:

The findings in this report indicate that in these 11 states the unintentional and undetermined poisoning death rate increased during 1990--2001 and that the types of substances associated with these deaths varied by state. Among U.S. adults, drug overdoses are the largest cause of poisoning deaths. In 1992, the total cost of medical spending for all poisoning treatment was approximately \$3 billion, an average of \$925 per case (3). Unintentional drug overdose deaths often are caused by the misuse of multiple drugs, leaving substantial uncertainty about the contribution of each drug to the death. Illicit drugs (e.g., cocaine and heroin) have been known to cause unintentional poisoning deaths. In certain states, the misuse of prescription drugs (e.g., pain-management opioids such as oxycodone HCl with acetaminophen, hydrocodone with acetaminophen, and methadone) has contributed to the increase in deaths from unintentional poisoning (4).

The findings in this report are subject to at least four limitations. First, because external cause-of-injury codes used to classify underlying causes of death often do not provide sufficient information to identify the particular substances to which a victim was exposed, T-codes were used to identify specific substances that contributed to death (5). However, approximately half of the substances identified by T-codes on the death certificates were nonspecific, including 27% classified only as "other and unspecified drugs, medicaments and biological substances." This lack of specificity could reflect limited information provided on the death

certificate rather than deficiency in the T-codes. Second, analyses based on T-codes also are limited because the underlying causal agent in deaths involving multiple drugs cannot be identified. Third, these data are state specific and might not be representative of the entire United States; death certificate reporting practices might differ both within and among states. Finally, the poisoning death trends presented in this report should be interpreted with caution because the analysis spans two revisions of the ICD (ICD-9 and ICD-10), and the two classification systems do not always produce comparable figures (6).

Key risk factors for drug overdose deaths include multidrug misuse and recent abstinence from substance abuse (7,8). Interventions directed at providing assistance to overdose patients could include using naloxone, teaching rescue breathing, and encouraging use of 911 to obtain emergency medical services. However, preventing these deaths is a complex challenge that might require a combination of psychological, behavioral, educational, and medical interventions.

States in this study reported different mortality profiles for different substances, suggesting that local surveillance data are needed to help guide prevention efforts. Understanding distribution patterns of medications and illicit drugs in each state, the circumstances of their use (e.g., while alone or with others who could intervene), and the factors that contribute to increased use (e.g., chronic pain, substance abuse, or mental illness) also could help in developing effective public health strategies. Public health professionals should engage the help of others (e.g., substance abuse and mental health workers, law enforcement officials, medical examiners, and physicians) to reduce use of illicit drugs and misuse of prescription drugs, particularly opioids prescribed for pain management (9,10).

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* Poisoning refers to the damaging physiologic effects of ingestion, inhalation, or other exposure to a range of pharmaceuticals, illicit drugs, and chemicals, including pesticides, heavy metals, gases/vapors, and common household substances, such as bleach and ammonia.

† Colorado, Delaware, Florida, Kentucky, Massachusetts, New Mexico, North Carolina, Oregon, Utah, Washington, and Wisconsin. These 11 states participated in the 1999 State Injury Indicators Report (2), a collaborative effort of 26 state health departments, CDC, the Council of State and Territorial Epidemiologists, and the State and Territorial Injury Prevention Directors Association, which noted an increase in poisoning deaths.

§ Categorized on the basis of the following codes: **all poisonings:** *International Classification of Diseases, Ninth Revision* (ICD-9), E850--E869, E950--E952, E962, E980--E982, E972; *International Classification of Diseases and Related Health Problems, Tenth Revision* (ICD-10), X40--X49, X60--X69, X85--X90, Y10--Y19, Y35.2; **unintentional poisonings:** (ICD-9), E850--E869; (ICD-10), X40--X49; **suicides:** (ICD-9), E950--E952; (ICD-10), X60--X69; **homicides:** (ICD-9), E962; (ICD-10), X85--X90; and **poisonings of undetermined intent:** (ICD-9), E980--E982; (ICD-10), Y10--Y19.

¶ Colorado, Florida, Kentucky, Massachusetts, North Carolina, Utah, Washington, and Wisconsin.

Table

TABLE. Number and percentage* of selected substances identified from *International Classification of Diseases and Related Health Problems, Tenth Revision* (ICD-10) T-codes involved in unintentional or undetermined poisoning deaths, by state — eight states†, 1999–2000

Category	ICD-10 codes	Colorado		Florida		Kentucky		Massachusetts	
		No.	(%)	No.	(%)	No.	(%)	No.	(%)
Total no. poisoning deaths		628		1,939		443		918	
Total no. T-codes identified (T36–T65)	T36–T65	1,145		3,819		867		1,192	
Poisoning by drugs, medicaments, and biological substances	T36–T50	972 (84.9)		3,542 (92.7)		747 (86.2)		1,143 (95.9)	
Systemic antibiotics	T36	0	—	0	—	0	—	0	—
Other systemic antiinfectives and antiparasitics	T37	1 (0.1)		0	—	0	—	0	—
Hormones and their synthetic substitutes and antagonists, not elsewhere classified (NEC)	T38	7 (0.6)		5 (0.1)		0 (0.0)		1 (0.1)	
Nonopioid analgesics, antipyretics, and antirheumatics	T39	12 (1.0)		75 (2.0)		26 (3.0)		9 (0.8)	
Narcotics and psychodysleptics (hallucinogens)	T40	510 (44.5)		1,585 (41.5)		232 (26.8)		966 (81.0)	
Heroin	T40.1	78 (6.8)		321 (8.4)		2 (0.2)		24 (2.0)	
Other opioids	T40.2	79 (6.9)		449 (11.8)		92 (10.6)		45 (3.8)	
Methadone	T40.3	29 (2.5)		123 (3.2)		41 (4.7)		18 (1.5)	
Other synthetic narcotics	T40.4	32 (2.8)		135 (3.5)		12 (1.4)		17 (1.4)	
Cocaine	T40.5	169 (14.8)		426 (11.2)		38 (4.4)		309 (25.9)	
Other and unspecified narcotics	T40.6	118 (10.3)		122 (3.2)		45 (5.2)		553 (46.4)	
Anaesthetics and therapeutic gases	T41	2 (0.2)		15 (0.4)		1 (0.1)		0	—
Antiepileptic, sedative-hypnotic, and antiparkinson drugs	T42	52 (4.5)		249 (6.5)		56 (6.5)		27 (2.3)	
Barbiturates	T42.3	7 (0.6)		23 (0.6)		2 (0.2)		5 (0.4)	
Benzodiazepines	T42.4	38 (3.3)		185 (4.8)		51 (5.9)		19 (1.6)	
Other antiepileptic and sedative-hypnotic drugs	T42.6	2 (0.2)		4 (0.1)		0	—	1 (0.1)	
Antiparkinsonism drugs and other central muscle tone depressants	T42.8	2 (0.2)		33 (0.9)		1 (0.1)		2 (0.2)	
Psychotropic drugs, NEC	T43	92 (8.0)		236 (6.2)		63 (7.3)		48 (4.0)	
Tricyclic and tetracyclic antidepressants	T43.0	34 (3.0)		85 (2.2)		29 (3.3)		38 (3.2)	
Drugs primarily affecting the autonomic nervous system	T44	2 (0.2)		6 (0.2)		0	—	0	—
Primarily systemic and haematological agents, NEC	T45	9 (0.8)		50 (1.3)		9 (1.0)		3 (0.3)	
Agents primarily affecting the cardiovascular system	T46	9 (0.8)		27 (0.7)		8 (0.9)		6 (0.5)	
Agents primarily affecting the gastrointestinal system	T47	0	—	0	—	0	—	0	—
Agents primarily acting on smooth, skeletal muscle and respiratory system	T48	3 (0.3)		3 (0.1)		3 (0.3)		2 (0.2)	
Topical agents primarily affecting skin, mucous membrane	T49	0	—	6 (0.2)		0	—	0	—
Diuretics and other and unspecified drugs, medicaments, and biological substances	T50	273 (23.8)		1,285 (33.6)		349 (40.3)		81 (6.8)	
Other and unspecified drugs, medicaments, and biological substances	T50.9	271 (23.7)		1,275 (33.4)		345 (39.8)		81 (6.8)	
Toxic effects of substances: chiefly nonmedicinal source	T51–T65	173 (15.1)		277 (7.3)		120 (13.8)		49 (4.1)	
Alcohol	T51	134 (11.7)		201 (5.3)		62 (7.2)		27 (2.3)	
Carbon monoxide	T58	25 (2.2)		35 (0.9)		32 (3.7)		13 (1.1)	
Other gases, fumes, and vapors	T59	3 (0.3)		20 (0.5)		17 (2.0)		4 (0.3)	

* Percentages represent each substance as a percentage of all T-codes identified.

† Colorado, Florida, Kentucky, Massachusetts, North Carolina, Utah, Washington, and Wisconsin.

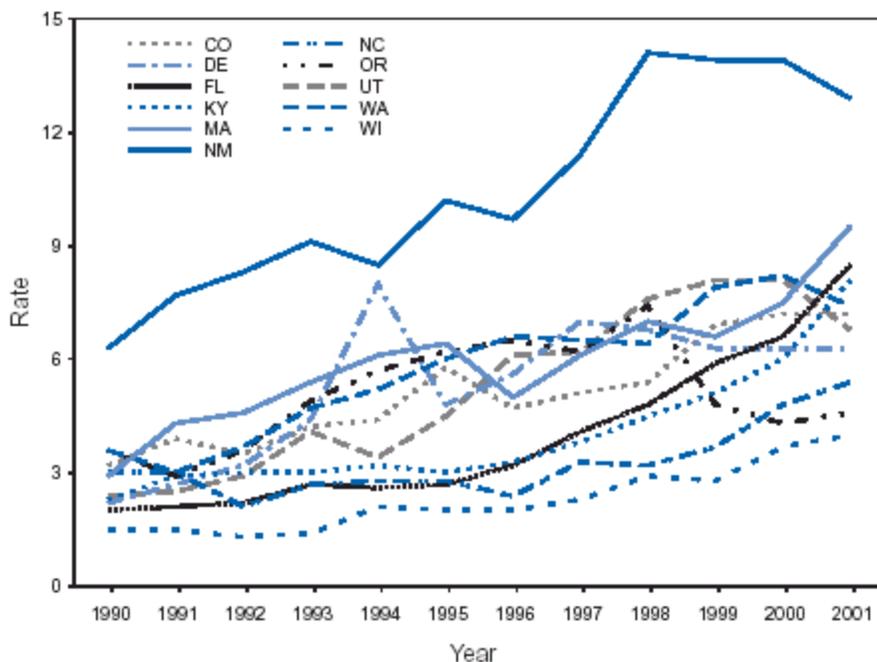
TABLE. (Continued) Number and percentage* of selected substances identified from *International Classification of Diseases and Related Health Problems, Tenth Revision (ICD-10)* T-codes involved in unintentional or undetermined poisoning deaths, by state — eight states†, 1999–2000

Category	North Carolina		Utah		Washington		Wisconsin		Total	
	No.	(%)	No.	(%)	No.	(%)	No.	(%)	No.	(%)
Total no. poisoning deaths	687		359		965		384		6,323	
Total no. T-codes identified (T36–T65)	913		793		1,157		670		10,556	
Poisoning by drugs, medicaments, and biological substances	767	(84.0)	732	(92.3)	928	(80.2)	584	(87.2)	9,415	(89.2)
Systemic antibiotics	1	(0.1)	0	—	0	—	0	—	1	(0.0)
Other systemic antiinfectives and antiparasitics	0	—	1	(0.1)	2	(0.2)	1	(0.1)	4	(0.0)
Hormones and their synthetic substitutes and antagonists, NEC	4	(0.4)	0	—	4	(0.3)	1	(0.1)	22	(0.2)
Nonopioid analgesics, antipyretics, and antirheumatics	19	(2.1)	8	(1.0)	44	(3.8)	15	(2.2)	208	(2.0)
Narcotics and psychodysleptics (hallucinogens)	528	(57.8)	480	(60.5)	751	(64.9)	286	(42.7)	5,338	(50.6)
Heroin	80	(8.8)	85	(10.7)	114	(9.9)	49	(7.3)	753	(7.1)
Other opioids	121	(13.3)	177	(22.3)	162	(14.0)	69	(10.3)	1,194	(11.3)
Methadone	112	(12.3)	45	(5.7)	115	(9.9)	27	(4.0)	510	(4.8)
Other synthetic narcotics	49	(5.4)	12	(1.5)	41	(3.5)	32	(4.8)	330	(3.1)
Cocaine	151	(16.5)	136	(17.2)	280	(24.2)	98	(14.6)	1,607	(15.2)
Other and unspecified narcotics	15	(1.6)	25	(3.2)	351	(30.3)	9	(1.3)	1,238	(11.7)
Anaesthetics and therapeutic gases	3	(0.3)	0	—	1	(0.1)	2	(0.3)	22	(0.2)
Antiepileptic, sedative-hypnotic, and antiparkinson drugs	49	(5.4)	32	(4.0)	123	(10.6)	53	(7.9)	641	(6.1)
Barbiturates	7	(0.8)	3	(0.4)	12	(1.0)	2	(0.3)	61	(0.6)
Benzodiazepines	31	(3.4)	17	(2.1)	92	(8.0)	30	(5.8)	472	(4.5)
Other antiepileptic and sedative-hypnotic drugs	6	(0.7)	3	(0.4)	8	(0.7)	3	(0.4)	25	(0.2)
Antiparkinsonism drugs and other central muscle-tone depressants	3	(0.3)	7	(0.9)	18	(1.6)	6	(0.9)	70	(0.7)
Psychotropic drugs, NEC	35	(3.8)	46	(5.8)	288	(24.9)	55	(8.2)	863	(8.2)
Tricyclic and tetracyclic antidepressants	18	(2.0)	7	(0.9)	106	(9.2)	23	(3.4)	340	(3.2)
Drugs primarily affecting the autonomic nervous system	3	(0.3)	3	(0.4)	9	(0.8)	5	(0.7)	26	(0.2)
Primarily systemic and haematological agents, NEC	19	(2.1)	7	(0.9)	41	(3.5)	14	(2.1)	152	(1.4)
Agents primarily affecting the cardiovascular system	13	(1.4)	1	(0.1)	16	(1.4)	11	(1.6)	91	(0.9)
Agents primarily affecting the gastrointestinal system	0	—	0	—	1	(0.1)	0	—	1	(0.0)
Agents primarily acting on smooth, skeletal muscle and respiratory system	4	(0.4)	2	(0.3)	4	(0.3)	11	(1.6)	32	(0.3)
Topical agents primarily affecting skin, mucous membrane	3	(0.3)	2	(0.3)	2	(0.2)	1	(0.1)	14	(0.1)
Diuretics and other and unspecified drugs, medicaments, and biological substances	86	(9.4)	150	(18.9)	478	(41.3)	129	(19.3)	2,831	(26.8)
Other and unspecified drugs, medicaments, and biological substances	85	(9.3)	149	(18.8)	478	(41.3)	129	(19.3)	2,813	(26.6)
Toxic effects of substances: chiefly nonmedicinal source	146	(16.0)	61	(7.7)	229	(19.8)	86	(12.8)	1,141	(10.8)
Alcohol	97	(10.6)	40	(5.0)	202	(17.5)	36	(5.4)	799	(7.6)
Carbon monoxide	28	(3.1)	10	(1.3)	18	(1.6)	37	(5.5)	198	(1.9)
Other gases, fumes, and vapors	9	(1.0)	7	(0.9)	6	(0.5)	5	(0.7)	71	(0.7)

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Figure

FIGURE. Death rates* for unintentional and undetermined poisonings, by year and state — 11 states†, 1990–2001



* Per 100,000 population.

† Colorado (CO), Delaware (DE), Florida (FL), Kentucky (KY), Massachusetts (MA), New Mexico (NM), North Carolina (NC), Oregon (OR), Utah (UT), Washington (WA), and Wisconsin (WI).

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